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Endmill

Drill

Tap

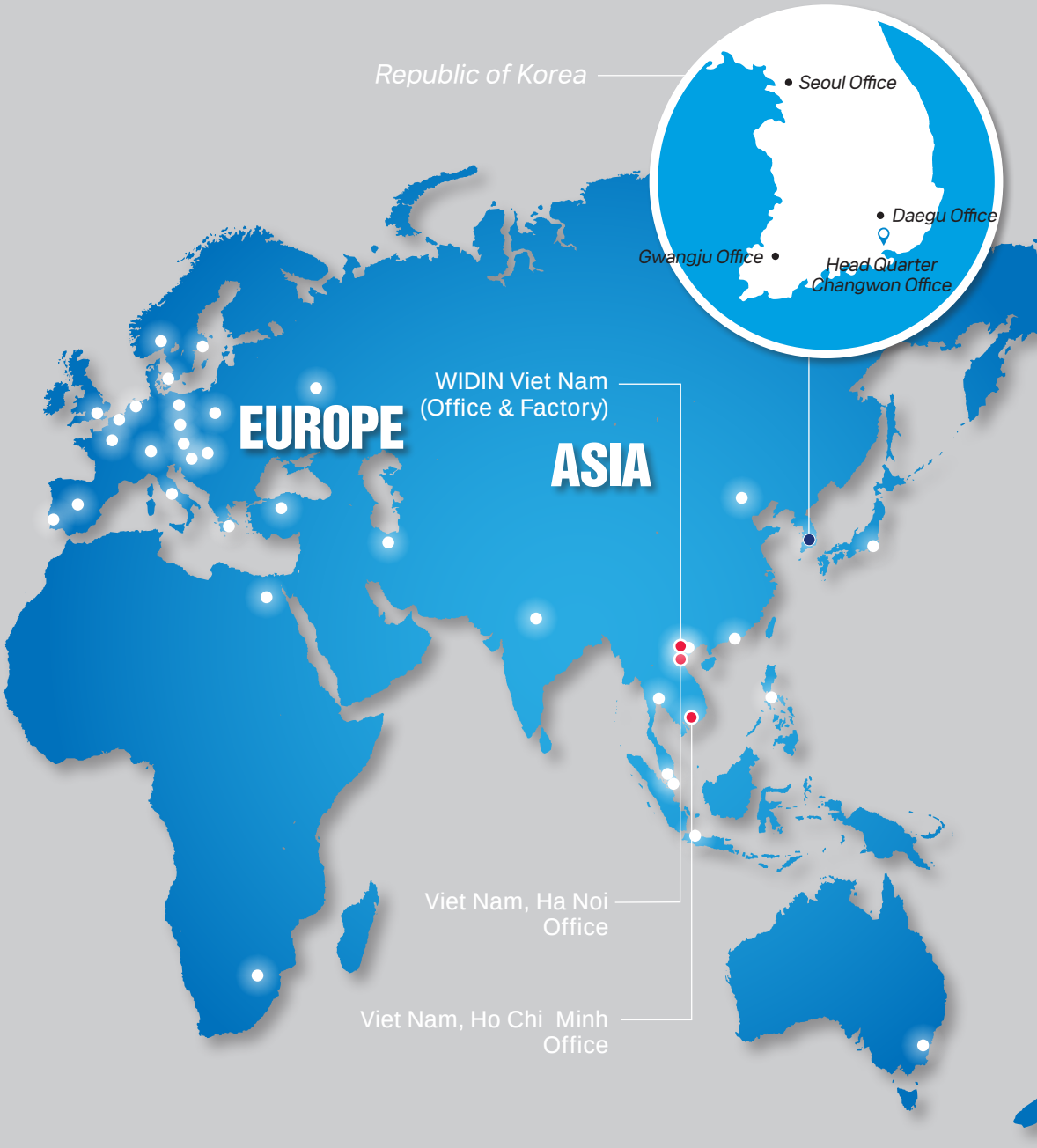
Center

Reamer

# 2023 ▸ 2024
# WIDIN PRODUCTS

WIDIN
DINE GROUP

# GLOBAL NETWORK



WIDIN USA
(Chicago Office)
AMERICA

# GUIDE LINE TO ICONS

| Section | Icon | Name | Description |
|---|---|---|---|
| Tool Material | | CARBIDE | Carbide |
| | | HSSE | HSSE |
| Surface Treatment | | AlTiN | Excellent wear resistance and heat resistance |
| | | TiAlN | Excellent oxidation resistance for high-speed processing |
| | | AlCrN | Excellent wear resistance and heat resistance |
| | | D.L.C | High surface hardness and excellent wear resistance |
| | | Diamond | Good wear resistance |
| | | CrN | Excellent wear resistance and welding resistance to copper and non-ferrous metals |
| | | TiN | Excellent welding resistance and wear resistance |
| | | TiCN | Excellent welding resistance, wear resistance, and heat resistance |
| | | Steam HOMO | Surface treatment with excellent welding resistance |
| | | Uncoated | Non coated |
| No. of Flute | | - | Indicates the number of flutes of the tool. |

| Section | Icon | Name | Description |
|---|---|---|---|
| DIN Standard | | DIN 371-374 376 | DIN371, 374, 376 |
| | | DIN 6537K | DIN6537K |
| | | DIN 6537L | DIN3567L |
| Roughing Shape | | FINE PITHC | For roughing |
| | | COARSE PITHC | For roughing (Wide pitch) |
| | | CHAMFERED PITCH | For finishing |
| Helix Angle | | - | The helix angle of the end mill |
| | | - | the helix angle of end mill and the variable helix angle |
| | | - | The helix angle of the drill |
| End Face Shape / Tolerance of Radius | | Ball Shape / R tolerance | R tolerance of ball end mill |
| | | Corner R Shape / R tolerance | Corner R tolerance of radius end mill |
| | | Chamfered end face | Chamfered end face |
| Shape of Cutting edge | | SHARP EDGE | Sharped cutting edge |
| Depth | | - | This indicates the drilling depth<br>* 3D, 5D, 8D, 10D, 20D |
| Point Angle | | - | Point angle on flute |
| Cutting Condition | | DATA | Refers to the indicated page for the cutting conditions reference table |

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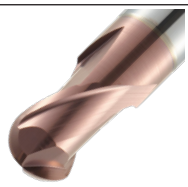
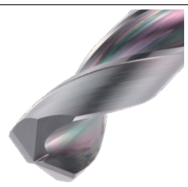
| **ENDMILL SERIES** | 16 |  |
| **DRILL SERIES** | 366 |  |
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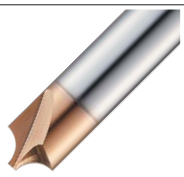
| **CENTERING TOOL SERIES** | 534 |  |
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# ENDMILL SERIES

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| | | ZE704 | | 4F | | ○ | | ○ | | D1 | D20 | 22 |
| | | ZE712 | | 2F | | ○ | | | | D1 | D12 | 23 |
| | | ZE714 | | 4F | | ○ | | | | D1 | D12 | 24 |
| | | ZE716 | | 6F | | ○ | | | | D6 | D20 | 25 |
| | | ZE724(6) | | 4&6F | | ○ | | ○ | | D1 | D12 | 26 |
| | | ZS124 | | 4F | | | ○ | | ○ | D2 | D12 | 27 |
| | | ZSLNS20 | | 2F | ○ | | | ○ | | D0.1 | D5 | 28 |
| | | ZSLNS40 | | 4F | ○ | | | ○ | | D1 | D5 | 33 |
| | RADIUS | ZR702 | | 2F | | ○ | | ○ | | D1 | D12 | 36 |
| | | ZR704 | | 4F | | ○ | | ○ | | D1 | D12 | 39 |
| | | ZR706 | | 6F | ○ | | | ○ | | D6 | D12 | 41 |
| | | ZR714 | | 4F | | ○ | | | | D3 | D12 | 42 |
| | | ZR724 | | 4F | ○ | | | ○ | | D6 | D12 | 43 |
| | | ZR732 | | 2F | | ○ | | ○ | | D1 | D12 | 44 |
| | | ZR734 | | 4F | | ○ | | | | D1 | D12 | 45 |
| | | ZR736 | | 6F | | ○ | | | | D6 | D12 | 46 |
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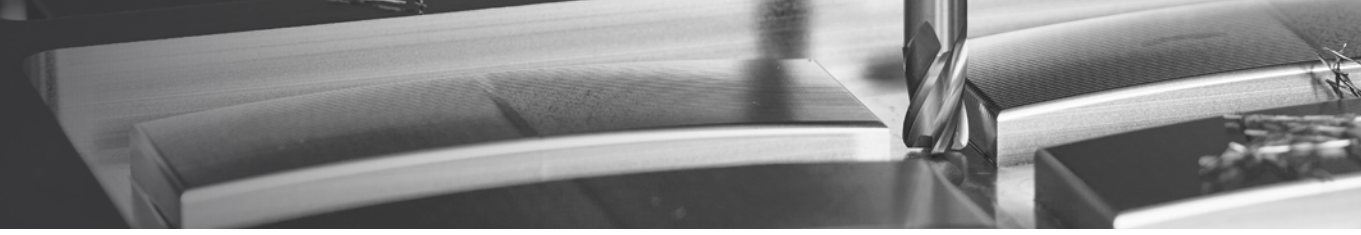
| | | ESE712 | | 2F | | ○ | | | | D1.0 | D12.0 | 77 |



| Series | Type | EDP No | Geometry | Flutes | Length | | | Neck | Multi Helix | Diameter(mm) | | Page |
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| | | | | | Short | Middle | Long | | | Min | Max | |
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| | | ESLNS20 | | 2F | ○ | | | ○ | | D0.1 | D5.0 | 91 |
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| | RADIUS | ESR702 | | 2F | | ○ | | ○ | | D1.0 | D12.0 | 99 |
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# ENDMILL SERIES

| Series | Type | EDP No | Geometry | Flutes | Length | | | Neck | Multi Helix | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Short | Middle | Long | | | Min | Max | |
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| | | UE522 | | 2F | | | ○ | | | D1 | D25 | 165 |
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| | | UXE504 | | 4F | ○ | ○ | ○ | | ○ | D1 | D20 | 178 |
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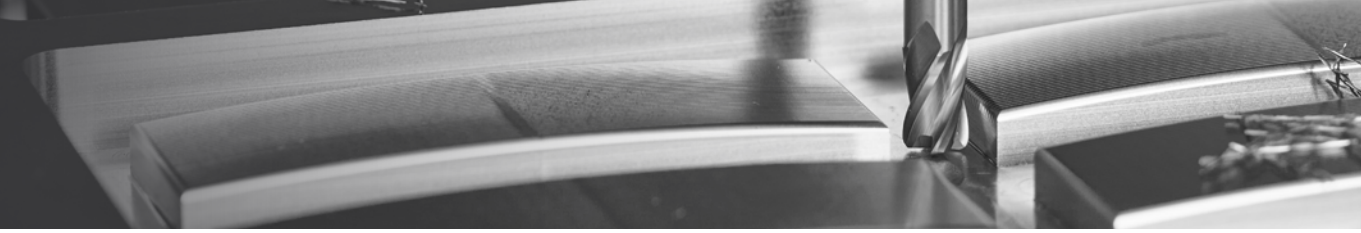

| Series | Type | EDP No | Geometry | Flutes | Length | | | Neck | Multi Helix | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Short | Middle | Long | | | Min | Max | |
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# ENDMILL SERIES

| Series | Type | EDP No | Geometry | Flutes | Length | | | Neck | Multi Helix | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Short | Middle | Long | | | Min | Max | |
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| | | XR504 | | 4F | | ○ | | | ○ | D2 | D25 | 301 |
| | | XR505 | | 5F | | ○ | | | ○ | D6 | D25 | 302 |
| | | XR514 | | 4F | | ○ | | | ○ | D2 | D20 | 303 |
| | BALL | XXB504 | | 4F | | ○ | | | ○ | R2 | R6 | 304 |
| | CHAMFER | XCC503 | | 3F | | ○ | | | ○ | D2 | D25 | 305 |
| | | XCC504 | | 4F | | ○ | | | ○ | D6 | D25 | 306 |
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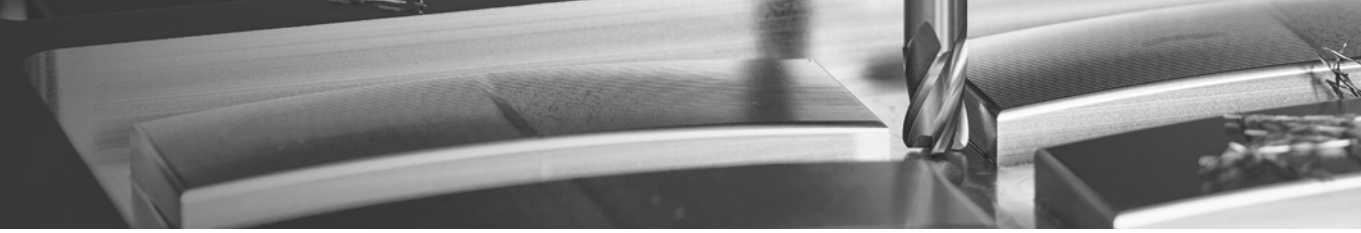

| Series | Type | EDP No | Geometry | Flutes | Length | | | Neck | Multi Helix | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Short | Middle | Long | | | Min | Max | |
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| | BALL | WAB312 | | 2F | ○ | | | ○ | | R3 | R10 | 334 |
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| | | WGE504 | | 4F | ○ | ○ | ○ | | | D2 | D20 | 358 |
| | RADIUS | WGR502 |  | 2F | | ○ | | ○ | | D0.2 | D6 | 359 |
| | | WGR504 |  | 4F | | ○ | | | | D3 | D20 | 360 |
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| | | WGB504 | | 4F | | ○ | | ○ | | R0.5 | R10 | 363 |

# DRILL SERIES

| Series | EDP No | Geometry | Flutes | Length | | | | | | | P | M | K | N | S | H | Internal coolant | Cutting Edge Tolerance | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3D | 4D | 5D | 7D | 8D | 10D | 20D | | | | | | | | | |
| New NEW DOLPHIN P. 368 | NDPG503 | | 2F | ○ | | | | | | | ◎ | ◎ | ○ | | ○ | | External | h7 | 372 |
| | NDPG504 | | 2F | | ○ | | | | | | ◎ | ◎ | ○ | | ○ | | External | h7 | 375 |
| | NDPG507 | | 2F | | | | ○ | | | | ◎ | ◎ | ○ | | ○ | | External | h7 | 378 |
| | NDPK504 (NDPR/L) | | 2F | | ○ | | | | | | ○ | | ◎ | | | | External | h7 | 381 |
| | NDPK507 (NDPR/L) | | 2F | | | | ○ | | | | ○ | | ◎ | | | | External | h7 | 384 |
| POWER MAX P. 388 | PF503 | | 2F | ○ | | | | | | | ◎ | ○ | ◎ | | | | External | h8 | 390 |
| | PF505 | | 2F | | | ○ | | | | | ◎ | ○ | ◎ | | | | External | h8 | 393 |
| | SF503 | | 2F | ○ | | | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | h8 | 396 |
| | SF505 | | 2F | | | ○ | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | h8 | 399 |
| | SF508 |  | 2F | | | | | ○ | | | ◎ | ◎ | ◎ | | ○ | | Internal | h7 | 402 |
| | SF510 |  | 2F | | | | | | ○ | | ◎ | ○ | ◎ | | | | Internal | h8 | 405 |
| | SF520 |  | 2F | | | | | | | ○ | ◎ | ○ | ◎ | | | | Internal | h8 | 407 |
| | HP503 | | 2F | ○ | | | | | | | ◎ | ○ | ◎ | | | | External | m7 | 409 |
| | HPI503 | | 2F | ○ | | | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 411 |
| | HPI505 | | 2F | | | ○ | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 414 |
| | HPI508-N | | 2F | | | | | ○ | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 417 |
| | P503A(F) | | 2F | ○ | | | | | | | ◎ | ○ | ◎ | | | | External | m7 | 420 |
| | P505A(F) | | 2F | | | ○ | | | | | ◎ | ○ | ◎ | | | | External | m7 | 423 |
| | PI503A(F) | | 2F | ○ | | | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 426 |
| | PI505A(F) | | 2F | | | ○ | | | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 429 |
| | PI508 | | 2F | | | | | ○ | | | ◎ | ◎ | ◎ | | ○ | | Internal | m7 | 432 |
| SOLID SPIRAL P. 434 | SSD | | 2F | | ○ | | | | | | ○ | | ○ | ◎ | | | External | h8 | 436 |
| | SSDL | | 2F | | | | ○ | | | | ○ | | ○ | ◎ | | | External | h8 | 439 |
| | SSTD | | 2F | | ○ | | | | | | ○ | | ○ | ◎ | | | External | h8 | 441 |
| | SSTDL | | 2F | | | | ○ | | | | ○ | | ○ | ◎ | | | External | h8 | 443 |
| | APF | | 3F | | | ○ | | | | | ○ | | | ◎ | | | External | 0 ~ -0.012 | 445 |

NEW DOLPHIN

# TAP SERIES

| Series | | Type | EDP No | Geometry | Coating | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Coating | UnCoating | Min | Max | |
| CARBIDE TAP P. 450 | JIS | SPIRAL | WPOM | | | ○ | M3 | M12 | 452 |
| | | | WPCM | | TiCN | | M3 | M12 | 453 |
| | | STRAIGHT | WSOM | | | ○ | M3 | M12 | 454 |
| | | | WSCM | | TiCN | | M3 | M12 | 455 |
| | | ROLL | WROM | | | ○ | M3 | M12 | 456 |
| | | | WRCM | | TiCN | | M3 | M12 | 457 |
| | | SPIRAL ROLL | WFOM | | | ○ | M3 | M6 | 458 |
| | | | WFCM | | TiCN | | M3 | M6 | 459 |
| | DIN | SPIRAL | WQOM | | | ○ | M3 | M12 | 461 |
| | | | WQCM | | TiCN | | M3 | M12 | 462 |
| | | STRAIGHT | WGOM | | | ○ | M3 | M12 | 463 |
| | | | WGCM | | TiCN | | M3 | M12 | 464 |
| | | ROLL | WMOM | | | ○ | M3 | M12 | 465 |
| | | | WMCM | | TiCN | | M3 | M12 | 467 |
| HSSE TAP P. 470 | JIS | SPIRAL | VPOM | | | ○ | M3 | M24 | 471 |
| | | | VPTM | | TiN | | M3 | M24 | 473 |
| | | | VPCM | | TiCN | | M3 | M24 | 475 |
| | | | VPHM | | HOMO | | M3 | M24 | 477 |
| | | POINT | VNOM | | | ○ | M3 | M24 | 479 |
| | | | VNTM | | TiN | | M3 | M24 | 481 |
| | | | VNCM | | TiCN | | M3 | M24 | 483 |
| | | | VNHM | | HOMO | | M3 | M24 | 485 |
| | | STRAIGHT | VSOM | | | ○ | M3 | M24 | 487 |
| | | | VSTM | | TiN | | M3 | M24 | 489 |
| | | | VSCM | | TiCN | | M3 | M24 | 491 |
| | | | VSHM | | HOMO | | M3 | M24 | 493 |
| | | ROLL | VROM | | | ○ | M3 | M12 | 495 |
| | | | VRTM | | TiN | | M3 | M12 | 496 |
| | | | VRCM | | TiCN | | M3 | M12 | 497 |
| | | SPIRAL ROLL | VFOM | | | ○ | M3 | M6 | 498 |
| | | | VFTM | | TiN | | M3 | M6 | 499 |

# TAP SERIES

| Series | | Type | EDP No | Geometry | Coating | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Coating | UnCoating | Min | Max | |
| HSSE TAP P. 470 | JIS | SPIRAL ROLL | VFCM | | TiCN | | M3 | M6 | 500 |
| | DIN | SPIRAL | VQOM | | | ○ | M3 | M24 | 503 |
| | | | VQTM | | TiN | | M3 | M24 | 505 |
| | | | VQCM | | TiCN | | M3 | M24 | 507 |
| | | | VQHM | | HOMO | | M3 | M24 | 509 |
| | | POINT | VDOM | | | ○ | M3 | M24 | 511 |
| | | | VDTM | | TiN | | M3 | M24 | 513 |
| | | | VDCM | | TiCN | | M3 | M24 | 515 |
| | | | VDHM | | HOMO | | M3 | M24 | 517 |
| | | STRAIGHT | VGOM | | | ○ | M3 | M24 | 519 |
| | | | VGTM | | TiN | | M3 | M24 | 521 |
| | | | VGCM | | TiCN | | M3 | M24 | 523 |
| | | | VGHM | | HOMO | | M3 | M24 | 525 |
| | | ROLL | VMOM | | | ○ | M3 | M12 | 527 |
| | | | VMTM | | TiN | | M3 | M12 | 529 |
| | | | VMCM | | TiCN | | M3 | M12 | 531 |

# CENTERING TOOL & REAMER SERIES

| Series | Type | EDP No | Geometry | Flutes | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | |
| CENTERING TOOL P. 536 | - | CDS | | 2F | D1 | D5 | 538 |
| | - | LDS | | 2F | D3 | D20 | 539 |
| | - | LDF---W | | 2F | D3 | D12 | 540 |
| | - | CES302 (60°) | | 2F | D3 | D20 | 541 |
| | - | CES302 (90°) | | 2F | D3 | D20 | 542 |
| | - | CEM---W | | 2F | D10 | D20 | 543 |
| | - | CRC | | 2F | D2 | D20 | 544 |
| | - | CFT---W | | 3~4F | D6 | D12 | 545 |
| | - | CCT | | 2F | D3 | D12 | 546 |
| | - | CCF | | 2F | D2 | D12 | 547 |
| REAMER P. 550 | STRAIGHT | SSR | | 4&6F | D2 | D12 | 551 |
| | 7˚Left Helix | SHR | | 4&6F | D2 | D12 | 552 |
| | | HRS---W | | 4&6F | D1.98 | D12.05 | 553 |
| | 60˚ Left Helix | SBR | | 4&6F | D3 | D20 | 555 |

# ENDMILL SERIES

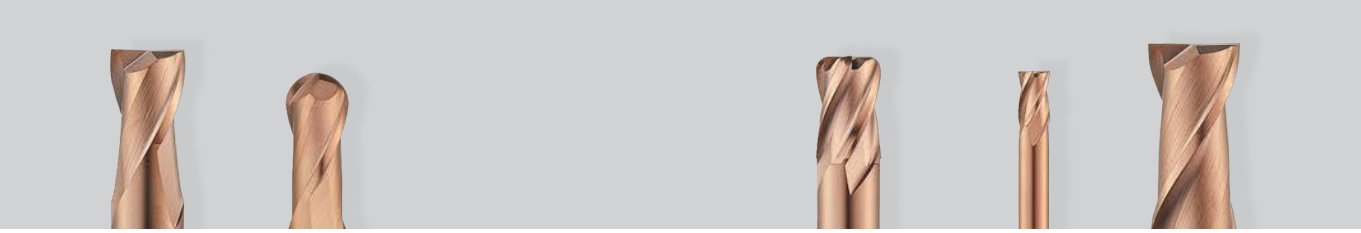
| | | |
|---|---|---|
| **ZAMUS STAR ENDMILL**<br>High Hardness HRc 50 ~ 70 | 18 | |
| **E-STAR ENDMILL** new<br>High Hardness HRc 50 ~ 63 | 72 | |
| **U-WING ENDMILL** new<br>Mid Hardness HRc 30 ~ 50 | 154 | |
| **ZAMUS THUNDER ENDMILL**<br>Low Hardness HRc 10 ~ 30 | 264 | |
| **X-STAR ENDMILL**<br>Difficult To Cut Material and Low Hardness Material HRc ~ 35 | 290 | |
| **S-WING ENDMILL** new<br>Difficult To Cut Material (STS, Ti, Ni and Inconel) | 308 | |
| **ALU-WAVE ENDMILL**<br>Aluminum, Aluminum Alloy and Non-ferrous Materials | 324 | |
| **STANDARD ENDMILL**<br>Low Hardness Materials under HRc 30 | 336 | |
| **COPPER-MATE ENDMILL**<br>Copper, Bronze and Non-ferrous Materials | 352 | |
| **GRA-MATE ENDMILL**<br>Graphite, Reinforced Plastics, Non-ferrous Materials | 356 | |

# ZAMUS STAR ENDMILL

High Hardness HRc 50 ~ 70

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | ZE702 | | 2 FLUTES NECK SQUARE ENDMILL | D0.1 | D20 | 21 |
| | 4F | ZE704 | | 4 FLUTES NECK SQUARE ENDMILL | D1 | D20 | 22 |
| | 2F | ZE712 | | 2 FLUTES SQUARE ENDMILL | D1 | D12 | 23 |
| | 4F | ZE714 | | 4 FLUTES SQUARE ENDMILL | D1 | D12 | 24 |
| | 6F | ZE716 | | 6 FLUTES SQUARE ENDMILL | D6 | D20 | 25 |
| | 4F&6F | ZE724(6) | | 4&6 FLUTES NECK SQUARE ENDMILL | D1 | D12 | 26 |
| | 4F | ZS124 | | 4 FLUTES SQUARE ENDMILL | D2 | D12 | 27 |
| | 2F | ZSLNS20 | | 2 FLUTES LONG NECK SQUARE ENDMILL | D0.1 | D5 | 28 |
| | 4F | ZSLNS40 | | 4 FLUTES LONG NECK SQUARE ENDMILL | D1 | D5 | 33 |
| RADIUS | 2F | ZR702 | | 2 FLUTES NECK RADIUS ENDMILL | D1 | D12 | 36 |
| | 4F | ZR704 | | 4 FLUTES NECK RADIUS ENDMILL | D1 | D12 | 39 |
| | 6F | ZR706 | | 6 FLUTES NECK RADIUS ENDMILL | D6 | D12 | 41 |
| | 4F | ZR714 | | 4 FLUTES RADIUS ENDMILL | D3 | D12 | 42 |
| | 4F | ZR724 | | 4 FLUTES NECK RADIUS ENDMILL | D6 | D12 | 43 |
| | 2F | ZR732 | | 2 FLUTES LONG SHANK RADIUS ENDMILL | D1 | D12 | 44 |
| | 4F | ZR734 | | 4 FLUTES LONG SHANK RADIUS ENDMILL | D1 | D12 | 45 |
| | 6F | ZR736 | | 6 FLUTES RADIUS ENDMILL | D6 | D12 | 46 |
| | 4F | ZS1(2)04 | | 4 FLUTES NECK RADIUS ENDMILL | D1 | D12 | 47 |
| | 4F | ZS204 | | 4 FLUTES NECK RADIUS ENDMILL | D2 | D12 | 48 |
| | 2F | ZSLNR20 | | 2 FLUTES LONG NECK RADIUS ENDMILL | D0.1 | D5 | 49 |
| | 2F | ZSTNR20 | | 2 FLUTES TAPERED NECK RADIUS ENDMILL | D2 | D3 | 53 |
| | 4F | ZSPM4 | | 4 FLUTES NECK RADIUS ENDMILL | D3 | D12 | 56 |
| BALL | 2F | DB702 | | 2 FLUTES NECK BALL NOSE ENDMILL | R0.05 | R6 | 57 |
| | 3F | DB703 | | 3 FLUTES NECK BALL NOSE ENDMILL | R1 | R6 | 58 |
| | 2F | DB712 | | 2 FLUTES BALL NOSE ENDMILL | R0.5 | R6 | 59 |
| | 4F | DB734 | | 4 FLUTES 15° HELIX BALL NOSE ENDMILL | R1 | R5 | 60 |
| | 2F | ZSLNB20 | | 2 FLUTES LONG NECK BALL NOSE ENDMILL | R0.05 | R2.5 | 61 |
| | 2F | ZSTNB20 | | 2 FLUTES TAPERED NECK BALL NOSE ENDMILL | R0.1 | R5 | 65 |
| | 3F | ZSTNB30 | | 3 FLUTES TAPERED NECK BALL NOSE ENDMILL | R0.5 | R2.5 | 69 |



## EDP No System

*If expressed as an integer, the decimal point is omitted.

| Z | R | 7 | 0 | 4 | 020 | 03 | 06 | S04 |
|---|---|---|---|---|---|---|---|---|

| Section | Appearance | Grade | Length, Shank Type | Flute | Cutting Dia | Corner R | Effective Length | Shank Dia |
|---|---|---|---|---|---|---|---|---|
| Z : Zamus | E : Square | 7 : Grade | 0 : Neck | 2 : 2 Flutes | 0.05 | 0.05 | | 4 |
| D : Dynamic | R : Radius | | 1 : Straight, Neck | 3 : 3 Flutes | ~ | ~ | | ~ |
| ZS : Zamus Star | B : Ball | | 2 : Long Neck | 4 : 4 Flutes | 20 | 3 | For more information, Refer to the detail pages. | 20 |
| | LNS : Long Neck Square | | 3 : Long Shank | 6 : 6 Flutes | | | | |
| | LNR : Long Neck Radius | | | | | | | |
| | LNB : Long Neck Ball | | | | | | | |
| | PM : Power Mill | | | | | | | |

Ex) 4 Flutes / Cutting Dia Ø2 / Corner R 0.3 / Effective Length 6mm / Shank Dia 4 / 70 Grade / Corner Radius Neck Type Zamus Endmill

# ZAMUS STAR ENDMILL

High Hardness HRc 50 ~ 70

## Characteristics

· Suitable for high-speed processing of high-hardness workpieces (recommended: HRc 50 ~ 70) such as heat treated steel, alloy steel, and carbon steel

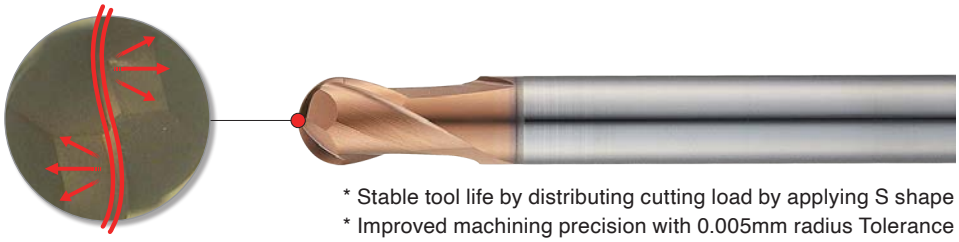
· Suitable for various type of machining with diverse specifications such as long neck, rib, and tapered neck

## Features

· Improved cutting edge strength of tools by using ultra-fine material

· Maintains hardness of the blade and has high temperature oxidation resistance and during high-speed processing by applying AlTiN coating

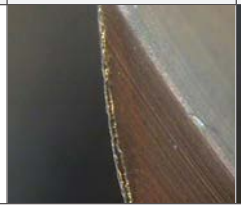
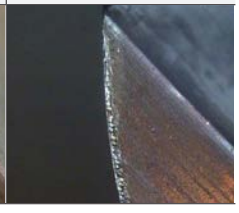
· Stable performance with designed cutting edge suitable for high-speed machining of high-hardness workpieces



* Stable tool life by distributing cutting load by applying S shape

* Improved machining precision with 0.005mm radius Tolerance

## Case Study

| | *Zamus Star* | Competitor |
|---|---|---|
| BALL |  |  |

TEST TOOL : DB702120

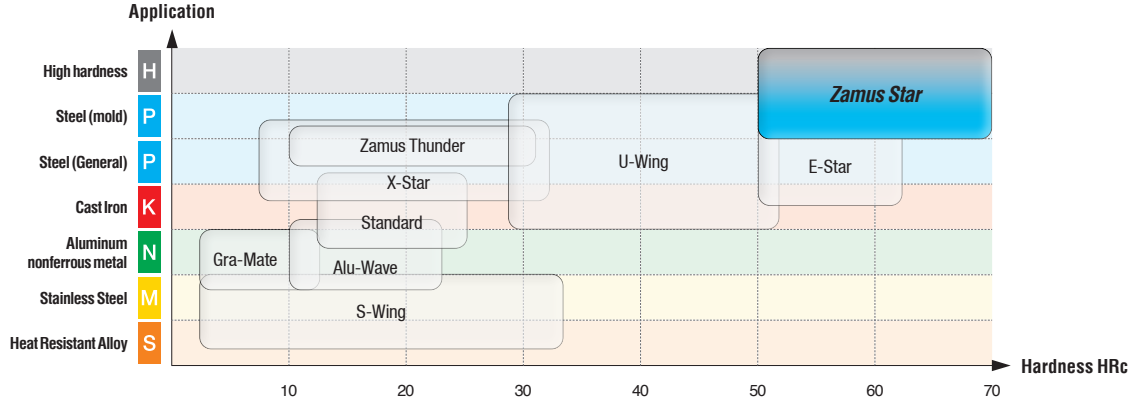
· MATERIAL : SKD11 Heat treatment / RPM : 5,950 / FEED : 1,870 / ap : 0.25 / ae : 0.6

| | *Zamus Star* | Competitor |
|---|---|---|
| CONER RADIUS | | |

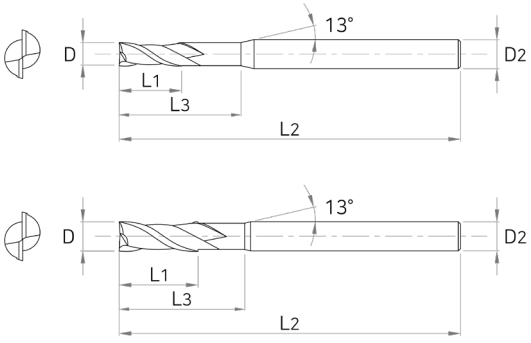
TEST TOOL : ZS2041001032

· MATERIAL : SKD11 Heat treatment / RPM : 5,500 / FEED : 1,100 / ap : 10 / ae : 0.5

## Applications



# ZE702 | 2 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~20 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.561

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ZE702 001 | 0.1 | 0.2 | - | 40 | 4 |
| ZE702 002 | 0.2 | 0.4 | - | 40 | 4 |
| ZE702 003 | 0.3 | 0.5 | - | 40 | 4 |
| ZE702 004 | 0.4 | 0.7 | - | 40 | 4 |
| ZE702 005 | 0.5 | 1 | - | 40 | 4 |
| ZE702 006 | 0.6 | 1.2 | - | 40 | 4 |
| ZE702 007 | 0.7 | 1.4 | - | 40 | 4 |
| ZE702 008 | 0.8 | 1.6 | - | 40 | 4 |
| ZE702 009 | 0.9 | 2 | - | 40 | 4 |
| ZE702 010 S4 | 1 | 1.5 | - | 40 | 4 |
| ZE702 010 | 1 | 1.5 | - | 40 | 6 |
| ZE702 015 | 1.5 | 2.2 | - | 40 | 6 |
| ZE702 020 S4 | 2 | 3 | 6 | 40 | 4 |

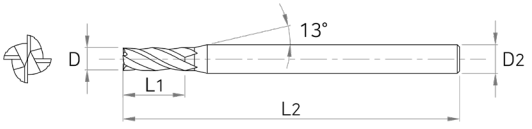
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ZE702 020 | 2 | 3 | 6 | 40 | 6 |
| ZE702 025 | 2.5 | 4 | 6 | 40 | 6 |
| ZE702 030 | 3 | 4 | 7 | 45 | 6 |
| ZE702 035 | 3.5 | 6 | 9 | 45 | 6 |
| ZE702 040 | 4 | 6 | 9 | 45 | 6 |
| ZE702 045 | 4.5 | 6 | 10 | 45 | 6 |
| ZE702 050 | 5 | 6 | 11 | 50 | 6 |
| ZE702 060 | 6 | 7 | 14 | 50 | 6 |
| ZE702 080 | 8 | 9 | 18 | 60 | 8 |
| ZE702 100 | 10 | 12 | 25 | 75 | 10 |
| ZE702 120 | 12 | 15 | 30 | 75 | 12 |
| ZE702 160 | 16 | 18 | 38 | 90 | 16 |
| ZE702 200 | 20 | 24 | 45 | 100 | 20 |

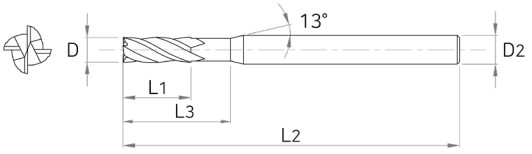
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE704 | 4 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~20 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.562

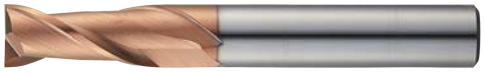
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ZE704 010 S4 | 1 | 1.5 | - | 40 | 4 |
| ZE704 010 | 1 | 1.5 | - | 40 | 6 |
| ZE704 015 | 1.5 | 2.2 | - | 40 | 6 |
| ZE704 020 S4 | 2 | 3 | 6 | 40 | 4 |
| ZE704 020 | 2 | 3 | 6 | 40 | 6 |
| ZE704 025 | 2.5 | 4 | 6 | 40 | 6 |
| ZE704 030 | 3 | 4 | 7 | 45 | 6 |
| ZE704 035 | 3.5 | 5 | 9 | 45 | 6 |
| ZE704 040 | 4 | 5 | 9 | 45 | 6 |
| ZE704 045 | 4.5 | 6 | 10 | 45 | 6 |
| ZE704 050 | 5 | 6 | 11 | 50 | 6 |
| ZE704 060 | 6 | 7 | 14 | 50 | 6 |
| ZE704 080 | 8 | 9 | 18 | 60 | 8 |
| ZE704 100 | 10 | 12 | 25 | 75 | 10 |
| ZE704 120 | 12 | 15 | 30 | 75 | 12 |
| ZE704 160 | 16 | 18 | 38 | 90 | 16 |
| ZE704 200 | 20 | 24 | 45 | 100 | 20 |

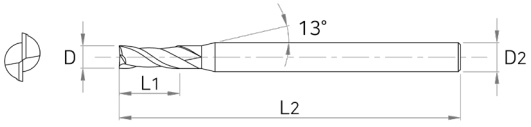
## ■ Applicable Working Material

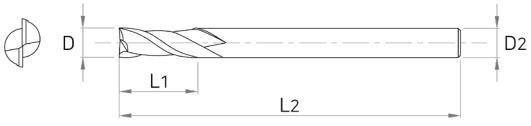
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE712 | 2 FLUTES SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 2 | 35° HELIX | DATA P.561

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE712 010-02 | 1 | 2 | 40 | 6 |
| ZE712 010 | 1 | 3 | 40 | 6 |
| ZE712 010-04 | 1 | 4 | 40 | 6 |
| ZE712 012 | 1.2 | 3 | 40 | 6 |
| ZE712 015 | 1.5 | 4 | 40 | 6 |
| ZE712 015-06 | 1.5 | 6 | 40 | 6 |
| ZE712 015-08 | 1.5 | 8 | 40 | 6 |
| ZE712 020 | 2 | 5 | 40 | 6 |
| ZE712 020-08 | 2 | 8 | 40 | 6 |
| ZE712 020-10 | 2 | 10 | 50 | 6 |
| ZE712 025 | 2.5 | 6 | 40 | 6 |
| ZE712 030 | 3 | 8 | 45 | 6 |
| ZE712 030-10 | 3 | 10 | 50 | 6 |
| ZE712 030-12 | 3 | 12 | 50 | 6 |
| ZE712 035 | 3.5 | 10 | 45 | 6 |

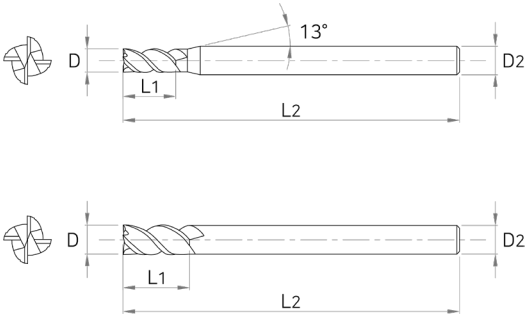
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE712 040 | 4 | 10 | 45 | 6 |
| ZE712 040-12 | 4 | 12 | 50 | 6 |
| ZE712 040-16 | 4 | 16 | 60 | 6 |
| ZE712 045 | 4.5 | 11 | 45 | 6 |
| ZE712 050 | 5 | 13 | 50 | 6 |
| ZE712 055 | 5.5 | 13 | 50 | 6 |
| ZE712 060 | 6 | 13 | 50 | 6 |
| ZE712 060-15 | 6 | 15 | 60 | 6 |
| ZE712 065 | 6.5 | 16 | 60 | 8 |
| ZE712 070 | 7 | 18 | 60 | 8 |
| ZE712 080 | 8 | 19 | 60 | 8 |
| ZE712 100 | 10 | 22 | 70 | 10 |
| ZE712 120 | 12 | 26 | 75 | 12 |
| ZE712 120-30 | 12 | 30 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE714 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | 45° HELIX | DATA P.562

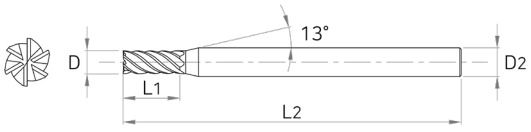
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE714 010 | 1 | 2.5 | 40 | 6 |
| ZE714 012 | 1.2 | 3 | 40 | 6 |
| ZE714 015 | 1.5 | 4 | 40 | 6 |
| ZE714 020 | 2 | 5 | 40 | 6 |
| ZE714 025 | 2.5 | 6 | 40 | 6 |
| ZE714 030 | 3 | 8 | 45 | 6 |
| ZE714 035 | 3.5 | 9 | 45 | 6 |
| ZE714 040 | 4 | 10 | 45 | 6 |
| ZE714 050 | 5 | 13 | 50 | 6 |
| ZE714 060 | 6 | 13 | 50 | 6 |
| ZE714 060-15 | 6 | 15 | 60 | 6 |
| ZE714 080 | 8 | 19 | 60 | 8 |
| ZE714 100 | 10 | 22 | 70 | 10 |
| ZE714 100-25 | 10 | 25 | 70 | 10 |
| ZE714 120 | 12 | 26 | 75 | 12 |
| ZE714 120-30 | 12 | 30 | 80 | 12 |

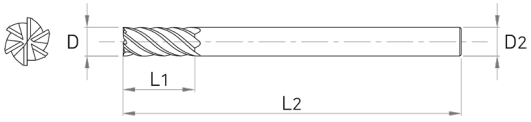
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE716 | 6 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 6 | 50° HELIX | DATA P.563

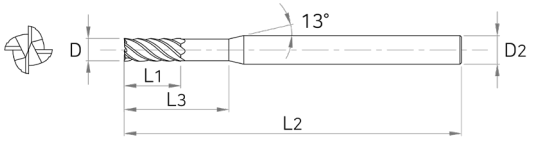
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE716 060 | 6 | 13 | 50 | 6 |
| ZE716 080 | 8 | 18 | 60 | 8 |
| ZE716 100 | 10 | 22 | 70 | 10 |
| ZE716 120 | 12 | 26 | 75 | 12 |
| ZE716 160 | 16 | 35 | 90 | 16 |
| ZE716 200 | 20 | 44 | 100 | 20 |

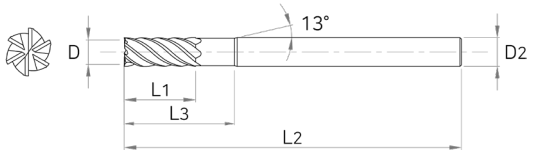
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE724(6) | 4&6 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 4 | 6 | 45° HELIX Z=4 | 60° HELIX Z=6 | DATA P.562

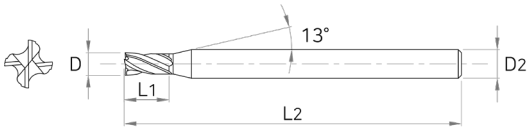
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| ZE724 010 | 1 | 1.5 | 5 | 45 | 6 | 4 |
| ZE724 015 | 1.5 | 2.2 | 6 | 45 | 6 | 4 |
| ZE724 020 | 2 | 3 | 8 | 45 | 6 | 4 |
| ZE724 030 | 3 | 4 | 9 | 50 | 6 | 4 |
| ZE724 040 | 4 | 5 | 12 | 50 | 6 | 4 |
| ZE724 050 | 5 | 6 | 15 | 50 | 6 | 4 |
| ZE726 060 | 6 | 7 | 20 | 60 | 6 | 6 |
| ZE726 080 | 8 | 9 | 25 | 70 | 8 | 6 |
| ZE726 100 | 10 | 12 | 32 | 75 | 10 | 6 |
| ZE726 120 | 12 | 15 | 38 | 80 | 12 | 6 |

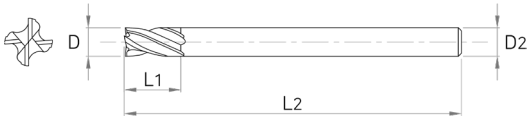
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZS124 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | DATA P.565

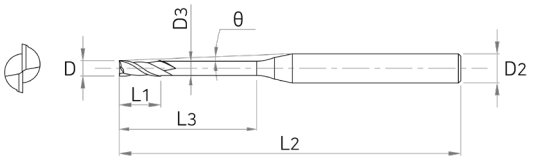
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZS124 020 | 2 | 5 | 45 | 4 |
| ZS124 030 | 3 | 8 | 45 | 6 |
| ZS124 040 | 4 | 10 | 45 | 6 |
| ZS124 060 | 6 | 16 | 50 | 6 |
| ZS124 080 | 8 | 20 | 60 | 8 |
| ZS124 100 | 10 | 25 | 75 | 10 |
| ZS124 120 | 12 | 35 | 85 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 0.5 | 0 ~ -0.012 | h5 |
| D0.6 ~ 5 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.563

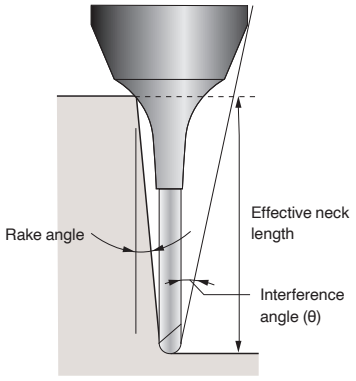
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 2001-0.3 | 0.1 | 0.15 | 0.3 | 0.08 | 45 | 4 | 11.6 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| ZSLNS 2001-0.5 | 0.1 | 0.15 | 0.5 | 0.08 | 45 | 4 | 11.4 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 |
| ZSLNS 2001-1 | 0.1 | 0.15 | 1 | 0.08 | 45 | 4 | 10.9 | 1.2 | 1.2 | 1.2 | 1.3 | 1.4 |
| ZSLNS 2002-0.5 | 0.2 | 0.3 | 0.5 | 0.17 | 50 | 4 | 11.3 | 1.2 | 1.3 | 1.5 | 1.7 | 2 |
| ZSLNS 2002-1 | 0.2 | 0.3 | 1 | 0.17 | 50 | 4 | 10.8 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ZSLNS 2002-1.5 | 0.2 | 0.3 | 1.5 | 0.17 | 50 | 4 | 10.3 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ZSLNS 2003-1 | 0.3 | 0.45 | 1 | 0.27 | 50 | 4 | 10.8 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ZSLNS 2003-1.5 | 0.3 | 0.45 | 1.5 | 0.27 | 50 | 4 | 10.3 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ZSLNS 2003-2 | 0.3 | 0.45 | 2 | 0.27 | 50 | 4 | 9.8 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNS 2003-2.5 | 0.3 | 0.45 | 2.5 | 0.27 | 50 | 4 | 9.4 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |
| ZSLNS 2003-3 | 0.3 | 0.45 | 3 | 0.27 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ZSLNS 2004-1 | 0.4 | 0.6 | 1 | 0.37 | 50 | 4 | 10.7 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ZSLNS 2004-1.5 | 0.4 | 0.6 | 1.5 | 0.37 | 50 | 4 | 10.2 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ZSLNS 2004-2 | 0.4 | 0.6 | 2 | 0.37 | 50 | 4 | 9.7 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNS 2004-2.5 | 0.4 | 0.6 | 2.5 | 0.37 | 50 | 4 | 9.3 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |
| ZSLNS 2004-3 | 0.4 | 0.6 | 3 | 0.37 | 50 | 4 | 8.9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ZSLNS 2004-3.5 | 0.4 | 0.6 | 3.5 | 0.37 | 50 | 4 | 8.6 | 4.5 | 4.9 | 5.2 | 5.5 | 6 |
| ZSLNS 2004-4 | 0.4 | 0.6 | 4 | 0.37 | 50 | 4 | 8.2 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2004-5 | 0.4 | 0.6 | 5 | 0.37 | 50 | 4 | 7.6 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |
| ZSLNS 2004-6 | 0.4 | 0.6 | 6 | 0.37 | 50 | 4 | 7.1 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNS 2005-1 | 0.5 | 0.75 | 1 | 0.47 | 50 | 4 | 10.7 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ZSLNS 2005-1.5 | 0.5 | 0.75 | 1.5 | 0.47 | 50 | 4 | 10.2 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ZSLNS 2005-2 | 0.5 | 0.75 | 2 | 0.47 | 50 | 4 | 9.7 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNS 2005-2.5 | 0.5 | 0.75 | 2.5 | 0.47 | 50 | 4 | 9.3 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |

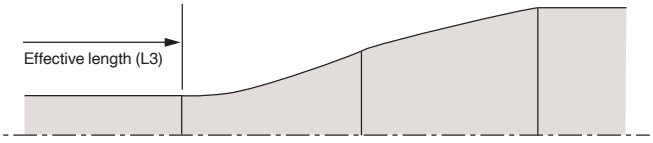
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 2005-3 | 0.5 | 0.75 | 3 | 0.47 | 50 | 4 | 8.9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ZSLNS 2005-4 | 0.5 | 0.75 | 4 | 0.47 | 50 | 4 | 8.1 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2005-5 | 0.5 | 0.75 | 5 | 0.47 | 50 | 4 | 7.5 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |
| ZSLNS 2005-6 | 0.5 | 0.75 | 6 | 0.47 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNS 2005-8 | 0.5 | 0.75 | 8 | 0.47 | 50 | 4 | 6.2 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNS 2006-2 | 0.6 | 0.9 | 2 | 0.57 | 50 | 4 | 9.6 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNS 2006-4 | 0.6 | 0.9 | 4 | 0.57 | 50 | 4 | 8.1 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2006-6 | 0.6 | 0.9 | 6 | 0.57 | 50 | 4 | 6.9 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNS 2006-8 | 0.6 | 0.9 | 8 | 0.57 | 50 | 4 | 6.1 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNS 2006-10 | 0.6 | 0.9 | 10 | 0.57 | 50 | 4 | 5.4 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2007-2 | 0.7 | 1.05 | 2 | 0.67 | 50 | 4 | 9.6 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNS 2007-4 | 0.7 | 1.05 | 4 | 0.67 | 50 | 4 | 8 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2007-6 | 0.7 | 1.05 | 6 | 0.67 | 50 | 4 | 6.9 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNS 2007-8 | 0.7 | 1.05 | 8 | 0.67 | 50 | 4 | 6 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNS 2007-10 | 0.7 | 1.05 | 10 | 0.67 | 50 | 4 | 5.3 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2008-4 | 0.8 | 1.2 | 4 | 0.77 | 50 | 4 | 7.9 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2008-6 | 0.8 | 1.2 | 6 | 0.77 | 50 | 4 | 6.8 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNS 2008-8 | 0.8 | 1.2 | 8 | 0.77 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNS 2008-10 | 0.8 | 1.2 | 10 | 0.77 | 50 | 4 | 5.2 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2008-12 | 0.8 | 1.2 | 12 | 0.77 | 55 | 4 | 4.7 | 13.6 | 14.2 | 14.8 | 15.2 | 16 |
| ZSLNS 2009-6 | 0.9 | 1.35 | 6 | 0.86 | 50 | 4 | 6.7 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ZSLNS 2009-8 | 0.9 | 1.35 | 8 | 0.86 | 50 | 4 | 5.8 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ZSLNS 2009-10 | 0.9 | 1.35 | 10 | 0.86 | 50 | 4 | 5.1 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2009-12 | 0.9 | 1.35 | 12 | 0.86 | 55 | 4 | 4.6 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 2010-2 | 1 | 1.5 | 2 | 0.96 | 50 | 4 | 9.4 | 2.9 | 3.2 | 3.4 | 3.7 | 4.1 |
| ZSLNS 2010-4 | 1 | 1.5 | 4 | 0.96 | 50 | 4 | 7.7 | 5.1 | 5.5 | 5.8 | 6.1 | 6.6 |
| ZSLNS 2010-6 | 1 | 1.5 | 6 | 0.96 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ZSLNS 2010-8 | 1 | 1.5 | 8 | 0.96 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ZSLNS 2010-10 | 1 | 1.5 | 10 | 0.96 | 50 | 4 | 5 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2010-12 | 1 | 1.5 | 12 | 0.96 | 55 | 4 | 4.5 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |
| ZSLNS 2010-14 | 1 | 1.5 | 14 | 0.96 | 55 | 4 | 4.1 | 15.7 | 16.4 | 17 | 17.4 | 18.7 |
| ZSLNS 2010-16 | 1 | 1.5 | 16 | 0.96 | 60 | 4 | 3.8 | 17.8 | 18.6 | 19.1 | 19.6 | 21.3 |
| ZSLNS 2010-20 | 1 | 1.5 | 20 | 0.96 | 60 | 4 | 3.2 | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ZSLNS 2012-6 | 1.2 | 1.8 | 6 | 1.15 | 50 | 4 | 6.3 | 7.3 | 7.7 | 8.1 | 8.5 | 9.1 |
| ZSLNS 2012-8 | 1.2 | 1.8 | 8 | 1.15 | 50 | 4 | 5.5 | 9.4 | 9.9 | 10.4 | 10.8 | 11.4 |
| ZSLNS 2012-10 | 1.2 | 1.8 | 10 | 1.15 | 50 | 4 | 4.8 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 2012-12 | 1.2 | 1.8 | 12 | 1.15 | 55 | 4 | 4.3 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |
| ZSLNS 2012-16 | 1.2 | 1.8 | 16 | 1.15 | 55 | 4 | 3.6 | 17.8 | 18.6 | 19.2 | 19.7 | 21.3 |
| ZSLNS 2014-6 | 1.4 | 2.1 | 6 | 1.34 | 50 | 4 | 6.1 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ZSLNS 2014-8 | 1.4 | 2.1 | 8 | 1.34 | 50 | 4 | 5.3 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 2014-10 | 1.4 | 2.1 | 10 | 1.34 | 50 | 4 | 4.6 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ZSLNS 2014-12 | 1.4 | 2.1 | 12 | 1.34 | 55 | 4 | 4.1 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ZSLNS 2014-14 | 1.4 | 2.1 | 14 | 1.34 | 55 | 4 | 3.7 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ZSLNS 2014-16 | 1.4 | 2.1 | 16 | 1.34 | 55 | 4 | 3.4 | 17.9 | 18.6 | 19.2 | 19.7 | 21.4 |
| ZSLNS 2015-4 | 1.5 | 2.25 | 4 | 1.44 | 50 | 4 | 7.2 | 5.2 | 5.5 | 5.9 | 6.2 | 6.7 |
| ZSLNS 2015-6 | 1.5 | 2.25 | 6 | 1.44 | 50 | 4 | 6 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ZSLNS 2015-8 | 1.5 | 2.25 | 8 | 1.44 | 50 | 4 | 5.1 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 2015-10 | 1.5 | 2.25 | 10 | 1.44 | 50 | 4 | 4.5 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ZSLNS 2015-12 | 1.5 | 2.25 | 12 | 1.44 | 55 | 4 | 4 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ZSLNS 2015-14 | 1.5 | 2.25 | 14 | 1.44 | 55 | 4 | 3.6 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ZSLNS 2015-16 | 1.5 | 2.25 | 16 | 1.44 | 55 | 4 | 3.3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ZSLNS 2015-18 | 1.5 | 2.25 | 18 | 1.44 | 60 | 4 | 3 | 20 | 20.7 | 21.3 | 21.9 | - |
| ZSLNS 2015-20 | 1.5 | 2.25 | 20 | 1.44 | 60 | 4 | 2.8 | 22 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 2015-25 | 1.5 | 2.25 | 25 | 1.44 | 65 | 4 | 2.4 | 27.3 | 28.1 | 28.8 | 30 | - |
| ZSLNS 2016-6 | 1.6 | 2.4 | 6 | 1.54 | 50 | 4 | 5.9 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ZSLNS 2016-8 | 1.6 | 2.4 | 8 | 1.54 | 50 | 4 | 5 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 2016-10 | 1.6 | 2.4 | 10 | 1.54 | 50 | 4 | 4.4 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ZSLNS 2016-12 | 1.6 | 2.4 | 12 | 1.54 | 55 | 4 | 3.9 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ZSLNS 2016-14 | 1.6 | 2.4 | 14 | 1.54 | 55 | 4 | 3.5 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ZSLNS 2016-16 | 1.6 | 2.4 | 16 | 1.54 | 55 | 4 | 3.2 | 17.9 | 18.6 | 19.2 | 19.7 | 21.4 |
| ZSLNS 2016-18 | 1.6 | 2.4 | 18 | 1.54 | 60 | 4 | 2.9 | 20 | 20.7 | 21.3 | 21.9 | - |
| ZSLNS 2016-20 | 1.6 | 2.4 | 20 | 1.54 | 60 | 4 | 2.7 | 22 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 2018-6 | 1.8 | 2.7 | 6 | 1.73 | 50 | 4 | 5.6 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ZSLNS 2018-8 | 1.8 | 2.7 | 8 | 1.73 | 50 | 4 | 4.8 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 2018-10 | 1.8 | 2.7 | 10 | 1.73 | 50 | 4 | 4.2 | 11.6 | 12.2 | 12.6 | 13 | 13.8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 2018-12 | 1.8 | 2.7 | 12 | 1.73 | 55 | 4 | 3.7 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ZSLNS 2018-14 | 1.8 | 2.7 | 14 | 1.73 | 55 | 4 | 3.3 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ZSLNS 2018-16 | 1.8 | 2.7 | 16 | 1.73 | 55 | 4 | 3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ZSLNS 2018-18 | 1.8 | 2.7 | 18 | 1.73 | 60 | 4 | 2.7 | 20 | 20.7 | 21.3 | 21.9 | - |
| ZSLNS 2018-20 | 1.8 | 2.7 | 20 | 1.73 | 60 | 4 | 2.5 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 2020-4 | 2 | 3 | 4 | 1.92 | 50 | 4 | 6.5 | 5.3 | 5.6 | 5.9 | 6.2 | 6.7 |
| ZSLNS 2020-6 | 2 | 3 | 6 | 1.92 | 50 | 4 | 5.3 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ZSLNS 2020-8 | 2 | 3 | 8 | 1.92 | 50 | 4 | 4.5 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 2020-10 | 2 | 3 | 10 | 1.92 | 50 | 4 | 3.9 | 11.6 | 12.2 | 12.7 | 13.1 | 13.8 |
| ZSLNS 2020-12 | 2 | 3 | 12 | 1.92 | 55 | 4 | 3.4 | 13.7 | 14.3 | 14.9 | 15.3 | 16.1 |
| ZSLNS 2020-14 | 2 | 3 | 14 | 1.92 | 55 | 4 | 3.1 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ZSLNS 2020-16 | 2 | 3 | 16 | 1.92 | 55 | 4 | 2.8 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ZSLNS 2020-18 | 2 | 3 | 18 | 1.92 | 60 | 4 | 2.6 | 20 | 20.8 | 21.4 | 21.9 | - |
| ZSLNS 2020-20 | 2 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 2020-25 | 2 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.9 | - | - |
| ZSLNS 2020-30 | 2 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ZSLNS 2025-8 | 2.5 | 3.75 | 8 | 2.4 | 50 | 4 | 3.7 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ZSLNS 2025-10 | 2.5 | 3.75 | 10 | 2.4 | 50 | 4 | 3.1 | 11.7 | 12.2 | 12.7 | 13.1 | 13.8 |
| ZSLNS 2025-12 | 2.5 | 3.75 | 12 | 2.4 | 55 | 4 | 2.7 | 13.8 | 14.4 | 14.9 | 15.3 | - |
| ZSLNS 2025-14 | 2.5 | 3.75 | 14 | 2.4 | 55 | 4 | 2.4 | 15.9 | 16.5 | 17.1 | 17.5 | - |
| ZSLNS 2025-16 | 2.5 | 3.75 | 16 | 2.4 | 55 | 4 | 2.2 | 18 | 18.7 | 19.2 | 19.7 | - |
| ZSLNS 2025-18 | 2.5 | 3.75 | 18 | 2.4 | 60 | 4 | 2 | 20.1 | 20.8 | 21.4 | - | - |
| ZSLNS 2025-20 | 2.5 | 3.75 | 20 | 2.4 | 60 | 4 | 1.8 | 22.1 | 22.9 | 23.5 | - | - |
| ZSLNS 2025-25 | 2.5 | 3.75 | 25 | 2.4 | 65 | 4 | 1.5 | 27.3 | 28.2 | - | - | - |
| ZSLNS 2025-30 | 2.5 | 3.75 | 30 | 2.4 | 70 | 4 | 1.3 | 32.6 | 33.5 | - | - | - |
| ZSLNS 2030-8 | 3 | 4.5 | 8 | 2.88 | 55 | 6 | 5.6 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ZSLNS 2030-10 | 3 | 4.5 | 10 | 2.88 | 55 | 6 | 5 | 11.7 | 12.3 | 12.7 | 13.1 | 13.8 |
| ZSLNS 2030-12 | 3 | 4.5 | 12 | 2.88 | 60 | 6 | 4.5 | 13.8 | 14.4 | 14.9 | 15.4 | 16.3 |
| ZSLNS 2030-14 | 3 | 4.5 | 14 | 2.88 | 60 | 6 | 4.1 | 15.9 | 16.6 | 17.1 | 17.6 | 18.9 |
| ZSLNS 2030-16 | 3 | 4.5 | 16 | 2.88 | 60 | 6 | 3.7 | 18 | 18.7 | 19.3 | 19.8 | 21.6 |
| ZSLNS 2030-18 | 3 | 4.5 | 18 | 2.88 | 60 | 6 | 3.4 | 20.1 | 20.8 | 21.4 | 21.9 | 24.2 |
| ZSLNS 2030-20 | 3 | 4.5 | 20 | 2.88 | 65 | 6 | 3.2 | 22.2 | 23 | 23.6 | 24.2 | 26.9 |
| ZSLNS 2030-25 | 3 | 4.5 | 25 | 2.88 | 70 | 6 | 2.7 | 27.4 | 28.2 | 28.9 | 30.2 | - |
| ZSLNS 2030-30 | 3 | 4.5 | 30 | 2.88 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ZSLNS 2030-35 | 3 | 4.5 | 35 | 2.88 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ZSLNS 2030-40 | 3 | 4.5 | 40 | 2.88 | 90 | 6 | 1.9 | 42.9 | 43.9 | 45.9 | - | - |
| ZSLNS 2040-12 | 4 | 6 | 12 | 3.85 | 60 | 6 | 3.4 | 13.9 | 14.5 | 15 | 15.4 | 16.3 |
| ZSLNS 2040-16 | 4 | 6 | 16 | 3.85 | 60 | 6 | 2.8 | 18.1 | 18.8 | 19.3 | 19.8 | - |
| ZSLNS 2040-20 | 4 | 6 | 20 | 3.85 | 70 | 6 | 2.3 | 22.3 | 23 | 23.6 | 24.3 | - |
| ZSLNS 2040-25 | 4 | 6 | 25 | 3.85 | 70 | 6 | 2 | 27.4 | 28.3 | 28.9 | - | - |
| ZSLNS 2040-30 | 4 | 6 | 30 | 3.85 | 80 | 6 | 1.7 | 32.6 | 33.5 | 34.6 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

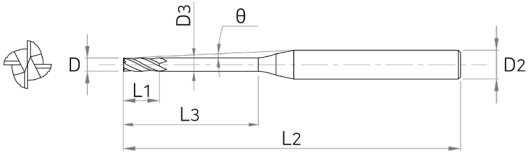
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 2040-35 | 4 | 6 | 35 | 3.85 | 80 | 6 | 1.5 | 37.8 | 38.8 | - | - | - |
| ZSLNS 2040-40 | 4 | 6 | 40 | 3.85 | 90 | 6 | 1.3 | 42.9 | 44 | - | - | - |
| ZSLNS 2040-45 | 4 | 6 | 45 | 3.85 | 90 | 6 | 1.2 | 48.1 | 49.4 | - | - | - |
| ZSLNS 2040-50 | 4 | 6 | 50 | 3.85 | 100 | 6 | 1.1 | 53.2 | 54.8 | - | - | - |
| ZSLNS 2050-16 | 5 | 7.5 | 16 | 4.85 | 60 | 6 | 1.5 | 18.1 | 18.8 | - | - | - |
| ZSLNS 2050-20 | 5 | 7.5 | 20 | 4.85 | 60 | 6 | 1.3 | 22.3 | 23 | - | - | - |
| ZSLNS 2050-25 | 5 | 7.5 | 25 | 4.85 | 70 | 6 | 1.1 | 27.4 | 28.3 | - | - | - |
| ZSLNS 2050-30 | 5 | 7.5 | 30 | 4.85 | 70 | 6 | 0.9 | 32.6 | - | - | - | - |
| ZSLNS 2050-35 | 5 | 7.5 | 35 | 4.85 | 80 | 6 | 0.8 | 37.8 | - | - | - | - |
| ZSLNS 2050-40 | 5 | 7.5 | 40 | 4.85 | 90 | 6 | 0.7 | 42.9 | - | - | - | - |
| ZSLNS 2050-50 | 5 | 7.5 | 50 | 4.85 | 100 | 6 | 0.6 | 53.2 | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.563

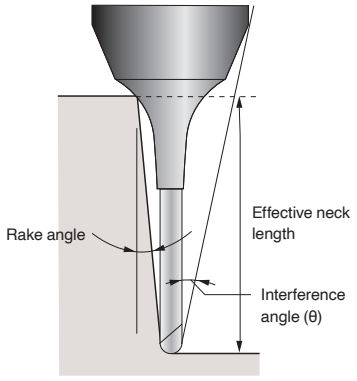
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 4010-4 | 1 | 1.5 | 4 | 0.96 | 50 | 4 | 7.7 | 5.1 | 5.5 | 5.8 | 6.1 | 6.6 |
| ZSLNS 4010-6 | 1 | 1.5 | 6 | 0.96 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ZSLNS 4010-8 | 1 | 1.5 | 8 | 0.96 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ZSLNS 4010-10 | 1 | 1.5 | 10 | 0.96 | 50 | 4 | 5 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNS 4015-4 | 1.5 | 2.25 | 4 | 1.44 | 50 | 4 | 7.2 | 5.2 | 5.5 | 5.9 | 6.2 | 6.7 |
| ZSLNS 4015-6 | 1.5 | 2.25 | 6 | 1.44 | 50 | 4 | 6 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ZSLNS 4015-8 | 1.5 | 2.25 | 8 | 1.44 | 50 | 4 | 5.1 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 4015-10 | 1.5 | 2.25 | 10 | 1.44 | 50 | 4 | 4.5 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ZSLNS 4015-12 | 1.5 | 2.25 | 12 | 1.44 | 55 | 4 | 4 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ZSLNS 4015-14 | 1.5 | 2.25 | 14 | 1.44 | 55 | 4 | 3.6 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ZSLNS 4015-16 | 1.5 | 2.25 | 16 | 1.44 | 55 | 4 | 3.3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ZSLNS 4015-18 | 1.5 | 2.25 | 18 | 1.44 | 60 | 4 | 3 | 20 | 20.7 | 21.3 | 21.9 | - |
| ZSLNS 4015-20 | 1.5 | 2.25 | 20 | 1.44 | 60 | 4 | 2.8 | 22 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 4015-25 | 1.5 | 2.25 | 25 | 1.44 | 65 | 4 | 2.4 | 27.3 | 28.1 | 28.8 | 30 | - |
| ZSLNS 4020-4 | 2 | 3 | 4 | 1.92 | 50 | 4 | 6.5 | 5.3 | 5.6 | 5.9 | 6.2 | 6.7 |
| ZSLNS 4020-6 | 2 | 3 | 6 | 1.92 | 50 | 4 | 5.3 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ZSLNS 4020-8 | 2 | 3 | 8 | 1.92 | 50 | 4 | 4.5 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ZSLNS 4020-10 | 2 | 3 | 10 | 1.92 | 50 | 4 | 3.9 | 11.6 | 12.2 | 12.7 | 13.1 | 13.8 |
| ZSLNS 4020-12 | 2 | 3 | 12 | 1.92 | 55 | 4 | 3.4 | 13.7 | 14.3 | 14.9 | 15.3 | 16.1 |
| ZSLNS 4020-14 | 2 | 3 | 14 | 1.92 | 55 | 4 | 3.1 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ZSLNS 4020-16 | 2 | 3 | 16 | 1.92 | 55 | 4 | 2.8 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ZSLNS 4020-18 | 2 | 3 | 18 | 1.92 | 60 | 4 | 2.6 | 20 | 20.8 | 21.4 | 21.9 | - |
| ZSLNS 4020-20 | 2 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNS 4020-25 | 2 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.9 | - | - |

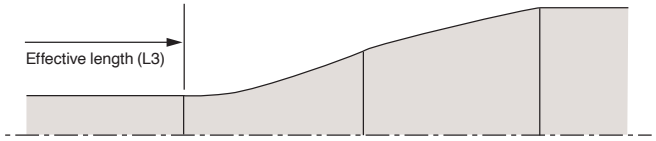
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 4020-30 | 2 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ZSLNS 4025-8 | 2.5 | 3.75 | 8 | 2.4 | 50 | 4 | 3.7 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ZSLNS 4025-10 | 2.5 | 3.75 | 10 | 2.4 | 50 | 4 | 3.1 | 11.7 | 12.2 | 12.7 | 13.1 | 13.8 |
| ZSLNS 4025-12 | 2.5 | 3.75 | 12 | 2.4 | 55 | 4 | 2.7 | 13.8 | 14.4 | 14.9 | 15.3 | - |
| ZSLNS 4025-14 | 2.5 | 3.75 | 14 | 2.4 | 55 | 4 | 2.4 | 15.9 | 16.5 | 17.1 | 17.5 | - |
| ZSLNS 4025-16 | 2.5 | 3.75 | 16 | 2.4 | 55 | 4 | 2.2 | 18 | 18.7 | 19.2 | 19.7 | - |
| ZSLNS 4025-18 | 2.5 | 3.75 | 18 | 2.4 | 60 | 4 | 2 | 20.1 | 20.8 | 21.4 | - | - |
| ZSLNS 4025-20 | 2.5 | 3.75 | 20 | 2.4 | 60 | 4 | 1.8 | 22.1 | 22.9 | 23.5 | - | - |
| ZSLNS 4025-25 | 2.5 | 3.75 | 25 | 2.4 | 65 | 4 | 1.5 | 27.3 | 28.2 | - | - | - |
| ZSLNS 4025-30 | 2.5 | 3.75 | 30 | 2.4 | 70 | 4 | 1.3 | 32.6 | 33.5 | - | - | - |
| ZSLNS 4030-8 | 3 | 4.5 | 8 | 2.88 | 55 | 6 | 5.6 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ZSLNS 4030-10 | 3 | 4.5 | 10 | 2.88 | 55 | 6 | 5 | 11.7 | 12.3 | 12.7 | 13.1 | 13.8 |
| ZSLNS 4030-12 | 3 | 4.5 | 12 | 2.88 | 60 | 6 | 4.5 | 13.8 | 14.4 | 14.9 | 15.4 | 16.3 |
| ZSLNS 4030-14 | 3 | 4.5 | 14 | 2.88 | 60 | 6 | 4.1 | 15.9 | 16.6 | 17.1 | 17.6 | 18.9 |
| ZSLNS 4030-16 | 3 | 4.5 | 16 | 2.88 | 60 | 6 | 3.7 | 18 | 18.7 | 19.3 | 19.8 | 21.6 |
| ZSLNS 4030-18 | 3 | 4.5 | 18 | 2.88 | 60 | 6 | 3.4 | 20.1 | 20.8 | 21.4 | 21.9 | 24.2 |
| ZSLNS 4030-20 | 3 | 4.5 | 20 | 2.88 | 65 | 6 | 3.2 | 22.2 | 23 | 23.6 | 24.2 | 26.9 |
| ZSLNS 4030-25 | 3 | 4.5 | 25 | 2.88 | 70 | 6 | 2.7 | 27.4 | 28.2 | 28.9 | 30.2 | - |
| ZSLNS 4030-30 | 3 | 4.5 | 30 | 2.88 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ZSLNS 4030-35 | 3 | 4.5 | 35 | 2.88 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ZSLNS 4030-40 | 3 | 4.5 | 40 | 2.88 | 90 | 6 | 1.9 | 42.9 | 43.9 | 45.9 | - | - |
| ZSLNS 4040-12 | 4 | 6 | 12 | 3.85 | 60 | 6 | 3.4 | 13.9 | 14.5 | 15 | 15.4 | 16.3 |
| ZSLNS 4040-16 | 4 | 6 | 16 | 3.85 | 60 | 6 | 2.8 | 18.1 | 18.8 | 19.3 | 19.8 | - |
| ZSLNS 4040-20 | 4 | 6 | 20 | 3.85 | 70 | 6 | 2.3 | 22.3 | 23 | 23.6 | 24.3 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNS 4040-25 | 4 | 6 | 25 | 3.85 | 70 | 6 | 2 | 27.4 | 28.3 | 28.9 | - | - |
| ZSLNS 4040-30 | 4 | 6 | 30 | 3.85 | 80 | 6 | 1.7 | 32.6 | 33.5 | 34.6 | - | - |
| ZSLNS 4040-35 | 4 | 6 | 35 | 3.85 | 80 | 6 | 1.5 | 37.8 | 38.8 | - | - | - |
| ZSLNS 4040-40 | 4 | 6 | 40 | 3.85 | 90 | 6 | 1.3 | 42.9 | 44 | - | - | - |
| ZSLNS 4040-45 | 4 | 6 | 45 | 3.85 | 90 | 6 | 1.2 | 48.1 | 49.4 | - | - | - |
| ZSLNS 4040-50 | 4 | 6 | 50 | 3.85 | 100 | 6 | 1.1 | 53.2 | 54.8 | - | - | - |
| ZSLNS 4050-16 | 5 | 7.5 | 16 | 4.85 | 60 | 6 | 1.5 | 18.1 | 18.8 | - | - | - |
| ZSLNS 4050-20 | 5 | 7.5 | 20 | 4.85 | 60 | 6 | 1.3 | 22.3 | 23 | - | - | - |
| ZSLNS 4050-25 | 5 | 7.5 | 25 | 4.85 | 70 | 6 | 1.1 | 27.4 | 28.3 | - | - | - |
| ZSLNS 4050-30 | 5 | 7.5 | 30 | 4.85 | 60 | 6 | 0.9 | 32.6 | - | - | - | - |
| ZSLNS 4050-35 | 5 | 7.5 | 35 | 4.85 | 80 | 6 | 0.8 | 37.8 | - | - | - | - |
| ZSLNS 4050-40 | 5 | 7.5 | 40 | 4.85 | 90 | 6 | 0.7 | 42.9 | - | - | - | - |
| ZSLNS 4050-50 | 5 | 7.5 | 50 | 4.85 | 100 | 6 | 0.6 | 53.2 | - | - | - | - |

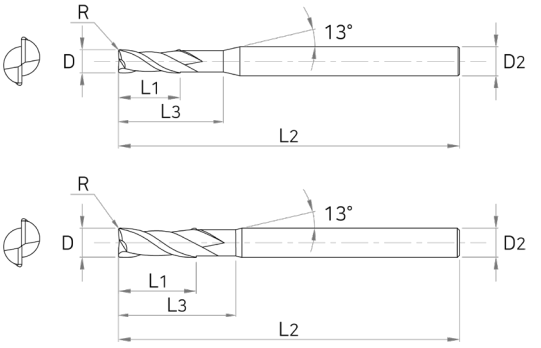


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR702 | 2 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.564

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 010 005 03 S4 | 1 | 0.05 | 1.5 | 3 | 50 | 4 |
| ZR702 010 005 04 S4 | 1 | 0.05 | 1.5 | 4 | 50 | 4 |
| ZR702 010 005 06 S4 | 1 | 0.05 | 1.5 | 6 | 50 | 4 |
| ZR702 010 005 08 S4 | 1 | 0.05 | 1.5 | 8 | 50 | 4 |
| ZR702 010 005 10 S4 | 1 | 0.05 | 1.5 | 10 | 50 | 4 |
| ZR702 010 01 03 S4 | 1 | 0.1 | 1.5 | 3 | 50 | 4 |
| ZR702 010 01 04 S4 | 1 | 0.1 | 1.5 | 4 | 50 | 4 |
| ZR702 010 01 06 S4 | 1 | 0.1 | 1.5 | 6 | 50 | 4 |
| ZR702 010 01 08 S4 | 1 | 0.1 | 1.5 | 8 | 50 | 4 |
| ZR702 010 01 10 S4 | 1 | 0.1 | 1.5 | 10 | 50 | 4 |
| ZR702 010 02 03 S4 | 1 | 0.2 | 1.5 | 3 | 50 | 4 |
| ZR702 010 02 04 S4 | 1 | 0.2 | 1.5 | 4 | 50 | 4 |
| ZR702 010 02 06 S4 | 1 | 0.2 | 1.5 | 6 | 50 | 4 |
| ZR702 010 02 08 S4 | 1 | 0.2 | 1.5 | 8 | 50 | 4 |
| ZR702 010 02 10 S4 | 1 | 0.2 | 1.5 | 10 | 50 | 4 |
| ZR702 010 03 03 S4 | 1 | 0.3 | 1.5 | 3 | 50 | 4 |
| ZR702 010 03 04 S4 | 1 | 0.3 | 1.5 | 4 | 50 | 4 |
| ZR702 010 03 06 S4 | 1 | 0.3 | 1.5 | 6 | 50 | 4 |
| ZR702 010 03 08 S4 | 1 | 0.3 | 1.5 | 8 | 50 | 4 |
| ZR702 010 03 10 S4 | 1 | 0.3 | 1.5 | 10 | 50 | 4 |
| ZR702 010 01 04 | 1 | 0.1 | 1.5 | 4 | 50 | 6 |
| ZR702 010 01 06 | 1 | 0.1 | 1.5 | 6 | 50 | 6 |
| ZR702 010 02 04 | 1 | 0.2 | 1.5 | 4 | 50 | 6 |
| ZR702 010 02 06 | 1 | 0.2 | 1.5 | 6 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 010 02 10 | 1 | 0.2 | 1.5 | 10 | 50 | 6 |
| ZR702 010 02 12 | 1 | 0.2 | 1.5 | 12 | 50 | 6 |
| ZR702 012 02 08 | 1.2 | 0.2 | 2 | 8 | 50 | 6 |
| ZR702 012 02 12 | 1.2 | 0.2 | 2 | 12 | 50 | 6 |
| ZR702 015 005 04 S4 | 1.5 | 0.05 | 2.5 | 4 | 50 | 4 |
| ZR702 015 005 06 S4 | 1.5 | 0.05 | 2.5 | 6 | 50 | 4 |
| ZR702 015 005 08 S4 | 1.5 | 0.05 | 2.5 | 8 | 50 | 4 |
| ZR702 015 005 10 S4 | 1.5 | 0.05 | 2.5 | 10 | 50 | 4 |
| ZR702 015 005 12 S4 | 1.5 | 0.05 | 2.5 | 12 | 50 | 4 |
| ZR702 015 01 04 S4 | 1.5 | 0.1 | 2.5 | 4 | 50 | 4 |
| ZR702 015 01 06 S4 | 1.5 | 0.1 | 2.5 | 6 | 50 | 4 |
| ZR702 015 01 08 S4 | 1.5 | 0.1 | 2.5 | 8 | 50 | 4 |
| ZR702 015 01 10 S4 | 1.5 | 0.1 | 2.5 | 10 | 50 | 4 |
| ZR702 015 01 12 S4 | 1.5 | 0.1 | 2.5 | 12 | 50 | 4 |
| ZR702 015 02 04 S4 | 1.5 | 0.2 | 2.5 | 4 | 50 | 4 |
| ZR702 015 02 06 S4 | 1.5 | 0.2 | 2.5 | 6 | 50 | 4 |
| ZR702 015 02 08 S4 | 1.5 | 0.2 | 2.5 | 8 | 50 | 4 |
| ZR702 015 02 10 S4 | 1.5 | 0.2 | 2.5 | 10 | 50 | 4 |
| ZR702 015 02 12 S4 | 1.5 | 0.2 | 2.5 | 12 | 50 | 4 |
| ZR702 015 03 04 S4 | 1.5 | 0.3 | 2.5 | 4 | 50 | 4 |
| ZR702 015 03 06 S4 | 1.5 | 0.3 | 2.5 | 6 | 50 | 4 |
| ZR702 015 03 08 S4 | 1.5 | 0.3 | 2.5 | 8 | 50 | 4 |
| ZR702 015 03 10 S4 | 1.5 | 0.3 | 2.5 | 10 | 50 | 4 |
| ZR702 015 03 12 S4 | 1.5 | 0.3 | 2.5 | 12 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR702 | 2 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 015 05 04 S4 | 1.5 | 0.5 | 2.5 | 4 | 50 | 4 |
| ZR702 015 05 06 S4 | 1.5 | 0.5 | 2.5 | 6 | 50 | 4 |
| ZR702 015 05 08 S4 | 1.5 | 0.5 | 2.5 | 8 | 50 | 4 |
| ZR702 015 05 10 S4 | 1.5 | 0.5 | 2.5 | 10 | 50 | 4 |
| ZR702 015 05 12 S4 | 1.5 | 0.5 | 2.5 | 12 | 50 | 4 |
| ZR702 015 02 04 | 1.5 | 0.2 | 2.5 | 4 | 50 | 6 |
| ZR702 015 02 06 | 1.5 | 0.2 | 2.5 | 6 | 50 | 6 |
| ZR702 015 02 08 | 1.5 | 0.2 | 2.5 | 8 | 50 | 6 |
| ZR702 015 02 10 | 1.5 | 0.2 | 2.5 | 10 | 50 | 6 |
| ZR702 015 02 15 | 1.5 | 0.2 | 2.5 | 15 | 50 | 6 |
| ZR702 020 01 06 S4 | 2 | 0.1 | 3 | 6 | 50 | 4 |
| ZR702 020 01 08 S4 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| ZR702 020 01 10 S4 | 2 | 0.1 | 3 | 10 | 50 | 4 |
| ZR702 020 01 12 S4 | 2 | 0.1 | 3 | 12 | 50 | 4 |
| ZR702 020 01 16 S4 | 2 | 0.1 | 3 | 16 | 50 | 4 |
| ZR702 020 01 20 S4 | 2 | 0.1 | 3 | 20 | 50 | 4 |
| ZR702 020 02 06 S4 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| ZR702 020 02 08 S4 | 2 | 0.2 | 3 | 8 | 50 | 4 |
| ZR702 020 02 10 S4 | 2 | 0.2 | 3 | 10 | 50 | 4 |
| ZR702 020 02 12 S4 | 2 | 0.2 | 3 | 12 | 50 | 4 |
| ZR702 020 02 16 S4 | 2 | 0.2 | 3 | 16 | 50 | 4 |
| ZR702 020 02 20 S4 | 2 | 0.2 | 3 | 20 | 50 | 4 |
| ZR702 020 03 06 S4 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| ZR702 020 03 08 S4 | 2 | 0.3 | 3 | 8 | 50 | 4 |
| ZR702 020 03 10 S4 | 2 | 0.3 | 3 | 10 | 50 | 4 |
| ZR702 020 03 12 S4 | 2 | 0.3 | 3 | 12 | 50 | 4 |
| ZR702 020 03 16 S4 | 2 | 0.3 | 3 | 16 | 50 | 4 |
| ZR702 020 03 20 S4 | 2 | 0.3 | 3 | 20 | 50 | 4 |
| ZR702 020 05 06 S4 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| ZR702 020 05 08 S4 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| ZR702 020 05 10 S4 | 2 | 0.5 | 3 | 10 | 50 | 4 |
| ZR702 020 05 12 S4 | 2 | 0.5 | 3 | 12 | 50 | 4 |
| ZR702 020 05 16 S4 | 2 | 0.5 | 3 | 16 | 50 | 4 |
| ZR702 020 05 20 S4 | 2 | 0.5 | 3 | 20 | 50 | 4 |
| ZR702 020 01 08 | 2 | 0.1 | 3 | 8 | 50 | 6 |
| ZR702 020 01 12 | 2 | 0.1 | 3 | 12 | 50 | 6 |
| ZR702 020 02 06 | 2 | 0.2 | 3 | 6 | 50 | 6 |
| ZR702 020 02 09 | 2 | 0.2 | 3 | 9 | 50 | 6 |
| ZR702 020 02 16 | 2 | 0.2 | 3 | 16 | 50 | 6 |
| ZR702 020 03 06 | 2 | 0.3 | 3 | 6 | 50 | 6 |
| ZR702 020 05 06 | 2 | 0.5 | 3 | 6 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 020 05 09 | 2 | 0.5 | 3 | 9 | 50 | 6 |
| ZR702 020 05 12 | 2 | 0.5 | 3 | 12 | 50 | 6 |
| ZR702 020 05 16 | 2 | 0.5 | 3 | 16 | 50 | 6 |
| ZR702 025 02 08 S4 | 2.5 | 0.2 | 3.5 | 8 | 50 | 4 |
| ZR702 025 02 10 S4 | 2.5 | 0.2 | 3.5 | 10 | 50 | 4 |
| ZR702 025 02 12 S4 | 2.5 | 0.2 | 3.5 | 12 | 50 | 4 |
| ZR702 025 02 16 S4 | 2.5 | 0.2 | 3.5 | 16 | 50 | 4 |
| ZR702 025 03 08 S4 | 2.5 | 0.3 | 3.5 | 8 | 50 | 4 |
| ZR702 025 03 10 S4 | 2.5 | 0.3 | 3.5 | 10 | 50 | 4 |
| ZR702 025 03 12 S4 | 2.5 | 0.3 | 3.5 | 12 | 50 | 4 |
| ZR702 025 03 16 S4 | 2.5 | 0.3 | 3.5 | 16 | 50 | 4 |
| ZR702 025 05 08 S4 | 2.5 | 0.5 | 3.5 | 8 | 50 | 4 |
| ZR702 025 05 10 S4 | 2.5 | 0.5 | 3.5 | 10 | 50 | 4 |
| ZR702 025 05 12 S4 | 2.5 | 0.5 | 3.5 | 12 | 50 | 4 |
| ZR702 025 05 16 S4 | 2.5 | 0.5 | 3.5 | 16 | 50 | 4 |
| ZR702 030 01 08 | 3 | 0.1 | 4.5 | 8 | 55 | 6 |
| ZR702 030 01 10 | 3 | 0.1 | 4.5 | 10 | 55 | 6 |
| ZR702 030 01 12 | 3 | 0.1 | 4.5 | 12 | 55 | 6 |
| ZR702 030 01 16 | 3 | 0.1 | 4.5 | 16 | 55 | 6 |
| ZR702 030 01 20 | 3 | 0.1 | 4.5 | 20 | 60 | 6 |
| ZR702 030 02 08 | 3 | 0.2 | 4.5 | 8 | 55 | 6 |
| ZR702 030 02 09 | 3 | 0.2 | 4.5 | 9 | 55 | 6 |
| ZR702 030 02 10 | 3 | 0.2 | 4.5 | 10 | 55 | 6 |
| ZR702 030 02 12 | 3 | 0.2 | 4.5 | 12 | 55 | 6 |
| ZR702 030 02 16 | 3 | 0.2 | 4.5 | 16 | 55 | 6 |
| ZR702 030 02 20 | 3 | 0.2 | 4.5 | 20 | 60 | 6 |
| ZR702 030 03 08 | 3 | 0.3 | 4.5 | 8 | 55 | 6 |
| ZR702 030 03 09 | 3 | 0.3 | 4.5 | 9 | 55 | 6 |
| ZR702 030 03 10 | 3 | 0.3 | 4.5 | 10 | 55 | 6 |
| ZR702 030 03 12 | 3 | 0.3 | 4.5 | 12 | 55 | 6 |
| ZR702 030 03 14 | 3 | 0.3 | 4.5 | 14 | 55 | 6 |
| ZR702 030 03 16 | 3 | 0.3 | 4.5 | 16 | 55 | 6 |
| ZR702 030 03 20 | 3 | 0.3 | 4.5 | 20 | 60 | 6 |
| ZR702 030 05 08 | 3 | 0.5 | 4.5 | 8 | 55 | 6 |
| ZR702 030 05 09 | 3 | 0.5 | 4.5 | 9 | 55 | 6 |
| ZR702 030 05 10 | 3 | 0.5 | 4.5 | 10 | 55 | 6 |
| ZR702 030 05 12 | 3 | 0.5 | 4.5 | 12 | 55 | 6 |
| ZR702 030 05 16 | 3 | 0.5 | 4.5 | 16 | 55 | 6 |
| ZR702 030 05 20 | 3 | 0.5 | 4.5 | 20 | 60 | 6 |
| ZR702 030 10 08 | 3 | 1 | 4.5 | 8 | 55 | 6 |
| ZR702 030 10 10 | 3 | 1 | 4.5 | 10 | 55 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR702 | 2 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 030 10 12 | 3 | 1 | 4.5 | 12 | 55 | 6 |
| ZR702 030 10 16 | 3 | 1 | 4.5 | 16 | 55 | 6 |
| ZR702 030 10 20 | 3 | 1 | 4.5 | 20 | 60 | 6 |
| ZR702 030 10 25 | 3 | 1 | 4.5 | 25 | 60 | 6 |
| ZR702 040 01 10 | 4 | 0.1 | 6 | 10 | 55 | 6 |
| ZR702 040 01 12 | 4 | 0.1 | 6 | 12 | 55 | 6 |
| ZR702 040 01 16 | 4 | 0.1 | 6 | 16 | 55 | 6 |
| ZR702 040 01 20 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| ZR702 040 01 25 | 4 | 0.1 | 6 | 25 | 60 | 6 |
| ZR702 040 02 10 | 4 | 0.2 | 6 | 10 | 55 | 6 |
| ZR702 040 02 12 | 4 | 0.2 | 6 | 12 | 55 | 6 |
| ZR702 040 02 16 | 4 | 0.2 | 6 | 16 | 55 | 6 |
| ZR702 040 02 20 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| ZR702 040 02 25 | 4 | 0.2 | 6 | 25 | 60 | 6 |
| ZR702 040 03 10 | 4 | 0.3 | 6 | 10 | 55 | 6 |
| ZR702 040 03 12 | 4 | 0.3 | 6 | 12 | 55 | 6 |
| ZR702 040 03 16 | 4 | 0.3 | 6 | 16 | 55 | 6 |
| ZR702 040 03 20 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| ZR702 040 03 25 | 4 | 0.3 | 6 | 25 | 60 | 6 |
| ZR702 040 05 10 | 4 | 0.5 | 6 | 10 | 55 | 6 |
| ZR702 040 05 12 | 4 | 0.5 | 6 | 12 | 55 | 6 |
| ZR702 040 05 16 | 4 | 0.5 | 6 | 16 | 55 | 6 |
| ZR702 040 05 20 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| ZR702 040 05 25 | 4 | 0.5 | 6 | 25 | 60 | 6 |
| ZR702 040 05 30 | 4 | 0.5 | 6 | 30 | 70 | 6 |
| ZR702 040 10 10 | 4 | 1 | 6 | 10 | 55 | 6 |
| ZR702 040 10 12 | 4 | 1 | 6 | 12 | 55 | 6 |

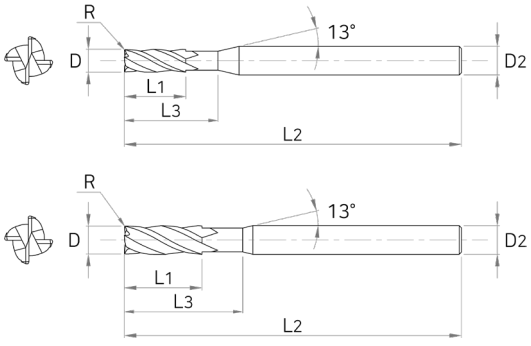
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR702 040 10 16 | 4 | 1 | 6 | 16 | 55 | 6 |
| ZR702 040 10 20 | 4 | 1 | 6 | 20 | 60 | 6 |
| ZR702 040 10 25 | 4 | 1 | 6 | 25 | 60 | 6 |
| ZR702 040 10 30 | 4 | 1 | 6 | 30 | 70 | 6 |
| ZR702 050 03 18 | 5 | 0.3 | 8 | 18 | 60 | 6 |
| ZR702 060 02 20 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| ZR702 060 03 20 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| ZR702 060 05 20 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| ZR702 060 10 20 | 6 | 1 | 9 | 20 | 60 | 6 |
| ZR702 060 15 20 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| ZR702 060 20 20 | 6 | 2 | 9 | 20 | 60 | 6 |
| ZR702 080 02 25 | 8 | 0.2 | 12 | 25 | 60 | 8 |
| ZR702 080 03 25 | 8 | 0.3 | 12 | 25 | 60 | 8 |
| ZR702 080 05 25 | 8 | 0.5 | 12 | 25 | 60 | 8 |
| ZR702 080 10 25 | 8 | 1 | 12 | 25 | 60 | 8 |
| ZR702 080 15 25 | 8 | 1.5 | 12 | 25 | 60 | 8 |
| ZR702 100 02 32 | 10 | 0.2 | 15 | 32 | 70 | 10 |
| ZR702 100 03 32 | 10 | 0.3 | 15 | 32 | 70 | 10 |
| ZR702 100 05 32 | 10 | 0.5 | 15 | 32 | 70 | 10 |
| ZR702 100 10 32 | 10 | 1 | 15 | 32 | 70 | 10 |
| ZR702 100 15 32 | 10 | 1.5 | 15 | 32 | 70 | 10 |
| ZR702 100 20 32 | 10 | 2 | 15 | 32 | 70 | 10 |
| ZR702 120 03 38 | 12 | 0.3 | 18 | 38 | 80 | 12 |
| ZR702 120 05 38 | 12 | 0.5 | 18 | 38 | 80 | 12 |
| ZR702 120 10 38 | 12 | 1 | 18 | 38 | 80 | 12 |
| ZR702 120 15 38 | 12 | 1.5 | 18 | 38 | 80 | 12 |
| ZR702 120 20 38 | 12 | 2 | 18 | 38 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR704 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR704 010 01 03 S4 | 1 | 0.1 | 2 | 3 | 50 | 4 |
| ZR704 010 01 04 S4 | 1 | 0.1 | 2 | 4 | 50 | 4 |
| ZR704 010 01 06 S4 | 1 | 0.1 | 2 | 6 | 50 | 4 |
| ZR704 010 02 03 S4 | 1 | 0.2 | 2 | 3 | 50 | 4 |
| ZR704 010 02 04 S4 | 1 | 0.2 | 2 | 4 | 50 | 4 |
| ZR704 010 02 06 S4 | 1 | 0.2 | 2 | 6 | 50 | 4 |
| ZR704 010 03 03 S4 | 1 | 0.3 | 2 | 3 | 50 | 4 |
| ZR704 010 03 04 S4 | 1 | 0.3 | 2 | 4 | 50 | 4 |
| ZR704 010 03 06 S4 | 1 | 0.3 | 2 | 6 | 50 | 4 |
| ZR704 015 01 04 S4 | 1.5 | 0.1 | 2.5 | 4 | 50 | 4 |
| ZR704 015 01 06 S4 | 1.5 | 0.1 | 2.5 | 6 | 50 | 4 |
| ZR704 015 02 04 S4 | 1.5 | 0.2 | 2.5 | 4 | 50 | 4 |
| ZR704 015 02 06 S4 | 1.5 | 0.2 | 2.5 | 6 | 50 | 4 |
| ZR704 015 03 04 S4 | 1.5 | 0.3 | 2.5 | 4 | 50 | 4 |
| ZR704 015 03 06 S4 | 1.5 | 0.3 | 2.5 | 6 | 50 | 4 |
| ZR704 020 01 06 S4 | 2 | 0.1 | 3 | 6 | 50 | 4 |
| ZR704 020 01 08 S4 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| ZR704 020 02 06 S4 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| ZR704 020 02 08 S4 | 2 | 0.2 | 3 | 8 | 50 | 4 |
| ZR704 020 03 06 S4 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| ZR704 020 03 08 S4 | 2 | 0.3 | 3 | 8 | 50 | 4 |
| ZR704 020 05 06 S4 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| ZR704 020 05 08 S4 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| ZR704 020 02 08 | 2 | 0.2 | 3 | 8 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR704 020 02 10 | 2 | 0.2 | 3 | 10 | 50 | 6 |
| ZR704 020 02 12 | 2 | 0.2 | 3 | 12 | 50 | 6 |
| ZR704 025 01 06 S4 | 2.5 | 0.1 | 3.5 | 6 | 50 | 4 |
| ZR704 030 01 08 | 3 | 0.1 | 4 | 8 | 55 | 6 |
| ZR704 030 01 10 | 3 | 0.1 | 4 | 10 | 55 | 6 |
| ZR704 030 01 12 | 3 | 0.1 | 4 | 12 | 55 | 6 |
| ZR704 030 01 16 | 3 | 0.1 | 4 | 16 | 55 | 6 |
| ZR704 030 01 20 | 3 | 0.1 | 4 | 20 | 60 | 6 |
| ZR704 030 02 08 | 3 | 0.2 | 4 | 8 | 55 | 6 |
| ZR704 030 02 10 | 3 | 0.2 | 4 | 10 | 55 | 6 |
| ZR704 030 02 12 | 3 | 0.2 | 4 | 12 | 55 | 6 |
| ZR704 030 02 16 | 3 | 0.2 | 4 | 16 | 55 | 6 |
| ZR704 030 02 20 | 3 | 0.2 | 4 | 20 | 60 | 6 |
| ZR704 030 03 08 | 3 | 0.3 | 4 | 8 | 55 | 6 |
| ZR704 030 03 09 | 3 | 0.3 | 4 | 9 | 55 | 6 |
| ZR704 030 03 10 | 3 | 0.3 | 4 | 10 | 55 | 6 |
| ZR704 030 03 12 | 3 | 0.3 | 4 | 12 | 55 | 6 |
| ZR704 030 03 16 | 3 | 0.3 | 4 | 16 | 55 | 6 |
| ZR704 030 03 20 | 3 | 0.3 | 4 | 20 | 60 | 6 |
| ZR704 030 05 08 | 3 | 0.5 | 4 | 8 | 55 | 6 |
| ZR704 030 05 09 | 3 | 0.5 | 4 | 9 | 55 | 6 |
| ZR704 030 05 10 | 3 | 0.5 | 4 | 10 | 55 | 6 |
| ZR704 030 05 12 | 3 | 0.5 | 4 | 12 | 55 | 6 |
| ZR704 030 05 16 | 3 | 0.5 | 4 | 16 | 55 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR704 | 4 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR704 030 05 20 | 3 | 0.5 | 4 | 20 | 60 | 6 |
| ZR704 030 10 08 | 3 | 1 | 4 | 8 | 55 | 6 |
| ZR704 030 10 10 | 3 | 1 | 4 | 10 | 55 | 6 |
| ZR704 030 10 12 | 3 | 1 | 4 | 12 | 55 | 6 |
| ZR704 030 10 16 | 3 | 1 | 4 | 16 | 55 | 6 |
| ZR704 030 10 20 | 3 | 1 | 4 | 20 | 60 | 6 |
| ZR704 040 01 10 | 4 | 0.1 | 6 | 10 | 55 | 6 |
| ZR704 040 01 12 | 4 | 0.1 | 6 | 12 | 55 | 6 |
| ZR704 040 01 16 | 4 | 0.1 | 6 | 16 | 55 | 6 |
| ZR704 040 01 20 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| ZR704 040 01 25 | 4 | 0.1 | 6 | 25 | 60 | 6 |
| ZR704 040 02 10 | 4 | 0.2 | 6 | 10 | 55 | 6 |
| ZR704 040 02 12 | 4 | 0.2 | 6 | 12 | 55 | 6 |
| ZR704 040 02 16 | 4 | 0.2 | 6 | 16 | 55 | 6 |
| ZR704 040 02 20 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| ZR704 040 02 25 | 4 | 0.2 | 6 | 25 | 60 | 6 |
| ZR704 040 03 10 | 4 | 0.3 | 6 | 10 | 55 | 6 |
| ZR704 040 03 12 | 4 | 0.3 | 6 | 12 | 55 | 6 |
| ZR704 040 03 16 | 4 | 0.3 | 6 | 16 | 55 | 6 |
| ZR704 040 03 20 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| ZR704 040 03 25 | 4 | 0.3 | 6 | 25 | 55 | 6 |
| ZR704 040 05 10 | 4 | 0.5 | 6 | 10 | 55 | 6 |
| ZR704 040 05 12 | 4 | 0.5 | 6 | 12 | 55 | 6 |
| ZR704 040 05 16 | 4 | 0.5 | 6 | 16 | 55 | 6 |
| ZR704 040 05 20 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| ZR704 040 05 25 | 4 | 0.5 | 6 | 25 | 60 | 6 |
| ZR704 040 10 10 | 4 | 1 | 6 | 10 | 55 | 6 |

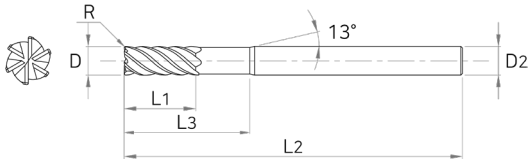
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR704 040 10 12 | 4 | 1 | 6 | 12 | 55 | 6 |
| ZR704 040 10 16 | 4 | 1 | 6 | 16 | 55 | 6 |
| ZR704 040 10 20 | 4 | 1 | 6 | 20 | 60 | 6 |
| ZR704 040 10 25 | 4 | 1 | 6 | 25 | 60 | 6 |
| ZR704 060 02 20 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| ZR704 060 03 20 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| ZR704 060 05 20 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| ZR704 060 10 20 | 6 | 1 | 9 | 20 | 60 | 6 |
| ZR704 060 15 20 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| ZR704 060 20 20 | 6 | 2 | 9 | 20 | 60 | 6 |
| ZR704 080 02 25 | 8 | 0.2 | 12 | 25 | 60 | 8 |
| ZR704 080 03 25 | 8 | 0.3 | 12 | 25 | 60 | 8 |
| ZR704 080 05 25 | 8 | 0.5 | 12 | 25 | 60 | 8 |
| ZR704 080 10 25 | 8 | 1 | 12 | 25 | 60 | 8 |
| ZR704 080 15 25 | 8 | 1.5 | 12 | 25 | 60 | 8 |
| ZR704 080 20 25 | 8 | 2 | 12 | 25 | 60 | 8 |
| ZR704 100 02 32 | 10 | 0.2 | 15 | 32 | 70 | 10 |
| ZR704 100 03 32 | 10 | 0.3 | 15 | 32 | 70 | 10 |
| ZR704 100 05 32 | 10 | 0.5 | 15 | 32 | 70 | 10 |
| ZR704 100 10 32 | 10 | 1 | 15 | 32 | 70 | 10 |
| ZR704 100 15 32 | 10 | 1.5 | 15 | 32 | 70 | 10 |
| ZR704 100 20 32 | 10 | 2 | 15 | 32 | 70 | 10 |
| ZR704 120 03 38 | 12 | 0.3 | 18 | 38 | 80 | 12 |
| ZR704 120 05 38 | 12 | 0.5 | 18 | 38 | 80 | 12 |
| ZR704 120 10 38 | 12 | 1 | 18 | 38 | 80 | 12 |
| ZR704 120 15 38 | 12 | 1.5 | 18 | 38 | 80 | 12 |
| ZR704 120 20 38 | 12 | 2 | 18 | 38 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR706 | 6 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.563

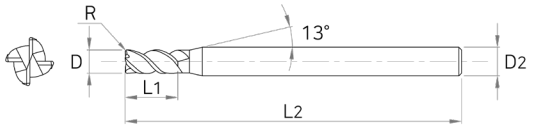
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR706 060 03 14 | 6 | 0.3 | 6 | 14 | 50 | 6 |
| ZR706 060 05 14 | 6 | 0.5 | 6 | 14 | 50 | 6 |
| ZR706 080 05 24 | 8 | 0.5 | 8 | 24 | 60 | 8 |
| ZR706 080 10 24 | 8 | 1 | 8 | 24 | 60 | 8 |
| ZR706 100 05 30 | 10 | 0.5 | 10 | 30 | 70 | 10 |
| ZR706 100 10 30 | 10 | 1 | 10 | 30 | 70 | 10 |
| ZR706 120 05 30 | 12 | 0.5 | 12 | 30 | 75 | 12 |
| ZR706 120 10 30 | 12 | 1 | 12 | 30 | 75 | 12 |

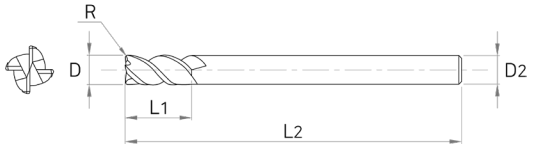
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR714 | 4 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR714 0303 | 3 | 0.3 | 8 | 50 | 6 |
| ZR714 0305 | 3 | 0.5 | 8 | 50 | 6 |
| ZR714 0403 | 4 | 0.3 | 11 | 50 | 6 |
| ZR714 0405 | 4 | 0.5 | 11 | 50 | 6 |
| ZR714 0410 | 4 | 1 | 11 | 50 | 6 |
| ZR714 0603 | 6 | 0.3 | 15 | 60 | 6 |
| ZR714 0605 | 6 | 0.5 | 15 | 60 | 6 |
| ZR714 0610 | 6 | 1 | 15 | 60 | 6 |
| ZR714 0803 | 8 | 0.3 | 20 | 60 | 8 |
| ZR714 0805 | 8 | 0.5 | 20 | 60 | 8 |
| ZR714 0810 | 8 | 1 | 20 | 60 | 8 |
| ZR714 0815 | 8 | 1.5 | 20 | 60 | 8 |
| ZR714 0820 | 8 | 2 | 20 | 60 | 8 |
| ZR714 1003 | 10 | 0.3 | 25 | 70 | 10 |

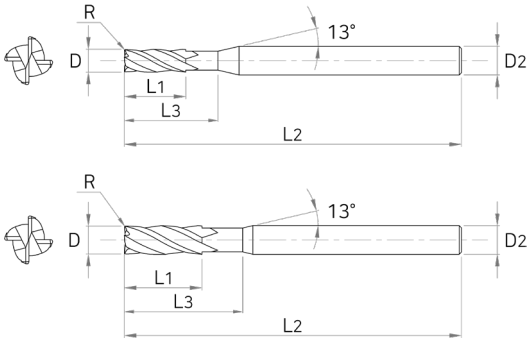
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR714 1005 | 10 | 0.5 | 25 | 70 | 10 |
| ZR714 1010 | 10 | 1 | 25 | 70 | 10 |
| ZR714 1015 | 10 | 1.5 | 25 | 70 | 10 |
| ZR714 1020 | 10 | 2 | 25 | 70 | 10 |
| ZR714 1025 | 10 | 2.5 | 25 | 70 | 10 |
| ZR714 1030 | 10 | 3 | 25 | 70 | 10 |
| ZR714 1203 | 12 | 0.3 | 30 | 80 | 12 |
| ZR714 1205 | 12 | 0.5 | 30 | 80 | 12 |
| ZR714 1210 | 12 | 1 | 30 | 80 | 12 |
| ZR714 1215 | 12 | 1.5 | 30 | 80 | 12 |
| ZR714 1220 | 12 | 2 | 30 | 80 | 12 |
| ZR714 1225 | 12 | 2.5 | 30 | 80 | 12 |
| ZR714 1230 | 12 | 3 | 30 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR724 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

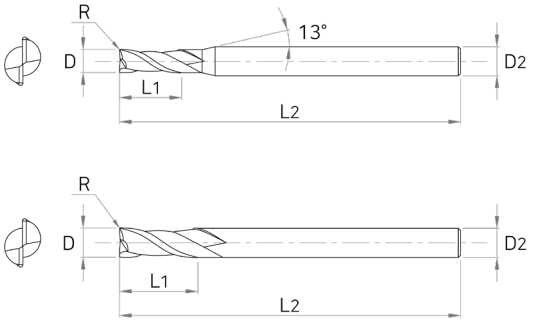
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR724 060 05 20 | 6 | 0.5 | 9 | 20 | 90 | 6 |
| ZR724 060 10 20 | 6 | 1 | 9 | 20 | 90 | 6 |
| ZR724 080 05 25 | 8 | 0.5 | 12 | 25 | 100 | 8 |
| ZR724 080 10 25 | 8 | 1 | 12 | 25 | 100 | 8 |
| ZR724 100 05 32 | 10 | 0.5 | 15 | 32 | 100 | 10 |
| ZR724 100 10 32 | 10 | 1 | 15 | 32 | 100 | 10 |
| ZR724 100 20 32 | 10 | 2 | 15 | 32 | 100 | 10 |
| ZR724 120 05 38 | 12 | 0.5 | 18 | 38 | 110 | 12 |
| ZR724 120 10 38 | 12 | 1 | 18 | 38 | 110 | 12 |
| ZR724 120 20 38 | 12 | 2 | 18 | 38 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR732 | 2 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR732 010 01 | 1 | 0.1 | 2 | 50 | 6 |
| ZR732 010 02 | 1 | 0.2 | 2 | 50 | 6 |
| ZR732 010 03 | 1 | 0.3 | 2 | 50 | 6 |
| ZR732 015 01 | 1.5 | 0.1 | 3 | 50 | 6 |
| ZR732 015 02 | 1.5 | 0.2 | 3 | 50 | 6 |
| ZR732 015 03 | 1.5 | 0.3 | 3 | 50 | 6 |
| ZR732 015 05 | 1.5 | 0.5 | 3 | 50 | 6 |
| ZR732 020 01 | 2 | 0.1 | 5 | 50 | 6 |
| ZR732 020 02 | 2 | 0.2 | 5 | 50 | 6 |
| ZR732 020 03 | 2 | 0.3 | 5 | 50 | 6 |
| ZR732 020 05 | 2 | 0.5 | 5 | 50 | 6 |
| ZR732 025 01 | 2.5 | 0.1 | 7 | 60 | 6 |
| ZR732 025 02 | 2.5 | 0.2 | 7 | 60 | 6 |
| ZR732 025 03 | 2.5 | 0.3 | 7 | 60 | 6 |
| ZR732 025 05 | 2.5 | 0.5 | 7 | 60 | 6 |
| ZR732 030 01 | 3 | 0.1 | 8 | 60 | 6 |
| ZR732 030 02 | 3 | 0.2 | 8 | 60 | 6 |
| ZR732 030 03 | 3 | 0.3 | 8 | 60 | 6 |
| ZR732 030 05 | 3 | 0.5 | 8 | 60 | 6 |
| ZR732 040 01 | 4 | 0.1 | 10 | 70 | 6 |
| ZR732 040 02 | 4 | 0.2 | 10 | 70 | 6 |
| ZR732 040 03 | 4 | 0.3 | 10 | 70 | 6 |
| ZR732 040 05 | 4 | 0.5 | 10 | 70 | 6 |
| ZR732 040 10 | 4 | 1 | 10 | 70 | 6 |
| ZR732 050 01 | 5 | 0.1 | 13 | 80 | 6 |

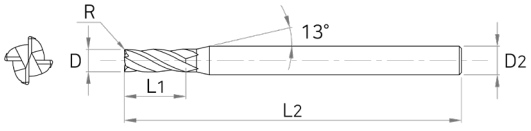
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR732 050 02 | 5 | 0.2 | 13 | 80 | 6 |
| ZR732 050 03 | 5 | 0.3 | 13 | 80 | 6 |
| ZR732 050 05 | 5 | 0.5 | 13 | 80 | 6 |
| ZR732 050 10 | 5 | 1 | 13 | 80 | 6 |
| ZR732 060 01 | 6 | 0.1 | 15 | 90 | 6 |
| ZR732 060 02 | 6 | 0.2 | 15 | 90 | 6 |
| ZR732 060 03 | 6 | 0.3 | 15 | 90 | 6 |
| ZR732 060 05 | 6 | 0.5 | 15 | 90 | 6 |
| ZR732 060 10 | 6 | 1 | 15 | 90 | 6 |
| ZR732 080 01 | 8 | 0.1 | 20 | 100 | 8 |
| ZR732 080 02 | 8 | 0.2 | 20 | 100 | 8 |
| ZR732 080 03 | 8 | 0.3 | 20 | 100 | 8 |
| ZR732 080 05 | 8 | 0.5 | 20 | 100 | 8 |
| ZR732 080 10 | 8 | 1 | 20 | 100 | 8 |
| ZR732 080 20 | 8 | 2 | 20 | 100 | 8 |
| ZR732 100 02 | 10 | 0.2 | 25 | 100 | 10 |
| ZR732 100 03 | 10 | 0.3 | 25 | 100 | 10 |
| ZR732 100 05 | 10 | 0.5 | 25 | 100 | 10 |
| ZR732 100 10 | 10 | 1 | 25 | 100 | 10 |
| ZR732 100 20 | 10 | 2 | 25 | 100 | 10 |
| ZR732 120 02 | 12 | 0.2 | 30 | 110 | 12 |
| ZR732 120 03 | 12 | 0.3 | 30 | 110 | 12 |
| ZR732 120 05 | 12 | 0.5 | 30 | 110 | 12 |
| ZR732 120 10 | 12 | 1 | 30 | 110 | 12 |
| ZR732 120 20 | 12 | 2 | 30 | 110 | 12 |

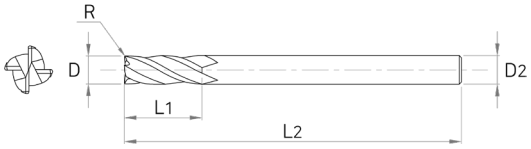
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR734 010 01 | 1 | 0.1 | 2 | 50 | 6 |
| ZR734 010 02 | 1 | 0.2 | 2 | 50 | 6 |
| ZR734 010 03 | 1 | 0.3 | 2 | 50 | 6 |
| ZR734 015 01 | 1.5 | 0.1 | 3 | 50 | 6 |
| ZR734 015 02 | 1.5 | 0.2 | 3 | 50 | 6 |
| ZR734 015 03 | 1.5 | 0.3 | 3 | 50 | 6 |
| ZR734 015 05 | 1.5 | 0.5 | 3 | 50 | 6 |
| ZR734 020 01 | 2 | 0.1 | 5 | 50 | 6 |
| ZR734 020 02 | 2 | 0.2 | 5 | 50 | 6 |
| ZR734 020 03 | 2 | 0.3 | 5 | 50 | 6 |
| ZR734 020 05 | 2 | 0.5 | 5 | 50 | 6 |
| ZR734 025 01 | 2.5 | 0.1 | 7 | 60 | 6 |
| ZR734 025 02 | 2.5 | 0.2 | 7 | 60 | 6 |
| ZR734 025 03 | 2.5 | 0.3 | 7 | 60 | 6 |
| ZR734 025 05 | 2.5 | 0.5 | 7 | 60 | 6 |
| ZR734 030 01 | 3 | 0.1 | 8 | 60 | 6 |
| ZR734 030 02 | 3 | 0.2 | 8 | 60 | 6 |
| ZR734 030 03 | 3 | 0.3 | 8 | 60 | 6 |
| ZR734 030 05 | 3 | 0.5 | 8 | 60 | 6 |
| ZR734 040 01 | 4 | 0.1 | 10 | 70 | 6 |
| ZR734 040 02 | 4 | 0.2 | 10 | 70 | 6 |
| ZR734 040 03 | 4 | 0.3 | 10 | 70 | 6 |
| ZR734 040 05 | 4 | 0.5 | 10 | 70 | 6 |
| ZR734 040 10 | 4 | 1 | 10 | 70 | 6 |
| ZR734 050 01 | 5 | 0.1 | 13 | 80 | 6 |

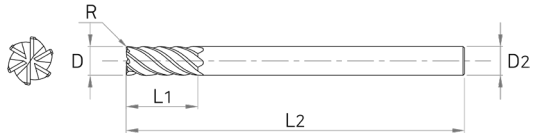
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR734 050 02 | 5 | 0.2 | 13 | 80 | 6 |
| ZR734 050 03 | 5 | 0.3 | 13 | 80 | 6 |
| ZR734 050 05 | 5 | 0.5 | 13 | 80 | 6 |
| ZR734 050 10 | 5 | 1 | 13 | 80 | 6 |
| ZR734 060 01 | 6 | 0.1 | 15 | 90 | 6 |
| ZR734 060 02 | 6 | 0.2 | 15 | 90 | 6 |
| ZR734 060 03 | 6 | 0.3 | 15 | 90 | 6 |
| ZR734 060 05 | 6 | 0.5 | 15 | 90 | 6 |
| ZR734 060 10 | 6 | 1 | 15 | 90 | 6 |
| ZR734 080 01 | 8 | 0.1 | 20 | 100 | 8 |
| ZR734 080 02 | 8 | 0.2 | 20 | 100 | 8 |
| ZR734 080 03 | 8 | 0.3 | 20 | 100 | 8 |
| ZR734 080 05 | 8 | 0.5 | 20 | 100 | 8 |
| ZR734 080 10 | 8 | 1 | 20 | 100 | 8 |
| ZR734 080 20 | 8 | 2 | 20 | 100 | 8 |
| ZR734 100 02 | 10 | 0.2 | 25 | 100 | 10 |
| ZR734 100 03 | 10 | 0.3 | 25 | 100 | 10 |
| ZR734 100 05 | 10 | 0.5 | 25 | 100 | 10 |
| ZR734 100 10 | 10 | 1 | 25 | 100 | 10 |
| ZR734 100 20 | 10 | 2 | 25 | 100 | 10 |
| ZR734 120 02 | 12 | 0.2 | 30 | 110 | 12 |
| ZR734 120 03 | 12 | 0.3 | 30 | 110 | 12 |
| ZR734 120 05 | 12 | 0.5 | 30 | 110 | 12 |
| ZR734 120 10 | 12 | 1 | 30 | 110 | 12 |
| ZR734 120 20 | 12 | 2 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR736 | 6 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.563

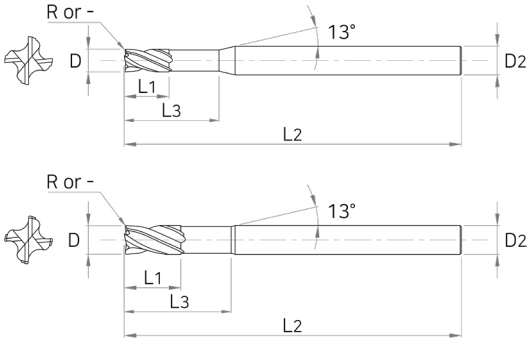
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 |
| ZR736 060 05 | 6 | 0.5 | 15 | 90 | 6 |
| ZR736 060 10 | 6 | 1 | 15 | 90 | 6 |
| ZR736 080 05 | 8 | 0.5 | 20 | 100 | 8 |
| ZR736 080 10 | 8 | 1 | 20 | 100 | 8 |
| ZR736 100 05 | 10 | 0.5 | 25 | 100 | 10 |
| ZR736 100 10 | 10 | 1 | 25 | 100 | 10 |
| ZR736 120 05 | 12 | 0.5 | 30 | 110 | 12 |
| ZR736 120 10 | 12 | 1 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZS1(2)04 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

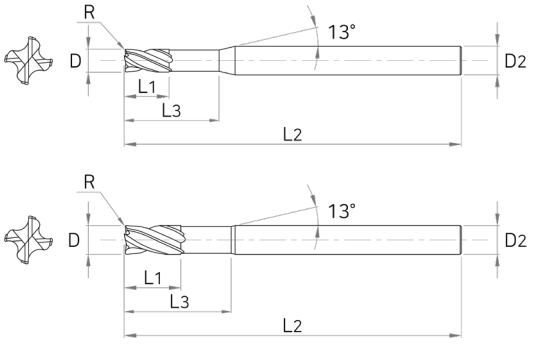
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZS104 010 | 1 | - | 1.5 | 4 | 45 | 4 |
| ZS204 010 | 1 | 0.05 | 1.5 | 4 | 45 | 4 |
| ZS104 020 | 2 | - | 3 | 6 | 45 | 4 |
| ZS204 020 | 2 | 0.05 | 3 | 6 | 45 | 4 |
| ZS104 030 | 3 | - | 4 | 7 | 45 | 6 |
| ZS204 030 | 3 | 0.1 | 4 | 7 | 45 | 6 |
| ZS104 040 | 4 | - | 5 | 9 | 45 | 6 |
| ZS204 040 | 4 | 0.1 | 5 | 9 | 45 | 6 |
| ZS104 060 | 6 | - | 7 | 14 | 50 | 6 |
| ZS204 060 | 6 | 0.2 | 7 | 14 | 50 | 6 |
| ZS104 080 | 8 | - | 9 | 18 | 60 | 8 |
| ZS204 080 | 8 | 0.2 | 9 | 18 | 60 | 8 |
| ZS104 100 | 10 | - | 12 | 25 | 75 | 10 |
| ZS204 100 | 10 | 0.2 | 12 | 25 | 75 | 10 |
| ZS104 120 | 12 | - | 15 | 30 | 75 | 12 |
| ZS204 120 | 12 | 0.3 | 15 | 30 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZS204 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.565

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZS204 020 005 07 | 2 | 0.05 | 2.5 | 7 | 50 | 4 |
| ZS204 020 01 07 | 2 | 0.1 | 2.5 | 7 | 50 | 4 |
| ZS204 030 01 09 | 3 | 0.1 | 4 | 9 | 55 | 6 |
| ZS204 030 02 09 | 3 | 0.2 | 4 | 9 | 55 | 6 |
| ZS204 030 03 09 | 3 | 0.3 | 4 | 9 | 55 | 6 |
| ZS204 030 03 12 | 3 | 0.3 | 4 | 12 | 55 | 6 |
| ZS204 030 03 16 | 3 | 0.3 | 4 | 16 | 55 | 6 |
| ZS204 040 02 12 | 4 | 0.2 | 5 | 12 | 55 | 6 |
| ZS204 040 03 12 | 4 | 0.3 | 5 | 12 | 55 | 6 |
| ZS204 040 03 16 | 4 | 0.3 | 5 | 16 | 55 | 6 |
| ZS204 040 03 20 | 4 | 0.3 | 5 | 20 | 55 | 6 |
| ZS204 040 05 12 | 4 | 0.5 | 5 | 12 | 55 | 6 |
| ZS204 040 05 16 | 4 | 0.5 | 5 | 16 | 55 | 6 |
| ZS204 040 05 20 | 4 | 0.5 | 5 | 20 | 55 | 6 |
| ZS204 040 10 12 | 4 | 1 | 5 | 12 | 55 | 6 |
| ZS204 050 01 16 | 5 | 0.1 | 6 | 16 | 60 | 6 |
| ZS204 050 02 16 | 5 | 0.2 | 6 | 16 | 60 | 6 |
| ZS204 050 03 16 | 5 | 0.3 | 6 | 16 | 60 | 6 |
| ZS204 050 05 16 | 5 | 0.5 | 6 | 16 | 60 | 6 |
| ZS204 050 10 16 | 5 | 1 | 6 | 16 | 60 | 6 |
| ZS204 060 01 20 | 6 | 0.1 | 7 | 20 | 60 | 6 |
| ZS204 060 02 20 | 6 | 0.2 | 7 | 20 | 60 | 6 |
| ZS204 060 03 20 | 6 | 0.3 | 7 | 20 | 60 | 6 |

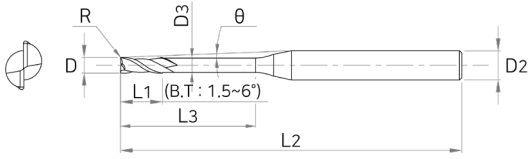
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZS204 060 05 20 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| ZS204 060 10 20 | 6 | 1 | 7 | 20 | 60 | 6 |
| ZS204 060 15 20 | 6 | 1.5 | 7 | 20 | 60 | 6 |
| ZS204 080 01 25 | 8 | 0.1 | 9 | 25 | 60 | 8 |
| ZS204 080 02 25 | 8 | 0.2 | 9 | 25 | 60 | 8 |
| ZS204 080 03 25 | 8 | 0.3 | 9 | 25 | 60 | 8 |
| ZS204 080 05 25 | 8 | 0.5 | 9 | 25 | 60 | 8 |
| ZS204 080 10 25 | 8 | 1 | 9 | 25 | 60 | 8 |
| ZS204 080 15 25 | 8 | 1.5 | 9 | 25 | 60 | 8 |
| ZS204 080 20 25 | 8 | 2 | 9 | 25 | 60 | 8 |
| ZS204 100 02 32 | 10 | 0.2 | 11 | 32 | 75 | 10 |
| ZS204 100 03 32 | 10 | 0.3 | 11 | 32 | 75 | 10 |
| ZS204 100 05 32 | 10 | 0.5 | 11 | 32 | 75 | 10 |
| ZS204 100 10 32 | 10 | 1 | 11 | 32 | 75 | 10 |
| ZS204 100 15 32 | 10 | 1.5 | 11 | 32 | 75 | 10 |
| ZS204 100 20 32 | 10 | 2 | 11 | 32 | 75 | 10 |
| ZS204 120 02 38 | 12 | 0.2 | 12 | 38 | 75 | 12 |
| ZS204 120 03 38 | 12 | 0.3 | 12 | 38 | 75 | 12 |
| ZS204 120 05 38 | 12 | 0.5 | 12 | 38 | 75 | 12 |
| ZS204 120 10 38 | 12 | 1 | 12 | 38 | 75 | 12 |
| ZS204 120 15 38 | 12 | 1.5 | 12 | 38 | 75 | 12 |
| ZS204 120 20 38 | 12 | 2 | 12 | 38 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.567

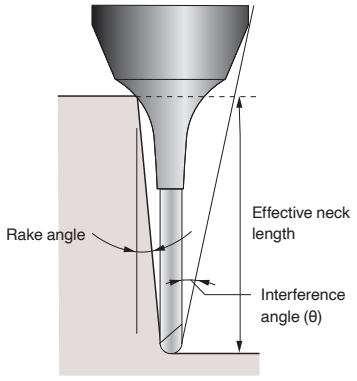
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNR 2002-0.5-005 | 0.2 | 0.05 | 0.15 | 0.5 | 0.17 | 50 | 4 | 11.4 | 0.9 | 1 | 1 | 1.1 | 12 |
| ZSLNR 2002-1-005 | 0.2 | 0.05 | 0.15 | 1 | 0.17 | 50 | 4 | 10.9 | 1.6 | 1.7 | 1.9 | 2 | 2.3 |
| ZSLNR 2002-1.5-005 | 0.2 | 0.05 | 0.15 | 1.5 | 0.17 | 50 | 4 | 10.3 | 2.1 | 2.3 | 2.5 | 2.7 | 3 |
| ZSLNR 2002-2-005 | 0.2 | 0.05 | 0.15 | 2 | 0.17 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNR 2003-1-005 | 0.3 | 0.05 | 0.25 | 1 | 0.27 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ZSLNR 2003-1.5-005 | 0.3 | 0.05 | 0.25 | 1.5 | 0.27 | 50 | 4 | 10.3 | 2.1 | 2.3 | 2.5 | 2.7 | 3 |
| ZSLNR 2003-2-005 | 0.3 | 0.05 | 0.25 | | 0.27 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ZSLNR 2003-2.5-005 | 0.3 | 0.05 | 0.25 | 2.5 | 0.27 | 50 | 4 | 9.4 | 3.2 | 3.5 | 3.7 | 3.9 | 4.3 |
| ZSLNR 2003-3-005 | 0.3 | 0.05 | 0.25 | 3 | 0.27 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ZSLNR 2004-1-005 | 0.4 | 0.05 | 0.3 | 1 | 0.37 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ZSLNR 2004-1.5-005 | 0.4 | 0.05 | 0.3 | 1.5 | 0.37 | 50 | 4 | 10.3 | 2 | 2.1 | 2.2 | 2.3 | 2.5 |
| ZSLNR 2004-2-005 | 0.4 | 0.05 | 0.3 | 2 | 0.37 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ZSLNR 2004-2.5-005 | 0.4 | 0.05 | 0.3 | 2.5 | 0.37 | 50 | 4 | 9.4 | 3.2 | 3.5 | 3.7 | 3.9 | 4.3 |
| ZSLNR 2004-3-005 | 0.4 | 0.05 | 0.3 | 3 | 0.37 | 50 | 4 | 9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ZSLNR 2004-3.5-005 | 0.4 | 0.05 | 0.3 | 3.5 | 0.37 | 50 | 4 | 8.6 | 4.3 | 4.6 | 4.9 | 5.1 | 5.5 |
| ZSLNR 2004-4-005 | 0.4 | 0.05 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNR 2004-2-01 | 0.4 | 0.1 | 0.3 | 2 | 0.37 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ZSLNR 2004-3-01 | 0.4 | 0.1 | 0.3 | 3 | 0.37 | 50 | 4 | 9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ZSLNR 2004-4-01 | 0.4 | 0.1 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ZSLNR 2005-1-005 | 0.5 | 0.05 | 0.35 | 1 | 0.47 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ZSLNR 2005-2-005 | 0.5 | 0.05 | 0.35 | 2 | 0.47 | 50 | 4 | 9.7 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ZSLNR 2005-3-005 | 0.5 | 0.05 | 0.35 | 3 | 0.47 | 50 | 4 | 8.9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ZSLNR 2005-4-005 | 0.5 | 0.05 | 0.35 | 4 | 0.47 | 50 | 4 | 8.2 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ZSLNR 2005-5-005 | 0.5 | 0.05 | 0.35 | 5 | 0.47 | 50 | 4 | 7.6 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |

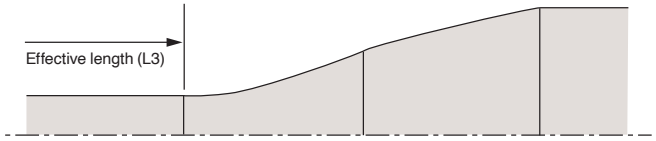
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNR 2005-6-005 | 0.5 | 0.05 | 0.35 | 6 | 0.47 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNR 2005-1-01 | 0.5 | 0.1 | 0.35 | 1 | 0.47 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ZSLNR 2005-2-01 | 0.5 | 0.1 | 0.35 | 2 | 0.47 | 50 | 4 | 9.8 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ZSLNR 2005-3-01 | 0.5 | 0.1 | 0.35 | 3 | 0.47 | 50 | 4 | 8.9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ZSLNR 2005-4-01 | 0.5 | 0.1 | 0.35 | 4 | 0.47 | 50 | 4 | 8.2 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ZSLNR 2005-5-01 | 0.5 | 0.1 | 0.35 | 5 | 0.47 | 50 | 4 | 7.6 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ZSLNR 2005-6-01 | 0.5 | 0.1 | 0.35 | 6 | 0.47 | 50 | 4 | 7.1 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNR 2006-2-01 | 0.6 | 0.1 | 0.4 | 2 | 0.57 | 50 | 4 | 9.7 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ZSLNR 2006-4-01 | 0.6 | 0.1 | 0.4 | 4 | 0.57 | 50 | 4 | 8.1 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ZSLNR 2006-6-01 | 0.6 | 0.1 | 0.4 | 6 | 0.57 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNR 2006-8-01 | 0.6 | 0.1 | 0.4 | 8 | 0.57 | 50 | 4 | 6.1 | 9.3 | 9.9 | 10.3 | 10.7 | 11 |
| ZSLNR 2006-10-01 | 0.6 | 0.1 | 0.4 | 10 | 0.57 | 50 | 4 | 5.5 | 11.5 | 12.1 | 12.5 | 13 | 13.7 |
| ZSLNR 2008-4-01 | 0.8 | 0.1 | 0.5 | 4 | 0.77 | 50 | 4 | 8 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ZSLNR 2008-6-01 | 0.8 | 0.1 | 0.5 | 6 | 0.77 | 50 | 4 | 6.8 | 7 | 7.4 | 7.7 | 7.9 | 8.4 |
| ZSLNR 2008-8-01 | 0.8 | 0.1 | 0.5 | 8 | 0.77 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNR 2008-12-01 | 0.8 | 0.1 | 0.5 | 12 | 0.77 | 50 | 4 | 4.7 | 13.6 | 14.2 | 14.7 | 15.2 | 16 |
| ZSLNR 2008-4-02 | 0.8 | 0.2 | 0.5 | 4 | 0.77 | 50 | 4 | 8 | 4.8 | 5.1 | 5.4 | 5.6 | 6.1 |
| ZSLNR 2008-6-02 | 0.8 | 0.2 | 0.5 | 6 | 0.77 | 50 | 4 | 6.9 | 7 | 7.3 | 7.7 | 7.9 | 8.4 |
| ZSLNR2010-4-01 | 1 | 0.1 | 0.8 | 4 | 0.94 | 50 | 4 | 7.7° | 4.7 | 4.9 | 5.1 | 5.2 | 5.5 |
| ZSLNR2010-6-01 | 1 | 0.1 | 0.8 | 6 | 0.94 | 50 | 4 | 6.6° | 7.1 | 7.4 | 7.7 | 8 | 8.5 |
| ZSLNR2010-8-01 | 1 | 0.1 | 0.8 | 8 | 0.94 | 50 | 4 | 5.7° | 9.2 | 9.6 | 9.9 | 10.2 | 10.8 |
| ZSLNR2010-10-01 | 1 | 0.1 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1° | 11.6 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNR2010-4-02 | 1 | 0.2 | 0.8 | 4 | 0.94 | 50 | 4 | 7.8° | 4.7 | 4.9 | 5.1 | 5.2 | 5.5 |
| ZSLNR2010-6-02 | 1 | 0.2 | 0.8 | 6 | 0.94 | 50 | 4 | 6.6° | 7.1 | 7.4 | 7.7 | 8 | 8.5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNR2010-8-02 | 1 | 0.2 | 0.8 | 8 | 0.94 | 50 | 4 | 5.8° | 9.2 | 9.6 | 9.9 | 10.2 | 10.8 |
| ZSLNR2010-10-02 | 1 | 0.2 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1° | 11.6 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNR2010-6-03 | 1 | 0.3 | 0.8 | 6 | 0.94 | 50 | 4 | 6.7° | 7.1 | 7.4 | 7.7 | 8 | 8.4 |
| ZSLNR2010-10-03 | 1 | 0.3 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1° | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ZSLNR2010-12-01 | 1 | 0.1 | 0.8 | 12 | 0.94 | 55 | 4 | 4.5° | 13.7 | 14.3 | 14.8 | 15.3 | 16 |
| ZSLNR2010-12-02 | 1 | 0.2 | 0.8 | 12 | 0.94 | 55 | 4 | 4.6° | 13.7 | 14.3 | 14.8 | 15.2 | 16 |
| ZSLNR2010-16-01 | 1 | 0.1 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8° | 17.9 | 18.6 | 19.2 | 19.7 | 21.3 |
| ZSLNR2010-20-01 | 1 | 0.1 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2° | 22 | 22.8 | 23.5 | 24 | 26.7 |
| ZSLNR2010-16-02 | 1 | 0.2 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8° | 17.9 | 18.6 | 19.2 | 19.7 | 21.3 |
| ZSLNR2010-20-02 | 1 | 0.2 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2° | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ZSLNR2010-16-03 | 1 | 0.3 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8° | 17.9 | 18.6 | 19.1 | 19.6 | 21.3 |
| ZSLNR2010-20-03 | 1 | 0.3 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2° | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ZSLNR 2015-4-01 | 1.5 | 0.1 | 1.35 | 4 | 1.42 | 50 | 4 | 7.2 | 4.8 | 4.9 | 5.1 | 5.3 | 5.5 |
| ZSLNR 2015-8-01 | 1.5 | 0.1 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ZSLNR 2015-12-01 | 1.5 | 0.1 | 1.35 | 12 | 1.42 | 55 | 4 | 4 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ZSLNR 2015-15-01 | 1.5 | 0.1 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.6 | 18.1 | 18.6 | 20.1 |
| ZSLNR 2015-20-01 | 1.5 | 0.1 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNR 2015-4-02 | 1.5 | 0.2 | 1.35 | 4 | 1.42 | 50 | 4 | 7.3 | 4.7 | 4.9 | 5.1 | 5.3 | 5.5 |
| ZSLNR 2015-8-02 | 1.5 | 0.2 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ZSLNR 2015-12-02 | 1.5 | 0.2 | 1.35 | 12 | 1.42 | 55 | 4 | 4.1 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ZSLNR 2015-15-02 | 1.5 | 0.2 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.5 | 18.1 | 18.6 | 20 |
| ZSLNR 2015-20-02 | 1.5 | 0.2 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNR 2015-8-03 | 1.5 | 0.3 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ZSLNR 2015-15-03 | 1.5 | 0.3 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.5 | 18.1 | 18.6 | 20 |
| ZSLNR 2015-20-03 | 1.5 | 0.3 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24 | - |
| ZSLNR 2020-6-02 | 2 | 0.2 | 1.7 | 6 | 1.92 | 50 | 4 | 5.4 | 6.8 | 7.1 | 7.3 | 7.5 | 8.1 |
| ZSLNR 2020-8-02 | 2 | 0.2 | 1.7 | 8 | 1.92 | 50 | 4 | 4.6 | 8.9 | 9.2 | 9.4 | 9.7 | 10.8 |
| ZSLNR 2020-12-02 | 2 | 0.2 | 1.7 | 12 | 1.92 | 55 | 4 | 3.5 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ZSLNR 2020-16-02 | 2 | 0.2 | 1.7 | 16 | 1.92 | 55 | 4 | 2.8 | 17.6 | 18.1 | 18.6 | 19.3 | - |
| ZSLNR 2020-20-02 | 2 | 0.2 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ZSLNR 2020-25-02 | 2 | 0.2 | 1.7 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.8 | - | - |
| ZSLNR 2020-30-02 | 2 | 0.2 | 1.7 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ZSLNR 2020-8-03 | 2 | 0.3 | 1.7 | 8 | 1.92 | 50 | 4 | 4.6 | 8.9 | 9.2 | 9.4 | 9.7 | 10.7 |
| ZSLNR 2020-16-03 | 2 | 0.3 | 1.7 | 16 | 1.92 | 55 | 4 | 2.8 | 17.6 | 18.1 | 18.6 | 19.3 | - |
| ZSLNR 2020-20-03 | 2 | 0.3 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24 | - |
| ZSLNR 2020-6-05 | 2 | 0.5 | 1.7 | 6 | 1.92 | 50 | 4 | 5.5 | 6.8 | 7.1 | 7.3 | 7.4 | 8 |
| ZSLNR 2020-8-05 | 2 | 0.5 | 1.7 | 8 | 1.92 | 50 | 4 | 4.7 | 8.9 | 9.2 | 9.4 | 9.6 | 10.7 |
| ZSLNR 2020-12-05 | 2 | 0.5 | 1.7 | 12 | 1.92 | 55 | 4 | 3.5 | 13.4 | 13.9 | 14.3 | 14.6 | 16 |
| ZSLNR 2020-16-05 | 2 | 0.5 | 1.7 | 16 | 1.92 | 55 | 4 | 2.9 | 17.6 | 18.1 | 18.6 | 19.2 | - |
| ZSLNR 2020-20-05 | 2 | 0.5 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24 | - |
| ZSLNR 2020-25-05 | 2 | 0.5 | 1.7 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.1 | 28.8 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL



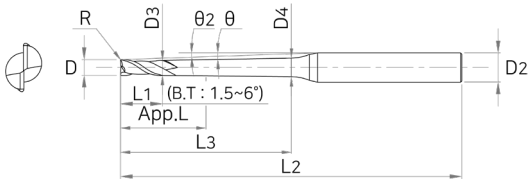
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNR 2020-30-05 | 2 | 0.5 | 1.7 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.3 | - | - |
| ZSLNR 2020-8-08 | 2 | 0.8 | 1.7 | 8 | 1.92 | 50 | 4 | 4.8 | 8.9 | 9.2 | 9.4 | 9.6 | 10.6 |
| ZSLNR 2020-16-08 | 2 | 0.8 | 1.7 | 16 | 1.92 | 55 | 4 | 2.9 | 17.6 | 18.1 | 18.6 | 19.2 | - |
| ZSLNR 2020-20-08 | 2 | 0.8 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.8 | 23.5 | 24 | - |
| ZSLNR 2030-8-02 | 3 | 0.2 | 2.5 | 8 | 2.86 | 55 | 6 | 5.7 | 9 | 9.3 | 9.5 | 9.9 | 10.9 |
| ZSLNR 2030-12-02 | 3 | 0.2 | 2.5 | 12 | 2.86 | 60 | 6 | 4.5 | 13.1 | 13.5 | 14 | 14.7 | 16.2 |
| ZSLNR 2030-16-02 | 3 | 0.2 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.5 | 21.6 |
| ZSLNR 2030-20-02 | 3 | 0.2 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.9 |
| ZSLNR 2030-30-02 | 3 | 0.2 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ZSLNR 2030-35-02 | 3 | 0.2 | 2.5 | 35 | 2.86 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ZSLNR 2030-8-03 | 3 | 0.3 | 2.5 | 8 | 2.86 | 55 | 6 | 5.7 | 9 | 9.3 | 9.5 | 9.9 | 10.9 |
| ZSLNR 2030-16-03 | 3 | 0.3 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.4 | 21.5 |
| ZSLNR 2030-20-03 | 3 | 0.3 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.8 |
| ZSLNR 2030-30-03 | 3 | 0.3 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ZSLNR 2030-8-05 | 3 | 0.5 | 2.5 | 8 | 2.86 | 55 | 6 | 5.8 | 9 | 9.3 | 9.5 | 9.8 | 10.8 |
| ZSLNR 2030-12-05 | 3 | 0.5 | 2.5 | 12 | 2.86 | 60 | 6 | 4.6 | 13.1 | 13.5 | 13.9 | 14.6 | 16.2 |
| ZSLNR 2030-16-05 | 3 | 0.5 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.4 | 21.5 |
| ZSLNR 2030-20-05 | 3 | 0.5 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.8 |
| ZSLNR 2030-30-05 | 3 | 0.5 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.1 | - |
| ZSLNR 2030-35-05 | 3 | 0.5 | 2.5 | 35 | 2.86 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.1 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.567

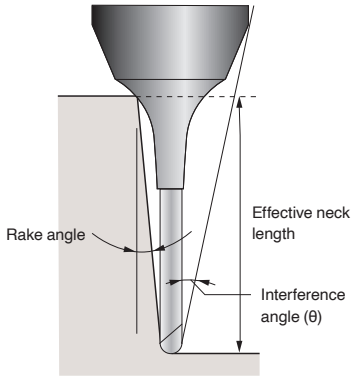
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNR 2002-2-09005 | 0.2 | 0.05 | 0.15 | 2 | 0.9 | 0.17 | 0.23 | 50 | 4 | 1.1 | 10 | x | 2.8 | 3.1 | 3.4 | 3.9 |
| ZSTNR 2004-4-09005 | 0.4 | 0.05 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.4 | x | 4.9 | 5.3 | 5.7 | 6.3 |
| ZSTNR 2004-5-09005 | 0.4 | 0.05 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.8 | x | 5.9 | 6.4 | 6.8 | 7.5 |
| ZSTNR 2004-4-0901 | 0.4 | 0.1 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.5 | x | 4.9 | 5.3 | 5.7 | 6.3 |
| ZSTNR 2004-5-0901 | 0.4 | 0.1 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.9 | x | 5.9 | 6.4 | 6.8 | 7.5 |
| ZSTNR 2005-5-0901 | 0.5 | 0.1 | 0.35 | 5 | 0.9 | 0.47 | 0.62 | 50 | 4 | 1.3 | 7.8 | x | 5.9 | 6.4 | 6.8 | 7.5 |
| ZSTNR 2005-8-0901 | 0.5 | 0.1 | 0.35 | 8 | 0.9 | 0.47 | 0.71 | 50 | 4 | 1.3 | 6.4 | x | 9 | 9.7 | 10.2 | 11 |
| ZSTNR 2005-10-0901 | 0.5 | 0.1 | 0.35 | 10 | 0.9 | 0.47 | 0.77 | 55 | 4 | 1.3 | 5.8 | x | 11 | 11.8 | 12.4 | 13.2 |
| ZSTNR 2006-12-0901 | 0.6 | 0.1 | 0.4 | 12 | 0.9 | 0.57 | 0.93 | 55 | 4 | 1.35 | 5.1 | x | 13 | 13.9 | 14.5 | 15.5 |
| ZSTNR 2006-15-0901 | 0.6 | 0.1 | 0.4 | 15 | 0.9 | 0.57 | 1.03 | 55 | 4 | 1.35 | 4.5 | x | 16.1 | 17.1 | 17.8 | 18.8 |
| ZSTNR 2008-6-0402 | 0.8 | 0.2 | 0.5 | 6 | 0.4 | 0.77 | 0.85 | 50 | 4 | 2.64 | 7 | 6.6 | 7.1 | 7.5 | 7.8 | 8.3 |
| ZSTNR 2008-12-0902 | 0.8 | 0.2 | 0.5 | 12 | 0.9 | 0.77 | 1.13 | 55 | 4 | 1.45 | 5 | x | 13 | 13.9 | 14.5 | 15.5 |
| ZSTNR 2010-8-0402 | 1 | 0.2 | 0.8 | 8 | 0.4 | 0.94 | 1.04 | 55 | 6 | 5.09 | 7.4 | 8.8 | 9.3 | 9.7 | 10.1 | 10.6 |
| ZSTNR 2010-10-0902 | 1 | 0.2 | 0.8 | 10 | 0.9 | 0.94 | 1.23 | 55 | 6 | 5.09 | 6.8 | x | 11.2 | 11.9 | 12.4 | 13.3 |
| ZSTNR 2010-15-0902 | 1 | 0.2 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.6 | x | 16.3 | 17.2 | 17.8 | 18.8 |
| ZSTNR 2010-20-0902 | 1 | 0.2 | 0.8 | 20 | 0.9 | 0.94 | 1.54 | 65 | 6 | 2.7 | 4.8 | x | 21.3 | 22.4 | 23.2 | 24.7 |
| ZSTNR 2010-25-0902 | 1 | 0.2 | 0.8 | 25 | 0.9 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.1 | x | 26.4 | 27.6 | 28.5 | 30.9 |
| ZSTNR 2010-30-0902 | 1 | 0.2 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | x | 31.5 | 32.8 | 33.7 | 37 |
| ZSTNR 2010-35-0902 | 1 | 0.2 | 0.8 | 35 | 0.9 | 0.94 | 2.02 | 80 | 6 | 2.7 | 3.3 | x | 36.5 | 38 | 39 | 43.2 |
| ZSTNR 2010-8-0403 | 1 | 0.3 | 0.8 | 8 | 0.4 | 0.94 | 1.04 | 55 | 6 | 2.7 | 7.4 | 8.8 | 9.3 | 9.7 | 10 | 10.6 |
| ZSTNR 2010-15-0903 | 1 | 0.3 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.6 | x | 16.3 | 17.2 | 17.8 | 18.8 |
| ZSTNR 2010-25-0903 | 1 | 0.3 | 0.8 | 25 | 0.9 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.2 | x | 26.4 | 27.6 | 28.5 | 30.8 |
| ZSTNR 2010-30-0903 | 1 | 0.3 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | x | 31.5 | 32.8 | 33.7 | 37 |
| ZSTNR 2015-10-0402 | 1.5 | 0.2 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 7.07 | 6.4 | 11 | 11.5 | 11.9 | 12.3 | 13 |

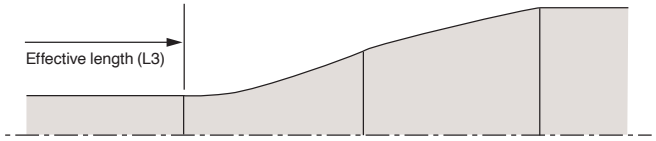
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNR 2015-15-0902 | 1.5 | 0.2 | 1.35 | 15 | 0.9 | 1.42 | 1.85 | 60 | 6 | 7.07 | 5.3 | x | 16.4 | 17.3 | 17.9 | 18.9 |
| ZSTNR 2015-20-0902 | 1.5 | 0.2 | 1.35 | 20 | 0.9 | 1.42 | 2.01 | 65 | 6 | 3.89 | 4.5 | x | 21.5 | 22.5 | 23.2 | 24.9 |
| ZSTNR 2015-25-0902 | 1.5 | 0.2 | 1.35 | 25 | 0.9 | 1.42 | 2.16 | 70 | 6 | 3.89 | 3.9 | x | 26.6 | 27.7 | 28.5 | 31 |
| ZSTNR 2015-30-0902 | 1.5 | 0.2 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | x | 31.6 | 32.9 | 33.8 | 37.1 |
| ZSTNR 2015-10-0403 | 1.5 | 0.3 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 3.89 | 6.4 | 11 | 11.5 | 11.9 | 12.3 | 13 |
| ZSTNR 2015-20-0903 | 1.5 | 0.3 | 1.35 | 20 | 0.9 | 1.42 | 2.01 | 65 | 6 | 3.89 | 4.5 | x | 21.5 | 22.5 | 23.2 | 24.8 |
| ZSTNR 2015-25-0903 | 1.5 | 0.3 | 1.35 | 25 | 0.9 | 1.42 | 2.16 | 70 | 6 | 3.89 | 3.9 | x | 26.5 | 27.7 | 28.5 | 31 |
| ZSTNR 2015-30-0903 | 1.5 | 0.3 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | x | 31.6 | 32.9 | 33.8 | 37.1 |
| ZSTNR 2020-30-0902 | 2 | 0.2 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 7.42 | 3.1 | x | 31.6 | 32.9 | 33.8 | 37.2 |
| ZSTNR 2020-40-0902 | 2 | 0.2 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 7.42 | 2.5 | x | 41.8 | 43.3 | 44.6 | - |
| ZSTNR 2020-50-0902 | 2 | 0.2 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 7.42 | 2.1 | x | 51.9 | 53.6 | 55.7 | - |
| ZSTNR 2020-12-0403 | 2 | 0.3 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.5 | 13 | 13.6 | 14.1 | 14.5 | 15.6 |
| ZSTNR 2020-20-0903 | 2 | 0.3 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.1 | x | 21.5 | 22.5 | 23.2 | 24.9 |
| ZSTNR 2020-30-0903 | 2 | 0.3 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.1 | x | 31.6 | 32.9 | 33.8 | 37.1 |
| ZSTNR 2020-40-0903 | 2 | 0.3 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.5 | x | 41.7 | 43.3 | 44.6 | - |
| ZSTNR 2020-50-0903 | 2 | 0.3 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | x | 51.8 | 53.6 | 55.7 | - |
| ZSTNR 2020-8-0405 | 2 | 0.5 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 4.24 | 6.8 | 8.7 | 9 | 9.3 | 9.5 | 10.4 |
| ZSTNR 2020-12-0405 | 2 | 0.5 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 4.24 | 5.6 | 13 | 13.6 | 14.1 | 14.4 | 15.5 |
| ZSTNR 2020-16-0405 | 2 | 0.5 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 4.24 | 4.7 | 17 | 17.8 | 18.3 | 18.7 | 20.7 |
| ZSTNR 2020-20-0905 | 2 | 0.5 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | x | 21.5 | 22.5 | 23.2 | 24.8 |
| ZSTNR 2020-25-0905 | 2 | 0.5 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | x | 26.6 | 27.7 | 28.5 | 30.9 |
| ZSTNR 2020-30-0905 | 2 | 0.5 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.1 | x | 31.6 | 32.9 | 33.8 | 37.1 |
| ZSTNR 2020-40-0905 | 2 | 0.5 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.5 | x | 41.7 | 43.2 | 44.6 | - |
| ZSTNR 2020-50-0905 | 2 | 0.5 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | x | 51.8 | 53.6 | 55.6 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNR 2030-40-0902 | 3 | 0.2 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | x | 42 | 43.4 | - | - |
| ZSTNR 2030-50-0902 | 3 | 0.2 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.6 | x | 52.1 | 53.7 | - | - |
| ZSTNR 2030-60-0902 | 3 | 0.2 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | x | 62.2 | - | - | - |
| ZSTNR 2030-40-0903 | 3 | 0.3 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | x | 42 | 43.4 | - | - |
| ZSTNR 2030-50-0903 | 3 | 0.3 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | x | 52.1 | 53.7 | - | - |
| ZSTNR 2030-60-0903 | 3 | 0.3 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | x | 62.2 | - | - | - |
| ZSTNR 2030-40-0905 | 3 | 0.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | x | 42 | 43.4 | - | - |
| ZSTNR 2030-50-0905 | 3 | 0.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | x | 52.1 | 53.7 | - | - |
| ZSTNR 2030-60-0905 | 3 | 0.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | x | 62.1 | - | - | - |

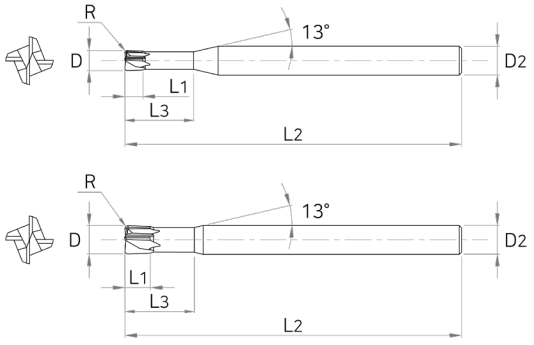


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSPM4 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | 0° HELIX | R ±0.015 All Sizes | DATA P.566

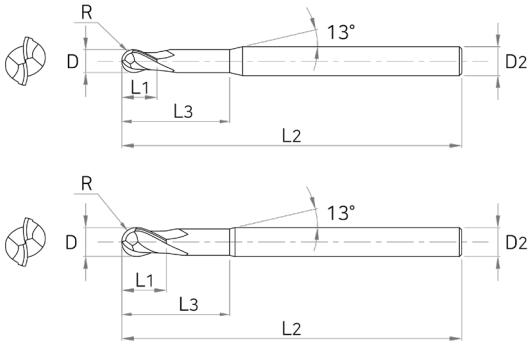
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZSPM4 030-05 | 3 | 0.5 | 1.2 | 8 | 50 | 6 |
| ZSPM4 040-05 | 4 | 0.5 | 1.5 | 10 | 50 | 6 |
| ZSPM4 060-05 | 6 | 0.5 | 2.5 | 12 | 60 | 6 |
| ZSPM4 060-10 | 6 | 1 | 2.5 | 12 | 60 | 6 |
| ZSPM4 060-15 | 6 | 1.5 | 2.5 | 12 | 60 | 6 |
| ZSPM4 060-15L | 6 | 1.5 | 2.5 | 12 | 90 | 6 |
| ZSPM4 080-10 | 8 | 1 | 3.5 | 16 | 60 | 8 |
| ZSPM4 080-20 | 8 | 2 | 3.5 | 16 | 60 | 8 |
| ZSPM4 080-20L | 8 | 2 | 3.5 | 16 | 100 | 8 |
| ZSPM4 100-10 | 10 | 1 | 4 | 20 | 70 | 10 |
| ZSPM4 100-20 | 10 | 2 | 4 | 20 | 70 | 10 |
| ZSPM4 100-20L | 10 | 2 | 4 | 20 | 100 | 10 |
| ZSPM4 120-20 | 12 | 2 | 5 | 25 | 80 | 12 |
| ZSPM4 120-30 | 12 | 3 | 5 | 25 | 80 | 12 |
| ZSPM4 120-30L | 12 | 3 | 5 | 25 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# DB702 | 2 FLUTES NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| DB702 001 | 0.1 | 0.05 | 0.15 | - | 40 | 4 |
| DB702 002 | 0.2 | 0.1 | 0.3 | - | 40 | 4 |
| DB702 003 | 0.3 | 0.15 | 0.5 | - | 40 | 4 |
| DB702 004 | 0.4 | 0.2 | 0.6 | - | 40 | 4 |
| DB702 005 | 0.5 | 0.25 | 0.7 | - | 40 | 4 |
| DB702 006 | 0.6 | 0.3 | 0.9 | - | 40 | 4 |
| DB702 007 | 0.7 | 0.35 | 1.1 | - | 40 | 4 |
| DB702 008 | 0.8 | 0.4 | 1.2 | - | 40 | 4 |
| DB702 009 | 0.9 | 0.45 | 1.4 | - | 40 | 4 |
| DB702 010 S4 | 1 | 0.5 | 1.5 | - | 45 | 4 |
| DB702 010 | 1 | 0.5 | 1.5 | 3 | 50 | 6 |
| DB702 015 S4 | 1.5 | 0.75 | 2 | - | 45 | 4 |
| DB702 015 | 1.5 | 0.75 | 2 | 4 | 50 | 6 |
| DB702 020 S4 | 2 | 1 | 2.5 | - | 45 | 4 |
| DB702 020 | 2 | 1 | 2.5 | 5 | 50 | 6 |
| DB702 025 | 2.5 | 1.25 | 3 | 7 | 50 | 6 |
| DB702 030S4 | 3 | 1.5 | 4 | - | 45 | 4 |

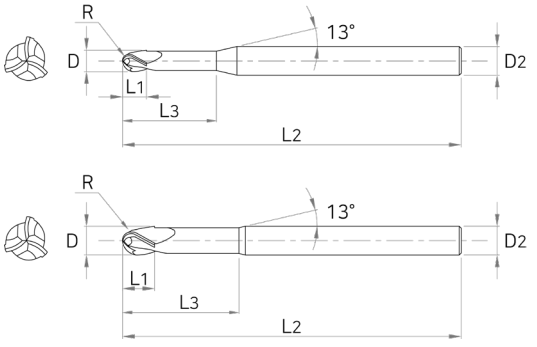
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| DB702 030S | 3 | 1.5 | 4 | 10 | 50 | 6 |
| DB702 030 | 3 | 1.5 | 4 | 10 | 60 | 6 |
| DB702 031 | 3 | 1.5 | 4 | 10 | 70 | 6 |
| DB702 040 S4 | 4 | 2 | 5 | - | 45 | 4 |
| DB702 040 S | 4 | 2 | 5 | 10 | 50 | 6 |
| DB702 040 | 4 | 2 | 5 | 10 | 60 | 6 |
| DB702 041 | 4 | 2 | 5 | 10 | 70 | 6 |
| DB702 050 | 5 | 2.5 | 6 | 12 | 60 | 6 |
| DB702 060 | 6 | 3 | 7 | 12 | 60 | 6 |
| DB702 061 | 6 | 3 | 7 | 12 | 90 | 6 |
| DB702 080 | 8 | 4 | 9 | 15 | 70 | 8 |
| DB702 081 | 8 | 4 | 9 | 15 | 100 | 8 |
| DB702 100 | 10 | 5 | 11 | 25 | 75 | 10 |
| DB702 101 | 10 | 5 | 11 | 25 | 100 | 10 |
| DB702 120 | 12 | 6 | 12 | 25 | 80 | 12 |
| DB702 121 | 12 | 6 | 12 | 25 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# DB703 | 3 FLUTES NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

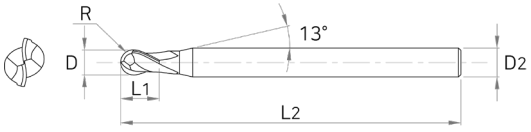
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| DB703 025 | 2.5 | 1.25 | 3 | 7 | 50 | 6 |
| DB703 030 S | 3 | 1.5 | 4 | 10 | 50 | 6 |
| DB703 030 | 3 | 1.5 | 4 | 10 | 60 | 6 |
| DB703 031 | 3 | 1.5 | 4 | 10 | 70 | 6 |
| DB703 040 S | 4 | 2 | 5 | 10 | 50 | 6 |
| DB703 040 | 4 | 2 | 5 | 10 | 60 | 6 |
| DB703 041 | 4 | 2 | 5 | 10 | 70 | 6 |
| DB703 050 | 5 | 2.5 | 6 | 12 | 60 | 6 |
| DB703 060 | 6 | 3 | 7 | 12 | 60 | 6 |
| DB703 061 | 6 | 3 | 7 | 12 | 90 | 6 |
| DB703 080 | 8 | 4 | 9 | 15 | 70 | 8 |
| DB703 081 | 8 | 4 | 9 | 15 | 100 | 8 |
| DB703 100 | 10 | 5 | 11 | 25 | 75 | 10 |
| DB703 101 | 10 | 5 | 11 | 25 | 100 | 10 |
| DB703 120 | 12 | 6 | 12 | 25 | 80 | 12 |
| DB703 121 | 12 | 6 | 12 | 25 | 110 | 12 |

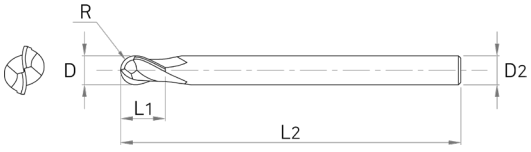
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# DB712 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.570

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| DB712 010 S | 1 | 0.5 | 1.5 | 40 | 6 |
| DB712 010 S4 | 1 | 0.5 | 2.5 | 50 | 4 |
| DB712 010 | 1 | 0.5 | 2.5 | 50 | 6 |
| DB712 012 | 1.2 | 0.6 | 3 | 50 | 6 |
| DB712 015 S | 1.5 | 0.75 | 2.5 | 40 | 6 |
| DB712 015 S4 | 1.5 | 0.75 | 4 | 50 | 4 |
| DB712 015 | 1.5 | 0.75 | 4 | 50 | 6 |
| DB712 020 S | 2 | 1 | 3 | 40 | 6 |
| DB712 020 S4 | 2 | 1 | 5 | 50 | 4 |
| DB712 020 | 2 | 1 | 5 | 50 | 6 |
| DB712 025 | 2.5 | 1.25 | 7 | 60 | 6 |
| DB712 030 S | 3 | 1.5 | 4.5 | 50 | 6 |
| DB712 030 S4 | 3 | 1.5 | 8 | 60 | 4 |

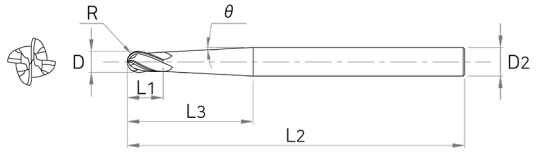
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| DB712 030 | 3 | 1.5 | 8 | 60 | 6 |
| DB712 040 S | 4 | 2 | 6 | 50 | 6 |
| DB712 040 | 4 | 2 | 8 | 70 | 6 |
| DB712 050 S | 5 | 2.5 | 7.5 | 50 | 6 |
| DB712 050 | 5 | 2.5 | 10 | 80 | 6 |
| DB712 060 S | 6 | 3 | 9 | 50 | 6 |
| DB712 060 | 6 | 3 | 12 | 90 | 6 |
| DB712 080 S | 8 | 4 | 12 | 50 | 8 |
| DB712 081 | 8 | 4 | 14 | 100 | 8 |
| DB712 100 S | 10 | 5 | 15 | 60 | 10 |
| DB712 100 | 10 | 5 | 18 | 100 | 10 |
| DB712 120 S | 12 | 6 | 18 | 60 | 12 |
| DB712 120 | 12 | 6 | 22 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# DB734 | 4 FLUTES 15° HELIX BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 4 | 15° HELIX | R ±0.01 All Sizes | DATA P.571

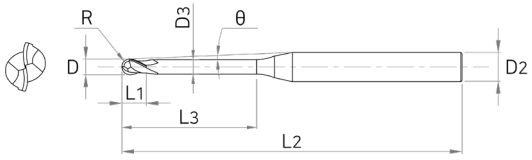
| EDP No | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | θ | D2 |
| DB734 020-2.5 | 2 | 1 | 2 | 25 | 60 | 2.5 | 4 |
| DB734 020-3.5 | 2 | 1 | 2 | 18 | 60 | 3.5 | 4 |
| DB734 025-2.5 | 2.5 | 1.25 | 3 | 20 | 60 | 2.5 | 4 |
| DB734 025-3.0 | 2.5 | 1.25 | 3 | 17 | 60 | 3 | 4 |
| DB734 030-2.0 | 3 | 1.5 | 3 | 46 | 70 | 2 | 6 |
| DB734 030-2.5 | 3 | 1.5 | 3 | 37 | 70 | 2.5 | 6 |
| DB734 040-2.0 | 4 | 2 | 4 | 33 | 70 | 2 | 6 |
| DB734 040-2.5 | 4 | 2 | 4 | 27 | 70 | 2.5 | 6 |
| DB734 050-2.5 | 5 | 2.5 | 5 | 16 | 70 | 2.5 | 6 |
| DB734 060-1.5 | 6 | 3 | 6 | 44 | 100 | 1.5 | 8 |
| DB734 060-2.5 | 6 | 3 | 6 | 29 | 100 | 2.5 | 8 |
| DB734 080-1.5 | 8 | 4 | 8 | 46 | 100 | 1.5 | 10 |
| DB734 080-2.5 | 8 | 4 | 8 | 31 | 100 | 2.5 | 10 |
| DB734 100-1.5 | 10 | 5 | 10 | 48 | 110 | 1.5 | 12 |
| DB734 100-2.5 | 10 | 5 | 10 | 33 | 110 | 2.5 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 All Sizes | DATA P.571

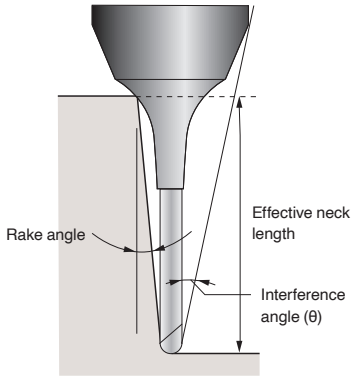
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNB 2001-0.2 | 0.1 | 0.05 | 0.08 | 0.2 | 0.08 | 45 | 4 | 11.8 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 |
| ZSLNB 2001-0.3 | 0.1 | 0.05 | 0.08 | 0.3 | 0.08 | 45 | 4 | 11.7 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| ZSLNB 2001-0.5 | 0.1 | 0.05 | 0.08 | 0.5 | 0.08 | 45 | 4 | 11.4 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 |
| ZSLNB 2002-0.5 | 0.2 | 0.1 | 0.15 | 0.5 | 0.17 | 50 | 4 | 11.5 | 1.2 | 1.3 | 1.5 | 1.6 | 2 |
| ZSLNB 2002-1 | 0.2 | 0.1 | 0.15 | 1 | 0.17 | 50 | 4 | 10.9 | 1.7 | 1.9 | 2.1 | 2.3 | 2.7 |
| ZSLNB 2002-1.5 | 0.2 | 0.1 | 0.15 | 1.5 | 0.17 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ZSLNB 2002-2 | 0.2 | 0.1 | 0.15 | 2 | 0.17 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ZSLNB 2002-2.5 | 0.2 | 0.1 | 0.15 | 2.5 | 0.17 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ZSLNB 2002-3.0 | 0.2 | 0.1 | 0.15 | 3 | 0.17 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ZSLNB 2003-1 | 0.3 | 0.15 | 0.25 | 1 | 0.27 | 50 | 4 | 10.9 | 1.7 | 1.9 | 2.1 | 2.3 | 5.4 |
| ZSLNB 2003-1.5 | 0.3 | 0.15 | 0.25 | 1.5 | 0.27 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.7 | 3 | 3.4 |
| ZSLNB 2003-2 | 0.3 | 0.15 | 0.25 | 2 | 0.27 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4 |
| ZSLNB 2003-2.5 | 0.3 | 0.15 | 0.25 | 2.5 | 0.27 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ZSLNB 2003-3 | 0.3 | 0.15 | 0.25 | 3 | 0.27 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ZSLNB 2004-1 | 0.4 | 0.2 | 0.3 | 1 | 0.37 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.7 |
| ZSLNB 2004-1.5 | 0.4 | 0.2 | 0.3 | 1.5 | 0.37 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.7 | 2.9 | 3.4 |
| ZSLNB 2004-2 | 0.4 | 0.2 | 0.3 | 2 | 0.37 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4 |
| ZSLNB 2004-2.5 | 0.4 | 0.2 | 0.3 | 2.5 | 0.37 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ZSLNB 2004-3 | 0.4 | 0.2 | 0.3 | 3 | 0.37 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ZSLNB 2004-3.5 | 0.4 | 0.2 | 0.3 | 3.5 | 0.37 | 50 | 4 | 8.7 | 4.5 | 4.8 | 5.2 | 5.4 | 6 |
| ZSLNB 2004-4 | 0.4 | 0.2 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ZSLNB 2004-4.5 | 0.4 | 0.2 | 0.3 | 4.5 | 0.37 | 50 | 4 | 8 | 5.6 | 6 | 6.3 | 6.6 | 7.2 |
| ZSLNB 2005-1 | 0.5 | 0.25 | 0.35 | 1 | 0.47 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.6 |
| ZSLNB 2005-2 | 0.5 | 0.25 | 0.35 | 2 | 0.47 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.6 | 4 |

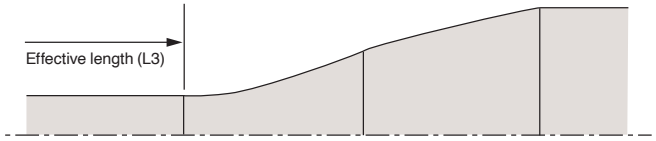
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNB 2005-3 | 0.5 | 0.25 | 0.35 | 3 | 0.47 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ZSLNB 2005-4 | 0.5 | 0.25 | 0.35 | 4 | 0.47 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ZSLNB 2005-5 | 0.5 | 0.25 | 0.35 | 5 | 0.47 | 50 | 4 | 7.7 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ZSLNB 2005-6 | 0.5 | 0.25 | 0.35 | 6 | 0.47 | 50 | 4 | 7.1 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ZSLNB 2005-8 | 0.5 | 0.25 | 0.35 | 8 | 0.47 | 50 | 4 | 6.3 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNB 2006-1 | 0.6 | 0.3 | 0.4 | 1 | 0.57 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.6 |
| ZSLNB 2006-2 | 0.6 | 0.3 | 0.4 | 2 | 0.57 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.6 | 4 |
| ZSLNB 2006-3 | 0.6 | 0.3 | 0.4 | 3 | 0.57 | 50 | 4 | 9 | 3.9 | 4.3 | 4.5 | 4.8 | 5.3 |
| ZSLNB 2006-4 | 0.6 | 0.3 | 0.4 | 4 | 0.57 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ZSLNB 2006-5 | 0.6 | 0.3 | 0.4 | 5 | 0.57 | 50 | 4 | 7.6 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ZSLNB 2006-6 | 0.6 | 0.3 | 0.4 | 6 | 0.57 | 50 | 4 | 7.1 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ZSLNB 2006-7 | 0.6 | 0 .3 | 0.4 | 7 | 0.57 | 50 | 4 | 6.6 | 8.3 | 8.8 | 9.2 | 9.5 | 10.2 |
| ZSLNB 2006-8 | 0.6 | 0.3 | 0.4 | 8 | 0.57 | 50 | 4 | 6.2 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ZSLNB 2006-9 | 0.6 | 0.3 | 0.4 | 9 | 0.57 | 50 | 4 | 5.8 | 10.4 | 10.9 | 11.4 | 11.8 | 12.5 |
| ZSLNB 2006-10 | 0.6 | 0.3 | 0.4 | 10 | 0.57 | 50 | 4 | 5.5 | 11.4 | 12 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2006-12 | 0.6 | 0.3 | 0.4 | 12 | 0.57 | 50 | 4 | 5 | 13.6 | 14.2 | 14.7 | 15.2 | 16 |
| ZSLNB 2008-2 | 0.8 | 0.4 | 0.5 | 2 | 0.77 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.5 | 4 |
| ZSLNB 2008-4 | 0.8 | 0.4 | 0.5 | 4 | 0.77 | 50 | 4 | 8.2 | 5 | 5.4 | 5.7 | 6 | 6.5 |
| ZSLNB 2008-5 | 0.8 | 0.4 | 0.5 | 5 | 0.77 | 50 | 4 | 7.5 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ZSLNB 2008-6 | 0.8 | 0.4 | 0.5 | 6 | 0.77 | 50 | 4 | 7 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ZSLNB 2008-8 | 0.8 | 0.4 | 0.5 | 8 | 0.77 | 50 | 4 | 6.1 | 9.3 | 9.8 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2008-10 | 0.8 | 0.4 | 0.5 | 10 | 0.77 | 50 | 4 | 5.4 | 11.4 | 12 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2010-2 | 1 | 0.5 | 0.8 | 2 | 0.96 | 50 | 4 | 9.9 | 2.9 | 3.1 | 3.3 | 3.5 | 4 |
| ZSLNB 2010-3 | 1 | 0.5 | 0.8 | 3 | 0.96 | 50 | 4 | 8.9 | 4 | 4.3 | 4.5 | 4.8 | 5.3 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNB 2010-4 | 1 | 0.5 | 0.8 | 4 | 0.96 | 50 | 4 | 8.1 | 5 | 5.4 | 5.7 | 6 | 6.5 |
| ZSLNB 2010-5 | 1 | 0.5 | 0.8 | 5 | 0.96 | 50 | 4 | 7.4 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ZSLNB 2010-6 | 1 | 0.5 | 0.8 | 6 | 0.96 | 50 | 4 | 6.8 | 7.2 | 7.7 | 8 | 8.4 | 9 |
| ZSLNB 2010-7 | 1 | 0.5 | 0.8 | 7 | 0.96 | 50 | 4 | 6.3 | 8.3 | 8.8 | 9.2 | 9.5 | 10.2 |
| ZSLNB 2010-8 | 1 | 0.5 | 0.8 | 8 | 0.96 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2010-9 | 1 | 0.5 | 0.8 | 9 | 0.96 | 50 | 4 | 5.5 | 10.4 | 11 | 11.4 | 11.8 | 12.5 |
| ZSLNB 2010-10 | 1 | 0.5 | 0.8 | 10 | 0.96 | 50 | 4 | 5.2 | 11.5 | 12 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2010-12 | 1 | 0.5 | 0.8 | 12 | 0.96 | 55 | 4 | 4.6 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2010-14 | 1 | 0.5 | 0.8 | 14 | 0.96 | 55 | 4 | 4.2 | 15.7 | 16.4 | 16.9 | 17.4 | 18.5 |
| ZSLNB 2010-16 | 1 | 0.5 | 0.8 | 16 | 0.96 | 55 | 4 | 3.8 | 17.8 | 18.5 | 19.1 | 19.6 | 21.2 |
| ZSLNB 2010-18 | 1 | 0.5 | 0.8 | 18 | 0.96 | 60 | 4 | 3.5 | 19.9 | 20.7 | 21.3 | 21.8 | 23.8 |
| ZSLNB 2010-20 | 1 | 0.5 | 0.8 | 20 | 0.96 | 60 | 4 | 3.3 | 22 | 22.8 | 23.4 | 24 | 26.5 |
| ZSLNB 2012-4 | 1.2 | 0.6 | 1.1 | 4 | 1.15 | 50 | 4 | 7.9 | 5.1 | 5.4 | 5.7 | 6 | 6.5 |
| ZSLNB 2012-6 | 1.2 | 0.6 | 1.1 | 6 | 1.15 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8 | 8.4 | 9 |
| ZSLNB 2012-8 | 1.2 | 0.6 | 1.1 | 8 | 1.15 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2012-10 | 1.2 | 0.6 | 1.1 | 10 | 1.15 | 50 | 4 | 5 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2012-12 | 1.2 | 0.6 | 1.1 | 12 | 1.15 | 55 | 4 | 4.5 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2014-8 | 1.4 | 0.7 | 1.3 | 8 | 1.34 | 50 | 4 | 5.5 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2014-12 | 1.4 | 0.7 | 1.3 | 12 | 1.34 | 55 | 4 | 4.3 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2014-16 | 1.4 | 0.7 | 1.3 | 16 | 1.34 | 55 | 4 | 3.5 | 17.8 | 18.5 | 19.1 | 19.6 | 21.2 |
| ZSLNB 2015-4 | 1.5 | 0.75 | 1.35 | 4 | 1.44 | 50 | 4 | 7.7 | 5.1 | 5.4 | 5.7 | 6 | 6.5 |
| ZSLNB 2015-6 | 1.5 | 0.75 | 1.35 | 6 | 1.44 | 50 | 4 | 6.4 | 7.3 | 7.7 | 8 | 8.4 | 9 |
| ZSLNB 2015-8 | 1.5 | 0.75 | 1.35 | 8 | 1.44 | 50 | 4 | 5.4 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2015-10 | 1.5 | 0.75 | 1.35 | 10 | 1.44 | 50 | 4 | 4.7 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2015-12 | 1.5 | 0.75 | 1.35 | 12 | 1.44 | 55 | 4 | 4.2 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2015-14 | 1.5 | 0.75 | 1.35 | 14 | 1.44 | 55 | 4 | 3.8 | 15.7 | 16.4 | 16.9 | 17.4 | 18.5 |
| ZSLNB 2015-16 | 1.5 | 0.75 | 1.35 | 16 | 1.44 | 55 | 4 | 3.4 | 17.8 | 18.5 | 19.1 | 19.6 | 21.1 |
| ZSLNB 2015-20 | 1.5 | 0.75 | 1.35 | 20 | 1.44 | 60 | 4 | 2.9 | 22 | 22.8 | 23.4 | 24 | - |
| ZSLNB 2016-8 | 1.6 | 0.8 | 1.4 | 8 | 1.54 | 50 | 4 | 5.3 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2016-10 | 1.6 | 0.8 | 1.4 | 10 | 1.54 | 50 | 4 | 4.6 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ZSLNB 2016-12 | 1.6 | 0.8 | 1.4 | 12 | 1.54 | 55 | 4 | 4.1 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2016-16 | 1.6 | 0.8 | 1.4 | 16 | 1.54 | 55 | 4 | 3.3 | 17.8 | 18.5 | 19.1 | 19.6 | 21.1 |
| ZSLNB 2016-20 | 1.6 | 0.8 | 1.4 | 20 | 1.54 | 60 | 4 | 2.8 | 22 | 22.8 | 23.4 | 24 | - |
| ZSLNB 2018-8 | 1.8 | 0.9 | 1.6 | 8 | 1.73 | 50 | 4 | 5.1 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ZSLNB 2018-12 | 1.8 | 0.9 | 1.6 | 12 | 1.73 | 55 | 4 | 3.9 | 13.7 | 14.3 | 14.7 | 15.2 | 15.9 |
| ZSLNB 2018-16 | 1.8 | 0.9 | 1.6 | 16 | 1.73 | 55 | 4 | 3.1 | 17.9 | 18.6 | 19.1 | 19.6 | 21.1 |
| ZSLNB 2018-20 | 1.8 | 0.9 | 1.6 | 20 | 1.73 | 60 | 4 | 2.6 | 22 | 22.8 | 23.4 | 24 | - |
| ZSLNB 2020-3 | 2 | 1 | 1.7 | 3 | 1.92 | 50 | 4 | 8.3 | 4.1 | 4.4 | 4.6 | 4.8 | 5.2 |
| ZSLNB 2020-4 | 2 | 1 | 3 | 4 | 1.92 | 50 | 4 | 7.3 | 5.2 | 5.5 | 5.8 | 6 | 6.5 |
| ZSLNB 2020-6 | 2 | 1 | 3 | 6 | 1.92 | 50 | 4 | 5.8 | 7.3 | 7.7 | 8.1 | 8.4 | 9 |
| ZSLNB 2020-8 | 2 | 1 | 3 | 8 | 1.92 | 50 | 4 | 4.9 | 9.5 | 9.9 | 10.3 | 10.7 | 11.3 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

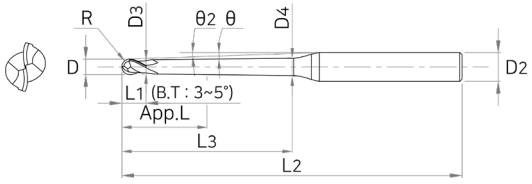
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSLNB 2020-10 | 2 | 1 | 3 | 10 | 1.92 | 50 | 4 | 4.2 | 11.6 | 12.1 | 12.6 | 12.9 | 13.6 |
| ZSLNB 2020-12 | 2 | 1 | 3 | 12 | 1.92 | 55 | 4 | 3.7 | 13.7 | 14.3 | 14.8 | 15.2 | 15.9 |
| ZSLNB 2020-14 | 2 | 1 | 3 | 14 | 1.92 | 55 | 4 | 3.2 | 15.8 | 16.4 | 16.9 | 17.4 | 18.5 |
| ZSLNB 2020-16 | 2 | 1 | 3 | 16 | 1.92 | 55 | 4 | 2.9 | 17.9 | 18.6 | 19.1 | 19.6 | - |
| ZSLNB 2020-18 | 2 | 1 | 3 | 18 | 1.92 | 60 | 4 | 2.7 | 20 | 20.7 | 21.3 | 21.8 | - |
| ZSLNB 2020-20 | 2 | 1 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.8 | 23.4 | 24 | - |
| ZSLNB 2020-22 | 2 | 1 | 3 | 22 | 1.92 | 60 | 4 | 2.3 | 24.1 | 24.9 | 25.6 | 26.3 | - |
| ZSLNB 2020-25 | 2 | 1 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.1 | 28.8 | - | - |
| ZSLNB 2020-30 | 2 | 1 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.4 | 33.4 | 34.2 | - | - |
| ZSLNB 2020-35 | 2 | 1 | 3 | 35 | 1.92 | 75 | 4 | 1.5 | 37.6 | 38.6 | - | - | - |
| ZSLNB 2020-40 | 2 | 1 | 3 | 40 | 1.92 | 80 | 4 | 1.4 | 42.8 | 43.8 | - | - | - |
| ZSLNB 2025-10 | 2.5 | 1.25 | 4 | 10 | 2.4 | 50 | 4 | 3.4 | 11.6 | 12.1 | 12.6 | 13 | 13.6 |
| ZSLNB 2025-16 | 2.5 | 1.25 | 4 | 16 | 2.4 | 55 | 4 | 2.3 | 17.9 | 18.6 | 19.1 | 19.6 | - |
| ZSLNB 2025-20 | 2.5 | 1.25 | 4 | 20 | 2.4 | 60 | 4 | 1.9 | 22.1 | 22.8 | 23.5 | - | - |
| ZSLNB 2030-8 | 3 | 1.5 | 4 | 8 | 2.88 | 55 | 6 | 6.2 | 9.6 | 10 | 10.4 | 10.7 | 11.3 |
| ZSLNB 2030-10 | 3 | 1.5 | 4 | 10 | 2.88 | 55 | 6 | 5.5 | 11.7 | 12.2 | 12.6 | 13 | 13.6 |
| ZSLNB 2030-13 | 3 | 1.5 | 4 | 13 | 2.88 | 60 | 6 | 4.6 | 14.8 | 15.4 | 15.9 | 16.3 | 17.1 |
| ZSLNB 2030-16 | 3 | 1.5 | 4 | 16 | 2.88 | 60 | 6 | 4 | 18 | 18.6 | 19.1 | 19.6 | 21.1 |
| ZSLNB 2030-18 | 3 | 1.5 | 4 | 18 | 2.88 | 60 | 6 | 3.6 | 20 | 20.7 | 21.3 | 21.8 | 23.7 |
| ZSLNB 2030-20 | 3 | 1.5 | 4 | 20 | 2.88 | 65 | 6 | 3.4 | 22.1 | 22.9 | 23.5 | 24 | 26.4 |
| ZSLNB 2030-25 | 3 | 1.5 | 4 | 25 | 2.88 | 70 | 6 | 2.8 | 27.3 | 28.2 | 28.8 | 29.9 | - |
| ZSLNB 2030-30 | 3 | 1.5 | 4 | 30 | 2.88 | 75 | 6 | 2.5 | 32.5 | 33.4 | 34.3 | 35.9 | - |
| ZSLNB 2030-35 | 3 | 1.5 | 4 | 35 | 2.88 | 80 | 6 | 2.2 | 37.7 | 38.7 | 40 | 41.9 | - |
| ZSLNB 2040-10 | 4 | 2 | 5 | 10 | 3.9 | 55 | 6 | 4.5 | 11.6 | 12.1 | 12.5 | 12.9 | 13.5 |
| ZSLNB 2040-13 | 4 | 2 | 5 | 13 | 3.9 | 60 | 6 | 3.6 | 14.7 | 15.3 | 15.8 | 16.2 | 17 |
| ZSLNB 2040-16 | 4 | 2 | 5 | 16 | 3.9 | 60 | 6 | 3.1 | 17.9 | 18.5 | 19.1 | 19.5 | 20.9 |
| ZSLNB 2040-20 | 4 | 2 | 5 | 20 | 3.9 | 65 | 6 | 2.5 | 22.1 | 22.8 | 23.4 | 23.9 | - |
| ZSLNB 2040-25 | 4 | 2 | 5 | 25 | 3.9 | 70 | 6 | 2.1 | 27.3 | 28.1 | 28.8 | 29.8 | - |
| ZSLNB 2040-30 | 4 | 2 | 5 | 30 | 3.9 | 75 | 6 | 1.8 | 32.4 | 33.4 | 34.2 | - | - |
| ZSLNB 2040-35 | 4 | 2 | 5 | 35 | 3.9 | 80 | 6 | 1.6 | 37.6 | 38.6 | 39.9 | - | - |
| ZSLNB 2040-40 | 4 | 2 | 5 | 40 | 3.9 | 80 | 6 | 1.4 | 42.8 | 43.8 | - | - | - |
| ZSLNB 2040-45 | 4 | 2 | 5 | 45 | 3.9 | 90 | 6 | 1.2 | 47.9 | 49.1 | - | - | - |
| ZSLNB 2040-50 | 4 | 2 | 5 | 50 | 3.9 | 100 | 6 | 1.1 | 53.1 | 54.5 | - | - | - |
| ZSLNB 2050-20 | 5 | 2.5 | 6 | 20 | 4.9 | 65 | 6 | 1.4 | 22 | 22.8 | - | - | - |
| ZSLNB 2050-25 | 5 | 2.5 | 6 | 25 | 4.9 | 70 | 6 | 1.2 | 27.2 | 28.1 | - | - | - |
| ZSLNB 2050-30 | 5 | 2.5 | 6 | 30 | 4.9 | 75 | 6 | 1 | 32.4 | - | - | - | - |
| ZSLNB 2050-35 | 5 | 2.5 | 6 | 35 | 4.9 | 80 | 6 | 0.8 | 42.8 | - | - | - | - |
| ZSLNB 2050-40 | 5 | 2.5 | 6 | 40 | 4.9 | 90 | 6 | 0.7 | 42.8 | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL




※ R2 and below are not back draft Type



## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.572

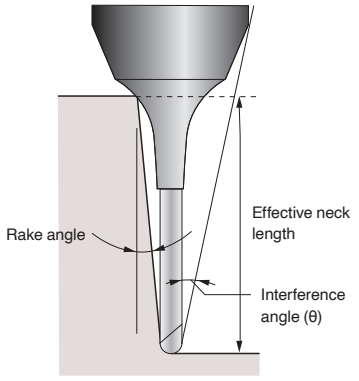
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 2002-1-04 | 0.2 | 0.1 | 0.15 | 1 | 0.4 | 0.17 | 0.18 | 50 | 4 | 1.35 | 10.9 | 1.5 | 1.7 | 1.8 | 2 | 2.3 |
| ZSTNB 2002-1.5-04 | 0.2 | 0.1 | 0.15 | 1.5 | 0.4 | 0.17 | 0.19 | 50 | 4 | 1.77 | 10.4 | 2 | 2.2 | 2.4 | 2.6 | 2.9 |
| ZSTNB 2002-2-09 | 0.2 | 0.1 | 0.15 | 2 | 0.9 | 0.17 | 0.23 | 50 | 4 | 1.1 | 10.1 | x | 2.8 | 3.1 | 3.4 | 3.9 |
| ZSTNB 2002-2.5-09 | 0.2 | 0.1 | 0.15 | 2.5 | 0.9 | 0.17 | 0.24 | 50 | 4 | 1.1 | 9.6 | x | 3.3 | 3.7 | 4 | 4.5 |
| ZSTNB 2003-2-04 | 0.3 | 0.15 | 0.25 | 2 | 0.4 | 0.27 | 0.29 | 50 | 4 | 2.19 | 10 | 2.5 | 2.8 | 3 | 3.2 | 3.5 |
| ZSTNB 2003-3-09 | 0.3 | 0.15 | 0.25 | 3 | 0.9 | 0.27 | 0.36 | 50 | 4 | 1.2 | 9.3 | x | 3.8 | 4.2 | 4.5 | 5.1 |
| ZSTNB 2003-4-09 | 0.3 | 0.15 | 0.25 | 4 | 0.9 | 0.27 | 0.39 | 50 | 4 | 1.2 | 8.6 | x | 4.8 | 5.3 | 5.7 | 6.3 |
| ZSTNB 2004-2-04 | 0.4 | 0.2 | 0.3 | 2 | 0.4 | 0.37 | 0.39 | 50 | 4 | 2.2 | 10 | 2.5 | 2.8 | 3 | 3.2 | 3.5 |
| ZSTNB 2004-3-04 | 0.4 | 0.2 | 0.3 | 3 | 0.4 | 0.37 | 0.41 | 50 | 4 | 2.44 | 9.1 | 3.6 | 3.9 | 4.1 | 4.4 | 4.8 |
| ZSTNB 2004-4-04 | 0.4 | 0.2 | 0.3 | 4 | 0.4 | 0.37 | 0.42 | 50 | 4 | 2.44 | 8.4 | 4.7 | 5.2 | 5.6 | 5.9 | 6.5 |
| ZSTNB 2004-4-09 | 0.4 | 0.2 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.5 | x | 4.8 | 5.3 | 5.7 | 6.3 |
| ZSTNB 2004-5-04 | 0.4 | 0.2 | 0.3 | 5 | 0.4 | 0.37 | 0.44 | 50 | 4 | 2.44 | 7.8 | 5.7 | 6.3 | 6.7 | 7.1 | 7.7 |
| ZSTNB 2004-5-09 | 0.4 | 0.2 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.9 | x | 5.9 | 6.4 | 6.8 | 7.5 |
| ZSTNB 2005-4-04 | 0.5 | 0.25 | 0.35 | 4 | 0.4 | 0.47 | 0.52 | 50 | 4 | 2.49 | 8.4 | 4.6 | 5 | 5.3 | 5.5 | 5.9 |
| ZSTNB 2005-8-09 | 0.5 | 0.25 | 0.35 | 8 | 0.9 | 0.47 | 0.71 | 50 | 4 | 1.3 | 6.5 | x | 8.9 | 9.6 | 10.1 | 10.9 |
| ZSTNB 2005-12-09 | 0.5 | 0.25 | 0.35 | 12 | 0.9 | 0.47 | 0.84 | 50 | 4 | 1.3 | 5.3 | x | 13 | 13.9 | 14.5 | 15.4 |
| ZSTNB 20054-2-04 | 0.54 | 0.27 | 0.37 | 2 | 0.4 | 0.51 | 0.53 | 50 | 4 | 1.8 | 10 | 2.3 | 2.5 | 2.7 | 2.8 | 3 |
| ZSTNB 20054-4-04 | 0.54 | 0.27 | 0.37 | 4 | 0.4 | 0.51 | 0.56 | 50 | 4 | 1.8 | 8.4 | 4.5 | 4.9 | 5.2 | 5.5 | 5.9 |
| ZSTNB 20054-5-04 | 0.54 | 0.27 | 0.37 | 5 | 0.4 | 0.51 | 0.58 | 50 | 4 | 1.8 | 7.8 | 5.5 | 6 | 6.3 | 6.6 | 7.1 |
| ZSTNB 20054-6-04 | 0.54 | 0.27 | 0.37 | 6 | 0.4 | 0.51 | 0.59 | 50 | 4 | 1.8 | 7.2 | 6.7 | 7.3 | 7.8 | 8.2 | 8.8 |
| ZSTNB 20054-6.5-04 | 0.54 | 0.27 | 0.37 | 6.5 | 0.4 | 0.51 | 0.6 | 50 | 4 | 1.8 | 7 | 7.2 | 7.9 | 8.3 | 8.7 | 9.4 |
| ZSTNB 20054-7-04 | 0.54 | 0.27 | 0.37 | 7 | 0.4 | 0.51 | 0.6 | 50 | 4 | 1.8 | 6.8 | 7.7 | 8.4 | 8.9 | 9.3 | 10 |
| ZSTNB 2006-2-04 | 0.6 | 0.3 | 0.4 | 2 | 0.4 | 0.57 | 0.59 | 50 | 4 | 2.17 | 10 | 2.4 | 2.5 | 2.7 | 2.8 | 3 |
| ZSTNB 2006-4-04 | 0.6 | 0.3 | 0.4 | 4 | 0.4 | 0.57 | 0.62 | 50 | 4 | 2.54 | 8.4 | 4.6 | 5 | 5.2 | 5.5 | 5.9 |

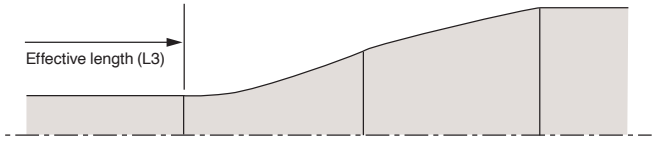
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 2006-6-04 | 0.6 | 0.3 | 0.4 | 6 | 0.4 | 0.57 | 0.65 | 50 | 4 | 2.54 | 7.2 | 6.8 | 7.4 | 7.8 | 8.2 | 8.8 |
| ZSTNB 2006-6-09 | 0.6 | 0.3 | 0.4 | 6 | 0.9 | 0.57 | 0.75 | 50 | 4 | 1.35 | 7.3 | x | 6.9 | 7.5 | 7.9 | 8.6 |
| ZSTNB 2006-8-09 | 0.6 | 0.3 | 0.4 | 8 | 0.9 | 0.57 | 0.81 | 50 | 4 | 1.35 | 6.4 | x | 8.9 | 9.6 | 10.1 | 10.9 |
| ZSTNB 2006-10-04 | 0.6 | 0.3 | 0.4 | 10 | 0.4 | 0.57 | 0.7 | 50 | 4 | 2.54 | 5.6 | 10.8 | 11.7 | 12.2 | 12.7 | 13.5 |
| ZSTNB 2006-10-09 | 0.6 | 0.3 | 0.4 | 10 | 0.9 | 0.57 | 0.87 | 50 | 4 | 1.35 | 5.7 | x | 11 | 11.8 | 12.3 | 13.2 |
| ZSTNB 2006-12-09 | 0.6 | 0.3 | 0.4 | 12 | 0.9 | 0.57 | 0.93 | 55 | 4 | 1.35 | 5.2 | x | 13 | 13.9 | 14.5 | 15.4 |
| ZSTNB 2006-15-04 | 0.6 | 0.3 | 0.4 | 15 | 0.4 | 0.57 | 0.77 | 55 | 4 | 2.54 | 4.4 | 15.9 | 17 | 17.6 | 18.2 | 19.2 |
| ZSTNB 2006-15-09 | 0.6 | 0.3 | 0.4 | 15 | 0.9 | 0.57 | 1.03 | 55 | 4 | 1.35 | 4.5 | x | 16.1 | 17.1 | 17.7 | 18.8 |
| ZSTNB 2008-4-04 | 0.8 | 0.4 | 0.5 | 4 | 0.4 | 0.77 | 0.82 | 50 | 4 | 2.64 | 8.3 | 4.6 | 4.9 | 5.2 | 5.5 | 5.9 |
| ZSTNB 2008-6-04 | 0.8 | 0.4 | 0.5 | 6 | 0.4 | 0.77 | 0.85 | 50 | 4 | 2.64 | 7.1 | 6.6 | 7.1 | 7.5 | 7.7 | 8.3 |
| ZSTNB 2008-8-09 | 0.8 | 0.4 | 0.5 | 8 | 0.9 | 0.77 | 1.01 | 50 | 4 | 1.45 | 6.3 | x | 8.9 | 9.6 | 10.1 | 10.9 |
| ZSTNB 2008-12-09 | 0.8 | 0.4 | 0.5 | 12 | 0.9 | 0.77 | 1.13 | 55 | 4 | 1.45 | 5 | x | 13 | 13.9 | 14.5 | 15.4 |
| ZSTNB 2008-16-09 | 0.8 | 0.4 | 0.5 | 16 | 0.9 | 0.77 | 1.26 | 55 | 4 | 1.45 | 4.2 | x | 17.1 | 18.1 | 18.8 | 19.9 |
| ZSTNB 2009-4-04 | 0.9 | 0.45 | 0.6 | 4 | 0.4 | 0.86 | 0.91 | 50 | 4 | 3.46 | 8.2 | 4.5 | 4.7 | 4.9 | 5.1 | 5.4 |
| ZSTNB 2009-8-04 | 0.9 | 0.45 | 0.6 | 8 | 0.4 | 0.86 | 0.96 | 55 | 4 | 3.46 | 6.1 | 8.7 | 9.3 | 9.7 | 10 | 10.6 |
| ZSTNB 2009-12-04 | 0.9 | 0.45 | 0.6 | 12 | 0.4 | 0.86 | 1.02 | 55 | 4 | 3.46 | 4.8 | 12.9 | 13.8 | 14.4 | 14.9 | 15.7 |
| ZSTNB 2009-16-04 | 0.9 | 0.45 | 0.6 | 16 | 0.4 | 0.86 | 1.08 | 60 | 4 | 3.46 | 4 | 17 | 18 | 18.7 | 19.3 | 20.5 |
| ZSTNB 2009-18-04 | 0.9 | 0.45 | 0.6 | 18 | 0.4 | 0.86 | 1.1 | 65 | 4 | 3.46 | 3.7 | 19.1 | 20.1 | 20.9 | 21.5 | 23.1 |
| ZSTNB 2009-20-04 | 0.9 | 0.45 | 0.6 | 20 | 0.4 | 0.86 | 1.13 | 65 | 4 | 3.46 | 3.4 | 21.1 | 22.2 | 23 | 23.6 | 25.6 |
| ZSTNB 2009-22-04 | 0.9 | 0.45 | 0.6 | 22 | 0.4 | 0.86 | 1.16 | 65 | 4 | 3.46 | 3.2 | 23.1 | 24.3 | 25.1 | 25.8 | 28.2 |
| ZSTNB 2009-24-04 | 0.9 | 0.45 | 0.6 | 24 | 0.4 | 0.86 | 1.19 | 70 | 4 | 3.46 | 3 | 25.2 | 26.4 | 27.2 | 27.9 | - |
| ZSTNB 2010-6-04 | 1 | 0.5 | 0.8 | 6 | 0.4 | 0.94 | 1.01 | 50 | 6 | 5.09 | 8.3 | 6.8 | 7.2 | 7.5 | 7.8 | 8.3 |
| ZSTNB 2010-8-04 | 1 | 0.5 | 0.8 | 8 | 0.4 | 0.94 | 1.04 | 55 | 6 | 5.09 | 7.5 | 8.8 | 9.3 | 9.7 | 10 | 10.6 |
| ZSTNB 2010-10-04 | 1 | 0.5 | 0.8 | 10 | 0.4 | 0.94 | 1.07 | 55 | 6 | 5.09 | 6.8 | 11 | 11.7 | 12.3 | 12.7 | 13.5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 2010-10-09 | 1 | 0.5 | 0.8 | 10 | 0.9 | 0.94 | 1.23 | 55 | 6 | 2.7 | 6.9 | x | 11.2 | 11.9 | 12.4 | 13.2 |
| ZSTNB 2010-15-09 | 1 | 0.5 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.7 | x | 16.2 | 17.1 | 17.8 | 18.8 |
| ZSTNB 2010-20-04 | 1 | 0.5 | 0.8 | 20 | 0.4 | 0.94 | 1.21 | 65 | 6 | 5.09 | 4.7 | 21.2 | 22.3 | 23 | 23.6 | 25.7 |
| ZSTNB 2010-20-09 | 1 | 0.5 | 0.8 | 20 | 0.4 | 0.94 | 1.54 | 65 | 6 | 2.7 | 4.8 | x | 21.3 | 22.4 | 23.1 | 24.6 |
| ZSTNB 2010-25-09 | 1 | 0.5 | 0.8 | 25 | 0.4 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.2 | x | 26.4 | 27.6 | 28.4 | 30.8 |
| ZSTNB 2010-30-04 | 1 | 0.5 | 0.8 | 30 | 0.4 | 0.94 | 1.35 | 75 | 6 | 5.09 | 3.6 | 31.3 | 32.7 | 33.6 | 34.8 | 38.5 |
| ZSTNB 2010-30-09 | 1 | 0.5 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | x | 31.4 | 32.8 | 33.7 | 36.9 |
| ZSTNB 2010-35-09 | 1 | 0.5 | 0.8 | 35 | 0.9 | 0.94 | 2.02 | 80 | 6 | 2.7 | 3.3 | x | 36.5 | 38 | 39 | 43.1 |
| ZSTNB 2010-40-09 | 1 | 0.5 | 0.8 | 40 | 0.9 | 0.94 | 2.17 | 85 | 6 | 2.7 | 3 | x | 41.6 | 43.2 | 44.4 | - |
| ZSTNB 2010-50-09 | 1 | 0.5 | 0.8 | 50 | 0.9 | 0.94 | 2.49 | 95 | 6 | 2.7 | 2.5 | x | 51.7 | 53.5 | 55.5 | - |
| ZSTNB 2010-60-09 | 1 | 0.5 | 0.8 | 60 | 0.9 | 0.94 | 2.8 | 105 | 6 | 2.7 | 2.2 | x | 61.8 | 63.8 | 66.6 | - |
| ZSTNB 2010-70-09 | 1 | 0.5 | 0.8 | 70 | 0.9 | 0.94 | 3.11 | 115 | 6 | 2.7 | 1.9 | x | 71.9 | 74 | - | - |
| ZSTNB 2015-8-04 | 1.5 | 0.75 | 1.35 | 8 | 0.4 | 1.42 | 1.51 | 55 | 6 | 7.07 | 7.3 | 8.9 | 9.4 | 9.7 | 10 | 10.6 |
| ZSTNB 2015-10-04 | 1.5 | 0.75 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 7.07 | 6.6 | 10.9 | 11.5 | 11.9 | 12.2 | 12.9 |
| ZSTNB 2015-12-04 | 1.5 | 0.75 | 1.35 | 12 | 0.4 | 1.42 | 1.57 | 55 | 6 | 7.07 | 6 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ZSTNB 2015-15-09 | 1.5 | 0.75 | 1.35 | 15 | 0.9 | 1.42 | 1.85 | 60 | 6 | 3.89 | 5.4 | x | 16.4 | 17.2 | 17.8 | 18.8 |
| ZSTNB 2015-20-09 | 1.5 | 0.75 | 1.35 | 20 | 0.9 | 1.42 | 2.01 | 65 | 6 | 3.89 | 4.5 | x | 21.4 | 22.4 | 23.2 | 24.7 |
| ZSTNB 2015-30-09 | 1.5 | 0.75 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | x | 31.5 | 32.9 | 33.7 | 37 |
| ZSTNB 2018-4-04 | 1.8 | 0.9 | 1.6 | 4 | 0.4 | 1.73 | 1.76 | 50 | 6 | 4.38 | 9.2 | 4.6 | 4.8 | 4.9 | 5.1 | 5.4 |
| ZSTNB 2018-8-04 | 1.8 | 0.9 | 1.6 | 8 | 0.4 | 1.73 | 1.82 | 50 | 6 | 6.61 | 7.1 | 8.6 | 9 | 9.2 | 9.4 | 10.2 |
| ZSTNB 2018-12-04 | 1.8 | 0.9 | 1.6 | 12 | 0.4 | 1.73 | 1.88 | 55 | 6 | 6.61 | 5.8 | 12.9 | 13.5 | 14 | 14.4 | 15.4 |
| ZSTNB 2018-16-04 | 1.8 | 0.9 | 1.6 | 16 | 0.4 | 1.73 | 1.93 | 60 | 6 | 6.61 | 4.9 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ZSTNB 2018-20-04 | 1.8 | 0.9 | 1.6 | 20 | 0.4 | 1.73 | 1.99 | 65 | 6 | 6.61 | 4.3 | 21.2 | 22.3 | 23 | 23.6 | 25.6 |
| ZSTNB 2018-24-04 | 1.8 | 0.9 | 1.6 | 24 | 0.4 | 1.73 | 2.04 | 65 | 6 | 6.61 | 3.8 | 25.3 | 26.5 | 27.3 | 27.9 | 30.8 |
| ZSTNB 2018-28-04 | 1.8 | 0.9 | 1.6 | 28 | 0.4 | 1.73 | 2.1 | 70 | 6 | 6.61 | 3.4 | 29.4 | 30.6 | 31.5 | 32.4 | 35.9 |
| ZSTNB 2018-32-04 | 1.8 | 0.9 | 1.6 | 32 | 0.4 | 1.73 | 2.15 | 70 | 6 | 6.61 | 3 | 33.4 | 34.8 | 35.7 | 37.1 | - |
| ZSTNB 2018-36-04 | 1.8 | 0.9 | 1.6 | 36 | 0.4 | 1.73 | 2.21 | 75 | 6 | 6.61 | 2.8 | 37.5 | 38.9 | 39.9 | 41.7 | - |
| ZSTNB 2018-38-04 | 1.8 | 0.9 | 1.6 | 38 | 0.4 | 1.73 | 2.24 | 80 | 6 | 6.61 | 2.7 | 39.5 | 41 | 42 | 44 | - |
| ZSTNB 2018-40-04 | 1.8 | 0.9 | 1.6 | 40 | 0.4 | 1.73 | 2.27 | 80 | 6 | 6.61 | 2.6 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ZSTNB 2020-8-04 | 2 | 1 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 7.42 | 7 | 8.7 | 9 | 9.2 | 9.5 | 10.2 |
| ZSTNB 2020-12-04 | 2 | 1 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.7 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ZSTNB 2020-16-04 | 2 | 1 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 7.42 | 4.8 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ZSTNB 2020-20-04 | 2 | 1 | 1.7 | 20 | 0.4 | 1.92 | 2.18 | 65 | 6 | 7.42 | 4.1 | 21.3 | 22.3 | 23 | 23.6 | 25.6 |
| ZSTNB 2020-20-09 | 2 | 1 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | x | 21.4 | 22.4 | 23.2 | 24.6 |
| ZSTNB 2020-25-09 | 2 | 1 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | x | 26.5 | 27.7 | 28.5 | 30.8 |
| ZSTNB 2020-30-04 | 2 | 1 | 1.7 | 30 | 0.4 | 1.92 | 2.32 | 70 | 6 | 7.42 | 3.1 | 31.4 | 32.7 | 33.6 | 34.8 | 38.5 |
| ZSTNB 2020-30-09 | 2 | 1 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.2 | x | 31.6 | 32.9 | 33.7 | 36.9 |
| ZSTNB 2020-35-09 | 2 | 1 | 1.7 | 35 | 0.9 | 1.92 | 2.97 | 75 | 6 | 4.24 | 2.8 | x | 36.6 | 38 | 39 | - |
| ZSTNB 2020-40-04 | 2 | 1 | 1.7 | 40 | 0.4 | 1.92 | 2.46 | 80 | 6 | 7.42 | 2.5 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ZSTNB 2020-40-09 | 2 | 1 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.6 | x | 41.7 | 43.2 | 44.5 | - |
| ZSTNB 2020-50-09 | 2 | 1 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | x | 51.5 | 53.5 | 55.5 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

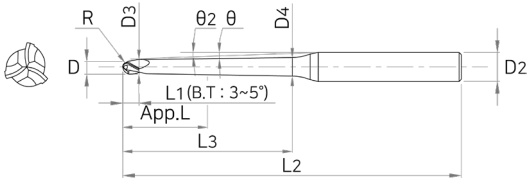
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 2020-60-09 | 2 | 1 | 1.7 | 60 | 0.9 | 1.92 | 3.75 | 100 | 6 | 4.24 | 1.8 | x | 61.9 | 63.8 | - | - |
| ZSTNB 2020-70-09 | 2 | 1 | 1.7 | 70 | 0.9 | 1.92 | 4.07 | 110 | 6 | 4.24 | 1.8 | x | 72 | 74.1 | - | - |
| ZSTNB 2030-8-04 | 3 | 1.5 | 2.5 | 8 | 0.4 | 2.86 | 2.94 | 50 | 6 | 8.5 | 6.3 | 8.8 | 9.1 | 9.3 | 9.5 | 10.3 |
| ZSTNB 2030-16-04 | 3 | 1.5 | 2.5 | 16 | 0.4 | 2.86 | 3.05 | 55 | 6 | 12.52 | 4.1 | 17.2 | 17.8 | 18.3 | 18.7 | 20.6 |
| ZSTNB 2030-20-04 | 3 | 1.5 | 2.5 | 20 | 0.4 | 2.86 | 3.1 | 60 | 6 | 12.52 | 3.4 | 21.2 | 22 | 22.6 | 23.3 | 25.7 |
| ZSTNB 2030-30-04 | 3 | 1.5 | 2.5 | 30 | 0.4 | 2.86 | 3.24 | 70 | 6 | 12.52 | 2.5 | 31.6 | 32.8 | 33.7 | 34.9 | - |
| ZSTNB 2030-30-09 | 3 | 1.5 | 2.5 | 30 | 0.9 | 2.86 | 3.72 | 70 | 6 | 6.95 | 2.6 | x | 31.8 | 33 | 33.8 | - |
| ZSTNB 2030-40-04 | 3 | 1.5 | 2.5 | 40 | 0.4 | 2.86 | 3.38 | 80 | 6 | 12.52 | 2 | 41.7 | 43.2 | 44.3 | - | - |
| ZSTNB 2030-40-09 | 3 | 1.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | x | 41.9 | 43.3 | - | - |
| ZSTNB 2030-50-09 | 3 | 1.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | x | 52 | 53.6 | - | - |
| ZSTNB 2030-60-09 | 3 | 1.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | x | 62.1 | - | - | - |
| ZSTNB 2030-70-09 | 3 | 1.5 | 2.5 | 70 | 0.9 | 2.86 | 4.98 | 110 | 6 | 6.95 | 1.2 | x | 72.1 | - | - | - |
| ZSTNB 2040-20-10 | 4 | 2 | 8 | 20 | 1 | 3.86 | 4.28 | 70 | 8 | 12.01 | 5 | 20.5 | 21.6 | 22.3 | 22.8 | 23.5 |
| ZSTNB 2040-30-10 | 4 | 2 | 8 | 30 | 1 | 3.86 | 4.63 | 80 | 8 | 12.01 | 3.51 | 22 | 31.6 | 32.5 | 33.2 | 34.16 |
| ZSTNB 2040-40-10 | 4 | 2 | 8 | 40 | 1 | 3.86 | 4.98 | 90 | 8 | 12.01 | 2.7 | 22 | 42 | 43.4 | 44.3 | - |
| ZSTNB 2040-50-10 | 4 | 2 | 8 | 50 | 1 | 3.86 | 5.33 | 100 | 8 | 12.01 | 2.2 | 22 | 52 | 53.6 | 54.7 | - |
| ZSTNB 2040-60-10 | 4 | 2 | 8 | 60 | 1 | 3.86 | 5.68 | 110 | 8 | 12.01 | 1.9 | 22 | 62 | 63.8 | - | - |
| ZSTNB 2050-30-10 | 5 | 2.5 | 10 | 30 | 1 | 4.86 | 5.56 | 80 | 8 | 14.01 | 2.8 | 25.5 | 31.7 | 32.6 | 33.2 | - |
| ZSTNB 2050-40-10 | 5 | 2.5 | 10 | 40 | 1 | 4.86 | 5.91 | 90 | 8 | 14.01 | 2.1 | 25.5 | 41.7 | 42.8 | 43.5 | - |
| ZSTNB 2050-60-10 | 5 | 2.5 | 10 | 60 | 1 | 4.86 | 6.61 | 110 | 8 | 14.01 | 1.5 | 25.5 | 62.1 | - | - | - |
| ZSTNB 2060-30-10 | 6 | 3 | 12 | 30 | 1 | 5.86 | 6.49 | 80 | 8 | 16.01 | 1.9 | 29 | 31.8 | 32.6 | - | - |
| ZSTNB 2060-40-10 | 6 | 3 | 12 | 40 | 1 | 5.86 | 6.84 | 90 | 8 | 16.01 | 1.5 | 29 | 41.8 | - | - | - |
| ZSTNB 2060-50-10 | 6 | 3 | 12 | 50 | 1 | 5.86 | 7.19 | 100 | 8 | 16.01 | 1.2 | 29 | 51.8 | - | - | - |
| ZSTNB 2060-60-10 | 6 | 3 | 12 | 60 | 1 | 5.86 | 7.54 | 110 | 10 | 16.01 | 1.9 | 29 | 62.2 | 63.9 | - | - |
| ZSTNB 2060-70-10 | 6 | 3 | 12 | 70 | 1 | 5.86 | 7.89 | 120 | 10 | 16.01 | 1.7 | 29 | 72.2 | 74.1 | - | - |
| ZSTNB 2060-80-10 | 6 | 3 | 12 | 80 | 1 | 5.86 | 8.23 | 130 | 10 | 16.01 | 1.5 | 29 | 82.2 | - | - | - |
| ZSTNB 2080-50-10 | 8 | 4 | 14 | 50 | 1 | 7.86 | 9.12 | 110 | 10 | 18.01 | 1.2 | 32 | 51.9 | - | - | - |
| ZSTNB 2080-60-10 | 8 | 4 | 14 | 60 | 1 | 7.86 | 9.47 | 120 | 10 | 18.01 | 1 | 32 | - | - | - | - |
| ZSTNB 2080-70-10 | 8 | 4 | 14 | 70 | 1 | 7.86 | 9.82 | 130 | 10 | 18.01 | 0.9 | 32 | - | - | - | - |
| ZSTNB 2080-80-10 | 8 | 4 | 14 | 80 | 1 | 7.86 | 10.16 | 140 | 12 | 18.01 | 1.5 | 32 | 82.3 | - | - | - |
| ZSTNB 2100-60-10 | 10 | 5 | 18 | 60 | 1 | 9.86 | 11.33 | 130 | 12 | 22.01 | 1.1 | 39 | 62.1 | - | - | - |
| ZSTNB 2100-75-10 | 10 | 5 | 18 | 75 | 1 | 9.86 | 11.85 | 140 | 12 | 22.01 | 0.9 | 39 | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL




※ R2 and below are not back draft Type



## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 All Sizes | DATA P.572

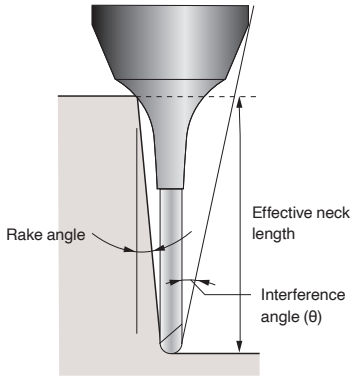
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 3020-8-04 | 2 | 1 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 7.42 | 7 | 8.7 | 9 | 9.2 | 9.5 | 10.2 |
| ZSTNB 3020-12-04 | 2 | 1 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.7 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ZSTNB 3020-16-04 | 2 | 1 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 7.42 | 4.8 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ZSTNB 3020-20-04 | 2 | 1 | 1.7 | 20 | 0.4 | 1.92 | 2.18 | 65 | 6 | 7.42 | 4.1 | 21.3 | 22.3 | 23 | 23.6 | 25.6 |
| ZSTNB 3020-20-09 | 2 | 1 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | x | 21.4 | 22.4 | 23.2 | 24.6 |
| ZSTNB 3020-25-09 | 2 | 1 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | x | 26.5 | 27.7 | 28.5 | 30.8 |
| ZSTNB 3020-30-04 | 2 | 1 | 1.7 | 30 | 0.4 | 1.92 | 2.32 | 70 | 6 | 7.42 | 3.1 | 31.4 | 32.7 | 33.6 | 34.8 | 38.5 |
| ZSTNB 3020-30-09 | 2 | 1 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.2 | x | 31.6 | 32.9 | 33.7 | 36.9 |
| ZSTNB 3020-35-09 | 2 | 1 | 1.7 | 35 | 0.9 | 1.92 | 2.97 | 75 | 6 | 4.24 | 2.8 | x | 36.6 | 38 | 39 | - |
| ZSTNB 3020-40-04 | 2 | 1 | 1.7 | 40 | 0.4 | 1.92 | 2.46 | 80 | 6 | 7.42 | 2.5 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ZSTNB 3020-40-09 | 2 | 1 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.6 | x | 41.7 | 43.2 | 44.5 | - |
| ZSTNB 3020-50-09 | 2 | 1 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | x | 51.8 | 53.5 | 55.5 | - |
| ZSTNB 3020-60-09 | 2 | 1 | 1.7 | 60 | 0.9 | 1.92 | 3.75 | 100 | 6 | 4.24 | 1.8 | x | 61.9 | 63.8 | - | - |
| ZSTNB 3020-70-09 | 2 | 1 | 1.7 | 70 | 0.9 | 1.92 | 4.07 | 110 | 6 | 4.24 | 1.6 | x | 72 | 74.1 | - | - |
| ZSTNB 3030-8-04 | 3 | 1.5 | 2.5 | 8 | 0.4 | 2.86 | 2.94 | 50 | 6 | 8.5 | 6.3 | 8.8 | 9.1 | 9.3 | 9.5 | 10.3 |
| ZSTNB 3030-16-04 | 3 | 1.5 | 2.5 | 16 | 0.4 | 2.86 | 3.05 | 55 | 6 | 12.52 | 4.1 | 17.2 | 17.8 | 18.3 | 18.7 | 20.6 |
| ZSTNB 3030-20-04 | 3 | 1.5 | 2.5 | 20 | 0.4 | 2.86 | 3.1 | 60 | 6 | 12.52 | 3.4 | 21.2 | 22 | 22.6 | 23.3 | 25.7 |
| ZSTNB 3030-30-04 | 3 | 1.5 | 2.5 | 30 | 0.4 | 2.86 | 3.24 | 70 | 6 | 12.52 | 2.5 | 31.6 | 32.8 | 33.7 | 34.9 | - |
| ZSTNB 3030-30-09 | 3 | 1.5 | 2.5 | 30 | 0.9 | 2.86 | 3.72 | 70 | 6 | 6.95 | 2.6 | x | 31.8 | 33 | 33.8 | - |
| ZSTNB 3030-40-04 | 3 | 1.5 | 2.5 | 40 | 0.4 | 2.86 | 3.38 | 80 | 6 | 12.52 | 2 | 41.7 | 43.2 | 44.3 | - | - |
| ZSTNB 3030-40-09 | 3 | 1.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | x | 41.9 | 43.3 | - | - |
| ZSTNB 3030-50-09 | 3 | 1.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | x | 52 | 53.6 | - | - |
| ZSTNB 3030-60-09 | 3 | 1.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | x | 62.1 | - | - | - |
| ZSTNB 3030-70-09 | 3 | 1.5 | 2.5 | 70 | 0.9 | 2.86 | 4.98 | 110 | 6 | 6.95 | 1.2 | x | 72.1 | - | - | - |

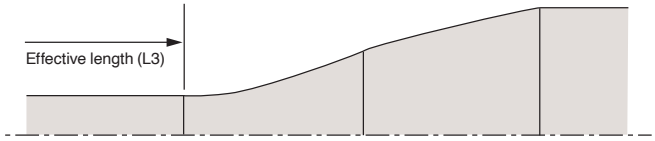
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZSTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ZSTNB 3040-20-10 | 4 | 2 | 8 | 20 | 1 | 3.86 | 4.28 | 70 | 8 | 12.01 | 5 | 20.5 | 21.6 | 22.3 | 22.8 | 23.5 |
| ZSTNB 3040-30-10 | 4 | 2 | 8 | 30 | 1 | 3.86 | 4.63 | 80 | 8 | 12.01 | 3.6 | 22 | 31.6 | 32.5 | 33.2 | 34.1 |
| ZSTNB 3040-40-10 | 4 | 2 | 8 | 40 | 1 | 3.86 | 4.98 | 90 | 8 | 12.01 | 2.7 | 22 | 42 | 43.4 | 44.3 | - |
| ZSTNB 3040-50-10 | 4 | 2 | 8 | 50 | 1 | 3.86 | 5.33 | 100 | 8 | 12.01 | 2.2 | 22 | 52 | 53.6 | 54.7 | - |
| ZSTNB 3040-60-10 | 4 | 2 | 8 | 60 | 1 | 3.86 | 5.68 | 110 | 8 | 12.01 | 1.9 | 22 | 62 | 63.8 | - | - |
| ZSTNB 3050-30-10 | 5 | 2.5 | 10 | 30 | 1 | 4.86 | 5.56 | 80 | 8 | 14.01 | 2.8 | 25.5 | 31.7 | 32.6 | 33.2 | - |
| ZSTNB 3050-40-10 | 5 | 2.5 | 10 | 40 | 1 | 4.86 | 5.91 | 90 | 8 | 14.01 | 2.1 | 25.5 | 41.7 | 42.8 | 43.5 | - |
| ZSTNB 3050-60-10 | 5 | 2.5 | 10 | 60 | 1 | 4.86 | 6.61 | 110 | 8 | 12.52 | 1.5 | 25.5 | 62.1 | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ○ | ◎ | ◎ | ○ | | | | |

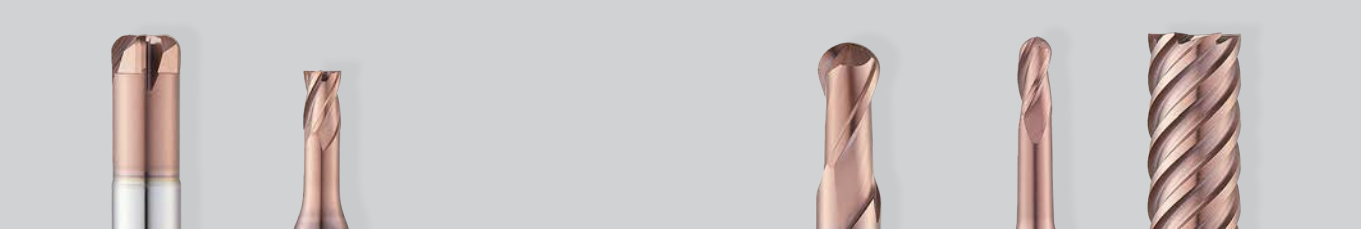
○ : GOOD ◎ : EXCELLENT

# E-STAR ENDMILL

High Hardness HRc 50 ~ 63

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | ESE702 | | 2 FLUTES NECK SQUARE ENDMILL | D0.1 | D20.0 | 76 |
| | 2F | ESE712 | | 2 FLUTES SQUARE ENDMILL | D1.0 | D12.0 | 77 |
| | 4F | ESE704 | | 4 FLUTES NECK SQUARE ENDMILL | D1.0 | D20.0 | 78 |
| | 4F | ESE714 | | 4 FLUTES HIGH HELIX SQUARE ENDMILL | D1.0 | D12.0 | 79 |
| | 4&6F | ESE724(6) | | 4 & 6 FLUTES HIGH HELIX SQUARE ENDMILL | D1.0 | D12.0 | 80 |
| | 4F | ESE744 | | 4 FLUTES 35° HELIX SQUARE ENDMILL | D1.0 | D12.0 | 81 |
| | 6F | ESE716 | | 6 FLUTES HIGH HELIX SQUARE ENDMILL | D6.0 | D20.0 | 82 |
| | 2F | ESRE712 | | 2 FLUTES RIB SQUARE ENDMILL | D0.1 | D12.0 | 83 |
| | 4F | ESRE714 | | 4 FLUTES RIB SQUARE ENDMILL | D0.5 | D12.0 | 86 |
| | 4F | ESXE704 | | 4 FLUTES NECK SQUARE ENDMILL | D1.0 | D12.0 | 89 |
| | 4F | ESXE714 | | 4 FLUTES SQUARE ENDMILL | D2.0 | D12.0 | 90 |
| | 2F | ESLNS20 | | 2 FLUTES LONG NECK SQAURE ENDMILL | D0.1 | D5.0 | 91 |
| | 4F | ESLNS40 | | 4 FLUTES LONG NECK SQAURE ENDMILL | D1.0 | D5.0 | 96 |
| RADIUS | 2F | ESR702 | | 2 FLUTES NECK RADIUS ENDMILL | D1.0 | D12.0 | 99 |
| | 2F | ESR732 | | 2 FLUTES LONG SHANK RADIUS ENDMILL | D1.0 | D12.0 | 102 |
| | 4F | ESR704 | | 4 FLUTES NECK RADIUS ENDMILL | D1.0 | D12.0 | 103 |
| | 4F | ESR714 | | 4 FLUTES RADIUS ENDMILL | D3.0 | D12.0 | 105 |
| | 4F | ESR724 | | 4 FLUTES NECK RADIUS ENDMILL | D6.0 | D12.0 | 106 |
| | 4F | ESR734 | | 4 FLUTES LONG SHANK RADIUS ENDMILL | D1.0 | D12.0 | 107 |
| | 6F | ESR706 | | 6 FLUTES NECK RADIUS ENDMILL | D6.0 | D12.0 | 108 |
| | 6F | ESR736 | | 6 FLUTES RADIUS ENDMILL | D6.0 | D12.0 | 109 |
| | 2F | ESRR712 | | 2 FLUTES RIB RADIUS ENDMILL | D0.2 | D16.0 | 111 |
| | 4F | ESRR714 | | 4 FLUTES RIB RADIUS ENDMILL | D0.5 | D2.0 | 117 |
| | 4F | ESXR704 | | 4 FLUTES NECK RADIUS ENDMILL | D1.0 | D12.0 | 124 |
| | 2F | ESLNR20 | | 2 FLUTES LONG NECK RADIUS ENDMILL | D0.2 | D3.0 | 126 |
| | 2F | ESTNR20 | | 2 FLUTES TAPER NECK RADIUS ENDMILL | D0.2 | D3.0 | 130 |
| | 4F | ESPM4 | | 4 FLUTES NECK RADIUS ENDMILL | D3.0 | D12.0 | 133 |
| BALL | 2F | ESB702 | | 2 FLUTES NECK BALL ENDMILL | R0.5 | R6.0 | 134 |
| | 2F | ESB712 | | 2 FLUTES BALL ENDMILL | R0.5 | R6.0 | 135 |



## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| BALL | 3F | ESB703 | | 3 FLUTES NECK BALL ENDMILL | R1.0 | R6.0 | 136 |
| | 4F | ESB734 | | 4 FLUTES 15° HELIX BALL ENDMILL | R1.0 | R5.0 | 137 |
| | 2F | ESRB712 | | 2 FLUTES RIB BALL ENDMILL | R0.05 | R6.0 | 138 |
| | 2F | ESLNB20 | | 2 FLUTES LONG NECK BALL ENDMILL | R0.05 | R2.5 | 143 |
| | 2F | ESTNB20 | | 2 FLUTES TAPER NECK BALL ENDMILL | R0.1 | R5.0 | 147 |
| | 3F | ESTNB30 | | 3 FLUTES TAPER NECK BALL ENDMILL | R1.0 | R2.5 | 151 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| ES | R | 7 | 0 | 4 | 100 | 15 | 32 | 10 |
|---|---|---|---|---|---|---|---|---|

| Section | Appearance | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R | Effective length | Shank Dia |
|---|---|---|---|---|---|---|---|---|
| ES : E-STAR | B : Ball | 7 : Grade | 0 : Neck | 2 : 2 Flutes | 010 : Ø1.0 | 05 : R0.5 | 10 : 10mm | 06 : Ø6.0 |
| | E : Square | | 1 : Straight, Neck | 3 : 3 Flutes | 060 : Ø6.0 | 15 : R1.5 | 12 : 12mm | 10 : Ø10.0 |
| | R : Radius | | 2 : Long Shank Neck | 4 : 4 Flutes | 065 : Ø6.5 | 20 : R2.0 | 32 : 32mm | 12 : Ø12.0 |
| | XE : Square (Unequal) | | 3 : Long Shank | 6 : 6 Flutes | 100 : Ø10.0 | | | |
| | XR : Radius (Unequal) | | 4 : Helix 35° | | | | | |
| | PM : Power Mill | | | | | | | |
| | RB : Rib Ball | | | | | | | |
| | RE : Rib Square | | | | | | | |
| | RR : Rib Radius | | | | | | | |
| | LNB : Long Neck Ball | | | | | | | |
| | TNB : Taper Neck Ball | | | | | | | |
| | LNS : Long Neck Square | | | | | | | |
| | LNR : Long Neck Radius | | | | | | | |

Ex) 4 Flute / Cutting Dia Ø2 / Corner R 0.3 / Neck Length 6mm / Shank Dia 10 / 70Grade / Corner Radius Neck Type E-Star Endmill

# E-STAR ENDMILL

High Hardness HRc 50 ~ 63

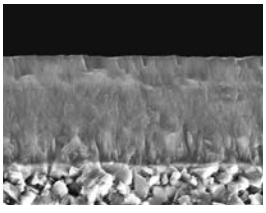
## Characteristics

· Suitable for High Hardness HRc 50 ~ 63
· Excellent Coating in high temperature hardness and heat resistance
· High precision Tolerance for precision machining

## Features

· HRc50~63 Carbide endmill for high hardness steel
· Appropriate for precision machining by applying high precision tolerance on Cutting Diameter and radius

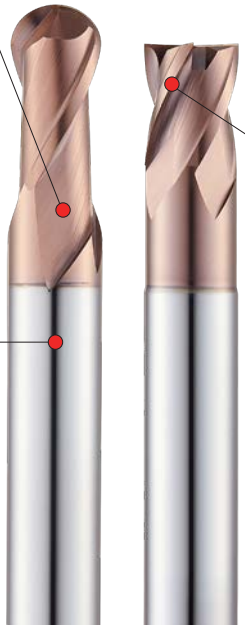
### Adopt a high hardness coating



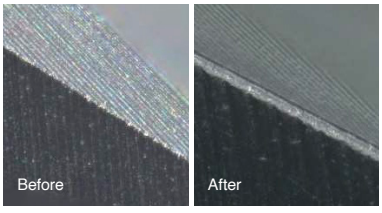
1) Improved wear resistance
2) improved heat resistance

### Adopt a high hardness raw-material

1) Expansion of versatility by special toughness

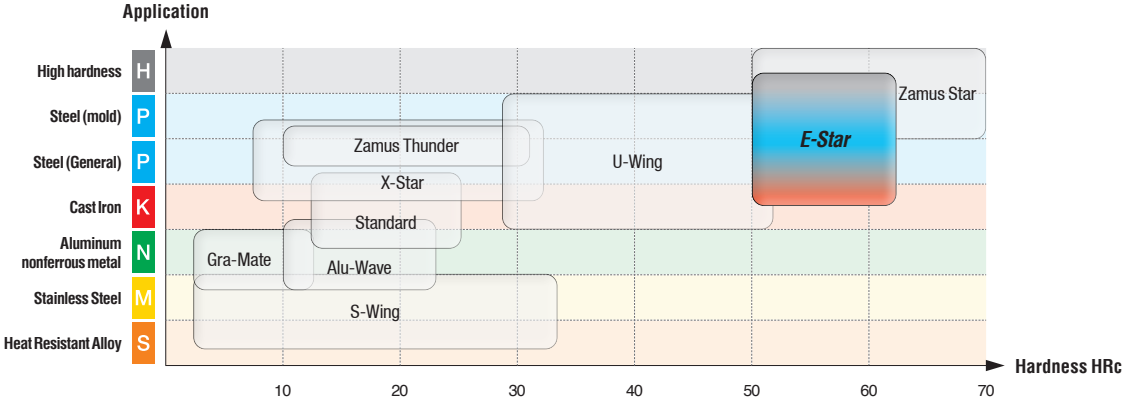


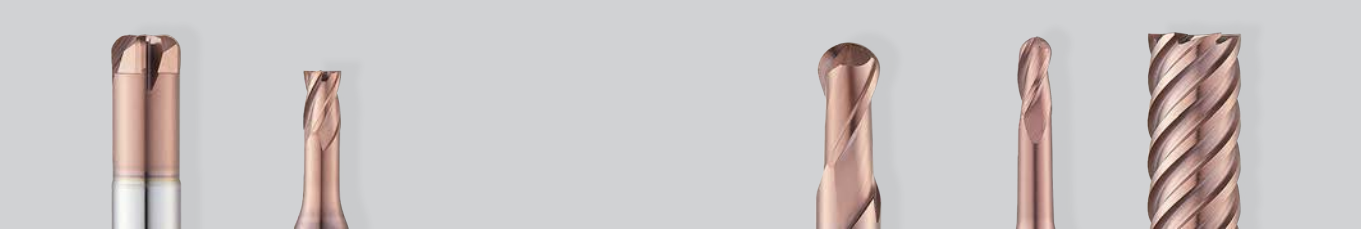
### Treatment of Cutting Edge




1) Improved chipping resistance
2) Improved wear resistance, induce to stable work

## Applications

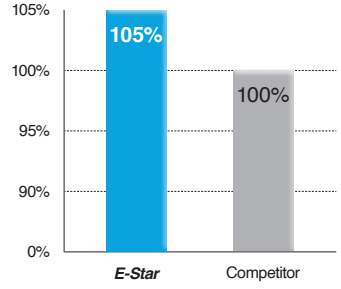


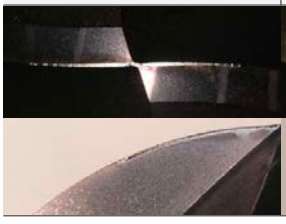


## Case Study

### 2F D12.0 BALL ENDMILL

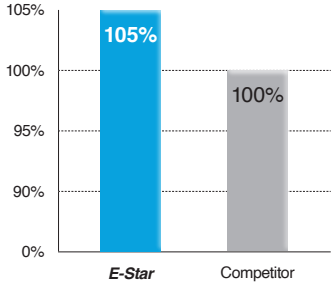
**STD61 (HRc50~55)**

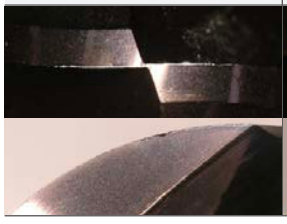
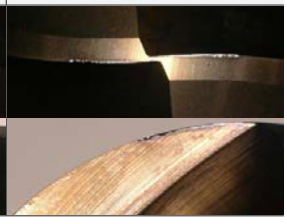



| *E-Star* | Competitor |
|---|---|
|  | |

· Cutting Condition
· rpm : 3,450 / vc : 130 / vf : 828 / fz : 0.06 / ap : 12 / ae : 0.4 / o claont : AIR

**STD11 (HRc60~63)**

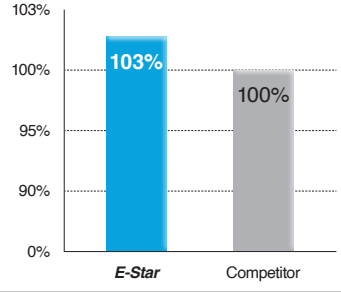


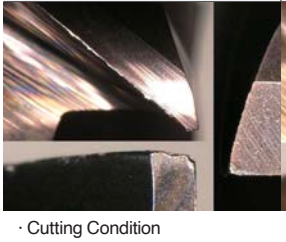
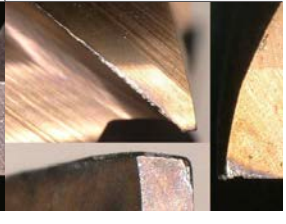

| *E-Star* | Competitor |
|---|---|
|  |  |

· Cutting Condition
· rpm : 3,981 / vc : 150 / vf : 955 / fz : 0.12 / ap : 0.4 / ae : 0.6 / o claont : AIR

### 4F D12.0 SQUARE ENDMILL

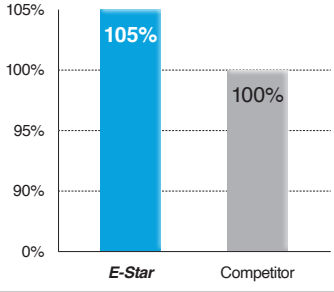
**STD61 (HRc50~55)**

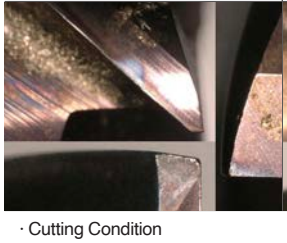
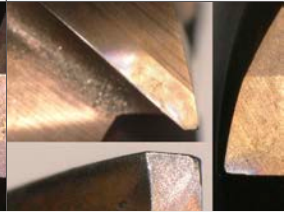



| *E-Star* | Competitor |
|---|---|
|  |  |

· Cutting Condition
· rpm : 3,450 / vc : 130 / vf : 828 / fz : 0.06 / ap : 12 / ae : 0.4 / o claont : AIR

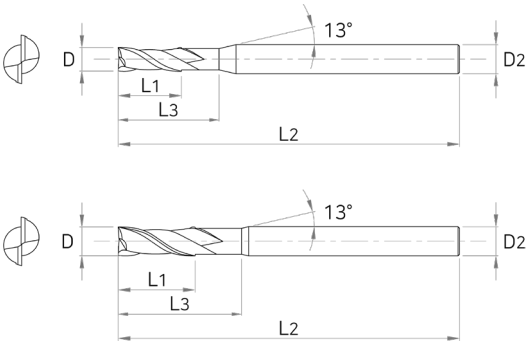
**STD11 (HRc60~63)**




| *E-Star* | Competitor |
|---|---|
|  |  |

· Cutting Condition
· rpm : 1,858 / vc : 70 / vf : 297 / fz : 0.04 / ap : 12 / ae : 0.4 / o claont : AIR

# ESE702 | 2 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.575

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESE702 001 | 0.1 | 0.2 | - | 40 | 4 |
| ESE702 002 | 0.2 | 0.4 | - | 40 | 4 |
| ESE702 003 | 0.3 | 0.5 | - | 40 | 4 |
| ESE702 004 | 0.4 | 0.7 | - | 40 | 4 |
| ESE702 005 | 0.5 | 1 | - | 40 | 4 |
| ESE702 006 | 0.6 | 1.2 | - | 40 | 4 |
| ESE702 007 | 0.7 | 1.4 | - | 40 | 4 |
| ESE702 008 | 0.8 | 1.6 | - | 40 | 4 |
| ESE702 009 | 0.9 | 2 | - | 40 | 4 |
| ESE702 010 | 1 | 1.5 | - | 40 | 6 |
| ESE702 010S4 | 1 | 1.5 | - | 40 | 4 |
| ESE702 015 | 1.5 | 2.2 | - | 40 | 6 |
| ESE702 020 | 2 | 3 | 6 | 40 | 6 |

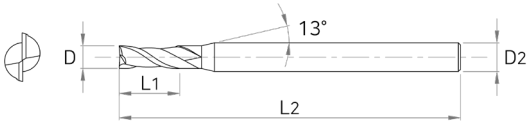
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESE702 020S4 | 2 | 3 | 6 | 40 | 4 |
| ESE702 025 | 2.5 | 4 | 6 | 40 | 6 |
| ESE702 030 | 3 | 4 | 7 | 45 | 6 |
| ESE702 035 | 3.5 | 6 | 9 | 45 | 6 |
| ESE702 040 | 4 | 6 | 9 | 45 | 6 |
| ESE702 045 | 4.5 | 6 | 10 | 45 | 6 |
| ESE702 050 | 5 | 6 | 11 | 50 | 6 |
| ESE702 060 | 6 | 7 | 14 | 50 | 6 |
| ESE702 080 | 8 | 9 | 18 | 60 | 8 |
| ESE702 100 | 10 | 12 | 25 | 75 | 10 |
| ESE702 120 | 12 | 15 | 30 | 75 | 12 |
| ESE702 160 | 16 | 18 | 38 | 90 | 16 |
| ESE702 200 | 20 | 24 | 45 | 100 | 20 |

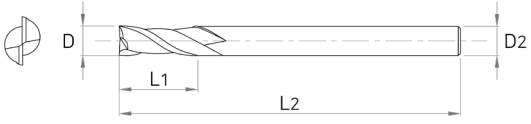
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE712 | 2 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 35° HELIX | DATA P.577

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE712 010 | 1 | 3 | 40 | 6 |
| ESE712 010-02 | 1 | 2 | 40 | 6 |
| ESE712 010-02S4 | 1 | 2 | 40 | 4 |
| ESE712 010-04 | 1 | 4 | 40 | 6 |
| ESE712 012 | 1.2 | 3 | 40 | 6 |
| ESE712 015 | 1.5 | 4 | 40 | 6 |
| ESE712 015S4 | 1.5 | 4 | 40 | 4 |
| ESE712 015-06 | 1.5 | 6 | 40 | 6 |
| ESE712 015-08 | 1.5 | 8 | 40 | 6 |
| ESE712 020 | 2 | 5 | 40 | 6 |
| ESE712 020S4 | 2 | 5 | 40 | 4 |
| ESE712 020-08 | 2 | 8 | 40 | 6 |
| ESE712 020-10 | 2 | 10 | 50 | 6 |
| ESE712 025 | 2.5 | 6 | 40 | 6 |
| ESE712 025S4 | 2.5 | 6 | 40 | 4 |
| ESE712 030 | 3 | 8 | 45 | 6 |
| ESE712 030S4 | 3 | 8 | 45 | 4 |
| ESE712 030-10 | 3 | 10 | 50 | 6 |

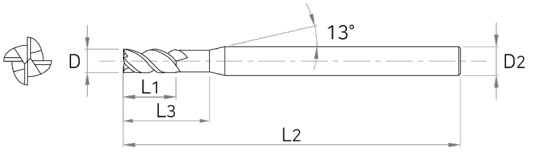
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE712 030-12 | 3 | 12 | 50 | 6 |
| ESE712 035 | 3.5 | 10 | 45 | 6 |
| ESE712 040 | 4 | 10 | 45 | 6 |
| ESE712 040S4 | 4 | 10 | 45 | 4 |
| ESE712 040-12 | 4 | 12 | 50 | 6 |
| ESE712 040-16 | 4 | 16 | 60 | 6 |
| ESE712 045 | 4.5 | 11 | 45 | 6 |
| ESE712 050 | 5 | 13 | 50 | 6 |
| ESE712 055 | 5.5 | 13 | 50 | 6 |
| ESE712 060 | 6 | 13 | 50 | 6 |
| ESE712 060-15 | 6 | 15 | 60 | 6 |
| ESE712 065 | 6.5 | 16 | 60 | 8 |
| ESE712 070 | 7 | 18 | 60 | 8 |
| ESE712 080 | 8 | 19 | 60 | 8 |
| ESE712 100 | 10 | 22 | 70 | 10 |
| ESE712 100-25 | 10 | 25 | 70 | 10 |
| ESE712 120 | 12 | 26 | 75 | 12 |
| ESE712 120-30 | 12 | 30 | 75 | 12 |

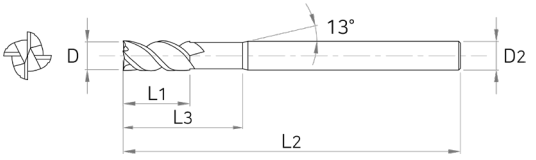
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE704 | 4 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.579

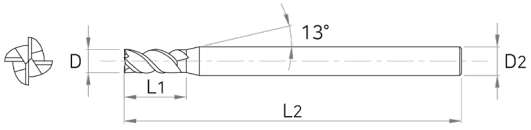
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESE704 010 | 1 | 1.5 | - | 40 | 6 |
| ESE704 010S4 | 1 | 1.5 | - | 40 | 4 |
| ESE704 015 | 1.5 | 2.2 | - | 40 | 6 |
| ESE704 015S4 | 1.5 | 2.2 | - | 40 | 4 |
| ESE704 020 | 2 | 3 | 6 | 40 | 6 |
| ESE704 020S4 | 2 | 3 | 6 | 40 | 4 |
| ESE704 025 | 2.5 | 4 | 6 | 40 | 6 |
| ESE704 025S4 | 2.5 | 4 | 6 | 40 | 4 |
| ESE704 030 | 3 | 4 | 7 | 45 | 6 |
| ESE704 030S4 | 3 | 4 | 7 | 45 | 4 |
| ESE704 035 | 3.5 | 5 | 9 | 45 | 6 |
| ESE704 040 | 4 | 5 | 9 | 45 | 6 |
| ESE704 040S4 | 4 | 5 | 9 | 45 | 4 |
| ESE704 045 | 4.5 | 6 | 10 | 45 | 6 |
| ESE704 050 | 5 | 6 | 11 | 50 | 6 |
| ESE704 060 | 6 | 7 | 14 | 50 | 6 |
| ESE704 080 | 8 | 9 | 18 | 60 | 8 |
| ESE704 100 | 10 | 12 | 25 | 75 | 10 |
| ESE704 120 | 12 | 15 | 30 | 75 | 12 |
| ESE704 160 | 16 | 18 | 38 | 90 | 16 |
| ESE704 200 | 20 | 24 | 45 | 100 | 20 |

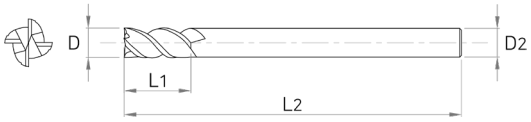
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE714 | 4 FLUTES HIGH HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 45° HELIX | DATA P.579

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE714 010 | 1 | 2.5 | 40 | 6 |
| ESE714 010S4 | 1 | 2.5 | 40 | 4 |
| ESE714 012 | 1.2 | 3 | 40 | 6 |
| ESE714 015 | 1.5 | 4 | 40 | 6 |
| ESE714 015S4 | 1.5 | 4 | 40 | 4 |
| ESE714 020 | 2 | 5 | 40 | 6 |
| ESE714 020S4 | 2 | 5 | 40 | 4 |
| ESE714 025 | 2.5 | 6 | 40 | 6 |
| ESE714 025S4 | 2.5 | 6 | 40 | 4 |
| ESE714 030 | 3 | 8 | 45 | 6 |
| ESE714 030S4 | 3 | 8 | 45 | 4 |
| ESE714 035 | 3.5 | 9 | 45 | 6 |
| ESE714 040 | 4 | 10 | 45 | 6 |

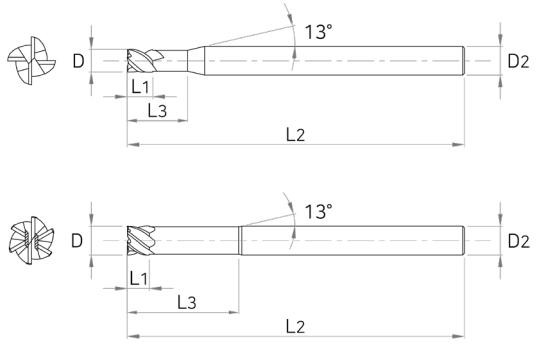
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE714 040S4 | 4 | 10 | 45 | 4 |
| ESE714 050 | 5 | 13 | 50 | 6 |
| ESE714 060 | 6 | 13 | 50 | 6 |
| ESE714 060-15 | 6 | 15 | 60 | 6 |
| ESE714 060-15L | 6 | 15 | 90 | 6 |
| ESE714 080 | 8 | 19 | 60 | 8 |
| ESE714 080L | 8 | 19 | 100 | 8 |
| ESE714 100 | 10 | 22 | 70 | 10 |
| ESE714 100-25 | 10 | 25 | 70 | 10 |
| ESE714 100-25L | 10 | 25 | 100 | 10 |
| ESE714 120 | 12 | 26 | 75 | 12 |
| ESE714 120-30 | 12 | 30 | 80 | 12 |
| ESE714 120-30L | 12 | 30 | 100 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE724(6) | 4&6 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 4 | 6 | 45° HELIX | 60° HELIX | DATA P.579,580

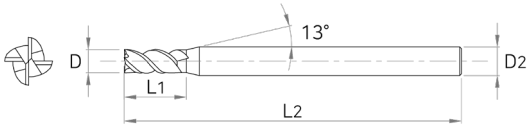
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| ESE724 010 | 1 | 1.5 | 5 | 45 | 6 | 4 |
| ESE724 015 | 1.5 | 2.2 | 6 | 45 | 6 | 4 |
| ESE724 020 | 2 | 3 | 8 | 45 | 6 | 4 |
| ESE724 030 | 3 | 4 | 9 | 50 | 6 | 4 |
| ESE724 040 | 4 | 5 | 12 | 50 | 6 | 4 |
| ESE724 040S4L | 4 | 5 | 12 | 75 | 4 | 4 |
| ESE724 050 | 5 | 6 | 15 | 50 | 6 | 4 |
| ESE726 060 | 6 | 7 | 20 | 60 | 6 | 6 |
| ESE726 080 | 8 | 9 | 25 | 70 | 8 | 6 |
| ESE726 100 | 10 | 12 | 32 | 75 | 10 | 6 |
| ESE726 120 | 12 | 15 | 38 | 80 | 12 | 6 |

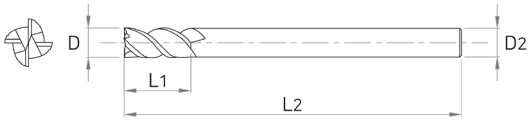
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE744 | 4 FLUTES HIGH HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 35° HELIX | DATA P.579

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE744 010S3 | 1 | 2.5 | 40 | 3 |
| ESE744 010S4 | 1 | 2.5 | 40 | 4 |
| ESE744 010 | 1 | 2.5 | 40 | 6 |
| ESE744 012S3 | 1.2 | 3 | 40 | 3 |
| ESE744 012S4 | 1.2 | 3 | 40 | 4 |
| ESE744 015S3 | 1.5 | 4 | 40 | 3 |
| ESE744 015S4 | 1.5 | 4 | 40 | 4 |
| ESE744 015 | 1.5 | 4 | 40 | 6 |
| ESE744 020S3 | 2 | 6 | 40 | 3 |
| ESE744 020S4 | 2 | 6 | 40 | 4 |
| ESE744 020 | 2 | 6 | 40 | 6 |
| ESE744 025S3 | 2.5 | 8 | 45 | 3 |
| ESE744 025S4 | 2.5 | 8 | 45 | 4 |
| ESE744 025 | 2.5 | 8 | 45 | 6 |

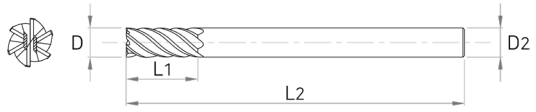
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE744 030S3 | 3 | 8 | 50 | 3 |
| ESE744 030S4 | 3 | 8 | 45 | 4 |
| ESE744 030 | 3 | 8 | 45 | 6 |
| ESE744 035 | 3.5 | 10 | 45 | 6 |
| ESE744 040S4 | 4 | 11 | 45 | 4 |
| ESE744 040 | 4 | 11 | 45 | 6 |
| ESE744 045 | 4.5 | 11 | 45 | 6 |
| ESE744 050 | 5 | 13 | 50 | 6 |
| ESE744 055 | 5.5 | 13 | 50 | 6 |
| ESE744 060 | 6 | 13 | 50 | 6 |
| ESE744 080 | 8 | 19 | 60 | 8 |
| ESE744 100 | 10 | 22 | 70 | 10 |
| ESE744 120 | 12 | 26 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESE716 | 6 FLUTES HIGH HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 6 | 50° HELIX | DATA P.580

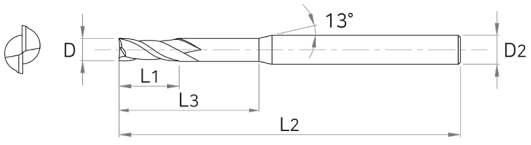
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESE716 060 | 6 | 13 | 50 | 6 |
| ESE716 080 | 8 | 18 | 60 | 8 |
| ESE716 100 | 10 | 22 | 70 | 10 |
| ESE716 120 | 12 | 26 | 75 | 12 |
| ESE716 160 | 16 | 35 | 90 | 16 |
| ESE716 200 | 20 | 44 | 100 | 20 |

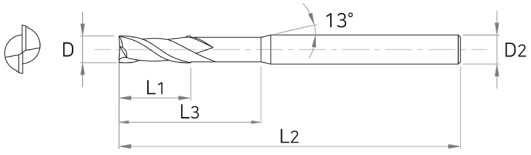
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE712 | 2 FLUTES RIB SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.581

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 001003 | 0.1 | 0.15 | 0.3 | 40 | 4 |
| ESRE712 001005 | 0.1 | 0.15 | 0.5 | 40 | 4 |
| ESRE712 00101 | 0.1 | 0.15 | 1 | 40 | 4 |
| ESRE712 002005 | 0.2 | 0.3 | 0.5 | 40 | 4 |
| ESRE712 002015 | 0.2 | 0.3 | 1.5 | 40 | 4 |
| ESRE712 00201 | 0.2 | 0.3 | 1 | 40 | 4 |
| ESRE712 00202 | 0.2 | 0.3 | 2 | 40 | 4 |
| ESRE712 003015 | 0.3 | 0.5 | 1.5 | 40 | 4 |
| ESRE712 00301 | 0.3 | 0.5 | 1 | 40 | 4 |
| ESRE712 003025 | 0.3 | 0.5 | 2.5 | 40 | 4 |
| ESRE712 00302 | 0.3 | 0.5 | 2 | 40 | 4 |
| ESRE712 00303 | 0.3 | 0.5 | 3 | 40 | 4 |
| ESRE712 00304 | 0.3 | 0.5 | 4 | 40 | 4 |
| ESRE712 00305 | 0.3 | 0.5 | 5 | 40 | 4 |
| ESRE712 004015 | 0.4 | 0.6 | 1.5 | 40 | 4 |
| ESRE712 00401 | 0.4 | 0.6 | 1 | 40 | 4 |
| ESRE712 004025 | 0.4 | 0.6 | 2.5 | 40 | 4 |
| ESRE712 00402 | 0.4 | 0.6 | 2 | 40 | 4 |
| ESRE712 00403 | 0.4 | 0.6 | 3 | 40 | 4 |
| ESRE712 00404 | 0.4 | 0.6 | 4 | 40 | 4 |
| ESRE712 00405 | 0.4 | 0.6 | 5 | 40 | 4 |
| ESRE712 00406 | 0.4 | 0.6 | 6 | 40 | 4 |
| ESRE712 00408 | 0.4 | 0.6 | 8 | 40 | 4 |
| ESRE712 00410 | 0.4 | 0.6 | 10 | 40 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 005015 | 0.5 | 0.7 | 1.5 | 45 | 4 |
| ESRE712 00501 | 0.5 | 0.7 | 1 | 45 | 4 |
| ESRE712 005025 | 0.5 | 0.7 | 2.5 | 45 | 4 |
| ESRE712 00502 | 0.5 | 0.7 | 2 | 45 | 4 |
| ESRE712 00503 | 0.5 | 0.7 | 3 | 45 | 4 |
| ESRE712 00504 | 0.5 | 0.7 | 4 | 45 | 4 |
| ESRE712 00505 | 0.5 | 0.7 | 5 | 45 | 4 |
| ESRE712 00506 | 0.5 | 0.7 | 6 | 45 | 4 |
| ESRE712 00508 | 0.5 | 0.7 | 8 | 45 | 4 |
| ESRE712 00510 | 0.5 | 0.7 | 10 | 45 | 4 |
| ESRE712 00512 | 0.5 | 0.7 | 12 | 45 | 4 |
| ESRE712 00514 | 0.5 | 0.7 | 14 | 45 | 4 |
| ESRE712 00516 | 0.5 | 0.7 | 16 | 45 | 4 |
| ESRE712 00602 | 0.6 | 0.9 | 2 | 45 | 4 |
| ESRE712 00603 | 0.6 | 0.9 | 3 | 45 | 4 |
| ESRE712 00604 | 0.6 | 0.9 | 4 | 45 | 4 |
| ESRE712 00605 | 0.6 | 0.9 | 5 | 45 | 4 |
| ESRE712 00606 | 0.6 | 0.9 | 6 | 45 | 4 |
| ESRE712 00608 | 0.6 | 0.9 | 8 | 45 | 4 |
| ESRE712 00610 | 0.6 | 0.9 | 10 | 45 | 4 |
| ESRE712 00612 | 0.6 | 0.9 | 12 | 45 | 4 |
| ESRE712 00614 | 0.6 | 0.9 | 14 | 45 | 4 |
| ESRE712 00616 | 0.6 | 0.9 | 16 | 45 | 4 |
| ESRE712 00702 | 0.7 | 1.2 | 2 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE712 | 2 FLUTES RIB SQUARE ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 00704 | 0.7 | 1.2 | 4 | 45 | 4 |
| ESRE712 00706 | 0.7 | 1.2 | 6 | 45 | 4 |
| ESRE712 00708 | 0.7 | 1.2 | 8 | 45 | 4 |
| ESRE712 00710 | 0.7 | 1.2 | 10 | 45 | 4 |
| ESRE712 00712 | 0.7 | 1.2 | 12 | 45 | 4 |
| ESRE712 00802 | 0.8 | 1.2 | 2 | 45 | 4 |
| ESRE712 00803 | 0.8 | 1.2 | 3 | 45 | 4 |
| ESRE712 00804 | 0.8 | 1.2 | 4 | 45 | 4 |
| ESRE712 00805 | 0.8 | 1.2 | 5 | 45 | 4 |
| ESRE712 00806 | 0.8 | 1.2 | 6 | 45 | 4 |
| ESRE712 00808 | 0.8 | 1.2 | 8 | 45 | 4 |
| ESRE712 00810 | 0.8 | 1.2 | 10 | 45 | 4 |
| ESRE712 00812 | 0.8 | 1.2 | 12 | 45 | 4 |
| ESRE712 00814 | 0.8 | 1.2 | 14 | 45 | 4 |
| ESRE712 00816 | 0.8 | 1.2 | 16 | 45 | 4 |
| ESRE712 00820 | 0.8 | 1.2 | 20 | 50 | 4 |
| ESRE712 00906 | 0.9 | 1.3 | 6 | 45 | 4 |
| ESRE712 00908 | 0.9 | 1.3 | 8 | 45 | 4 |
| ESRE712 00910 | 0.9 | 1.3 | 10 | 45 | 4 |
| ESRE712 01002 | 1 | 1.5 | 2 | 50 | 4 |
| ESRE712 01003 | 1 | 1.5 | 3 | 50 | 4 |
| ESRE712 01004 | 1 | 1.5 | 4 | 50 | 4 |
| ESRE712 01005 | 1 | 1.5 | 5 | 50 | 4 |
| ESRE712 01006 | 1 | 1.5 | 6 | 50 | 4 |
| ESRE712 01007 | 1 | 1.5 | 7 | 50 | 4 |
| ESRE712 01008 | 1 | 1.5 | 8 | 50 | 4 |
| ESRE712 01010 | 1 | 1.5 | 10 | 50 | 4 |
| ESRE712 01012 | 1 | 1.5 | 12 | 50 | 4 |
| ESRE712 01014 | 1 | 1.5 | 14 | 50 | 4 |
| ESRE712 01016 | 1 | 1.5 | 16 | 50 | 4 |
| ESRE712 01018 | 1 | 1.5 | 18 | 50 | 4 |
| ESRE712 01020 | 1 | 1.5 | 20 | 50 | 4 |
| ESRE712 01022 | 1 | 1.5 | 22 | 60 | 4 |
| ESRE712 01026 | 1 | 1.5 | 26 | 60 | 4 |
| ESRE712 01030 | 1 | 1.5 | 30 | 70 | 4 |
| ESRE712 01040 | 1 | 1.5 | 40 | 80 | 4 |
| ESRE712 01050 | 1 | 1.5 | 50 | 100 | 4 |
| ESRE712 01204 | 1.2 | 1.8 | 4 | 50 | 4 |
| ESRE712 01206 | 1.2 | 1.8 | 6 | 50 | 4 |
| ESRE712 01208 | 1.2 | 1.8 | 8 | 50 | 4 |
| ESRE712 01210 | 1.2 | 1.8 | 10 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 01212 | 1.2 | 1.8 | 12 | 50 | 4 |
| ESRE712 01214 | 1.2 | 1.8 | 14 | 50 | 4 |
| ESRE712 01216 | 1.2 | 1.8 | 16 | 50 | 4 |
| ESRE712 01220 | 1.2 | 1.8 | 20 | 50 | 4 |
| ESRE712 01226 | 1.2 | 1.8 | 26 | 60 | 4 |
| ESRE712 01230 | 1.2 | 1.8 | 30 | 70 | 4 |
| ESRE712 01406 | 1.4 | 2.1 | 6 | 50 | 4 |
| ESRE712 01408 | 1.4 | 2.1 | 8 | 50 | 4 |
| ESRE712 01410 | 1.4 | 2.1 | 10 | 50 | 4 |
| ESRE712 01414 | 1.4 | 2.1 | 14 | 50 | 4 |
| ESRE712 01416 | 1.4 | 2.1 | 16 | 50 | 4 |
| ESRE712 01420 | 1.4 | 2.1 | 20 | 50 | 4 |
| ESRE712 01504 | 1.5 | 2.3 | 4 | 50 | 4 |
| ESRE712 01505 | 1.5 | 2.3 | 5 | 50 | 4 |
| ESRE712 01506 | 1.5 | 2.3 | 6 | 50 | 4 |
| ESRE712 01507 | 1.5 | 2.3 | 7 | 50 | 4 |
| ESRE712 01508 | 1.5 | 2.3 | 8 | 50 | 4 |
| ESRE712 01510 | 1.5 | 2.3 | 10 | 50 | 4 |
| ESRE712 01512 | 1.5 | 2.3 | 12 | 50 | 4 |
| ESRE712 01514 | 1.5 | 2.3 | 14 | 50 | 4 |
| ESRE712 01516 | 1.5 | 2.3 | 16 | 50 | 4 |
| ESRE712 01518 | 1.5 | 2.3 | 18 | 50 | 4 |
| ESRE712 01520 | 1.5 | 2.3 | 20 | 50 | 4 |
| ESRE712 01522 | 1.5 | 2.3 | 22 | 60 | 4 |
| ESRE712 01526 | 1.5 | 2.3 | 26 | 60 | 4 |
| ESRE712 01530 | 1.5 | 2.3 | 30 | 70 | 4 |
| ESRE712 01608 | 1.6 | 2.3 | 8 | 50 | 4 |
| ESRE712 01610 | 1.6 | 2.3 | 10 | 50 | 4 |
| ESRE712 01612 | 1.6 | 2.3 | 12 | 50 | 4 |
| ESRE712 01616 | 1.6 | 2.3 | 16 | 50 | 4 |
| ESRE712 01620 | 1.6 | 2.3 | 20 | 50 | 4 |
| ESRE712 01808 | 1.8 | 2.7 | 8 | 50 | 4 |
| ESRE712 01810 | 1.8 | 2.7 | 10 | 50 | 4 |
| ESRE712 01812 | 1.8 | 2.7 | 12 | 50 | 4 |
| ESRE712 01816 | 1.8 | 2.7 | 16 | 50 | 4 |
| ESRE712 01820 | 1.8 | 2.7 | 20 | 50 | 4 |
| ESRE712 02006 | 2 | 3 | 6 | 50 | 4 |
| ESRE712 02008 | 2 | 3 | 8 | 50 | 4 |
| ESRE712 02010 | 2 | 3 | 10 | 50 | 4 |
| ESRE712 02012 | 2 | 3 | 12 | 50 | 4 |
| ESRE712 02014 | 2 | 3 | 14 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE712 | 2 FLUTES RIB SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 02016 | 2 | 3 | 16 | 50 | 4 |
| ESRE712 02018 | 2 | 3 | 18 | 50 | 4 |
| ESRE712 02020 | 2 | 3 | 20 | 50 | 4 |
| ESRE712 02022 | 2 | 3 | 22 | 60 | 4 |
| ESRE712 02026 | 2 | 3 | 26 | 60 | 4 |
| ESRE712 02030 | 2 | 3 | 30 | 70 | 4 |
| ESRE712 02035 | 2 | 3 | 35 | 70 | 4 |
| ESRE712 02040 | 2 | 3 | 40 | 80 | 4 |
| ESRE712 02045 | 2 | 3 | 45 | 90 | 4 |
| ESRE712 02050 | 2 | 3 | 50 | 100 | 4 |
| ESRE712 02060 | 2 | 3 | 60 | 110 | 4 |
| ESRE712 02508 | 2.5 | 4 | 8 | 50 | 4 |
| ESRE712 02510 | 2.5 | 4 | 10 | 50 | 4 |
| ESRE712 02512 | 2.5 | 4 | 12 | 50 | 4 |
| ESRE712 02514 | 2.5 | 4 | 14 | 50 | 4 |
| ESRE712 02516 | 2.5 | 4 | 16 | 50 | 4 |
| ESRE712 02518 | 2.5 | 4 | 18 | 50 | 4 |
| ESRE712 02520 | 2.5 | 4 | 20 | 50 | 4 |
| ESRE712 02522 | 2.5 | 4 | 22 | 60 | 4 |
| ESRE712 02526 | 2.5 | 4 | 26 | 60 | 4 |
| ESRE712 02530 | 2.5 | 4 | 30 | 70 | 4 |
| ESRE712 02535 | 2.5 | 4 | 35 | 70 | 4 |
| ESRE712 02540 | 2.5 | 4 | 40 | 80 | 4 |
| ESRE712 02545 | 2.5 | 4 | 45 | 90 | 4 |
| ESRE712 02550 | 2.5 | 4 | 50 | 100 | 4 |
| ESRE712 03006 | 3 | 4.5 | 6 | 50 | 6 |
| ESRE712 03008 | 3 | 4.5 | 8 | 50 | 6 |
| ESRE712 03010 | 3 | 4.5 | 10 | 50 | 6 |
| ESRE712 03012 | 3 | 4.5 | 12 | 50 | 6 |
| ESRE712 03014 | 3 | 4.5 | 14 | 60 | 6 |
| ESRE712 03016 | 3 | 4.5 | 16 | 60 | 6 |
| ESRE712 03018 | 3 | 4.5 | 18 | 60 | 6 |
| ESRE712 03020 | 3 | 4.5 | 20 | 60 | 6 |
| ESRE712 03022 | 3 | 4.5 | 22 | 65 | 6 |
| ESRE712 03026 | 3 | 4.5 | 26 | 65 | 6 |
| ESRE712 03030 | 3 | 4.5 | 30 | 70 | 6 |
| ESRE712 03035 | 3 | 4.5 | 35 | 70 | 6 |
| ESRE712 03040 | 3 | 4.5 | 40 | 80 | 6 |
| ESRE712 03045 | 3 | 4.5 | 45 | 90 | 6 |

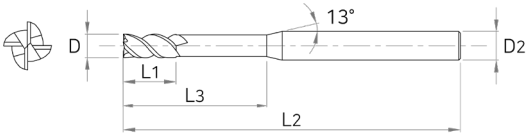
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE712 03050 | 3 | 4.5 | 50 | 100 | 6 |
| ESRE712 03060 | 3 | 4.5 | 60 | 100 | 6 |
| ESRE712 04008 | 4 | 6 | 8 | 50 | 6 |
| ESRE712 04010 | 4 | 6 | 10 | 50 | 6 |
| ESRE712 04012 | 4 | 6 | 12 | 50 | 6 |
| ESRE712 04014 | 4 | 6 | 14 | 60 | 6 |
| ESRE712 04016 | 4 | 6 | 16 | 60 | 6 |
| ESRE712 04018 | 4 | 6 | 18 | 60 | 6 |
| ESRE712 04020 | 4 | 6 | 20 | 60 | 6 |
| ESRE712 04022 | 4 | 6 | 22 | 65 | 6 |
| ESRE712 04026 | 4 | 6 | 26 | 65 | 6 |
| ESRE712 04030 | 4 | 6 | 30 | 70 | 6 |
| ESRE712 04035 | 4 | 6 | 35 | 70 | 6 |
| ESRE712 04040 | 4 | 6 | 40 | 80 | 6 |
| ESRE712 04045 | 4 | 6 | 45 | 90 | 6 |
| ESRE712 04050 | 4 | 6 | 50 | 100 | 6 |
| ESRE712 04060 | 4 | 6 | 60 | 100 | 6 |
| ESRE712 05016 | 5 | 8 | 16 | 60 | 6 |
| ESRE712 05020 | 5 | 8 | 20 | 60 | 6 |
| ESRE712 05026 | 5 | 8 | 26 | 65 | 6 |
| ESRE712 05030 | 5 | 8 | 30 | 70 | 6 |
| ESRE712 05035 | 5 | 8 | 35 | 75 | 6 |
| ESRE712 05040 | 5 | 8 | 40 | 80 | 6 |
| ESRE712 05050 | 5 | 8 | 50 | 90 | 6 |
| ESRE712 05060 | 5 | 8 | 60 | 100 | 6 |
| ESRE712 06015 | 6 | 9 | 15 | 60 | 6 |
| ESRE712 06020 | 6 | 9 | 20 | 60 | 6 |
| ESRE712 06030 | 6 | 9 | 30 | 70 | 6 |
| ESRE712 06032 | 6 | 9 | 32 | 90 | 6 |
| ESRE712 08025 | 8 | 12 | 25 | 70 | 8 |
| ESRE712 08030 | 8 | 12 | 30 | 80 | 8 |
| ESRE712 08042 | 8 | 12 | 42 | 100 | 8 |
| ESRE712 10030 | 10 | 15 | 30 | 75 | 10 |
| ESRE712 10035 | 10 | 15 | 35 | 80 | 10 |
| ESRE712 10045 | 10 | 15 | 45 | 100 | 10 |
| ESRE712 12035 | 12 | 20 | 35 | 80 | 12 |
| ESRE712 12040 | 12 | 20 | 40 | 90 | 12 |
| ESRE712 12050 | 12 | 20 | 50 | 110 | 12 |

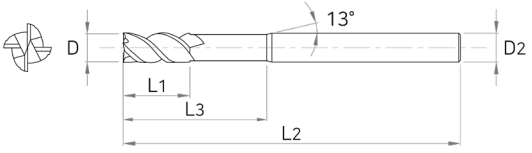
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE714 | 4 FLUTES RIB SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.586

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 00501 | 0.5 | 0.5 | 1 | 40 | 4 |
| ESRE714 00502 | 0.5 | 0.5 | 2 | 40 | 4 |
| ESRE714 00503 | 0.5 | 0.5 | 3 | 45 | 4 |
| ESRE714 00504 | 0.5 | 0.5 | 4 | 45 | 4 |
| ESRE714 00505 | 0.5 | 0.5 | 5 | 45 | 4 |
| ESRE714 00506 | 0.5 | 0.5 | 6 | 45 | 4 |
| ESRE714 00508 | 0.5 | 0.5 | 8 | 45 | 4 |
| ESRE714 00510 | 0.5 | 0.5 | 10 | 50 | 4 |
| ESRE714 00601 | 0.6 | 0.6 | 1 | 45 | 4 |
| ESRE714 00602 | 0.6 | 0.6 | 2 | 45 | 4 |
| ESRE714 00603 | 0.6 | 0.6 | 3 | 45 | 4 |
| ESRE714 00604 | 0.6 | 0.6 | 4 | 45 | 4 |
| ESRE714 00605 | 0.6 | 0.6 | 5 | 45 | 4 |
| ESRE714 00606 | 0.6 | 0.6 | 6 | 45 | 4 |
| ESRE714 00608 | 0.6 | 0.6 | 8 | 45 | 4 |
| ESRE714 00610 | 0.6 | 0.6 | 10 | 50 | 4 |
| ESRE714 00612 | 0.6 | 0.6 | 12 | 50 | 4 |
| ESRE714 00702 | 0.7 | 0.7 | 2 | 45 | 4 |
| ESRE714 00704 | 0.7 | 0.7 | 4 | 45 | 4 |
| ESRE714 00706 | 0.7 | 0.7 | 6 | 45 | 4 |
| ESRE714 00708 | 0.7 | 0.7 | 8 | 45 | 4 |
| ESRE714 00710 | 0.7 | 0.7 | 10 | 50 | 4 |
| ESRE714 00801 | 0.8 | 0.8 | 1 | 40 | 4 |
| ESRE714 00802 | 0.8 | 0.8 | 2 | 40 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 00803 | 0.8 | 0.8 | 3 | 40 | 4 |
| ESRE714 00804 | 0.8 | 0.8 | 4 | 40 | 4 |
| ESRE714 00805 | 0.8 | 0.8 | 5 | 40 | 4 |
| ESRE714 00806 | 0.8 | 0.8 | 6 | 40 | 4 |
| ESRE714 00808 | 0.8 | 0.8 | 8 | 40 | 4 |
| ESRE714 00810 | 0.8 | 0.8 | 10 | 50 | 4 |
| ESRE714 00812 | 0.8 | 0.8 | 12 | 50 | 4 |
| ESRE714 00816 | 0.8 | 0.8 | 16 | 50 | 4 |
| ESRE714 01002 | 1 | 1 | 2 | 45 | 4 |
| ESRE714 01003 | 1 | 1 | 3 | 45 | 4 |
| ESRE714 01004 | 1 | 1 | 4 | 45 | 4 |
| ESRE714 01006 | 1 | 1 | 6 | 45 | 4 |
| ESRE714 01008 | 1 | 1 | 8 | 45 | 4 |
| ESRE714 01010 | 1 | 1 | 10 | 50 | 4 |
| ESRE714 01012 | 1 | 1 | 12 | 50 | 4 |
| ESRE714 01014 | 1 | 1 | 14 | 50 | 4 |
| ESRE714 01016 | 1 | 1 | 16 | 50 | 4 |
| ESRE714 01018 | 1 | 1 | 18 | 60 | 4 |
| ESRE714 01020 | 1 | 1 | 20 | 60 | 4 |
| ESRE714 01204 | 1.2 | 1.2 | 4 | 45 | 4 |
| ESRE714 01206 | 1.2 | 1.2 | 6 | 45 | 4 |
| ESRE714 01208 | 1.2 | 1.2 | 8 | 45 | 4 |
| ESRE714 01210 | 1.2 | 1.2 | 10 | 50 | 4 |
| ESRE714 01212 | 1.2 | 1.2 | 12 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE714 | 4 FLUTES RIB SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 01216 | 1.2 | 1.2 | 16 | 50 | 4 |
| ESRE714 01218 | 1.2 | 1.2 | 18 | 60 | 4 |
| ESRE714 01220 | 1.2 | 1.2 | 20 | 60 | 4 |
| ESRE714 01406 | 1.4 | 1.4 | 6 | 45 | 4 |
| ESRE714 01408 | 1.4 | 1.4 | 8 | 45 | 4 |
| ESRE714 01410 | 1.4 | 1.4 | 10 | 50 | 4 |
| ESRE714 01412 | 1.4 | 1.4 | 12 | 50 | 4 |
| ESRE714 01414 | 1.4 | 1.4 | 14 | 50 | 4 |
| ESRE714 01416 | 1.4 | 1.4 | 16 | 50 | 4 |
| ESRE714 01504 | 1.5 | 1.5 | 4 | 45 | 4 |
| ESRE714 01506 | 1.5 | 1.5 | 6 | 45 | 4 |
| ESRE714 01508 | 1.5 | 1.5 | 8 | 45 | 4 |
| ESRE714 01510 | 1.5 | 1.5 | 10 | 50 | 4 |
| ESRE714 01512 | 1.5 | 1.5 | 12 | 50 | 4 |
| ESRE714 01516 | 1.5 | 1.5 | 16 | 50 | 4 |
| ESRE714 01518 | 1.5 | 1.5 | 18 | 60 | 4 |
| ESRE714 01520 | 1.5 | 1.5 | 20 | 60 | 4 |
| ESRE714 01525 | 1.5 | 1.5 | 25 | 60 | 4 |
| ESRE714 01530 | 1.5 | 1.5 | 30 | 70 | 4 |
| ESRE714 01606 | 1.6 | 1.6 | 6 | 45 | 4 |
| ESRE714 01608 | 1.6 | 1.6 | 8 | 45 | 4 |
| ESRE714 01610 | 1.6 | 1.6 | 10 | 50 | 4 |
| ESRE714 01612 | 1.6 | 1.6 | 12 | 50 | 4 |
| ESRE714 01614 | 1.6 | 1.6 | 14 | 50 | 4 |
| ESRE714 01616 | 1.6 | 1.6 | 16 | 50 | 4 |
| ESRE714 01618 | 1.6 | 1.6 | 18 | 60 | 4 |
| ESRE714 01620 | 1.6 | 1.6 | 20 | 60 | 4 |
| ESRE714 01625 | 1.6 | 1.6 | 25 | 70 | 4 |
| ESRE714 01806 | 1.8 | 1.8 | 6 | 45 | 4 |
| ESRE714 01808 | 1.8 | 1.8 | 8 | 45 | 4 |
| ESRE714 01810 | 1.8 | 1.8 | 10 | 50 | 4 |
| ESRE714 01812 | 1.8 | 1.8 | 12 | 50 | 4 |
| ESRE714 01816 | 1.8 | 1.8 | 16 | 50 | 4 |
| ESRE714 01820 | 1.8 | 1.8 | 20 | 60 | 4 |
| ESRE714 01825 | 1.8 | 1.8 | 25 | 70 | 4 |
| ESRE714 02004 | 2 | 2 | 4 | 45 | 4 |
| ESRE714 02006 | 2 | 2 | 6 | 45 | 4 |
| ESRE714 02008 | 2 | 2 | 8 | 45 | 4 |
| ESRE714 02010 | 2 | 2 | 10 | 50 | 4 |
| ESRE714 02012 | 2 | 2 | 12 | 50 | 4 |
| ESRE714 02014 | 2 | 2 | 14 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 02016 | 2 | 2 | 16 | 50 | 4 |
| ESRE714 02018 | 2 | 2 | 18 | 50 | 4 |
| ESRE714 02020 | 2 | 2 | 20 | 50 | 4 |
| ESRE714 02022 | 2 | 2 | 22 | 60 | 4 |
| ESRE714 02025 | 2 | 2 | 25 | 60 | 4 |
| ESRE714 02030 | 2 | 2 | 30 | 70 | 4 |
| ESRE714 02510 | 2.5 | 2.5 | 10 | 50 | 4 |
| ESRE714 02512 | 2.5 | 2.5 | 12 | 50 | 4 |
| ESRE714 02516 | 2.5 | 2.5 | 16 | 50 | 4 |
| ESRE714 02520 | 2.5 | 2.5 | 20 | 50 | 4 |
| ESRE714 02525 | 2.5 | 2.5 | 25 | 60 | 4 |
| ESRE714 02530 | 2.5 | 2.5 | 30 | 70 | 4 |
| ESRE714 03006 | 3 | 3 | 6 | 45 | 6 |
| ESRE714 03008 | 3 | 3 | 8 | 45 | 6 |
| ESRE714 03010 | 3 | 3 | 10 | 50 | 6 |
| ESRE714 03012 | 3 | 3 | 12 | 50 | 6 |
| ESRE714 03016 | 3 | 3 | 16 | 55 | 6 |
| ESRE714 03020 | 3 | 3 | 20 | 60 | 6 |
| ESRE714 03025 | 3 | 3 | 25 | 65 | 6 |
| ESRE714 03030 | 3 | 3 | 30 | 70 | 6 |
| ESRE714 03035 | 3 | 3 | 35 | 75 | 6 |
| ESRE714 03040 | 3 | 3 | 40 | 80 | 6 |
| ESRE714 03045 | 3 | 3 | 45 | 90 | 6 |
| ESRE714 03050 | 3 | 3 | 50 | 100 | 6 |
| ESRE714 03060 | 3 | 3 | 60 | 110 | 6 |
| ESRE714 03512 | 3.5 | 3.5 | 12 | 50 | 6 |
| ESRE714 03516 | 3.5 | 3.5 | 16 | 55 | 6 |
| ESRE714 03520 | 3.5 | 3.5 | 20 | 60 | 6 |
| ESRE714 03525 | 3.5 | 3.5 | 25 | 65 | 6 |
| ESRE714 03530 | 3.5 | 3.5 | 30 | 70 | 6 |
| ESRE714 03535 | 3.5 | 3.5 | 35 | 75 | 6 |
| ESRE714 03540 | 3.5 | 3.5 | 40 | 80 | 6 |
| ESRE714 04006 | 4 | 4 | 6 | 50 | 6 |
| ESRE714 04008 | 4 | 4 | 8 | 50 | 6 |
| ESRE714 04010 | 4 | 4 | 10 | 50 | 6 |
| ESRE714 04012 | 4 | 4 | 12 | 50 | 6 |
| ESRE714 04016 | 4 | 4 | 16 | 55 | 6 |
| ESRE714 04020 | 4 | 4 | 20 | 60 | 6 |
| ESRE714 04025 | 4 | 4 | 25 | 65 | 6 |
| ESRE714 04030 | 4 | 4 | 30 | 70 | 6 |
| ESRE714 04040 | 4 | 4 | 40 | 80 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRE714 | 4 FLUTES RIB SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 04045 | 4 | 4 | 45 | 90 | 6 |
| ESRE714 04050 | 4 | 4 | 50 | 100 | 6 |
| ESRE714 04060 | 4 | 4 | 60 | 110 | 6 |
| ESRE714 04512 | 4.5 | 4.5 | 12 | 50 | 6 |
| ESRE714 04516 | 4.5 | 4.5 | 16 | 55 | 6 |
| ESRE714 04520 | 4.5 | 4.5 | 20 | 60 | 6 |
| ESRE714 04525 | 4.5 | 4.5 | 25 | 65 | 6 |
| ESRE714 04530 | 4.5 | 4.5 | 30 | 70 | 6 |
| ESRE714 04540 | 4.5 | 4.5 | 40 | 80 | 6 |
| ESRE714 05016 | 5 | 5 | 16 | 60 | 6 |
| ESRE714 05020 | 5 | 5 | 20 | 60 | 6 |
| ESRE714 05025 | 5 | 5 | 25 | 65 | 6 |
| ESRE714 05030 | 5 | 5 | 30 | 70 | 6 |
| ESRE714 05040 | 5 | 5 | 40 | 80 | 6 |
| ESRE714 05050 | 5 | 5 | 50 | 100 | 6 |

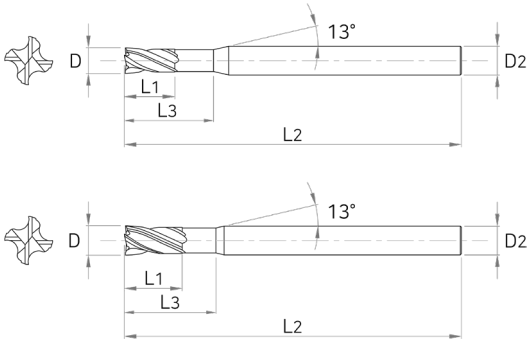
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESRE714 05060 | 5 | 5 | 60 | 110 | 6 |
| ESRE714 06020 | 6 | 6 | 20 | 60 | 6 |
| ESRE714 06030 | 6 | 6 | 30 | 75 | 6 |
| ESRE714 06040 | 6 | 6 | 40 | 80 | 6 |
| ESRE714 06050 | 6 | 6 | 50 | 90 | 6 |
| ESRE714 06060 | 6 | 6 | 60 | 100 | 6 |
| ESRE714 08025 | 8 | 12 | 25 | 65 | 8 |
| ESRE714 08040 | 8 | 12 | 40 | 100 | 8 |
| ESRE714 08050 | 8 | 12 | 50 | 110 | 8 |
| ESRE714 10030 | 10 | 15 | 30 | 70 | 10 |
| ESRE714 10050 | 10 | 15 | 50 | 100 | 10 |
| ESRE714 10060 | 10 | 15 | 60 | 120 | 10 |
| ESRE714 12040 | 12 | 18 | 40 | 80 | 12 |
| ESRE714 12060 | 12 | 18 | 60 | 110 | 12 |
| ESRE714 12070 | 12 | 18 | 70 | 130 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESXE704 | 4 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | DATA P.590

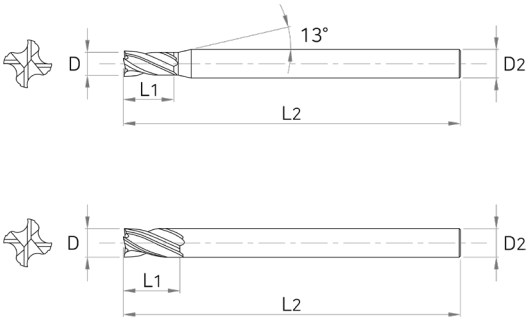
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| ESXE704 010 | 1 | 1.5 | 4 | 45 | 4 |
| ESXE704 020 | 2 | 3 | 6 | 45 | 4 |
| ESXE704 030 | 3 | 4 | 7 | 45 | 6 |
| ESXE704 040 | 4 | 5 | 9 | 45 | 6 |
| ESXE704 060 | 6 | 7 | 14 | 50 | 6 |
| ESXE704 080 | 8 | 9 | 18 | 60 | 8 |
| ESXE704 100 | 10 | 12 | 25 | 75 | 10 |
| ESXE704 120 | 12 | 15 | 30 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESXE714 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | DATA P.590

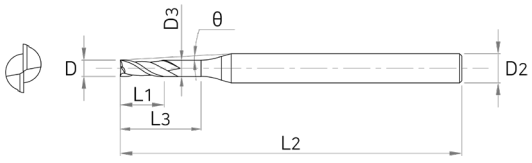
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ESXE714 020 | 2 | 5 | 45 | 4 |
| ESXE714 030 | 3 | 8 | 45 | 6 |
| ESXE714 040 | 4 | 10 | 45 | 6 |
| ESXE714 040S4 | 4 | 10 | 45 | 4 |
| ESXE714 060 | 6 | 16 | 50 | 6 |
| ESXE714 080 | 8 | 20 | 60 | 8 |
| ESXE714 100 | 10 | 25 | 75 | 10 |
| ESXE714 120 | 12 | 35 | 85 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | DATA P.590

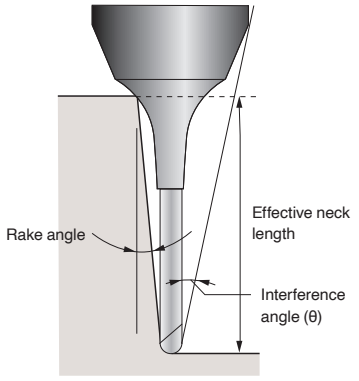
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS20 01-0.3 | 0.1 | 0.15 | 0.3 | 0.08 | 45 | 4 | 11.6 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| ESLNS20 01-0.5 | 0.1 | 0.15 | 0.5 | 0.08 | 45 | 4 | 11.4 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 |
| ESLNS20 01-1 | 0.1 | 0.15 | 1 | 0.08 | 45 | 4 | 10.9 | 1.2 | 1.2 | 1.2 | 1.3 | 1.4 |
| ESLNS20 02-0.5 | 0.2 | 0.3 | 0.5 | 0.17 | 50 | 4 | 11.3 | 1.2 | 1.3 | 1.5 | 1.7 | 2 |
| ESLNS20 02-1 | 0.2 | 0.3 | 1 | 0.17 | 50 | 4 | 10.8 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ESLNS20 02-1.5 | 0.2 | 0.3 | 1.5 | 0.17 | 50 | 4 | 10.3 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ESLNS20 03-1 | 0.3 | 0.45 | 1 | 0.27 | 50 | 4 | 10.8 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ESLNS20 03-1.5 | 0.3 | 0.45 | 1.5 | 0.27 | 50 | 4 | 10.3 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ESLNS20 03-2 | 0.3 | 0.45 | 2 | 0.27 | 50 | 4 | 9.8 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNS20 03-2.5 | 0.3 | 0.45 | 2.5 | 0.27 | 50 | 4 | 9.4 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |
| ESLNS20 03-3 | 0.3 | 0.45 | 3 | 0.27 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ESLNS20 04-1 | 0.4 | 0.6 | 1 | 0.37 | 50 | 4 | 10.7 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ESLNS20 04-1.5 | 0.4 | 0.6 | 1.5 | 0.37 | 50 | 4 | 10.2 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ESLNS20 04-2 | 0.4 | 0.6 | 2 | 0.37 | 50 | 4 | 9.7 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNS20 04-2.5 | 0.4 | 0.6 | 2.5 | 0.37 | 50 | 4 | 9.3 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |
| ESLNS20 04-3 | 0.4 | 0.6 | 3 | 0.37 | 50 | 4 | 8.9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ESLNS20 04-3.5 | 0.4 | 0.6 | 3.5 | 0.37 | 50 | 4 | 8.6 | 4.5 | 4.9 | 5.2 | 5.5 | 6 |
| ESLNS20 04-4 | 0.4 | 0.6 | 4 | 0.37 | 50 | 4 | 8.2 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNS20 04-5 | 0.4 | 0.6 | 5 | 0.37 | 50 | 4 | 7.6 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |
| ESLNS20 04-6 | 0.4 | 0.6 | 6 | 0.37 | 50 | 4 | 7.1 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNS20 05-1 | 0.5 | 0.75 | 1 | 0.47 | 50 | 4 | 10.7 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 |
| ESLNS20 05-1.5 | 0.5 | 0.75 | 1.5 | 0.47 | 50 | 4 | 10.2 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ESLNS20 05-2 | 0.5 | 0.75 | 2 | 0.47 | 50 | 4 | 9.7 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNS20 05-2.5 | 0.5 | 0.75 | 2.5 | 0.47 | 50 | 4 | 9.3 | 3.4 | 3.7 | 4 | 4.3 | 4.7 |

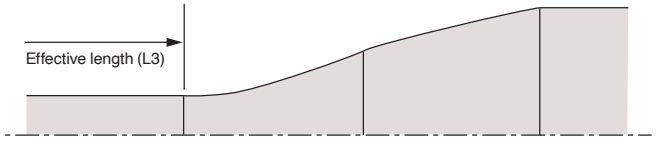
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS2005-3 | 0.5 | 0.75 | 3 | 0.47 | 50 | 4 | 8.9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ESLNS2005-4 | 0.5 | 0.75 | 4 | 0.47 | 50 | 4 | 8.1 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNS2005-5 | 0.5 | 0.75 | 5 | 0.47 | 50 | 4 | 7.5 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |
| ESLNS2005-6 | 0.5 | 0.75 | 6 | 0.47 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNS2005-8 | 0.5 | 0.75 | 8 | 0.47 | 50 | 4 | 6.2 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNS2006-2 | 0.6 | 0.9 | 2 | 0.57 | 50 | 4 | 9.6 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNS2006-4 | 0.6 | 0.9 | 4 | 0.57 | 50 | 4 | 6.9 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNS2006-6 | 0.6 | 0.9 | 6 | 0.57 | 50 | 4 | 6.1 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNS2006-8 | 0.6 | 0.9 | 8 | 0.57 | 50 | 4 | 5.4 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2006-10 | 0.6 | 0.9 | 10 | 0.57 | 50 | 4 | 9.6 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNS2007-2 | 0.7 | 1.05 | 2 | 0.67 | 50 | 4 | 8 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNS2007-4 | 0.7 | 1.05 | 4 | 0.67 | 50 | 4 | 6.9 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNS2007-6 | 0.7 | 1.05 | 6 | 0.67 | 50 | 4 | 6 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNS2007-8 | 0.7 | 1.05 | 8 | 0.67 | 50 | 4 | 5.3 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2007-10 | 0.7 | 1.2 | 10 | 0.77 | 50 | 4 | 7.9 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNS2008-4 | 0.8 | 1.2 | 4 | 0.77 | 50 | 4 | 6.8 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNS2008-6 | 0.8 | 1.2 | 6 | 0.77 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNS2008-8 | 0.8 | 1.2 | 8 | 0.77 | 50 | 4 | 5.2 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2008-10 | 0.8 | 1.2 | 10 | 0.77 | 55 | 4 | 4.7 | 13.6 | 14.2 | 14.8 | 15.2 | 16 |
| ESLNS2008-12 | 0.8 | 1.2 | 12 | 0.77 | 55 | 4 | 6.7 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ESLNS2009-6 | 0.9 | 1.35 | 6 | 0.86 | 50 | 4 | 5.8 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ESLNS2009-8 | 0.9 | 1.35 | 8 | 0.86 | 50 | 4 | 5.1 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2009-10 | 0.9 | 1.35 | 10 | 0.86 | 55 | 4 | 4.6 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |
| ESLNS2009-12 | 0.9 | 1.35 | 12 | 0.86 | 55 | 4 | 9.4 | 2.9 | 3.2 | 3.4 | 3.7 | 4.1 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS2010-2 | 1 | 1.5 | 2 | 0.96 | 50 | 4 | 7.7 | 5.1 | 5.5 | 5.8 | 6.1 | 6.6 |
| ESLNS2010-4 | 1 | 1.5 | 4 | 0.96 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ESLNS2010-6 | 1 | 1.5 | 6 | 0.96 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ESLNS2010-8 | 1 | 1.5 | 8 | 0.96 | 50 | 4 | 5 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2010-10 | 1 | 1.5 | 10 | 0.96 | 55 | 4 | 4.5 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |
| ESLNS2010-12 | 1 | 1.5 | 12 | 0.96 | 55 | 4 | 4.1 | 15.7 | 16.4 | 17 | 17.4 | 18.7 |
| ESLNS2010-14 | 1 | 1.5 | 14 | 0.96 | 60 | 4 | 3.8 | 17.8 | 18.6 | 19.1 | 19.6 | 21.3 |
| ESLNS2010-16 | 1 | 1.5 | 16 | 0.96 | 60 | 4 | 3.2 | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ESLNS2010-20 | 1 | 1.5 | 20 | 0.96 | 60 | 4 | 6.3 | 7.3 | 7.7 | 8.1 | 8.5 | 9.1 |
| ESLNS2012-6 | 1.2 | 1.8 | 6 | 1.15 | 50 | 4 | 5.5 | 9.4 | 9.9 | 10.4 | 10.8 | 11.4 |
| ESLNS2012-8 | 1.2 | 1.8 | 8 | 1.15 | 50 | 4 | 4.8 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS2012-10 | 1.2 | 1.8 | 10 | 1.15 | 50 | 4 | 11.5 | 12.1 | 12.6 | 13 | 13.7 | 16 |
| ESLNS2012-12 | 1.2 | 1.8 | 12 | 1.15 | 55 | 4 | 4.3 | 13.6 | 14.3 | 14.8 | 15.2 | 16 |
| ESLNS2012-16 | 1.2 | 1.8 | 16 | 1.15 | 55 | 4 | 3.6 | 17.8 | 18.6 | 19.2 | 19.7 | 21.3 |
| ESLNS2014-6 | 1.4 | 2.1 | 6 | 1.34 | 50 | 4 | 6.1 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ESLNS2014-8 | 1.4 | 2.1 | 8 | 1.34 | 50 | 4 | 5.3 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS2014-10 | 1.4 | 2.1 | 10 | 1.34 | 50 | 4 | 4.6 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ESLNS2014-12 | 1.4 | 2.1 | 12 | 1.34 | 55 | 4 | 4.1 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ESLNS2014-14 | 1.4 | 2.1 | 14 | 1.34 | 55 | 4 | 3.7 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ESLNS2014-16 | 1.4 | 2.1 | 16 | 1.34 | 55 | 4 | 3.4 | 17.9 | 18.6 | 19.2 | 19.7 | 21.4 |
| ESLNS2015-4 | 1.5 | 2.25 | 4 | 1.44 | 50 | 4 | 7.2 | 5.2 | 5.5 | 5.9 | 6.2 | 6.7 |
| ESLNS2015-6 | 1.5 | 2.25 | 6 | 1.44 | 50 | 4 | 6 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ESLNS2015-8 | 1.5 | 2.25 | 8 | 1.44 | 50 | 4 | 5.1 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS2015-10 | 1.5 | 2.25 | 10 | 1.44 | 50 | 4 | 4.5 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ESLNS2015-12 | 1.5 | 2.25 | 12 | 1.44 | 55 | 4 | 4 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ESLNS2015-14 | 1.5 | 2.25 | 14 | 1.44 | 55 | 4 | 3.6 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ESLNS2015-16 | 1.5 | 2.25 | 16 | 1.44 | 55 | 4 | 3.3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ESLNS2015-18 | 1.5 | 2.25 | 18 | 1.44 | 60 | 4 | 3 | 20 | 20.7 | 21.3 | 21.9 | - |
| ESLNS2015-20 | 1.5 | 2.25 | 20 | 1.44 | 60 | 4 | 2.8 | 22 | 22.9 | 23.5 | 24.1 | - |
| ESLNS2015-25 | 1.5 | 2.25 | 25 | 1.44 | 65 | 4 | 2.4 | 27.3 | 28.1 | 28.8 | 30 | - |
| ESLNS2016-6 | 1.6 | 2.4 | 6 | 1.54 | 50 | 4 | 5.9 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ESLNS2016-8 | 1.6 | 2.4 | 8 | 1.54 | 50 | 4 | 5 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS2016-10 | 1.6 | 2.4 | 10 | 1.54 | 50 | 4 | 4.4 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ESLNS2016-12 | 1.6 | 2.4 | 12 | 1.54 | 55 | 4 | 3.9 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ESLNS2016-14 | 1.6 | 2.4 | 14 | 1.54 | 55 | 4 | 3.5 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ESLNS2016-16 | 1.6 | 2.4 | 16 | 1.54 | 55 | 4 | 3.2 | 17.9 | 18.6 | 19.2 | 19.7 | 21.4 |
| ESLNS2016-18 | 1.6 | 2.4 | 18 | 1.54 | 60 | 4 | 2.9 | 20 | 20.7 | 21.3 | 21.9 | - |
| ESLNS2016-20 | 1.6 | 2.4 | 20 | 1.54 | 60 | 4 | 2.7 | 22 | 22.9 | 23.5 | 24.1 | - |
| ESLNS2018-6 | 1.8 | 2.7 | 6 | 1.73 | 50 | 4 | 5.6 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ESLNS2018-8 | 1.8 | 2.7 | 8 | 1.73 | 50 | 4 | 4.8 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS2018-10 | 1.8 | 2.7 | 10 | 1.73 | 50 | 4 | 4.2 | 11.6 | 12.2 | 12.6 | 13 | 13.8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS2018-12 | 1.8 | 2.7 | 12 | 1.73 | 55 | 4 | 3.7 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ESLNS2018-14 | 1.8 | 2.7 | 14 | 1.73 | 55 | 4 | 3.3 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ESLNS2018-16 | 1.8 | 2.7 | 16 | 1.73 | 55 | 4 | 3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ESLNS2018-18 | 1.8 | 2.7 | 18 | 1.73 | 60 | 4 | 2.7 | 20 | 20.7 | 21.3 | 21.9 | - |
| ESLNS2018-20 | 1.8 | 2.7 | 20 | 1.73 | 60 | 4 | 2.5 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNS2020-4 | 2 | 3 | 4 | 1.92 | 50 | 4 | 6.5 | 5.3 | 5.6 | 5.9 | 6.2 | 6.7 |
| ESLNS2020-6 | 2 | 3 | 6 | 1.92 | 50 | 4 | 5.3 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ESLNS2020-8 | 2 | 3 | 8 | 1.92 | 50 | 4 | 4.5 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS2020-10 | 2 | 3 | 10 | 1.92 | 50 | 4 | 3.9 | 11.6 | 12.2 | 12.7 | 13.1 | 13.8 |
| ESLNS2020-12 | 2 | 3 | 12 | 1.92 | 55 | 4 | 3.4 | 13.7 | 14.3 | 14.9 | 15.3 | 16.1 |
| ESLNS2020-14 | 2 | 3 | 14 | 1.92 | 55 | 4 | 3.1 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ESLNS2020-16 | 2 | 3 | 16 | 1.92 | 55 | 4 | 2.8 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ESLNS2020-18 | 2 | 3 | 18 | 1.92 | 60 | 4 | 2.6 | 20 | 20.8 | 21.4 | 21.9 | - |
| ESLNS2020-20 | 2 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNS2020-25 | 2 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.9 | - | - |
| ESLNS2020-30 | 2 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ESLNS2025-8 | 2.5 | 3.75 | 8 | 2.4 | 50 | 4 | 3.7 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ESLNS2025-10 | 2.5 | 3.75 | 10 | 2.4 | 50 | 4 | 3.1 | 11.7 | 12.2 | 12.7 | 13.1 | 13.8 |
| ESLNS2025-12 | 2.5 | 3.75 | 12 | 2.4 | 55 | 4 | 2.7 | 13.8 | 14.4 | 14.9 | 15.3 | - |
| ESLNS2025-14 | 2.5 | 3.75 | 14 | 2.4 | 55 | 4 | 2.4 | 15.9 | 16.5 | 17.1 | 17.5 | - |
| ESLNS2025-16 | 2.5 | 3.75 | 16 | 2.4 | 55 | 4 | 2.2 | 18 | 18.7 | 19.2 | 19.7 | - |
| ESLNS2025-18 | 2.5 | 3.75 | 18 | 2.4 | 55 | 4 | 2 | 20.1 | 20.8 | 21.4 | - | - |
| ESLNS2025-20 | 2.5 | 3.75 | 20 | 2.4 | 60 | 4 | 1.8 | 22.1 | 22.9 | 23.5 | - | - |
| ESLNS2025-25 | 2.5 | 3.75 | 25 | 2.4 | 60 | 4 | 1.5 | 27.3 | 28.2 | - | - | - |
| ESLNS2025-30 | 2.5 | 3.75 | 30 | 2.4 | 70 | 4 | 1.3 | 32.6 | 33.5 | - | - | - |
| ESLNS2030-8 | 3 | 4.5 | 8 | 2.88 | 55 | 6 | 5.6 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ESLNS2030-10 | 3 | 4.5 | 10 | 2.88 | 55 | 6 | 5 | 11.7 | 12.3 | 12.7 | 13.1 | 13.8 |
| ESLNS2030-12 | 3 | 4.5 | 12 | 2.88 | 60 | 6 | 4.5 | 13.8 | 14.4 | 14.9 | 15.4 | 16.3 |
| ESLNS2030-14 | 3 | 4.5 | 14 | 2.88 | 60 | 6 | 4.1 | 15.9 | 16.6 | 17.1 | 17.6 | 18.9 |
| ESLNS2030-16 | 3 | 4.5 | 16 | 2.88 | 60 | 6 | 3.7 | 18 | 18.7 | 19.3 | 19.8 | 21.6 |
| ESLNS2030-18 | 3 | 4.5 | 18 | 2.88 | 60 | 6 | 3.4 | 20.1 | 20.8 | 21.4 | 21.9 | 24.2 |
| ESLNS2030-20 | 3 | 4.5 | 20 | 2.88 | 65 | 6 | 3.2 | 22.2 | 23 | 23.6 | 24.2 | 26.9 |
| ESLNS2030-25 | 3 | 4.5 | 25 | 2.88 | 70 | 6 | 2.7 | 27.4 | 28.2 | 28.9 | 30.2 | - |
| ESLNS2030-30 | 3 | 4.5 | 30 | 2.88 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ESLNS2030-35 | 3 | 4.5 | 35 | 2.88 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ESLNS2030-40 | 3 | 4.5 | 40 | 2.88 | 90 | 6 | 1.9 | 42.9 | 43.9 | 45.9 | - | - |
| ESLNS2040-12 | 4 | 6 | 12 | 3.85 | 60 | 6 | 3.4 | 13.9 | 14.5 | 15 | 15.4 | 16.3 |
| ESLNS2040-16 | 4 | 6 | 16 | 3.85 | 60 | 6 | 2.8 | 18.1 | 18.8 | 19.3 | 19.8 | - |
| ESLNS2040-20 | 4 | 6 | 20 | 3.85 | 70 | 6 | 2.3 | 22.3 | 23 | 23.6 | 24.3 | - |
| ESLNS2040-25 | 4 | 6 | 25 | 3.85 | 70 | 6 | 2 | 27.4 | 28.3 | 28.9 | - | - |
| ESLNS2040-30 | 4 | 6 | 30 | 3.85 | 80 | 6 | 1.7 | 32.6 | 33.5 | 34.6 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS20 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS2040-35 | 4 | 6 | 35 | 3.85 | 80 | 6 | 1.5 | 37.8 | 38.8 | - | - | - |
| ESLNS2040-40 | 4 | 6 | 40 | 3.85 | 90 | 6 | 1.3 | 42.9 | 44 | - | - | - |
| ESLNS2040-45 | 4 | 6 | 45 | 3.85 | 90 | 6 | 1.2 | 48.1 | 49.4 | - | - | - |
| ESLNS2040-50 | 4 | 6 | 50 | 3.85 | 100 | 6 | 1.1 | 53.2 | 54.8 | - | - | - |
| ESLNS2050-16 | 5 | 7.5 | 16 | 4.85 | 60 | 6 | 1.5 | 18.1 | 18.8 | - | - | - |
| ESLNS2050-20 | 5 | 7.5 | 20 | 4.85 | 60 | 6 | 1.3 | 22.3 | 23 | - | - | - |
| ESLNS2050-25 | 5 | 7.5 | 25 | 4.85 | 70 | 6 | 1.1 | 27.4 | 28.3 | - | - | - |
| ESLNS2050-30 | 5 | 7.5 | 30 | 4.85 | 70 | 6 | 0.9 | 32.6 | - | - | - | - |
| ESLNS2050-35 | 5 | 7.5 | 35 | 4.85 | 80 | 6 | 0.8 | 37.8 | - | - | - | - |
| ESLNS2050-40 | 5 | 7.5 | 40 | 4.85 | 90 | 6 | 0.7 | 42.9 | - | - | - | - |
| ESLNS2050-50 | 5 | 7.5 | 50 | 4.85 | 100 | 6 | 0.6 | 53.2 | - | - | - | - |

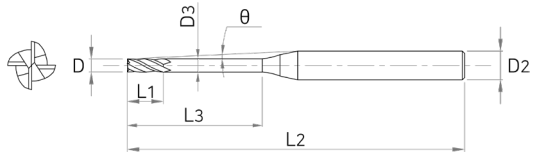


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 4 | 30° HELIX | DATA P.590

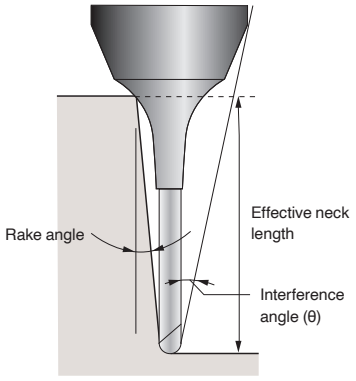
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS4010-4 | 1 | 1.5 | 4 | 0.96 | 50 | 4 | 7.7 | 5.1 | 5.5 | 5.8 | 6.1 | 6.6 |
| ESLNS4010-6 | 1 | 1.5 | 6 | 0.96 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8.1 | 8.4 | 9.1 |
| ESLNS4010-8 | 1 | 1.5 | 8 | 0.96 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.4 | 10.7 | 11.4 |
| ESLNS4010-10 | 1 | 1.5 | 10 | 0.96 | 50 | 4 | 5 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNS4015-4 | 1.5 | 2.25 | 4 | 1.44 | 50 | 4 | 7.2 | 5.2 | 5.5 | 5.9 | 6.2 | 6.7 |
| ESLNS4015-6 | 1.5 | 2.25 | 6 | 1.44 | 50 | 4 | 6 | 7.3 | 7.8 | 8.1 | 8.5 | 9.1 |
| ESLNS4015-8 | 1.5 | 2.25 | 8 | 1.44 | 50 | 4 | 5.1 | 9.4 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS4015-10 | 1.5 | 2.25 | 10 | 1.44 | 50 | 4 | 4.5 | 11.6 | 12.1 | 12.6 | 13 | 13.8 |
| ESLNS4015-12 | 1.5 | 2.25 | 12 | 1.44 | 55 | 4 | 4 | 13.7 | 14.3 | 14.8 | 15.3 | 16.1 |
| ESLNS4015-14 | 1.5 | 2.25 | 14 | 1.44 | 55 | 4 | 3.6 | 15.8 | 16.5 | 17 | 17.5 | 18.7 |
| ESLNS4015-16 | 1.5 | 2.25 | 16 | 1.44 | 55 | 4 | 3.3 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ESLNS4015-18 | 1.5 | 2.25 | 18 | 1.44 | 60 | 4 | 3 | 20 | 20.7 | 21.3 | 21.9 | - |
| ESLNS4015-20 | 1.5 | 2.25 | 20 | 1.44 | 60 | 4 | 2.8 | 22 | 22.9 | 23.5 | 24.1 | - |
| ESLNS4015-25 | 1.5 | 2.25 | 25 | 1.44 | 65 | 4 | 2.4 | 27.3 | 28.1 | 28.8 | 30 | - |
| ESLNS4020-4 | 2 | 3 | 4 | 1.92 | 50 | 4 | 6.5 | 5.3 | 5.6 | 5.9 | 6.2 | 6.7 |
| ESLNS4020-6 | 2 | 3 | 6 | 1.92 | 50 | 4 | 5.3 | 7.4 | 7.8 | 8.2 | 8.5 | 9.1 |
| ESLNS4020-8 | 2 | 3 | 8 | 1.92 | 50 | 4 | 4.5 | 9.5 | 10 | 10.4 | 10.8 | 11.5 |
| ESLNS4020-10 | 2 | 3 | 10 | 1.92 | 50 | 4 | 3.9 | 11.6 | 12.2 | 12.7 | 13.1 | 13.8 |
| ESLNS4020-12 | 2 | 3 | 12 | 1.92 | 55 | 4 | 3.4 | 13.7 | 14.3 | 14.9 | 15.3 | 16.1 |
| ESLNS4020-14 | 2 | 3 | 14 | 1.92 | 55 | 4 | 3.1 | 15.8 | 16.5 | 17 | 17.5 | 18.8 |
| ESLNS4020-16 | 2 | 3 | 16 | 1.92 | 55 | 4 | 2.8 | 17.9 | 18.6 | 19.2 | 19.7 | - |
| ESLNS4020-18 | 2 | 3 | 18 | 1.92 | 60 | 4 | 2.6 | 20 | 20.8 | 21.4 | 21.9 | - |
| ESLNS4020-20 | 2 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNS4020-25 | 2 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.9 | - | - |

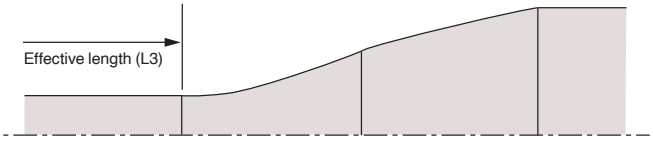
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS4020-30 | 2 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ESLNS4025-8 | 2.5 | 3.75 | 8 | 2.4 | 50 | 4 | 3.7 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ESLNS4025-10 | 2.5 | 3.75 | 10 | 2.4 | 50 | 4 | 3.1 | 11.7 | 12.2 | 12.7 | 13.1 | 13.8 |
| ESLNS4025-12 | 2.5 | 3.75 | 12 | 2.4 | 55 | 4 | 2.7 | 13.8 | 14.4 | 14.9 | 15.3 | - |
| ESLNS4025-14 | 2.5 | 3.75 | 14 | 2.4 | 55 | 4 | 2.4 | 15.9 | 16.5 | 17.1 | 17.5 | - |
| ESLNS4025-16 | 2.5 | 3.75 | 16 | 2.4 | 55 | 4 | 2.2 | 18 | 18.7 | 19.2 | 19.7 | - |
| ESLNS4025-18 | 2.5 | 3.75 | 18 | 2.4 | 60 | 4 | 2 | 20.1 | 20.8 | 21.4 | - | - |
| ESLNS4025-20 | 2.5 | 3.75 | 20 | 2.4 | 60 | 4 | 1.8 | 22.1 | 22.9 | 23.5 | - | - |
| ESLNS4025-25 | 2.5 | 3.75 | 25 | 2.4 | 65 | 4 | 1.5 | 27.3 | 28.2 | - | - | - |
| ESLNS4025-30 | 2.5 | 3.75 | 30 | 2.4 | 70 | 4 | 1.3 | 32.6 | 33.5 | - | - | - |
| ESLNS4030-8 | 3 | 4.5 | 8 | 2.88 | 55 | 6 | 5.6 | 9.6 | 10.1 | 10.5 | 10.9 | 11.5 |
| ESLNS4030-10 | 3 | 4.5 | 10 | 2.88 | 55 | 6 | 5 | 11.7 | 12.3 | 12.7 | 13.1 | 13.8 |
| ESLNS4030-12 | 3 | 4.5 | 12 | 2.88 | 60 | 6 | 4.5 | 13.8 | 14.4 | 14.9 | 15.4 | 16.3 |
| ESLNS4030-14 | 3 | 4.5 | 14 | 2.88 | 60 | 6 | 4.1 | 15.9 | 16.6 | 17.1 | 17.6 | 18.9 |
| ESLNS4030-16 | 3 | 4.5 | 16 | 2.88 | 60 | 6 | 3.7 | 18 | 18.7 | 19.3 | 19.8 | 21.6 |
| ESLNS4030-18 | 3 | 4.5 | 18 | 2.88 | 60 | 6 | 3.4 | 20.1 | 20.8 | 21.4 | 21.9 | 24.2 |
| ESLNS4030-20 | 3 | 4.5 | 20 | 2.88 | 65 | 6 | 3.2 | 22.2 | 23 | 23.6 | 24.2 | 26.9 |
| ESLNS4030-25 | 3 | 4.5 | 25 | 2.88 | 70 | 6 | 2.7 | 27.4 | 28.2 | 28.9 | 30.2 | - |
| ESLNS4030-30 | 3 | 4.5 | 30 | 2.88 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ESLNS4030-35 | 3 | 4.5 | 35 | 2.88 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ESLNS4030-40 | 3 | 4.5 | 40 | 2.88 | 90 | 6 | 1.9 | 42.9 | 43.9 | 45.9 | - | - |
| ESLNS4040-12 | 4 | 6 | 12 | 3.85 | 60 | 6 | 3.4 | 13.9 | 14.5 | 15 | 15.4 | 16.3 |
| ESLNS4040-16 | 4 | 6 | 16 | 3.85 | 60 | 6 | 2.8 | 18.1 | 18.8 | 19.3 | 19.8 | - |
| ESLNS4040-20 | 4 | 6 | 20 | 3.85 | 70 | 6 | 2.3 | 22.3 | 23 | 23.6 | 24.3 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNS40 | 4 FLUTES LONG NECK SQUARE ENDMILL



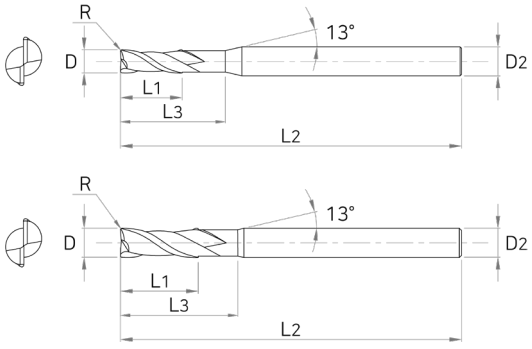
| EDP No | SIZES (mm) | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNS4040-25 | 4 | 6 | 25 | 3.85 | 70 | 6 | 2 | 27.4 | 28.3 | 28.9 | - | - |
| ESLNS4040-30 | 4 | 6 | 30 | 3.85 | 80 | 6 | 1.7 | 32.6 | 33.5 | 34.6 | - | - |
| ESLNS4040-35 | 4 | 6 | 35 | 3.85 | 80 | 6 | 1.5 | 37.8 | 38.8 | - | - | - |
| ESLNS4040-40 | 4 | 6 | 40 | 3.85 | 90 | 6 | 1.3 | 42.9 | 44 | - | - | - |
| ESLNS4040-45 | 4 | 6 | 45 | 3.85 | 90 | 6 | 1.2 | 48.1 | 49.4 | - | - | - |
| ESLNS4040-50 | 4 | 6 | 50 | 3.85 | 100 | 6 | 1.1 | 53.2 | 54.8 | - | - | - |
| ESLNS4050-16 | 5 | 7.5 | 16 | 4.85 | 60 | 6 | 1.5 | 18.1 | 18.8 | - | - | - |
| ESLNS4050-20 | 5 | 7.5 | 20 | 4.85 | 60 | 6 | 1.3 | 22.3 | 23 | - | - | - |
| ESLNS4050-25 | 5 | 7.5 | 25 | 4.85 | 70 | 6 | 1.1 | 27.4 | 28.3 | - | - | - |
| ESLNS4050-30 | 5 | 7.5 | 30 | 4.85 | 70 | 6 | 0.9 | 32.6 | - | - | - | - |
| ESLNS4050-35 | 5 | 7.5 | 35 | 4.85 | 80 | 6 | 0.8 | 37.8 | - | - | - | - |
| ESLNS4050-40 | 5 | 7.5 | 40 | 4.85 | 90 | 6 | 0.7 | 42.9 | - | - | - | - |
| ESLNS4050-50 | 5 | 7.5 | 50 | 4.85 | 100 | 6 | 0.6 | 53.2 | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR702 | 2 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.591

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 01000503S4 | 1 | 0.05 | 1.5 | 3 | 50 | 4 |
| ESR702 01000504S4 | 1 | 0.05 | 1.5 | 4 | 50 | 4 |
| ESR702 01000506S4 | 1 | 0.05 | 1.5 | 6 | 50 | 4 |
| ESR702 01000508S4 | 1 | 0.05 | 1.5 | 8 | 50 | 4 |
| ESR702 01000510S4 | 1 | 0.05 | 1.5 | 10 | 50 | 4 |
| ESR702 0100103S4 | 1 | 0.1 | 1.5 | 3 | 50 | 4 |
| ESR702 0100104 | 1 | 0.1 | 1.5 | 4 | 50 | 6 |
| ESR702 0100104S4 | 1 | 0.1 | 1.5 | 4 | 50 | 4 |
| ESR702 0100106 | 1 | 0.1 | 1.5 | 6 | 50 | 6 |
| ESR702 0100106S4 | 1 | 0.1 | 1.5 | 6 | 50 | 4 |
| ESR702 0100108S4 | 1 | 0.1 | 1.5 | 8 | 50 | 4 |
| ESR702 0100110S4 | 1 | 0.1 | 1.5 | 10 | 50 | 4 |
| ESR702 0100203S4 | 1 | 0.2 | 1.5 | 3 | 50 | 4 |
| ESR702 0100204 | 1 | 0.2 | 1.5 | 4 | 50 | 6 |
| ESR702 0100204S4 | 1 | 0.2 | 1.5 | 4 | 50 | 4 |
| ESR702 0100206 | 1 | 0.2 | 1.5 | 6 | 50 | 6 |
| ESR702 0100206S4 | 1 | 0.2 | 1.5 | 6 | 50 | 4 |
| ESR702 0100208S4 | 1 | 0.2 | 1.5 | 8 | 50 | 4 |
| ESR702 0100210 | 1 | 0.2 | 1.5 | 10 | 50 | 6 |
| ESR702 0100210S4 | 1 | 0.2 | 1.5 | 10 | 50 | 4 |
| ESR702 0100212 | 1 | 0.2 | 1.5 | 12 | 50 | 6 |
| ESR702 0100303S4 | 1 | 0.3 | 1.5 | 3 | 50 | 4 |
| ESR702 0100304S4 | 1 | 0.3 | 1.5 | 4 | 50 | 4 |
| ESR702 0100306S4 | 1 | 0.3 | 1.5 | 6 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 0100308S4 | 1 | 0.3 | 1.5 | 8 | 50 | 4 |
| ESR702 0100310S4 | 1 | 0.3 | 1.5 | 10 | 50 | 4 |
| ESR702 0120208 | 1.2 | 0.2 | 2 | 8 | 50 | 6 |
| ESR702 0120212 | 1.2 | 0.2 | 2 | 12 | 50 | 6 |
| ESR702 01500504S4 | 1.5 | 0.05 | 2.5 | 4 | 50 | 4 |
| ESR702 01500506S4 | 1.5 | 0.05 | 2.5 | 6 | 50 | 4 |
| ESR702 01500508S4 | 1.5 | 0.05 | 2.5 | 8 | 50 | 4 |
| ESR702 01500510S4 | 1.5 | 0.05 | 2.5 | 10 | 50 | 4 |
| ESR702 01500512S4 | 1.5 | 0.05 | 2.5 | 12 | 50 | 4 |
| ESR702 0150104S4 | 1.5 | 0.1 | 2.5 | 4 | 50 | 4 |
| ESR702 0150106S4 | 1.5 | 0.1 | 2.5 | 6 | 50 | 4 |
| ESR702 0150108S4 | 1.5 | 0.1 | 2.5 | 8 | 50 | 4 |
| ESR702 0150110S4 | 1.5 | 0.1 | 2.5 | 10 | 50 | 4 |
| ESR702 0150112S4 | 1.5 | 0.1 | 2.5 | 12 | 50 | 4 |
| ESR702 0150204 | 1.5 | 0.2 | 2.5 | 4 | 50 | 6 |
| ESR702 0150204S4 | 1.5 | 0.2 | 2.5 | 4 | 50 | 4 |
| ESR702 0150206 | 1.5 | 0.2 | 2.5 | 6 | 50 | 6 |
| ESR702 0150206S4 | 1.5 | 0.2 | 2.5 | 6 | 50 | 4 |
| ESR702 0150208 | 1.5 | 0.2 | 2.5 | 8 | 50 | 6 |
| ESR702 0150208S4 | 1.5 | 0.2 | 2.5 | 8 | 50 | 4 |
| ESR702 0150210 | 1.5 | 0.2 | 2.5 | 10 | 50 | 6 |
| ESR702 0150210S4 | 1.5 | 0.2 | 2.5 | 10 | 50 | 4 |
| ESR702 0150212S4 | 1.5 | 0.2 | 2.5 | 12 | 50 | 4 |
| ESR702 0150215 | 1.5 | 0.2 | 2.5 | 15 | 50 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR702 | 2 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 0150304S4 | 1.5 | 0.3 | 2.5 | 4 | 50 | 4 |
| ESR702 0150306S4 | 1.5 | 0.3 | 2.5 | 6 | 50 | 4 |
| ESR702 0150308S4 | 1.5 | 0.3 | 2.5 | 8 | 50 | 4 |
| ESR702 0150310S4 | 1.5 | 0.3 | 2.5 | 10 | 50 | 4 |
| ESR702 0150312S4 | 1.5 | 0.3 | 2.5 | 12 | 50 | 4 |
| ESR702 0150504S4 | 1.5 | 0.5 | 2.5 | 4 | 50 | 4 |
| ESR702 0150506S4 | 1.5 | 0.5 | 2.5 | 6 | 50 | 4 |
| ESR702 0150508S4 | 1.5 | 0.5 | 2.5 | 8 | 50 | 4 |
| ESR702 0150510S4 | 1.5 | 0.5 | 2.5 | 10 | 50 | 4 |
| ESR702 0150512S4 | 1.5 | 0.5 | 2.5 | 12 | 50 | 4 |
| ESR702 0200106S4 | 2 | 0.1 | 3 | 6 | 50 | 4 |
| ESR702 0200108 | 2 | 0.1 | 3 | 8 | 50 | 6 |
| ESR702 0200108S4 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| ESR702 0200110S4 | 2 | 0.1 | 3 | 10 | 50 | 4 |
| ESR702 0200112 | 2 | 0.1 | 3 | 12 | 50 | 6 |
| ESR702 0200112S4 | 2 | 0.1 | 3 | 12 | 50 | 4 |
| ESR702 0200116S4 | 2 | 0.1 | 3 | 16 | 50 | 4 |
| ESR702 0200120S4 | 2 | 0.1 | 3 | 20 | 50 | 4 |
| ESR702 0200206 | 2 | 0.2 | 3 | 6 | 50 | 6 |
| ESR702 0200206S4 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| ESR702 0200208S4 | 2 | 0.2 | 3 | 8 | 50 | 4 |
| ESR702 0200209 | 2 | 0.2 | 3 | 9 | 50 | 6 |
| ESR702 0200210S4 | 2 | 0.2 | 3 | 10 | 50 | 4 |
| ESR702 0200212S4 | 2 | 0.2 | 3 | 12 | 50 | 4 |
| ESR702 0200216 | 2 | 0.2 | 3 | 16 | 50 | 6 |
| ESR702 0200216S4 | 2 | 0.2 | 3 | 16 | 50 | 4 |
| ESR702 0200220S4 | 2 | 0.2 | 3 | 20 | 50 | 4 |
| ESR702 0200306 | 2 | 0.3 | 3 | 6 | 50 | 6 |
| ESR702 0200306S4 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| ESR702 0200308S4 | 2 | 0.3 | 3 | 8 | 50 | 4 |
| ESR702 0200310S4 | 2 | 0.3 | 3 | 10 | 50 | 4 |
| ESR702 0200312S4 | 2 | 0.3 | 3 | 12 | 50 | 4 |
| ESR702 0200316S4 | 2 | 0.3 | 3 | 16 | 50 | 4 |
| ESR702 0200320S4 | 2 | 0.3 | 3 | 20 | 50 | 4 |
| ESR702 0200506 | 2 | 0.5 | 3 | 6 | 50 | 6 |
| ESR702 0200506S4 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| ESR702 0200508S4 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| ESR702 0200509 | 2 | 0.5 | 3 | 9 | 50 | 6 |
| ESR702 0200510S4 | 2 | 0.5 | 3 | 10 | 50 | 4 |
| ESR702 0200512 | 2 | 0.5 | 3 | 12 | 50 | 6 |
| ESR702 0200512S4 | 2 | 0.5 | 3 | 12 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 0200516 | 2 | 0.5 | 3 | 16 | 50 | 6 |
| ESR702 0200516S4 | 2 | 0.5 | 3 | 16 | 50 | 4 |
| ESR702 0200520S4 | 2 | 0.5 | 3 | 20 | 50 | 4 |
| ESR702 0250208S4 | 2.5 | 0.2 | 3.5 | 8 | 50 | 4 |
| ESR702 0250210S4 | 2.5 | 0.2 | 3.5 | 10 | 50 | 4 |
| ESR702 0250212S4 | 2.5 | 0.2 | 3.5 | 12 | 50 | 4 |
| ESR702 0250216S4 | 2.5 | 0.2 | 3.5 | 16 | 50 | 4 |
| ESR702 0250308S4 | 2.5 | 0.3 | 3.5 | 8 | 50 | 4 |
| ESR702 0250310S4 | 2.5 | 0.3 | 3.5 | 10 | 50 | 4 |
| ESR702 0250312S4 | 2.5 | 0.3 | 3.5 | 12 | 50 | 4 |
| ESR702 0250316S4 | 2.5 | 0.3 | 3.5 | 16 | 50 | 4 |
| ESR702 0250508S4 | 2.5 | 0.5 | 3.5 | 8 | 50 | 4 |
| ESR702 0250510S4 | 2.5 | 0.5 | 3.5 | 10 | 50 | 4 |
| ESR702 0250512S4 | 2.5 | 0.5 | 3.5 | 12 | 50 | 4 |
| ESR702 0250516S4 | 2.5 | 0.5 | 3.5 | 16 | 50 | 4 |
| ESR702 0300108 | 3 | 0.1 | 4.5 | 8 | 55 | 6 |
| ESR702 0300110 | 3 | 0.1 | 4.5 | 10 | 55 | 6 |
| ESR702 0300112 | 3 | 0.1 | 4.5 | 12 | 55 | 6 |
| ESR702 0300116 | 3 | 0.1 | 4.5 | 16 | 55 | 6 |
| ESR702 0300120 | 3 | 0.1 | 4.5 | 20 | 60 | 6 |
| ESR702 0300208 | 3 | 0.2 | 4.5 | 8 | 55 | 6 |
| ESR702 0300209 | 3 | 0.2 | 4.5 | 9 | 55 | 6 |
| ESR702 0300210 | 3 | 0.2 | 4.5 | 10 | 55 | 6 |
| ESR702 0300212 | 3 | 0.2 | 4.5 | 12 | 55 | 6 |
| ESR702 0300216 | 3 | 0.2 | 4.5 | 16 | 55 | 6 |
| ESR702 0300220 | 3 | 0.2 | 4.5 | 20 | 60 | 6 |
| ESR702 0300308 | 3 | 0.3 | 4.5 | 8 | 55 | 6 |
| ESR702 0300309 | 3 | 0.3 | 4.5 | 9 | 55 | 6 |
| ESR702 0300310 | 3 | 0.3 | 4.5 | 10 | 55 | 6 |
| ESR702 0300312 | 3 | 0.3 | 4.5 | 12 | 55 | 6 |
| ESR702 0300314 | 3 | 0.3 | 4.5 | 14 | 55 | 6 |
| ESR702 0300316 | 3 | 0.3 | 4.5 | 16 | 55 | 6 |
| ESR702 0300320 | 3 | 0.3 | 4.5 | 20 | 60 | 6 |
| ESR702 0300508 | 3 | 0.5 | 4.5 | 8 | 55 | 6 |
| ESR702 0300509 | 3 | 0.5 | 4.5 | 9 | 55 | 6 |
| ESR702 0300510 | 3 | 0.5 | 4.5 | 10 | 55 | 6 |
| ESR702 0300512 | 3 | 0.5 | 4.5 | 12 | 55 | 6 |
| ESR702 0300516 | 3 | 0.5 | 4.5 | 16 | 55 | 6 |
| ESR702 0300520 | 3 | 0.5 | 4.5 | 20 | 60 | 6 |
| ESR702 0301008 | 3 | 1 | 4.5 | 8 | 55 | 6 |
| ESR702 0301010 | 3 | 1 | 4.5 | 10 | 55 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR702 | 2 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 0301012 | 3 | 1 | 4.5 | 12 | 55 | 6 |
| ESR702 0301016 | 3 | 1 | 4.5 | 16 | 55 | 6 |
| ESR702 0301020 | 3 | 1 | 4.5 | 20 | 60 | 6 |
| ESR702 0301025 | 3 | 1 | 4.5 | 25 | 60 | 6 |
| ESR702 0400110 | 4 | 0.1 | 6 | 10 | 55 | 6 |
| ESR702 0400112 | 4 | 0.1 | 6 | 12 | 55 | 6 |
| ESR702 0400116 | 4 | 0.1 | 6 | 16 | 55 | 6 |
| ESR702 0400120 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| ESR702 0400125 | 4 | 0.1 | 6 | 25 | 60 | 6 |
| ESR702 0400210 | 4 | 0.2 | 6 | 10 | 55 | 6 |
| ESR702 0400212 | 4 | 0.2 | 6 | 12 | 55 | 6 |
| ESR702 0400216 | 4 | 0.2 | 6 | 16 | 55 | 6 |
| ESR702 0400220 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| ESR702 0400225 | 4 | 0.2 | 6 | 25 | 60 | 6 |
| ESR702 0400310 | 4 | 0.3 | 6 | 10 | 55 | 6 |
| ESR702 0400312 | 4 | 0.3 | 6 | 12 | 55 | 6 |
| ESR702 0400316 | 4 | 0.3 | 6 | 16 | 55 | 6 |
| ESR702 0400320 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| ESR702 0400325 | 4 | 0.3 | 6 | 25 | 60 | 6 |
| ESR702 0400510 | 4 | 0.5 | 6 | 10 | 55 | 6 |
| ESR702 0400512 | 4 | 0.5 | 6 | 12 | 55 | 6 |
| ESR702 0400516 | 4 | 0.5 | 6 | 16 | 55 | 6 |
| ESR702 0400520 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| ESR702 0400525 | 4 | 0.5 | 6 | 25 | 60 | 6 |
| ESR702 0400530 | 4 | 0.5 | 6 | 30 | 70 | 6 |
| ESR702 0401010 | 4 | 1 | 6 | 10 | 55 | 6 |
| ESR702 0401012 | 4 | 1 | 6 | 12 | 55 | 6 |

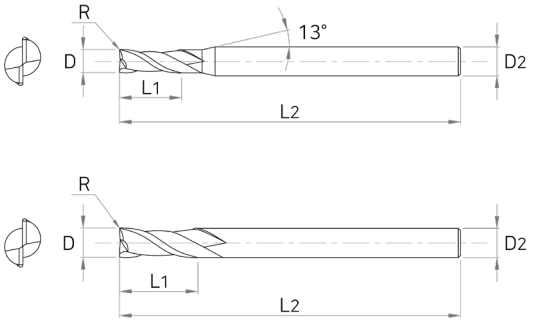
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR702 0401016 | 4 | 1 | 6 | 16 | 55 | 6 |
| ESR702 0401020 | 4 | 1 | 6 | 20 | 60 | 6 |
| ESR702 0401025 | 4 | 1 | 6 | 25 | 60 | 6 |
| ESR702 0401030 | 4 | 1 | 6 | 30 | 70 | 6 |
| ESR702 0500318 | 5 | 0.3 | 8 | 18 | 60 | 6 |
| ESR702 0600220 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| ESR702 0600320 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| ESR702 0600520 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| ESR702 0601020 | 6 | 1 | 9 | 20 | 60 | 6 |
| ESR702 0601520 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| ESR702 0602020 | 6 | 2 | 9 | 20 | 60 | 6 |
| ESR702 0800225 | 8 | 0.2 | 12 | 25 | 60 | 8 |
| ESR702 0800325 | 8 | 0.3 | 12 | 25 | 60 | 8 |
| ESR702 0800525 | 8 | 0.5 | 12 | 25 | 60 | 8 |
| ESR702 0801025 | 8 | 1 | 12 | 25 | 60 | 8 |
| ESR702 0801525 | 8 | 1.5 | 12 | 25 | 60 | 8 |
| ESR702 1000232 | 10 | 0.2 | 15 | 32 | 70 | 10 |
| ESR702 1000332 | 10 | 0.3 | 15 | 32 | 70 | 10 |
| ESR702 1000532 | 10 | 0.5 | 15 | 32 | 70 | 10 |
| ESR702 1001032 | 10 | 1 | 15 | 32 | 70 | 10 |
| ESR702 1001532 | 10 | 1.5 | 15 | 32 | 70 | 10 |
| ESR702 1002032 | 10 | 2 | 15 | 32 | 70 | 10 |
| ESR702 1200338 | 12 | 0.3 | 18 | 38 | 80 | 12 |
| ESR702 1200538 | 12 | 0.5 | 18 | 38 | 80 | 12 |
| ESR702 1201038 | 12 | 1 | 18 | 38 | 80 | 12 |
| ESR702 1201538 | 12 | 1.5 | 18 | 38 | 80 | 12 |
| ESR702 1202038 | 12 | 2 | 18 | 38 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR732 | 2 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.591

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR732 01001 | 1 | 0.1 | 2 | 50 | 6 |
| ESR732 01002 | 1 | 0.2 | 2 | 50 | 6 |
| ESR732 01003 | 1 | 0.3 | 2 | 50 | 6 |
| ESR732 01501 | 1.5 | 0.1 | 3 | 50 | 6 |
| ESR732 01502 | 1.5 | 0.2 | 3 | 50 | 6 |
| ESR732 01503 | 1.5 | 0.3 | 3 | 50 | 6 |
| ESR732 01505 | 1.5 | 0.5 | 3 | 50 | 6 |
| ESR732 02001 | 2 | 0.1 | 5 | 50 | 6 |
| ESR732 02002 | 2 | 0.2 | 5 | 50 | 6 |
| ESR732 02003 | 2 | 0.3 | 5 | 50 | 6 |
| ESR732 02005 | 2 | 0.5 | 5 | 50 | 6 |
| ESR732 02501 | 2.5 | 0.1 | 7 | 60 | 6 |
| ESR732 02502 | 2.5 | 0.2 | 7 | 60 | 6 |
| ESR732 02503 | 2.5 | 0.3 | 7 | 60 | 6 |
| ESR732 02505 | 2.5 | 0.5 | 7 | 60 | 6 |
| ESR732 03001 | 3 | 0.1 | 8 | 60 | 6 |
| ESR732 03002 | 3 | 0.2 | 8 | 60 | 6 |
| ESR732 03003 | 3 | 0.3 | 8 | 60 | 6 |
| ESR732 03005 | 3 | 0.5 | 8 | 60 | 6 |
| ESR732 04001 | 4 | 0.1 | 10 | 70 | 6 |
| ESR732 04002 | 4 | 0.2 | 10 | 70 | 6 |
| ESR732 04003 | 4 | 0.3 | 10 | 70 | 6 |
| ESR732 04005 | 4 | 0.5 | 10 | 70 | 6 |
| ESR732 04010 | 4 | 1 | 10 | 70 | 6 |
| ESR732 05001 | 5 | 0.1 | 13 | 80 | 6 |

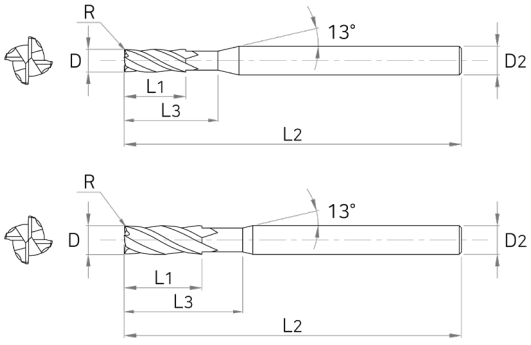
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR732 05002 | 5 | 0.2 | 13 | 80 | 6 |
| ESR732 05003 | 5 | 0.3 | 13 | 80 | 6 |
| ESR732 05005 | 5 | 0.5 | 13 | 80 | 6 |
| ESR732 05010 | 5 | 1 | 13 | 80 | 6 |
| ESR732 06001 | 6 | 0.1 | 15 | 90 | 6 |
| ESR732 06002 | 6 | 0.2 | 15 | 90 | 6 |
| ESR732 06003 | 6 | 0.3 | 15 | 90 | 6 |
| ESR732 06005 | 6 | 0.5 | 15 | 90 | 6 |
| ESR732 06010 | 6 | 1 | 15 | 90 | 6 |
| ESR732 08001 | 8 | 0.1 | 20 | 100 | 8 |
| ESR732 08002 | 8 | 0.2 | 20 | 100 | 8 |
| ESR732 08003 | 8 | 0.3 | 20 | 100 | 8 |
| ESR732 08005 | 8 | 0.5 | 20 | 100 | 8 |
| ESR732 08010 | 8 | 1 | 20 | 100 | 8 |
| ESR732 08020 | 8 | 2 | 20 | 100 | 8 |
| ESR732 10002 | 10 | 0.2 | 25 | 100 | 10 |
| ESR732 10003 | 10 | 0.3 | 25 | 100 | 10 |
| ESR732 10005 | 10 | 0.5 | 25 | 100 | 10 |
| ESR732 10010 | 10 | 1 | 25 | 100 | 10 |
| ESR732 10020 | 10 | 2 | 25 | 100 | 10 |
| ESR732 12002 | 12 | 0.2 | 30 | 110 | 12 |
| ESR732 12003 | 12 | 0.3 | 30 | 110 | 12 |
| ESR732 12005 | 12 | 0.5 | 30 | 110 | 12 |
| ESR732 12010 | 12 | 1 | 30 | 110 | 12 |
| ESR732 12020 | 12 | 2 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR704 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR704 0100103S4 | 1 | 0.1 | 2 | 3 | 50 | 4 |
| ESR704 0100104S4 | 1 | 0.1 | 2 | 4 | 50 | 4 |
| ESR704 0100106S4 | 1 | 0.1 | 2 | 6 | 50 | 4 |
| ESR704 0100203S4 | 1 | 0.2 | 2 | 3 | 50 | 4 |
| ESR704 0100204S4 | 1 | 0.2 | 2 | 4 | 50 | 4 |
| ESR704 0100206S4 | 1 | 0.2 | 2 | 6 | 50 | 4 |
| ESR704 0100303S4 | 1 | 0.3 | 2 | 3 | 50 | 4 |
| ESR704 0100304S4 | 1 | 0.3 | 2 | 4 | 50 | 4 |
| ESR704 0100306S4 | 1 | 0.3 | 2 | 6 | 50 | 4 |
| ESR704 0150104S4 | 1.5 | 0.1 | 2.5 | 4 | 50 | 4 |
| ESR704 0150106S4 | 1.5 | 0.1 | 2.5 | 6 | 50 | 4 |
| ESR704 0150204S4 | 1.5 | 0.2 | 2.5 | 4 | 50 | 4 |
| ESR704 0150206S4 | 1.5 | 0.2 | 2.5 | 6 | 50 | 4 |
| ESR704 0150304S4 | 1.5 | 0.3 | 2.5 | 4 | 50 | 4 |
| ESR704 0150306S4 | 1.5 | 0.3 | 2.5 | 6 | 50 | 4 |
| ESR704 0200106S4 | 2 | 0.1 | 3 | 6 | 50 | 4 |
| ESR704 0200108S4 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| ESR704 0200206S4 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| ESR704 0200208 | 2 | 0.2 | 3 | 8 | 50 | 6 |
| ESR704 0200208S4 | 2 | 0.2 | 3 | 8 | 50 | 4 |
| ESR704 0200210 | 2 | 0.2 | 3 | 10 | 50 | 6 |
| ESR704 0200212 | 2 | 0.2 | 3 | 12 | 50 | 6 |
| ESR704 0200306S4 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| ESR704 0200308S4 | 2 | 0.3 | 3 | 8 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR704 0200506S4 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| ESR704 0200508S4 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| ESR704 0250106S4 | 2.5 | 0.1 | 3.5 | 6 | 50 | 4 |
| ESR704 0300108 | 3 | 0.1 | 4 | 8 | 55 | 6 |
| ESR704 0300110 | 3 | 0.1 | 4 | 10 | 55 | 6 |
| ESR704 0300112 | 3 | 0.1 | 4 | 12 | 55 | 6 |
| ESR704 0300116 | 3 | 0.1 | 4 | 16 | 55 | 6 |
| ESR704 0300120 | 3 | 0.1 | 4 | 20 | 60 | 6 |
| ESR704 0300208 | 3 | 0.2 | 4 | 8 | 55 | 6 |
| ESR704 0300210 | 3 | 0.2 | 4 | 10 | 55 | 6 |
| ESR704 0300212 | 3 | 0.2 | 4 | 12 | 55 | 6 |
| ESR704 0300216 | 3 | 0.2 | 4 | 16 | 55 | 6 |
| ESR704 0300220 | 3 | 0.2 | 4 | 20 | 60 | 6 |
| ESR704 0300308 | 3 | 0.3 | 4 | 8 | 55 | 6 |
| ESR704 0300309 | 3 | 0.3 | 4 | 9 | 55 | 6 |
| ESR704 0300310 | 3 | 0.3 | 4 | 10 | 55 | 6 |
| ESR704 0300312 | 3 | 0.3 | 4 | 12 | 55 | 6 |
| ESR704 0300316 | 3 | 0.3 | 4 | 16 | 55 | 6 |
| ESR704 0300320 | 3 | 0.3 | 4 | 20 | 60 | 6 |
| ESR704 0300508 | 3 | 0.5 | 4 | 8 | 55 | 6 |
| ESR704 0300509 | 3 | 0.5 | 4 | 9 | 55 | 6 |
| ESR704 0300510 | 3 | 0.5 | 4 | 10 | 55 | 6 |
| ESR704 0300512 | 3 | 0.5 | 4 | 12 | 55 | 6 |
| ESR704 0300516 | 3 | 0.5 | 4 | 16 | 55 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR704 | 4 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR704 0300520 | 3 | 0.5 | 4 | 20 | 60 | 6 |
| ESR704 0301008 | 3 | 1 | 4 | 8 | 55 | 6 |
| ESR704 0301010 | 3 | 1 | 4 | 10 | 55 | 6 |
| ESR704 0301012 | 3 | 1 | 4 | 12 | 55 | 6 |
| ESR704 0301016 | 3 | 1 | 4 | 16 | 55 | 6 |
| ESR704 0301020 | 3 | 1 | 4 | 20 | 60 | 6 |
| ESR704 0400110 | 4 | 0.1 | 6 | 10 | 55 | 6 |
| ESR704 0400112 | 4 | 0.1 | 6 | 12 | 55 | 6 |
| ESR704 0400116 | 4 | 0.1 | 6 | 16 | 55 | 6 |
| ESR704 0400120 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| ESR704 0400125 | 4 | 0.1 | 6 | 25 | 60 | 6 |
| ESR704 0400210 | 4 | 0.2 | 6 | 10 | 55 | 6 |
| ESR704 0400212 | 4 | 0.2 | 6 | 12 | 55 | 6 |
| ESR704 0400216 | 4 | 0.2 | 6 | 16 | 55 | 6 |
| ESR704 0400220 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| ESR704 0400225 | 4 | 0.2 | 6 | 25 | 60 | 6 |
| ESR704 0400310 | 4 | 0.3 | 6 | 10 | 55 | 6 |
| ESR704 0400312 | 4 | 0.3 | 6 | 12 | 55 | 6 |
| ESR704 0400316 | 4 | 0.3 | 6 | 16 | 55 | 6 |
| ESR704 0400320 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| ESR704 0400325 | 4 | 0.3 | 6 | 25 | 60 | 6 |
| ESR704 0400510 | 4 | 0.5 | 6 | 10 | 55 | 6 |
| ESR704 0400512 | 4 | 0.5 | 6 | 12 | 55 | 6 |
| ESR704 0400516 | 4 | 0.5 | 6 | 16 | 55 | 6 |
| ESR704 0400520 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| ESR704 0400525 | 4 | 0.5 | 6 | 25 | 60 | 6 |
| ESR704 0401010 | 4 | 1 | 6 | 10 | 55 | 6 |

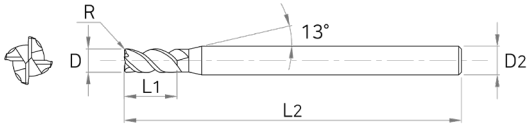
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR704 0401012 | 4 | 1 | 6 | 12 | 55 | 6 |
| ESR704 0401016 | 4 | 1 | 6 | 16 | 55 | 6 |
| ESR704 0401020 | 4 | 1 | 6 | 20 | 60 | 6 |
| ESR704 0401025 | 4 | 1 | 6 | 25 | 60 | 6 |
| ESR704 0600220 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| ESR704 0600320 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| ESR704 0600520 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| ESR704 0601020 | 6 | 1 | 9 | 20 | 60 | 6 |
| ESR704 0601520 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| ESR704 0602020 | 6 | 2 | 9 | 20 | 60 | 6 |
| ESR704 0800225 | 8 | 0.2 | 12 | 25 | 60 | 8 |
| ESR704 0800325 | 8 | 0.3 | 12 | 25 | 60 | 8 |
| ESR704 0800525 | 8 | 0.5 | 12 | 25 | 60 | 8 |
| ESR704 0801025 | 8 | 1 | 12 | 25 | 60 | 8 |
| ESR704 0801525 | 8 | 1.5 | 12 | 25 | 60 | 8 |
| ESR704 0802025 | 8 | 2 | 12 | 25 | 60 | 8 |
| ESR704 1000232 | 10 | 0.2 | 15 | 32 | 70 | 10 |
| ESR704 1000332 | 10 | 0.3 | 15 | 32 | 70 | 10 |
| ESR704 1000532 | 10 | 0.5 | 15 | 32 | 70 | 10 |
| ESR704 1001032 | 10 | 1 | 15 | 32 | 70 | 10 |
| ESR704 1001532 | 10 | 1.5 | 15 | 32 | 70 | 10 |
| ESR704 1002032 | 10 | 2 | 15 | 32 | 70 | 10 |
| ESR704 1200338 | 12 | 0.3 | 18 | 38 | 80 | 12 |
| ESR704 1200538 | 12 | 0.5 | 18 | 38 | 80 | 12 |
| ESR704 1201038 | 12 | 1 | 18 | 38 | 80 | 12 |
| ESR704 1201538 | 12 | 1.5 | 18 | 38 | 80 | 12 |
| ESR704 1202038 | 12 | 2 | 18 | 38 | 80 | 12 |

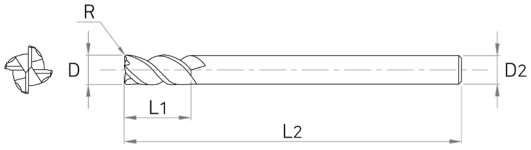
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR714 | 4 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR714 0303 | 3 | 0.3 | 8 | 50 | 6 |
| ESR714 0305S4 | 3 | 0.5 | 8 | 50 | 4 |
| ESR714 0305 | 3 | 0.5 | 8 | 50 | 6 |
| ESR714 0403 | 4 | 0.3 | 11 | 50 | 6 |
| ESR714 0405 | 4 | 0.5 | 11 | 50 | 6 |
| ESR714 0405S4 | 4 | 0.5 | 11 | 50 | 4 |
| ESR714 0410 | 4 | 1 | 11 | 50 | 6 |
| ESR714 0603 | 6 | 0.3 | 15 | 60 | 6 |
| ESR714 0605 | 6 | 0.5 | 15 | 60 | 6 |
| ESR714 0610 | 6 | 1 | 15 | 60 | 6 |
| ESR714 0803 | 8 | 0.3 | 20 | 60 | 8 |
| ESR714 0805 | 8 | 0.5 | 20 | 60 | 8 |
| ESR714 0810 | 8 | 1 | 20 | 60 | 8 |
| ESR714 0815 | 8 | 1.5 | 20 | 60 | 8 |
| ESR714 0820 | 8 | 2 | 20 | 60 | 8 |

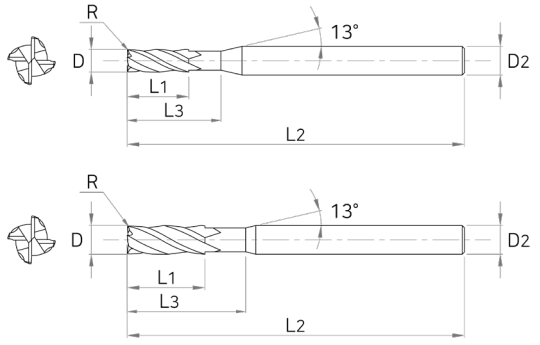
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR714 1003 | 10 | 0.3 | 25 | 70 | 10 |
| ESR714 1005 | 10 | 0.5 | 25 | 70 | 10 |
| ESR714 1010 | 10 | 1 | 25 | 70 | 10 |
| ESR714 1015 | 10 | 1.5 | 25 | 70 | 10 |
| ESR714 1020 | 10 | 2 | 25 | 70 | 10 |
| ESR714 1025 | 10 | 2.5 | 25 | 70 | 10 |
| ESR714 1030 | 10 | 3 | 25 | 70 | 10 |
| ESR714 1203 | 12 | 0.3 | 30 | 80 | 12 |
| ESR714 1205 | 12 | 0.5 | 30 | 80 | 12 |
| ESR714 1210 | 12 | 1 | 30 | 80 | 12 |
| ESR714 1215 | 12 | 1.5 | 30 | 80 | 12 |
| ESR714 1220 | 12 | 2 | 30 | 80 | 12 |
| ESR714 1225 | 12 | 2.5 | 30 | 80 | 12 |
| ESR714 1230 | 12 | 3 | 30 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR724 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

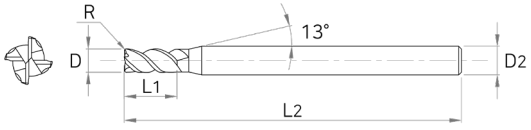
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR724 0600520 | 6 | 0.5 | 9 | 20 | 90 | 6 |
| ESR724 0601020 | 6 | 1 | 9 | 20 | 90 | 6 |
| ESR724 0800525 | 8 | 0.5 | 12 | 25 | 100 | 8 |
| ESR724 0801025 | 8 | 1 | 12 | 25 | 100 | 8 |
| ESR724 1000532 | 10 | 0.5 | 15 | 32 | 100 | 10 |
| ESR724 1001032 | 10 | 1 | 15 | 32 | 100 | 10 |
| ESR724 1002032 | 10 | 2 | 15 | 32 | 100 | 10 |
| ESR724 1200538 | 12 | 0.5 | 18 | 38 | 110 | 12 |
| ESR724 1201038 | 12 | 1 | 18 | 38 | 110 | 12 |
| ESR724 1202038 | 12 | 2 | 18 | 38 | 110 | 12 |

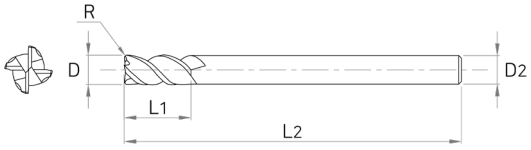
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR734 01001 | 1 | 0.1 | 2 | 50 | 6 |
| ESR734 01002 | 1 | 0.2 | 2 | 50 | 6 |
| ESR734 01003 | 1 | 0.3 | 2 | 50 | 6 |
| ESR734 01501 | 1.5 | 0.1 | 3 | 50 | 6 |
| ESR734 01502 | 1.5 | 0.2 | 3 | 50 | 6 |
| ESR734 01503 | 1.5 | 0.3 | 3 | 50 | 6 |
| ESR734 01505 | 1.5 | 0.5 | 3 | 50 | 6 |
| ESR734 02001 | 2 | 0.1 | 5 | 50 | 6 |
| ESR734 02002 | 2 | 0.2 | 5 | 50 | 6 |
| ESR734 02003 | 2 | 0.3 | 5 | 50 | 6 |
| ESR734 02005 | 2 | 0.5 | 5 | 50 | 6 |
| ESR734 02501 | 2.5 | 0.1 | 7 | 60 | 6 |
| ESR734 02502 | 2.5 | 0.2 | 7 | 60 | 6 |
| ESR734 02503 | 2.5 | 0.3 | 7 | 60 | 6 |
| ESR734 02505 | 2.5 | 0.5 | 7 | 60 | 6 |
| ESR734 03001 | 3 | 0.1 | 8 | 60 | 6 |
| ESR734 03002 | 3 | 0.2 | 8 | 60 | 6 |
| ESR734 03003 | 3 | 0.3 | 8 | 60 | 6 |
| ESR734 03005 | 3 | 0.5 | 8 | 60 | 6 |
| ESR734 04001 | 4 | 0.1 | 10 | 70 | 6 |
| ESR734 04002 | 4 | 0.2 | 10 | 70 | 6 |
| ESR734 04002S4 | 4 | 0.2 | 10 | 70 | 4 |
| ESR734 04003 | 4 | 0.3 | 10 | 70 | 6 |
| ESR734 04005 | 4 | 0.5 | 10 | 70 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR734 04005S4 | 4 | 0.5 | 10 | 70 | 4 |
| ESR734 04010 | 4 | 1 | 10 | 70 | 6 |
| ESR734 05001 | 5 | 0.1 | 13 | 80 | 6 |
| ESR734 05002 | 5 | 0.2 | 13 | 80 | 6 |
| ESR734 05003 | 5 | 0.3 | 13 | 80 | 6 |
| ESR734 05005 | 5 | 0.5 | 13 | 80 | 6 |
| ESR734 05010 | 5 | 1 | 13 | 80 | 6 |
| ESR734 06001 | 6 | 0.1 | 15 | 90 | 6 |
| ESR734 06002 | 6 | 0.2 | 15 | 90 | 6 |
| ESR734 06003 | 6 | 0.3 | 15 | 90 | 6 |
| ESR734 06005 | 6 | 0.5 | 15 | 90 | 6 |
| ESR734 06010 | 6 | 1 | 15 | 90 | 6 |
| ESR734 08001 | 8 | 0.1 | 20 | 100 | 8 |
| ESR734 08002 | 8 | 0.2 | 20 | 100 | 8 |
| ESR734 08003 | 8 | 0.3 | 20 | 100 | 8 |
| ESR734 08005 | 8 | 0.5 | 20 | 100 | 8 |
| ESR734 08010 | 8 | 1 | 20 | 100 | 8 |
| ESR734 08020 | 8 | 2 | 20 | 100 | 8 |
| ESR734 10002 | 10 | 0.2 | 25 | 100 | 10 |
| ESR734 10003 | 10 | 0.3 | 25 | 100 | 10 |
| ESR734 10005 | 10 | 0.5 | 25 | 100 | 10 |
| ESR734 10010 | 10 | 1 | 25 | 100 | 10 |
| ESR734 10020 | 10 | 2 | 25 | 100 | 10 |
| ESR734 12002 | 12 | 0.2 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR734 | 4 FLUTES LONG SHANK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR734 12003 | 12 | 0.3 | 30 | 110 | 12 |
| ESR734 12005 | 12 | 0.5 | 30 | 110 | 12 |
| ESR734 12010 | 12 | 1 | 30 | 110 | 12 |

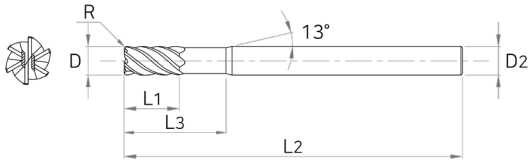
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR734 12010L | 12 | 1 | 30 | 150 | 12 |
| ESR734 12020 | 12 | 2 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR706 | 6 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.592

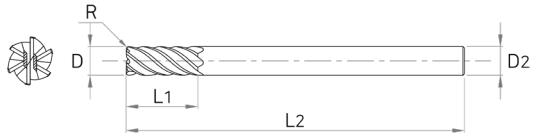
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESR706 0600314 | 6 | 0.3 | 6 | 14 | 50 | 6 |
| ESR706 0600514 | 6 | 0.5 | 6 | 14 | 50 | 6 |
| ESR706 0800524 | 8 | 0.5 | 8 | 24 | 60 | 8 |
| ESR706 0801024 | 8 | 1 | 8 | 24 | 60 | 8 |
| ESR706 1000530 | 10 | 0.5 | 10 | 30 | 70 | 10 |
| ESR706 1001030 | 10 | 1 | 10 | 30 | 70 | 10 |
| ESR706 1200530 | 12 | 0.5 | 12 | 30 | 75 | 12 |
| ESR706 1201030 | 12 | 1 | 12 | 30 | 75 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESR736 | 6 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 6 | 45° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.580

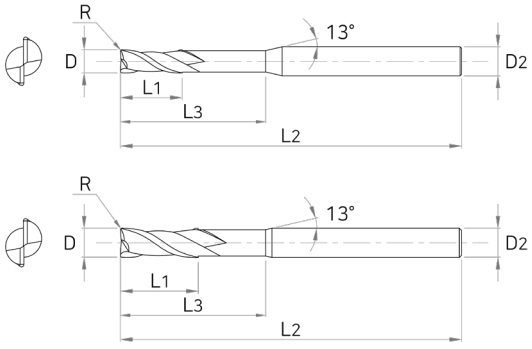
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESR736 06005 | 6 | 0.5 | 15 | 90 | 6 |
| ESR736 06010 | 6 | 1 | 15 | 90 | 6 |
| ESR736 08005 | 8 | 0.5 | 20 | 100 | 8 |
| ESR736 08010 | 8 | 1 | 20 | 100 | 8 |
| ESR736 10005 | 10 | 0.5 | 25 | 100 | 10 |
| ESR736 10010 | 10 | 1 | 25 | 100 | 10 |
| ESR736 12005 | 12 | 0.5 | 30 | 110 | 12 |
| ESR736 12010 | 12 | 1 | 30 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~16 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.593

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 002002005 | 0.2 | 0.02 | 0.2 | 0.5 | 40 | 4 |
| ESRR712 00200201 | 0.2 | 0.02 | 0.2 | 1 | 40 | 4 |
| ESRR712 002002015 | 0.2 | 0.02 | 0.2 | 1.5 | 40 | 4 |
| ESRR712 002005005 | 0.2 | 0.05 | 0.2 | 0.5 | 40 | 4 |
| ESRR712 00200501 | 0.2 | 0.05 | 0.2 | 1 | 40 | 4 |
| ESRR712 002005015 | 0.2 | 0.05 | 0.2 | 1.5 | 40 | 4 |
| ESRR712 00300201 | 0.3 | 0.02 | 0.3 | 1 | 40 | 4 |
| ESRR712 00300202 | 0.3 | 0.02 | 0.3 | 2 | 40 | 4 |
| ESRR712 00300203 | 0.3 | 0.02 | 0.3 | 3 | 40 | 4 |
| ESRR712 00300501 | 0.3 | 0.05 | 0.3 | 1 | 40 | 4 |
| ESRR712 00300502 | 0.3 | 0.05 | 0.3 | 2 | 40 | 4 |
| ESRR712 00300503 | 0.3 | 0.05 | 0.3 | 3 | 40 | 4 |
| ESRR712 00400201 | 0.4 | 0.02 | 0.4 | 1 | 40 | 4 |
| ESRR712 00400202 | 0.4 | 0.02 | 0.4 | 2 | 40 | 4 |
| ESRR712 00400203 | 0.4 | 0.02 | 0.4 | 3 | 40 | 4 |
| ESRR712 00400204 | 0.4 | 0.02 | 0.4 | 4 | 40 | 4 |
| ESRR712 00400501 | 0.4 | 0.05 | 0.4 | 1 | 40 | 4 |
| ESRR712 00400502 | 0.4 | 0.05 | 0.4 | 2 | 40 | 4 |
| ESRR712 00400503 | 0.4 | 0.05 | 0.4 | 3 | 40 | 4 |
| ESRR712 00400504 | 0.4 | 0.05 | 0.4 | 4 | 40 | 4 |
| ESRR712 00401001 | 0.4 | 0.1 | 0.4 | 1 | 40 | 4 |
| ESRR712 004010015 | 0.4 | 0.1 | 0.4 | 1.5 | 40 | 4 |
| ESRR712 00401002 | 0.4 | 0.1 | 0.4 | 2 | 40 | 4 |
| ESRR712 00401003 | 0.4 | 0.1 | 0.4 | 3 | 40 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 00401004 | 0.4 | 0.1 | 0.4 | 4 | 40 | 4 |
| ESRR712 00500201 | 0.5 | 0.02 | 0.5 | 1 | 45 | 4 |
| ESRR712 005002015 | 0.5 | 0.02 | 0.5 | 1.5 | 45 | 4 |
| ESRR712 00500202 | 0.5 | 0.02 | 0.5 | 2 | 45 | 4 |
| ESRR712 005002025 | 0.5 | 0.02 | 0.5 | 2.5 | 45 | 4 |
| ESRR712 00500203 | 0.5 | 0.02 | 0.5 | 3 | 45 | 4 |
| ESRR712 00500204 | 0.5 | 0.02 | 0.5 | 4 | 45 | 4 |
| ESRR712 00500205 | 0.5 | 0.02 | 0.5 | 5 | 45 | 4 |
| ESRR712 00500206 | 0.5 | 0.02 | 0.5 | 6 | 45 | 4 |
| ESRR712 00500208 | 0.5 | 0.02 | 0.5 | 8 | 45 | 4 |
| ESRR712 00500210 | 0.5 | 0.02 | 0.5 | 10 | 45 | 4 |
| ESRR712 00500501 | 0.5 | 0.05 | 0.5 | 1 | 45 | 4 |
| ESRR712 005005015 | 0.5 | 0.05 | 0.5 | 1.5 | 45 | 4 |
| ESRR712 00500502 | 0.5 | 0.05 | 0.5 | 2 | 45 | 4 |
| ESRR712 005005025 | 0.5 | 0.05 | 0.5 | 2.5 | 45 | 4 |
| ESRR712 00500503 | 0.5 | 0.05 | 0.5 | 3 | 45 | 4 |
| ESRR712 00500504 | 0.5 | 0.05 | 0.5 | 4 | 45 | 4 |
| ESRR712 00500505 | 0.5 | 0.05 | 0.5 | 5 | 45 | 4 |
| ESRR712 00500506 | 0.5 | 0.05 | 0.5 | 6 | 45 | 4 |
| ESRR712 00500508 | 0.5 | 0.05 | 0.5 | 8 | 45 | 4 |
| ESRR712 00500510 | 0.5 | 0.05 | 0.5 | 10 | 45 | 4 |
| ESRR712 00501001 | 0.5 | 0.1 | 0.5 | 1 | 45 | 4 |
| ESRR712 005010015 | 0.5 | 0.1 | 0.5 | 1.5 | 45 | 4 |
| ESRR712 00501002 | 0.5 | 0.1 | 0.5 | 2 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 005010025 | 0.5 | 0.1 | 0.5 | 2.5 | 45 | 4 |
| ESRR712 00501003 | 0.5 | 0.1 | 0.5 | 3 | 45 | 4 |
| ESRR712 00501004 | 0.5 | 0.1 | 0.5 | 4 | 45 | 4 |
| ESRR712 00501005 | 0.5 | 0.1 | 0.5 | 5 | 45 | 4 |
| ESRR712 00501006 | 0.5 | 0.1 | 0.5 | 6 | 45 | 4 |
| ESRR712 00501008 | 0.5 | 0.1 | 0.5 | 8 | 45 | 4 |
| ESRR712 00501010 | 0.5 | 0.1 | 0.5 | 10 | 45 | 4 |
| ESRR712 00600202 | 0.6 | 0.02 | 0.6 | 2 | 45 | 4 |
| ESRR712 00600203 | 0.6 | 0.02 | 0.6 | 3 | 45 | 4 |
| ESRR712 00600204 | 0.6 | 0.02 | 0.6 | 4 | 45 | 4 |
| ESRR712 00600206 | 0.6 | 0.02 | 0.6 | 6 | 45 | 4 |
| ESRR712 00600208 | 0.6 | 0.02 | 0.6 | 8 | 45 | 4 |
| ESRR712 00600210 | 0.6 | 0.02 | 0.6 | 10 | 45 | 4 |
| ESRR712 00600212 | 0.6 | 0.02 | 0.6 | 12 | 50 | 4 |
| ESRR712 00600502 | 0.6 | 0.05 | 0.6 | 2 | 45 | 4 |
| ESRR712 00600503 | 0.6 | 0.05 | 0.6 | 3 | 45 | 4 |
| ESRR712 00600504 | 0.6 | 0.05 | 0.6 | 4 | 45 | 4 |
| ESRR712 00600506 | 0.6 | 0.05 | 0.6 | 6 | 45 | 4 |
| ESRR712 00600508 | 0.6 | 0.05 | 0.6 | 8 | 45 | 4 |
| ESRR712 00600510 | 0.6 | 0.05 | 0.6 | 10 | 45 | 4 |
| ESRR712 00600512 | 0.6 | 0.05 | 0.6 | 12 | 50 | 4 |
| ESRR712 00601002 | 0.6 | 0.1 | 0.6 | 2 | 45 | 4 |
| ESRR712 00601003 | 0.6 | 0.1 | 0.6 | 3 | 45 | 4 |
| ESRR712 00601004 | 0.6 | 0.1 | 0.6 | 4 | 45 | 4 |
| ESRR712 00601006 | 0.6 | 0.1 | 0.6 | 6 | 45 | 4 |
| ESRR712 00601008 | 0.6 | 0.1 | 0.6 | 8 | 45 | 4 |
| ESRR712 00601010 | 0.6 | 0.1 | 0.6 | 10 | 45 | 4 |
| ESRR712 00601012 | 0.6 | 0.1 | 0.6 | 12 | 50 | 4 |
| ESRR712 00701002 | 0.7 | 0.1 | 0.7 | 2 | 45 | 4 |
| ESRR712 00701004 | 0.7 | 0.1 | 0.7 | 4 | 45 | 4 |
| ESRR712 00701006 | 0.7 | 0.1 | 0.7 | 6 | 45 | 4 |
| ESRR712 00701008 | 0.7 | 0.1 | 0.7 | 8 | 45 | 4 |
| ESRR712 00701010 | 0.7 | 0.1 | 0.7 | 10 | 45 | 4 |
| ESRR712 00800202 | 0.8 | 0.02 | 0.8 | 2 | 45 | 4 |
| ESRR712 00800204 | 0.8 | 0.02 | 0.8 | 4 | 45 | 4 |
| ESRR712 00800206 | 0.8 | 0.02 | 0.8 | 6 | 45 | 4 |
| ESRR712 00800208 | 0.8 | 0.02 | 0.8 | 8 | 45 | 4 |
| ESRR712 00800210 | 0.8 | 0.02 | 0.8 | 10 | 45 | 4 |
| ESRR712 00800212 | 0.8 | 0.02 | 0.8 | 12 | 50 | 4 |
| ESRR712 00800502 | 0.8 | 0.05 | 0.8 | 2 | 45 | 4 |
| ESRR712 00800504 | 0.8 | 0.05 | 0.8 | 4 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 00800506 | 0.8 | 0.05 | 0.8 | 6 | 45 | 4 |
| ESRR712 00800508 | 0.8 | 0.05 | 0.8 | 8 | 45 | 4 |
| ESRR712 00800510 | 0.8 | 0.05 | 0.8 | 10 | 45 | 4 |
| ESRR712 00800512 | 0.8 | 0.05 | 0.8 | 12 | 50 | 4 |
| ESRR712 00801002 | 0.8 | 0.1 | 0.8 | 2 | 45 | 4 |
| ESRR712 00801004 | 0.8 | 0.1 | 0.8 | 4 | 45 | 4 |
| ESRR712 00801006 | 0.8 | 0.1 | 0.8 | 6 | 45 | 4 |
| ESRR712 00801008 | 0.8 | 0.1 | 0.8 | 8 | 45 | 4 |
| ESRR712 00801010 | 0.8 | 0.1 | 0.8 | 10 | 45 | 4 |
| ESRR712 00801012 | 0.8 | 0.1 | 0.8 | 12 | 50 | 4 |
| ESRR712 00802002 | 0.8 | 0.2 | 0.8 | 2 | 45 | 4 |
| ESRR712 00802004 | 0.8 | 0.2 | 0.8 | 4 | 45 | 4 |
| ESRR712 00802006 | 0.8 | 0.2 | 0.8 | 6 | 45 | 4 |
| ESRR712 00802008 | 0.8 | 0.2 | 0.8 | 8 | 45 | 4 |
| ESRR712 00802010 | 0.8 | 0.2 | 0.8 | 10 | 45 | 4 |
| ESRR712 00802012 | 0.8 | 0.2 | 0.8 | 12 | 50 | 4 |
| ESRR712 01000204 | 1 | 0.02 | 1 | 4 | 45 | 4 |
| ESRR712 01000206 | 1 | 0.02 | 1 | 6 | 45 | 4 |
| ESRR712 01000208 | 1 | 0.02 | 1 | 8 | 45 | 4 |
| ESRR712 01000210 | 1 | 0.02 | 1 | 10 | 50 | 4 |
| ESRR712 01000212 | 1 | 0.02 | 1 | 12 | 50 | 4 |
| ESRR712 01000214 | 1 | 0.02 | 1 | 14 | 50 | 4 |
| ESRR712 01000216 | 1 | 0.02 | 1 | 16 | 50 | 4 |
| ESRR712 01000220 | 1 | 0.02 | 1 | 20 | 50 | 4 |
| ESRR712 01000504 | 1 | 0.05 | 1 | 4 | 45 | 4 |
| ESRR712 01000506 | 1 | 0.05 | 1 | 6 | 45 | 4 |
| ESRR712 01000508 | 1 | 0.05 | 1 | 8 | 45 | 4 |
| ESRR712 01000510 | 1 | 0.05 | 1 | 10 | 50 | 4 |
| ESRR712 01000512 | 1 | 0.05 | 1 | 12 | 50 | 4 |
| ESRR712 01000514 | 1 | 0.05 | 1 | 14 | 50 | 4 |
| ESRR712 01000516 | 1 | 0.05 | 1 | 16 | 50 | 4 |
| ESRR712 01000520 | 1 | 0.05 | 1 | 20 | 50 | 4 |
| ESRR712 01001004 | 1 | 0.1 | 1 | 4 | 45 | 4 |
| ESRR712 01001006 | 1 | 0.1 | 1 | 6 | 45 | 4 |
| ESRR712 01001008 | 1 | 0.1 | 1 | 8 | 45 | 4 |
| ESRR712 01001010 | 1 | 0.1 | 1 | 10 | 50 | 4 |
| ESRR712 01001012 | 1 | 0.1 | 1 | 12 | 50 | 4 |
| ESRR712 01001014 | 1 | 0.1 | 1 | 14 | 50 | 4 |
| ESRR712 01001016 | 1 | 0.1 | 1 | 16 | 50 | 4 |
| ESRR712 01001020 | 1 | 0.1 | 1 | 20 | 50 | 4 |
| ESRR712 01002004 | 1 | 0.2 | 1 | 4 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 01002006 | 1 | 0.2 | 1 | 6 | 45 | 4 |
| ESRR712 01002008 | 1 | 0.2 | 1 | 8 | 45 | 4 |
| ESRR712 01002010 | 1 | 0.2 | 1 | 10 | 50 | 4 |
| ESRR712 01002012 | 1 | 0.2 | 1 | 12 | 50 | 4 |
| ESRR712 01002014 | 1 | 0.2 | 1 | 14 | 50 | 4 |
| ESRR712 01002016 | 1 | 0.2 | 1 | 16 | 50 | 4 |
| ESRR712 01002020 | 1 | 0.2 | 1 | 20 | 50 | 4 |
| ESRR712 01003004 | 1 | 0.3 | 1 | 4 | 45 | 4 |
| ESRR712 01003006 | 1 | 0.3 | 1 | 6 | 45 | 4 |
| ESRR712 01003008 | 1 | 0.3 | 1 | 8 | 45 | 4 |
| ESRR712 01003010 | 1 | 0.3 | 1 | 10 | 50 | 4 |
| ESRR712 01003012 | 1 | 0.3 | 1 | 12 | 50 | 4 |
| ESRR712 01003014 | 1 | 0.3 | 1 | 14 | 50 | 4 |
| ESRR712 01003016 | 1 | 0.3 | 1 | 16 | 50 | 4 |
| ESRR712 01003020 | 1 | 0.3 | 1 | 20 | 50 | 4 |
| ESRR712 01200204 | 1.2 | 0.02 | 1.2 | 4 | 45 | 4 |
| ESRR712 01200206 | 1.2 | 0.02 | 1.2 | 6 | 45 | 4 |
| ESRR712 01200208 | 1.2 | 0.02 | 1.2 | 8 | 45 | 4 |
| ESRR712 01200210 | 1.2 | 0.02 | 1.2 | 10 | 50 | 4 |
| ESRR712 01200212 | 1.2 | 0.02 | 1.2 | 12 | 50 | 4 |
| ESRR712 01200214 | 1.2 | 0.02 | 1.2 | 14 | 50 | 4 |
| ESRR712 01200216 | 1.2 | 0.02 | 1.2 | 16 | 50 | 4 |
| ESRR712 01200220 | 1.2 | 0.02 | 1.2 | 20 | 50 | 4 |
| ESRR712 01200504 | 1.2 | 0.05 | 1.2 | 4 | 45 | 4 |
| ESRR712 01200506 | 1.2 | 0.05 | 1.2 | 6 | 45 | 4 |
| ESRR712 01200508 | 1.2 | 0.05 | 1.2 | 8 | 45 | 4 |
| ESRR712 01200510 | 1.2 | 0.05 | 1.2 | 10 | 50 | 4 |
| ESRR712 01200512 | 1.2 | 0.05 | 1.2 | 12 | 50 | 4 |
| ESRR712 01200514 | 1.2 | 0.05 | 1.2 | 14 | 50 | 4 |
| ESRR712 01200516 | 1.2 | 0.05 | 1.2 | 16 | 50 | 4 |
| ESRR712 01200520 | 1.2 | 0.05 | 1.2 | 20 | 50 | 4 |
| ESRR712 01201004 | 1.2 | 0.1 | 1.2 | 4 | 45 | 4 |
| ESRR712 01201006 | 1.2 | 0.1 | 1.2 | 6 | 45 | 4 |
| ESRR712 01201008 | 1.2 | 0.1 | 1.2 | 8 | 45 | 4 |
| ESRR712 01201010 | 1.2 | 0.1 | 1.2 | 10 | 50 | 4 |
| ESRR712 01201012 | 1.2 | 0.1 | 1.2 | 12 | 50 | 4 |
| ESRR712 01201014 | 1.2 | 0.1 | 1.2 | 14 | 50 | 4 |
| ESRR712 01201016 | 1.2 | 0.1 | 1.2 | 16 | 50 | 4 |
| ESRR712 01201020 | 1.2 | 0.1 | 1.2 | 20 | 50 | 4 |
| ESRR712 01202004 | 1.2 | 0.2 | 1.2 | 4 | 45 | 4 |
| ESRR712 01202006 | 1.2 | 0.2 | 1.2 | 6 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 01202008 | 1.2 | 0.2 | 1.2 | 8 | 45 | 4 |
| ESRR712 01202010 | 1.2 | 0.2 | 1.2 | 10 | 50 | 4 |
| ESRR712 01202012 | 1.2 | 0.2 | 1.2 | 12 | 50 | 4 |
| ESRR712 01202014 | 1.2 | 0.2 | 1.2 | 14 | 50 | 4 |
| ESRR712 01202016 | 1.2 | 0.2 | 1.2 | 16 | 50 | 4 |
| ESRR712 01202020 | 1.2 | 0.2 | 1.2 | 20 | 50 | 4 |
| ESRR712 01203004 | 1.2 | 0.3 | 1.2 | 4 | 45 | 4 |
| ESRR712 01203006 | 1.2 | 0.3 | 1.2 | 6 | 45 | 4 |
| ESRR712 01203008 | 1.2 | 0.3 | 1.2 | 8 | 45 | 4 |
| ESRR712 01203010 | 1.2 | 0.3 | 1.2 | 10 | 50 | 4 |
| ESRR712 01203012 | 1.2 | 0.3 | 1.2 | 12 | 50 | 4 |
| ESRR712 01203014 | 1.2 | 0.3 | 1.2 | 14 | 50 | 4 |
| ESRR712 01203016 | 1.2 | 0.3 | 1.2 | 16 | 50 | 4 |
| ESRR712 01203020 | 1.2 | 0.3 | 1.2 | 20 | 50 | 4 |
| ESRR712 01500204 | 1.5 | 0.02 | 1.5 | 4 | 45 | 4 |
| ESRR712 01500206 | 1.5 | 0.02 | 1.5 | 6 | 45 | 4 |
| ESRR712 01500208 | 1.5 | 0.02 | 1.5 | 8 | 45 | 4 |
| ESRR712 01500210 | 1.5 | 0.02 | 1.5 | 10 | 50 | 4 |
| ESRR712 01500212 | 1.5 | 0.02 | 1.5 | 12 | 50 | 4 |
| ESRR712 01500214 | 1.5 | 0.02 | 1.5 | 14 | 50 | 4 |
| ESRR712 01500216 | 1.5 | 0.02 | 1.5 | 16 | 50 | 4 |
| ESRR712 01500220 | 1.5 | 0.02 | 1.5 | 20 | 50 | 4 |
| ESRR712 01500504 | 1.5 | 0.05 | 1.5 | 4 | 45 | 4 |
| ESRR712 01500506 | 1.5 | 0.05 | 1.5 | 6 | 45 | 4 |
| ESRR712 01500508 | 1.5 | 0.05 | 1.5 | 8 | 45 | 4 |
| ESRR712 01500510 | 1.5 | 0.05 | 1.5 | 10 | 50 | 4 |
| ESRR712 01500512 | 1.5 | 0.05 | 1.5 | 12 | 50 | 4 |
| ESRR712 01500514 | 1.5 | 0.05 | 1.5 | 14 | 50 | 4 |
| ESRR712 01500516 | 1.5 | 0.05 | 1.5 | 16 | 50 | 4 |
| ESRR712 01500520 | 1.5 | 0.05 | 1.5 | 20 | 50 | 4 |
| ESRR712 01501004 | 1.5 | 0.1 | 1.5 | 4 | 45 | 4 |
| ESRR712 01501006 | 1.5 | 0.1 | 1.5 | 6 | 45 | 4 |
| ESRR712 01501008 | 1.5 | 0.1 | 1.5 | 8 | 45 | 4 |
| ESRR712 01501010 | 1.5 | 0.1 | 1.5 | 10 | 50 | 4 |
| ESRR712 01501012 | 1.5 | 0.1 | 1.5 | 12 | 50 | 4 |
| ESRR712 01501014 | 1.5 | 0.1 | 1.5 | 14 | 50 | 4 |
| ESRR712 01501016 | 1.5 | 0.1 | 1.5 | 16 | 50 | 4 |
| ESRR712 01501020 | 1.5 | 0.1 | 1.5 | 20 | 50 | 4 |
| ESRR712 01502004 | 1.5 | 0.2 | 1.5 | 4 | 45 | 4 |
| ESRR712 01502006 | 1.5 | 0.2 | 1.5 | 6 | 45 | 4 |
| ESRR712 01502008 | 1.5 | 0.2 | 1.5 | 8 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 01502010 | 1.5 | 0.2 | 1.5 | 10 | 50 | 4 |
| ESRR712 01502012 | 1.5 | 0.2 | 1.5 | 12 | 50 | 4 |
| ESRR712 01502014 | 1.5 | 0.2 | 1.5 | 14 | 50 | 4 |
| ESRR712 01502016 | 1.5 | 0.2 | 1.5 | 16 | 50 | 4 |
| ESRR712 01502020 | 1.5 | 0.2 | 1.5 | 20 | 50 | 4 |
| ESRR712 01503004 | 1.5 | 0.3 | 1.5 | 4 | 45 | 4 |
| ESRR712 01503006 | 1.5 | 0.3 | 1.5 | 6 | 45 | 4 |
| ESRR712 01503008 | 1.5 | 0.3 | 1.5 | 8 | 45 | 4 |
| ESRR712 01503010 | 1.5 | 0.3 | 1.5 | 10 | 50 | 4 |
| ESRR712 01503012 | 1.5 | 0.3 | 1.5 | 12 | 50 | 4 |
| ESRR712 01503014 | 1.5 | 0.3 | 1.5 | 14 | 50 | 4 |
| ESRR712 01503016 | 1.5 | 0.3 | 1.5 | 16 | 50 | 4 |
| ESRR712 01503020 | 1.5 | 0.3 | 1.5 | 20 | 50 | 4 |
| ESRR712 01505004 | 1.5 | 0.5 | 1.5 | 4 | 45 | 4 |
| ESRR712 01505006 | 1.5 | 0.5 | 1.5 | 6 | 45 | 4 |
| ESRR712 01505008 | 1.5 | 0.5 | 1.5 | 8 | 45 | 4 |
| ESRR712 01505010 | 1.5 | 0.5 | 1.5 | 10 | 50 | 4 |
| ESRR712 01505012 | 1.5 | 0.5 | 1.5 | 12 | 50 | 4 |
| ESRR712 01505014 | 1.5 | 0.5 | 1.5 | 14 | 50 | 4 |
| ESRR712 01505016 | 1.5 | 0.5 | 1.5 | 16 | 50 | 4 |
| ESRR712 01505020 | 1.5 | 0.5 | 1.5 | 20 | 50 | 4 |
| ESRR712 02000206 | 2 | 0.02 | 2 | 6 | 45 | 4 |
| ESRR712 02000208 | 2 | 0.02 | 2 | 8 | 45 | 4 |
| ESRR712 02000210 | 2 | 0.02 | 2 | 10 | 50 | 4 |
| ESRR712 02000212 | 2 | 0.02 | 2 | 12 | 50 | 4 |
| ESRR712 02000214 | 2 | 0.02 | 2 | 14 | 50 | 4 |
| ESRR712 02000216 | 2 | 0.02 | 2 | 16 | 50 | 4 |
| ESRR712 02000220 | 2 | 0.02 | 2 | 20 | 50 | 4 |
| ESRR712 02000225 | 2 | 0.02 | 2 | 25 | 60 | 4 |
| ESRR712 02000506 | 2 | 0.05 | 2 | 6 | 45 | 4 |
| ESRR712 02000508 | 2 | 0.05 | 2 | 8 | 45 | 4 |
| ESRR712 02000510 | 2 | 0.05 | 2 | 10 | 50 | 4 |
| ESRR712 02000512 | 2 | 0.05 | 2 | 12 | 50 | 4 |
| ESRR712 02000514 | 2 | 0.05 | 2 | 14 | 50 | 4 |
| ESRR712 02000516 | 2 | 0.05 | 2 | 16 | 50 | 4 |
| ESRR712 02000520 | 2 | 0.05 | 2 | 20 | 50 | 4 |
| ESRR712 02000525 | 2 | 0.05 | 2 | 25 | 60 | 4 |
| ESRR712 02001006 | 2 | 0.1 | 2 | 6 | 45 | 4 |
| ESRR712 02001008 | 2 | 0.1 | 2 | 8 | 45 | 4 |
| ESRR712 02001010 | 2 | 0.1 | 2 | 10 | 50 | 4 |
| ESRR712 02001012 | 2 | 0.1 | 2 | 12 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 02001014 | 2 | 0.1 | 2 | 14 | 50 | 4 |
| ESRR712 02001016 | 2 | 0.1 | 2 | 16 | 50 | 4 |
| ESRR712 02001020 | 2 | 0.1 | 2 | 20 | 50 | 4 |
| ESRR712 02001025 | 2 | 0.1 | 2 | 25 | 60 | 4 |
| ESRR712 02001030 | 2 | 0.1 | 2 | 30 | 70 | 4 |
| ESRR712 02002006 | 2 | 0.2 | 2 | 6 | 45 | 4 |
| ESRR712 02002008 | 2 | 0.2 | 2 | 8 | 45 | 4 |
| ESRR712 02002010 | 2 | 0.2 | 2 | 10 | 50 | 4 |
| ESRR712 02002012 | 2 | 0.2 | 2 | 12 | 50 | 4 |
| ESRR712 02002014 | 2 | 0.2 | 2 | 14 | 50 | 4 |
| ESRR712 02002016 | 2 | 0.2 | 2 | 16 | 50 | 4 |
| ESRR712 02002020 | 2 | 0.2 | 2 | 20 | 50 | 4 |
| ESRR712 02002025 | 2 | 0.2 | 2 | 25 | 60 | 4 |
| ESRR712 02002030 | 2 | 0.2 | 2 | 30 | 70 | 4 |
| ESRR712 02003006 | 2 | 0.3 | 2 | 6 | 45 | 4 |
| ESRR712 02003008 | 2 | 0.3 | 2 | 8 | 45 | 4 |
| ESRR712 02003010 | 2 | 0.3 | 2 | 10 | 50 | 4 |
| ESRR712 02003012 | 2 | 0.3 | 2 | 12 | 50 | 4 |
| ESRR712 02003014 | 2 | 0.3 | 2 | 14 | 50 | 4 |
| ESRR712 02003016 | 2 | 0.3 | 2 | 16 | 50 | 4 |
| ESRR712 02003020 | 2 | 0.3 | 2 | 20 | 50 | 4 |
| ESRR712 02003025 | 2 | 0.3 | 2 | 25 | 60 | 4 |
| ESRR712 02003030 | 2 | 0.3 | 2 | 30 | 70 | 4 |
| ESRR712 02005006 | 2 | 0.5 | 2 | 6 | 45 | 4 |
| ESRR712 02005008 | 2 | 0.5 | 2 | 8 | 45 | 4 |
| ESRR712 02005010 | 2 | 0.5 | 2 | 10 | 50 | 4 |
| ESRR712 02005012 | 2 | 0.5 | 2 | 12 | 50 | 4 |
| ESRR712 02005014 | 2 | 0.5 | 2 | 14 | 50 | 4 |
| ESRR712 02005016 | 2 | 0.5 | 2 | 16 | 50 | 4 |
| ESRR712 02005020 | 2 | 0.5 | 2 | 20 | 50 | 4 |
| ESRR712 02005025 | 2 | 0.5 | 2 | 25 | 60 | 4 |
| ESRR712 02005030 | 2 | 0.5 | 2 | 30 | 70 | 4 |
| ESRR712 02501010 | 2.5 | 0.1 | 2.5 | 10 | 50 | 4 |
| ESRR712 02501016 | 2.5 | 0.1 | 2.5 | 16 | 50 | 4 |
| ESRR712 02501020 | 2.5 | 0.1 | 2.5 | 20 | 50 | 4 |
| ESRR712 02501025 | 2.5 | 0.1 | 2.5 | 25 | 60 | 4 |
| ESRR712 02501030 | 2.5 | 0.1 | 2.5 | 30 | 70 | 4 |
| ESRR712 02502010 | 2.5 | 0.2 | 2.5 | 10 | 50 | 4 |
| ESRR712 02502016 | 2.5 | 0.2 | 2.5 | 16 | 50 | 4 |
| ESRR712 02502020 | 2.5 | 0.2 | 2.5 | 20 | 50 | 4 |
| ESRR712 02503010 | 2.5 | 0.3 | 2.5 | 10 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 02503016 | 2.5 | 0.3 | 2.5 | 16 | 50 | 4 |
| ESRR712 02503020 | 2.5 | 0.3 | 2.5 | 20 | 50 | 4 |
| ESRR712 02505010 | 2.5 | 0.5 | 2.5 | 10 | 50 | 4 |
| ESRR712 02505016 | 2.5 | 0.5 | 2.5 | 16 | 50 | 4 |
| ESRR712 02505020 | 2.5 | 0.5 | 2.5 | 20 | 50 | 4 |
| ESRR712 03001010 | 3 | 0.1 | 3 | 10 | 50 | 6 |
| ESRR712 03001012 | 3 | 0.1 | 3 | 12 | 50 | 6 |
| ESRR712 03001016 | 3 | 0.1 | 3 | 16 | 55 | 6 |
| ESRR712 03001020 | 3 | 0.1 | 3 | 20 | 60 | 6 |
| ESRR712 03001025 | 3 | 0.1 | 3 | 25 | 65 | 6 |
| ESRR712 03001030 | 3 | 0.1 | 3 | 30 | 70 | 6 |
| ESRR712 03001035 | 3 | 0.1 | 3 | 35 | 75 | 6 |
| ESRR712 03001040 | 3 | 0.1 | 3 | 40 | 80 | 6 |
| ESRR712 03002010 | 3 | 0.2 | 3 | 10 | 50 | 6 |
| ESRR712 03002012 | 3 | 0.2 | 3 | 12 | 50 | 6 |
| ESRR712 03002016 | 3 | 0.2 | 3 | 16 | 55 | 6 |
| ESRR712 03002020 | 3 | 0.2 | 3 | 20 | 60 | 6 |
| ESRR712 03002025 | 3 | 0.2 | 3 | 25 | 65 | 6 |
| ESRR712 03002030 | 3 | 0.2 | 3 | 30 | 70 | 6 |
| ESRR712 03002035 | 3 | 0.2 | 3 | 35 | 75 | 6 |
| ESRR712 03002040 | 3 | 0.2 | 3 | 40 | 80 | 6 |
| ESRR712 03003010 | 3 | 0.3 | 3 | 10 | 50 | 6 |
| ESRR712 03003012 | 3 | 0.3 | 3 | 12 | 50 | 6 |
| ESRR712 03003016 | 3 | 0.3 | 3 | 16 | 55 | 6 |
| ESRR712 03003020 | 3 | 0.3 | 3 | 20 | 60 | 6 |
| ESRR712 03003025 | 3 | 0.3 | 3 | 25 | 65 | 6 |
| ESRR712 03003030 | 3 | 0.3 | 3 | 30 | 70 | 6 |
| ESRR712 03003035 | 3 | 0.3 | 3 | 35 | 75 | 6 |
| ESRR712 03003040 | 3 | 0.3 | 3 | 40 | 80 | 6 |
| ESRR712 03005010 | 3 | 0.5 | 3 | 10 | 50 | 6 |
| ESRR712 03005012 | 3 | 0.5 | 3 | 12 | 50 | 6 |
| ESRR712 03005016 | 3 | 0.5 | 3 | 16 | 55 | 6 |
| ESRR712 03005020 | 3 | 0.5 | 3 | 20 | 60 | 6 |
| ESRR712 03005025 | 3 | 0.5 | 3 | 25 | 65 | 6 |
| ESRR712 03005030 | 3 | 0.5 | 3 | 30 | 70 | 6 |
| ESRR712 03005035 | 3 | 0.5 | 3 | 35 | 75 | 6 |
| ESRR712 03005040 | 3 | 0.5 | 3 | 40 | 80 | 6 |
| ESRR712 03010010 | 3 | 1 | 3 | 10 | 50 | 6 |
| ESRR712 03010012 | 3 | 1 | 3 | 12 | 50 | 6 |
| ESRR712 03010016 | 3 | 1 | 3 | 16 | 55 | 6 |
| ESRR712 03010020 | 3 | 1 | 3 | 20 | 60 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 03010025 | 3 | 1 | 3 | 25 | 65 | 6 |
| ESRR712 03010030 | 3 | 1 | 3 | 30 | 70 | 6 |
| ESRR712 03010035 | 3 | 1 | 3 | 35 | 75 | 6 |
| ESRR712 03010040 | 3 | 1 | 3 | 40 | 80 | 6 |
| ESRR712 04001012 | 4 | 0.1 | 4 | 12 | 50 | 6 |
| ESRR712 04001016 | 4 | 0.1 | 4 | 16 | 55 | 6 |
| ESRR712 04001020 | 4 | 0.1 | 4 | 20 | 60 | 6 |
| ESRR712 04001025 | 4 | 0.1 | 4 | 25 | 65 | 6 |
| ESRR712 04001030 | 4 | 0.1 | 4 | 30 | 70 | 6 |
| ESRR712 04001035 | 4 | 0.1 | 4 | 35 | 75 | 6 |
| ESRR712 04001040 | 4 | 0.1 | 4 | 40 | 80 | 6 |
| ESRR712 04002012 | 4 | 0.2 | 4 | 12 | 50 | 6 |
| ESRR712 04002016 | 4 | 0.2 | 4 | 16 | 55 | 6 |
| ESRR712 04002020 | 4 | 0.2 | 4 | 20 | 60 | 6 |
| ESRR712 04002025 | 4 | 0.2 | 4 | 25 | 65 | 6 |
| ESRR712 04002030 | 4 | 0.2 | 4 | 30 | 70 | 6 |
| ESRR712 04002035 | 4 | 0.2 | 4 | 35 | 75 | 6 |
| ESRR712 04002040 | 4 | 0.2 | 4 | 40 | 80 | 6 |
| ESRR712 04003012 | 4 | 0.3 | 4 | 12 | 50 | 6 |
| ESRR712 04003016 | 4 | 0.3 | 4 | 16 | 55 | 6 |
| ESRR712 04003020 | 4 | 0.3 | 4 | 20 | 60 | 6 |
| ESRR712 04003025 | 4 | 0.3 | 4 | 25 | 65 | 6 |
| ESRR712 04003030 | 4 | 0.3 | 4 | 30 | 70 | 6 |
| ESRR712 04003035 | 4 | 0.3 | 4 | 35 | 75 | 6 |
| ESRR712 04003040 | 4 | 0.3 | 4 | 40 | 80 | 6 |
| ESRR712 04005012 | 4 | 0.5 | 4 | 12 | 50 | 6 |
| ESRR712 04005016 | 4 | 0.5 | 4 | 16 | 55 | 6 |
| ESRR712 04005020 | 4 | 0.5 | 4 | 20 | 60 | 6 |
| ESRR712 04005025 | 4 | 0.5 | 4 | 25 | 65 | 6 |
| ESRR712 04005030 | 4 | 0.5 | 4 | 30 | 70 | 6 |
| ESRR712 04005035 | 4 | 0.5 | 4 | 35 | 75 | 6 |
| ESRR712 04005040 | 4 | 0.5 | 4 | 40 | 80 | 6 |
| ESRR712 04010012 | 4 | 1 | 4 | 12 | 50 | 6 |
| ESRR712 04010016 | 4 | 1 | 4 | 16 | 55 | 6 |
| ESRR712 04010020 | 4 | 1 | 4 | 20 | 60 | 6 |
| ESRR712 04010025 | 4 | 1 | 4 | 25 | 65 | 6 |
| ESRR712 04010030 | 4 | 1 | 4 | 30 | 70 | 6 |
| ESRR712 04010035 | 4 | 1 | 4 | 35 | 75 | 6 |
| ESRR712 04010040 | 4 | 1 | 4 | 40 | 80 | 6 |
| ESRR712 05002015 | 5 | 0.2 | 6 | 15 | 60 | 6 |
| ESRR712 05002025 | 5 | 0.2 | 6 | 25 | 70 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR712 | 2 FLUTES RIB RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 05002030 | 5 | 0.2 | 6 | 30 | 70 | 6 |
| ESRR712 05002040 | 5 | 0.2 | 6 | 40 | 80 | 6 |
| ESRR712 05005015 | 5 | 0.5 | 6 | 15 | 60 | 6 |
| ESRR712 05005025 | 5 | 0.5 | 6 | 25 | 70 | 6 |
| ESRR712 05005030 | 5 | 0.5 | 6 | 30 | 70 | 6 |
| ESRR712 05005040 | 5 | 0.5 | 6 | 40 | 80 | 6 |
| ESRR712 05010015 | 5 | 1 | 6 | 15 | 60 | 6 |
| ESRR712 05010025 | 5 | 1 | 6 | 25 | 70 | 6 |
| ESRR712 05010030 | 5 | 1 | 6 | 30 | 70 | 6 |
| ESRR712 05010040 | 5 | 1 | 6 | 40 | 80 | 6 |
| ESRR712 06001020 | 6 | 0.1 | 7 | 20 | 60 | 6 |
| ESRR712 06001040 | 6 | 0.1 | 7 | 40 | 80 | 6 |
| ESRR712 06002020 | 6 | 0.2 | 7 | 20 | 60 | 6 |
| ESRR712 06002040 | 6 | 0.2 | 7 | 40 | 80 | 6 |
| ESRR712 06003020 | 6 | 0.3 | 7 | 20 | 60 | 6 |
| ESRR712 06003040 | 6 | 0.3 | 7 | 40 | 80 | 6 |
| ESRR712 06005020 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| ESRR712 06005040 | 6 | 0.5 | 7 | 40 | 80 | 6 |
| ESRR712 06010020 | 6 | 1 | 7 | 20 | 60 | 6 |
| ESRR712 06010040 | 6 | 1 | 7 | 40 | 80 | 6 |
| ESRR712 06015020 | 6 | 1.5 | 7 | 20 | 60 | 6 |

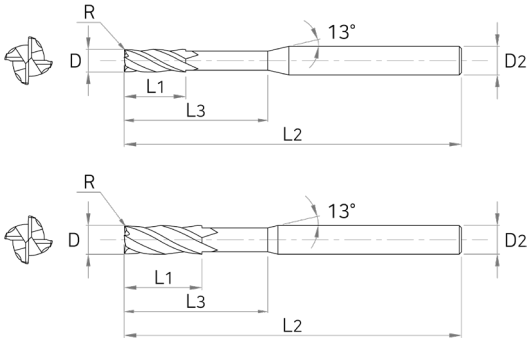
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR712 06015040 | 6 | 1.5 | 7 | 40 | 80 | 6 |
| ESRR712 08002022 | 8 | 0.2 | 9 | 22 | 65 | 8 |
| ESRR712 08003022 | 8 | 0.3 | 9 | 22 | 65 | 8 |
| ESRR712 08005022 | 8 | 0.5 | 9 | 22 | 65 | 8 |
| ESRR712 08010022 | 8 | 1 | 9 | 22 | 65 | 8 |
| ESRR712 08015022 | 8 | 1.5 | 9 | 22 | 65 | 8 |
| ESRR712 10002024 | 10 | 0.2 | 11 | 24 | 70 | 10 |
| ESRR712 10003024 | 10 | 0.3 | 11 | 24 | 70 | 10 |
| ESRR712 10005024 | 10 | 0.5 | 11 | 24 | 70 | 10 |
| ESRR712 10010024 | 10 | 1 | 11 | 24 | 70 | 10 |
| ESRR712 10015024 | 10 | 1.5 | 11 | 24 | 70 | 10 |
| ESRR712 10020024 | 10 | 2 | 11 | 24 | 70 | 10 |
| ESRR712 12002026 | 12 | 0.2 | 13 | 26 | 80 | 12 |
| ESRR712 12003026 | 12 | 0.3 | 13 | 26 | 80 | 12 |
| ESRR712 12005026 | 12 | 0.5 | 13 | 26 | 80 | 12 |
| ESRR712 12010026 | 12 | 1 | 13 | 26 | 80 | 12 |
| ESRR712 12015026 | 12 | 1.5 | 13 | 26 | 80 | 12 |
| ESRR712 12020026 | 12 | 2 | 13 | 26 | 80 | 12 |
| ESRR712 12030026 | 12 | 3 | 13 | 26 | 80 | 12 |
| ESRR712 16005035 | 16 | 0.5 | 20 | 35 | 110 | 16 |
| ESRR712 16010035 | 16 | 1 | 20 | 35 | 110 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~20 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.603

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 00500502 | 0.5 | 0.05 | 0.5 | 2 | 45 | 4 |
| ESRR714 00500504 | 0.5 | 0.05 | 0.5 | 4 | 45 | 4 |
| ESRR714 00500506 | 0.5 | 0.05 | 0.5 | 6 | 45 | 4 |
| ESRR714 00500508 | 0.5 | 0.05 | 0.5 | 8 | 45 | 4 |
| ESRR714 00501002 | 0.5 | 0.1 | 0.5 | 2 | 45 | 4 |
| ESRR714 00501004 | 0.5 | 0.1 | 0.5 | 4 | 45 | 4 |
| ESRR714 00501006 | 0.5 | 0.1 | 0.5 | 6 | 45 | 4 |
| ESRR714 00501008 | 0.5 | 0.1 | 0.5 | 8 | 45 | 4 |
| ESRR714 00600502 | 0.6 | 0.05 | 0.6 | 2 | 45 | 4 |
| ESRR714 00600504 | 0.6 | 0.05 | 0.6 | 4 | 45 | 4 |
| ESRR714 00600506 | 0.6 | 0.05 | 0.6 | 6 | 45 | 4 |
| ESRR714 00600508 | 0.6 | 0.05 | 0.6 | 8 | 45 | 4 |
| ESRR714 00601002 | 0.6 | 0.1 | 0.6 | 2 | 45 | 4 |
| ESRR714 00601004 | 0.6 | 0.1 | 0.6 | 4 | 45 | 4 |
| ESRR714 00601006 | 0.6 | 0.1 | 0.6 | 6 | 45 | 4 |
| ESRR714 00601008 | 0.6 | 0.1 | 0.6 | 8 | 45 | 4 |
| ESRR714 00700502 | 0.7 | 0.05 | 0.7 | 2 | 45 | 4 |
| ESRR714 00700504 | 0.7 | 0.05 | 0.7 | 4 | 45 | 4 |
| ESRR714 00700506 | 0.7 | 0.05 | 0.7 | 6 | 45 | 4 |
| ESRR714 00700508 | 0.7 | 0.05 | 0.7 | 8 | 45 | 4 |
| ESRR714 00701002 | 0.7 | 0.1 | 0.7 | 2 | 45 | 4 |
| ESRR714 00701004 | 0.7 | 0.1 | 0.7 | 4 | 45 | 4 |
| ESRR714 00701006 | 0.7 | 0.1 | 0.7 | 6 | 45 | 4 |
| ESRR714 00701008 | 0.7 | 0.1 | 0.7 | 8 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 00800202 | 0.8 | 0.02 | 0.8 | 2 | 45 | 4 |
| ESRR714 00800204 | 0.8 | 0.02 | 0.8 | 4 | 45 | 4 |
| ESRR714 00800206 | 0.8 | 0.02 | 0.8 | 6 | 45 | 4 |
| ESRR714 00800208 | 0.8 | 0.02 | 0.8 | 8 | 45 | 4 |
| ESRR714 00800210 | 0.8 | 0.02 | 0.8 | 10 | 45 | 4 |
| ESRR714 00800212 | 0.8 | 0.02 | 0.8 | 12 | 50 | 4 |
| ESRR714 00800502 | 0.8 | 0.05 | 0.8 | 2 | 45 | 4 |
| ESRR714 00800504 | 0.8 | 0.05 | 0.8 | 4 | 45 | 4 |
| ESRR714 00800506 | 0.8 | 0.05 | 0.8 | 6 | 45 | 4 |
| ESRR714 00800508 | 0.8 | 0.05 | 0.8 | 8 | 45 | 4 |
| ESRR714 00800510 | 0.8 | 0.05 | 0.8 | 10 | 45 | 4 |
| ESRR714 00800512 | 0.8 | 0.05 | 0.8 | 12 | 50 | 4 |
| ESRR714 00801002 | 0.8 | 0.1 | 0.8 | 2 | 45 | 4 |
| ESRR714 00801004 | 0.8 | 0.1 | 0.8 | 4 | 45 | 4 |
| ESRR714 00801006 | 0.8 | 0.1 | 0.8 | 6 | 45 | 4 |
| ESRR714 00801008 | 0.8 | 0.1 | 0.8 | 8 | 45 | 4 |
| ESRR714 00801010 | 0.8 | 0.1 | 0.8 | 10 | 45 | 4 |
| ESRR714 00801012 | 0.8 | 0.1 | 0.8 | 12 | 50 | 4 |
| ESRR714 01000204 | 1 | 0.02 | 1 | 4 | 45 | 4 |
| ESRR714 01000206 | 1 | 0.02 | 1 | 6 | 45 | 4 |
| ESRR714 01000208 | 1 | 0.02 | 1 | 8 | 45 | 4 |
| ESRR714 01000210 | 1 | 0.02 | 1 | 10 | 50 | 4 |
| ESRR714 01000212 | 1 | 0.02 | 1 | 12 | 50 | 4 |
| ESRR714 01000214 | 1 | 0.02 | 1 | 14 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 01000216 | 1 | 0.02 | 1 | 16 | 50 | 4 |
| ESRR714 01000220 | 1 | 0.02 | 1 | 20 | 50 | 4 |
| ESRR714 01000503 | 1 | 0.05 | 1 | 3 | 45 | 4 |
| ESRR714 01000504 | 1 | 0.05 | 1 | 4 | 45 | 4 |
| ESRR714 01000506 | 1 | 0.05 | 1 | 6 | 45 | 4 |
| ESRR714 01000508 | 1 | 0.05 | 1 | 8 | 45 | 4 |
| ESRR714 01000510 | 1 | 0.05 | 1 | 10 | 50 | 4 |
| ESRR714 01000512 | 1 | 0.05 | 1 | 12 | 50 | 4 |
| ESRR714 01000514 | 1 | 0.05 | 1 | 14 | 50 | 4 |
| ESRR714 01000516 | 1 | 0.05 | 1 | 16 | 50 | 4 |
| ESRR714 01000520 | 1 | 0.05 | 1 | 20 | 50 | 4 |
| ESRR714 01001003 | 1 | 0.1 | 1 | 3 | 45 | 4 |
| ESRR714 01001004 | 1 | 0.1 | 1 | 4 | 45 | 4 |
| ESRR714 01001006 | 1 | 0.1 | 1 | 6 | 45 | 4 |
| ESRR714 01001008 | 1 | 0.1 | 1 | 8 | 45 | 4 |
| ESRR714 01001010 | 1 | 0.1 | 1 | 10 | 50 | 4 |
| ESRR714 01001012 | 1 | 0.1 | 1 | 12 | 50 | 4 |
| ESRR714 01001014 | 1 | 0.1 | 1 | 14 | 50 | 4 |
| ESRR714 01001016 | 1 | 0.1 | 1 | 16 | 50 | 4 |
| ESRR714 01001020 | 1 | 0.1 | 1 | 20 | 50 | 4 |
| ESRR714 01002003 | 1 | 0.2 | 1 | 3 | 45 | 4 |
| ESRR714 01002004 | 1 | 0.2 | 1 | 4 | 45 | 4 |
| ESRR714 01002006 | 1 | 0.2 | 1 | 6 | 45 | 4 |
| ESRR714 01002008 | 1 | 0.2 | 1 | 8 | 45 | 4 |
| ESRR714 01002010 | 1 | 0.2 | 1 | 10 | 50 | 4 |
| ESRR714 01002012 | 1 | 0.2 | 1 | 12 | 50 | 4 |
| ESRR714 01002014 | 1 | 0.2 | 1 | 14 | 50 | 4 |
| ESRR714 01002016 | 1 | 0.2 | 1 | 16 | 50 | 4 |
| ESRR714 01002020 | 1 | 0.2 | 1 | 20 | 50 | 4 |
| ESRR714 01003003 | 1 | 0.3 | 1 | 3 | 45 | 4 |
| ESRR714 01003004 | 1 | 0.3 | 1 | 4 | 45 | 4 |
| ESRR714 01003006 | 1 | 0.3 | 1 | 6 | 45 | 4 |
| ESRR714 01003008 | 1 | 0.3 | 1 | 8 | 45 | 4 |
| ESRR714 01003010 | 1 | 0.3 | 1 | 10 | 50 | 4 |
| ESRR714 01003012 | 1 | 0.3 | 1 | 12 | 50 | 4 |
| ESRR714 01003014 | 1 | 0.3 | 1 | 14 | 50 | 4 |
| ESRR714 01003016 | 1 | 0.3 | 1 | 16 | 50 | 4 |
| ESRR714 01003020 | 1 | 0.3 | 1 | 20 | 50 | 4 |
| ESRR714 01200204 | 1.2 | 0.02 | 1.2 | 4 | 45 | 4 |
| ESRR714 01200206 | 1.2 | 0.02 | 1.2 | 6 | 45 | 4 |
| ESRR714 01200208 | 1.2 | 0.02 | 1.2 | 8 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 01200210 | 1.2 | 0.02 | 1.2 | 10 | 50 | 4 |
| ESRR714 01200212 | 1.2 | 0.02 | 1.2 | 12 | 50 | 4 |
| ESRR714 01200214 | 1.2 | 0.02 | 1.2 | 14 | 50 | 4 |
| ESRR714 01200216 | 1.2 | 0.02 | 1.2 | 16 | 50 | 4 |
| ESRR714 01200220 | 1.2 | 0.02 | 1.2 | 20 | 50 | 4 |
| ESRR714 01200503 | 1.2 | 0.05 | 1.2 | 3 | 45 | 4 |
| ESRR714 01200504 | 1.2 | 0.05 | 1.2 | 4 | 45 | 4 |
| ESRR714 01200506 | 1.2 | 0.05 | 1.2 | 6 | 45 | 4 |
| ESRR714 01200508 | 1.2 | 0.05 | 1.2 | 8 | 45 | 4 |
| ESRR714 01200510 | 1.2 | 0.05 | 1.2 | 10 | 50 | 4 |
| ESRR714 01200512 | 1.2 | 0.05 | 1.2 | 12 | 50 | 4 |
| ESRR714 01200514 | 1.2 | 0.05 | 1.2 | 14 | 50 | 4 |
| ESRR714 01200516 | 1.2 | 0.05 | 1.2 | 16 | 50 | 4 |
| ESRR714 01200520 | 1.2 | 0.05 | 1.2 | 20 | 50 | 4 |
| ESRR714 01201003 | 1.2 | 0.1 | 1.2 | 3 | 45 | 4 |
| ESRR714 01201004 | 1.2 | 0.1 | 1.2 | 4 | 45 | 4 |
| ESRR714 01201006 | 1.2 | 0.1 | 1.2 | 6 | 45 | 4 |
| ESRR714 01201008 | 1.2 | 0.1 | 1.2 | 8 | 45 | 4 |
| ESRR714 01201010 | 1.2 | 0.1 | 1.2 | 10 | 50 | 4 |
| ESRR714 01201012 | 1.2 | 0.1 | 1.2 | 12 | 50 | 4 |
| ESRR714 01201014 | 1.2 | 0.1 | 1.2 | 14 | 50 | 4 |
| ESRR714 01201016 | 1.2 | 0.1 | 1.2 | 16 | 50 | 4 |
| ESRR714 01201020 | 1.2 | 0.1 | 1.2 | 20 | 50 | 4 |
| ESRR714 01202003 | 1.2 | 0.2 | 1.2 | 3 | 45 | 4 |
| ESRR714 01202004 | 1.2 | 0.2 | 1.2 | 4 | 45 | 4 |
| ESRR714 01202006 | 1.2 | 0.2 | 1.2 | 6 | 45 | 4 |
| ESRR714 01202008 | 1.2 | 0.2 | 1.2 | 8 | 45 | 4 |
| ESRR714 01202010 | 1.2 | 0.2 | 1.2 | 10 | 50 | 4 |
| ESRR714 01202012 | 1.2 | 0.2 | 1.2 | 12 | 50 | 4 |
| ESRR714 01202014 | 1.2 | 0.2 | 1.2 | 14 | 50 | 4 |
| ESRR714 01202016 | 1.2 | 0.2 | 1.2 | 16 | 50 | 4 |
| ESRR714 01202020 | 1.2 | 0.2 | 1.2 | 20 | 50 | 4 |
| ESRR714 01203003 | 1.2 | 0.3 | 1.2 | 3 | 45 | 4 |
| ESRR714 01203004 | 1.2 | 0.3 | 1.2 | 4 | 45 | 4 |
| ESRR714 01203006 | 1.2 | 0.3 | 1.2 | 6 | 45 | 4 |
| ESRR714 01203008 | 1.2 | 0.3 | 1.2 | 8 | 45 | 4 |
| ESRR714 01203010 | 1.2 | 0.3 | 1.2 | 10 | 50 | 4 |
| ESRR714 01203012 | 1.2 | 0.3 | 1.2 | 12 | 50 | 4 |
| ESRR714 01203016 | 1.2 | 0.3 | 1.2 | 16 | 50 | 4 |
| ESRR714 01203020 | 1.2 | 0.3 | 1.2 | 20 | 50 | 4 |
| ESRR714 01500206 | 1.5 | 0.02 | 1.5 | 6 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 01500208 | 1.5 | 0.02 | 1.5 | 8 | 45 | 4 |
| ESRR714 01500210 | 1.5 | 0.02 | 1.5 | 10 | 50 | 4 |
| ESRR714 01500212 | 1.5 | 0.02 | 1.5 | 12 | 50 | 4 |
| ESRR714 01500214 | 1.5 | 0.02 | 1.5 | 14 | 50 | 4 |
| ESRR714 01500216 | 1.5 | 0.02 | 1.5 | 16 | 50 | 4 |
| ESRR714 01500220 | 1.5 | 0.02 | 1.5 | 20 | 50 | 4 |
| ESRR714 01500222 | 1.5 | 0.02 | 1.5 | 22 | 60 | 4 |
| ESRR714 01500504 | 1.5 | 0.05 | 1.5 | 4 | 45 | 4 |
| ESRR714 01500506 | 1.5 | 0.05 | 1.5 | 6 | 45 | 4 |
| ESRR714 01500508 | 1.5 | 0.05 | 1.5 | 8 | 45 | 4 |
| ESRR714 01500510 | 1.5 | 0.05 | 1.5 | 10 | 50 | 4 |
| ESRR714 01500512 | 1.5 | 0.05 | 1.5 | 12 | 50 | 4 |
| ESRR714 01500514 | 1.5 | 0.05 | 1.5 | 14 | 50 | 4 |
| ESRR714 01500516 | 1.5 | 0.05 | 1.5 | 16 | 50 | 4 |
| ESRR714 01500520 | 1.5 | 0.05 | 1.5 | 20 | 50 | 4 |
| ESRR714 01500522 | 1.5 | 0.05 | 1.5 | 22 | 60 | 4 |
| ESRR714 01500526 | 1.5 | 0.05 | 1.5 | 26 | 60 | 4 |
| ESRR714 01501004 | 1.5 | 0.1 | 1.5 | 4 | 45 | 4 |
| ESRR714 01501006 | 1.5 | 0.1 | 1.5 | 6 | 45 | 4 |
| ESRR714 01501008 | 1.5 | 0.1 | 1.5 | 8 | 45 | 4 |
| ESRR714 01501010 | 1.5 | 0.1 | 1.5 | 10 | 50 | 4 |
| ESRR714 01501012 | 1.5 | 0.1 | 1.5 | 12 | 50 | 4 |
| ESRR714 01501014 | 1.5 | 0.1 | 1.5 | 14 | 50 | 4 |
| ESRR714 01501016 | 1.5 | 0.1 | 1.5 | 16 | 50 | 4 |
| ESRR714 01501020 | 1.5 | 0.1 | 1.5 | 20 | 50 | 4 |
| ESRR714 01501022 | 1.5 | 0.1 | 1.5 | 22 | 60 | 4 |
| ESRR714 01501026 | 1.5 | 0.1 | 1.5 | 26 | 60 | 4 |
| ESRR714 01502004 | 1.5 | 0.2 | 1.5 | 4 | 45 | 4 |
| ESRR714 01502006 | 1.5 | 0.2 | 1.5 | 6 | 45 | 4 |
| ESRR714 01502008 | 1.5 | 0.2 | 1.5 | 8 | 45 | 4 |
| ESRR714 01502010 | 1.5 | 0.2 | 1.5 | 10 | 50 | 4 |
| ESRR714 01502012 | 1.5 | 0.2 | 1.5 | 12 | 50 | 4 |
| ESRR714 01502014 | 1.5 | 0.2 | 1.5 | 14 | 50 | 4 |
| ESRR714 01502016 | 1.5 | 0.2 | 1.5 | 16 | 50 | 4 |
| ESRR714 01502020 | 1.5 | 0.2 | 1.5 | 20 | 50 | 4 |
| ESRR714 01502022 | 1.5 | 0.2 | 1.5 | 22 | 60 | 4 |
| ESRR714 01502025 | 1.5 | 0.2 | 1.5 | 25 | 60 | 4 |
| ESRR714 01503004 | 1.5 | 0.3 | 1.5 | 4 | 45 | 4 |
| ESRR714 01503006 | 1.5 | 0.3 | 1.5 | 6 | 45 | 4 |
| ESRR714 01503008 | 1.5 | 0.3 | 1.5 | 8 | 45 | 4 |
| ESRR714 01503010 | 1.5 | 0.3 | 1.5 | 10 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 01503012 | 1.5 | 0.3 | 1.5 | 12 | 50 | 4 |
| ESRR714 01503014 | 1.5 | 0.3 | 1.5 | 14 | 50 | 4 |
| ESRR714 01503016 | 1.5 | 0.3 | 1.5 | 16 | 50 | 4 |
| ESRR714 01503020 | 1.5 | 0.3 | 1.5 | 20 | 50 | 4 |
| ESRR714 01503022 | 1.5 | 0.3 | 1.5 | 22 | 60 | 4 |
| ESRR714 01503025 | 1.5 | 0.3 | 1.5 | 25 | 60 | 4 |
| ESRR714 01505004 | 1.5 | 0.5 | 1.5 | 4 | 45 | 4 |
| ESRR714 01505006 | 1.5 | 0.5 | 1.5 | 6 | 45 | 4 |
| ESRR714 01505008 | 1.5 | 0.5 | 1.5 | 8 | 45 | 4 |
| ESRR714 01505010 | 1.5 | 0.5 | 1.5 | 10 | 50 | 4 |
| ESRR714 01505012 | 1.5 | 0.5 | 1.5 | 12 | 50 | 4 |
| ESRR714 01505014 | 1.5 | 0.5 | 1.5 | 14 | 50 | 4 |
| ESRR714 01505016 | 1.5 | 0.5 | 1.5 | 16 | 50 | 4 |
| ESRR714 01505020 | 1.5 | 0.5 | 1.5 | 20 | 50 | 4 |
| ESRR714 01505022 | 1.5 | 0.5 | 1.5 | 22 | 60 | 4 |
| ESRR714 01505025 | 1.5 | 0.5 | 1.5 | 25 | 60 | 4 |
| ESRR714 02000206 | 2 | 0.02 | 2 | 6 | 45 | 4 |
| ESRR714 02000208 | 2 | 0.02 | 2 | 8 | 45 | 4 |
| ESRR714 02000210 | 2 | 0.02 | 2 | 10 | 50 | 4 |
| ESRR714 02000212 | 2 | 0.02 | 2 | 12 | 50 | 4 |
| ESRR714 02000214 | 2 | 0.02 | 2 | 14 | 50 | 4 |
| ESRR714 02000216 | 2 | 0.02 | 2 | 16 | 50 | 4 |
| ESRR714 02000220 | 2 | 0.02 | 2 | 20 | 50 | 4 |
| ESRR714 02000225 | 2 | 0.02 | 2 | 25 | 60 | 4 |
| ESRR714 02000230 | 2 | 0.02 | 2 | 30 | 70 | 4 |
| ESRR714 02000506 | 2 | 0.05 | 2 | 6 | 45 | 4 |
| ESRR714 02000508 | 2 | 0.05 | 2 | 8 | 45 | 4 |
| ESRR714 02000510 | 2 | 0.05 | 2 | 10 | 50 | 4 |
| ESRR714 02000512 | 2 | 0.05 | 2 | 12 | 50 | 4 |
| ESRR714 02000514 | 2 | 0.05 | 2 | 14 | 50 | 4 |
| ESRR714 02000516 | 2 | 0.05 | 2 | 16 | 50 | 4 |
| ESRR714 02000520 | 2 | 0.05 | 2 | 20 | 50 | 4 |
| ESRR714 02000525 | 2 | 0.05 | 2 | 25 | 60 | 4 |
| ESRR714 02000530 | 2 | 0.05 | 2 | 30 | 70 | 4 |
| ESRR714 02001006 | 2 | 0.1 | 2 | 6 | 45 | 4 |
| ESRR714 02001008 | 2 | 0.1 | 2 | 8 | 45 | 4 |
| ESRR714 02001010 | 2 | 0.1 | 2 | 10 | 50 | 4 |
| ESRR714 02001012 | 2 | 0.1 | 2 | 12 | 50 | 4 |
| ESRR714 02001014 | 2 | 0.1 | 2 | 14 | 50 | 4 |
| ESRR714 02001016 | 2 | 0.1 | 2 | 16 | 50 | 4 |
| ESRR714 02001020 | 2 | 0.1 | 2 | 20 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 02001022 | 2 | 0.1 | 2 | 22 | 60 | 4 |
| ESRR714 02001025 | 2 | 0.1 | 2 | 25 | 60 | 4 |
| ESRR714 02001030 | 2 | 0.1 | 2 | 30 | 70 | 4 |
| ESRR714 02002006 | 2 | 0.2 | 2 | 6 | 45 | 4 |
| ESRR714 02002008 | 2 | 0.2 | 2 | 8 | 45 | 4 |
| ESRR714 02002010 | 2 | 0.2 | 2 | 10 | 50 | 4 |
| ESRR714 02002012 | 2 | 0.2 | 2 | 12 | 50 | 4 |
| ESRR714 02002014 | 2 | 0.2 | 2 | 14 | 50 | 4 |
| ESRR714 02002016 | 2 | 0.2 | 2 | 16 | 50 | 4 |
| ESRR714 02002020 | 2 | 0.2 | 2 | 20 | 50 | 4 |
| ESRR714 02002022 | 2 | 0.2 | 2 | 22 | 60 | 4 |
| ESRR714 02002025 | 2 | 0.2 | 2 | 25 | 60 | 4 |
| ESRR714 02002030 | 2 | 0.2 | 2 | 30 | 70 | 4 |
| ESRR714 02003006 | 2 | 0.3 | 2 | 6 | 45 | 4 |
| ESRR714 02003008 | 2 | 0.3 | 2 | 8 | 45 | 4 |
| ESRR714 02003010 | 2 | 0.3 | 2 | 10 | 50 | 4 |
| ESRR714 02003012 | 2 | 0.3 | 2 | 12 | 50 | 4 |
| ESRR714 02003014 | 2 | 0.3 | 2 | 14 | 50 | 4 |
| ESRR714 02003016 | 2 | 0.3 | 2 | 16 | 50 | 4 |
| ESRR714 02003020 | 2 | 0.3 | 2 | 20 | 50 | 4 |
| ESRR714 02003022 | 2 | 0.3 | 2 | 22 | 60 | 4 |
| ESRR714 02003025 | 2 | 0.3 | 2 | 25 | 60 | 4 |
| ESRR714 02003030 | 2 | 0.3 | 2 | 30 | 70 | 4 |
| ESRR714 02005006 | 2 | 0.5 | 3 | 6 | 45 | 4 |
| ESRR714 02005008 | 2 | 0.5 | 2 | 8 | 45 | 4 |
| ESRR714 02005010 | 2 | 0.5 | 2 | 10 | 50 | 4 |
| ESRR714 02005012 | 2 | 0.5 | 2 | 12 | 50 | 4 |
| ESRR714 02005014 | 2 | 0.5 | 2 | 14 | 50 | 4 |
| ESRR714 02005016 | 2 | 0.5 | 2 | 16 | 50 | 4 |
| ESRR714 02005020 | 2 | 0.5 | 2 | 20 | 50 | 4 |
| ESRR714 02005022 | 2 | 0.5 | 2 | 22 | 60 | 4 |
| ESRR714 02005025 | 2 | 0.5 | 2 | 25 | 60 | 4 |
| ESRR714 02005030 | 2 | 0.5 | 2 | 30 | 70 | 4 |
| ESRR714 02501008 | 2.5 | 0.1 | 2.5 | 8 | 45 | 4 |
| ESRR714 02501010 | 2.5 | 0.1 | 2.5 | 10 | 50 | 4 |
| ESRR714 02501012 | 2.5 | 0.1 | 2.5 | 12 | 50 | 4 |
| ESRR714 02501014 | 2.5 | 0.1 | 2.5 | 14 | 50 | 4 |
| ESRR714 02501016 | 2.5 | 0.1 | 2.5 | 16 | 50 | 4 |
| ESRR714 02501020 | 2.5 | 0.1 | 2.5 | 20 | 50 | 4 |
| ESRR714 02501025 | 2.5 | 0.1 | 2.5 | 25 | 60 | 4 |
| ESRR714 02501030 | 2.5 | 0.1 | 2.5 | 30 | 70 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 02502008 | 2.5 | 0.2 | 2.5 | 8 | 45 | 4 |
| ESRR714 02502010 | 2.5 | 0.2 | 2.5 | 10 | 50 | 4 |
| ESRR714 02502012 | 2.5 | 0.2 | 2.5 | 12 | 50 | 4 |
| ESRR714 02502014 | 2.5 | 0.2 | 2.5 | 14 | 50 | 4 |
| ESRR714 02502016 | 2.5 | 0.2 | 2.5 | 16 | 50 | 4 |
| ESRR714 02502020 | 2.5 | 0.2 | 2.5 | 20 | 50 | 4 |
| ESRR714 02502025 | 2.5 | 0.2 | 2.5 | 25 | 60 | 4 |
| ESRR714 02502030 | 2.5 | 0.2 | 2.5 | 30 | 70 | 4 |
| ESRR714 02503008 | 2.5 | 0.3 | 2.5 | 8 | 45 | 4 |
| ESRR714 02503010 | 2.5 | 0.3 | 2.5 | 10 | 50 | 4 |
| ESRR714 02503012 | 2.5 | 0.3 | 2.5 | 12 | 50 | 4 |
| ESRR714 02503014 | 2.5 | 0.3 | 2.5 | 14 | 50 | 4 |
| ESRR714 02503016 | 2.5 | 0.3 | 2.5 | 16 | 50 | 4 |
| ESRR714 02503020 | 2.5 | 0.3 | 2.5 | 20 | 50 | 4 |
| ESRR714 02503025 | 2.5 | 0.3 | 2.5 | 25 | 60 | 4 |
| ESRR714 02503030 | 2.5 | 0.3 | 2.5 | 30 | 70 | 4 |
| ESRR714 02505008 | 2.5 | 0.5 | 2.5 | 8 | 45 | 4 |
| ESRR714 02505010 | 2.5 | 0.5 | 2.5 | 10 | 50 | 4 |
| ESRR714 02505012 | 2.5 | 0.5 | 2.5 | 12 | 50 | 4 |
| ESRR714 02505014 | 2.5 | 0.5 | 2.5 | 14 | 50 | 4 |
| ESRR714 02505016 | 2.5 | 0.5 | 2.5 | 16 | 50 | 4 |
| ESRR714 02505020 | 2.5 | 0.5 | 2.5 | 20 | 50 | 4 |
| ESRR714 02505025 | 2.5 | 0.5 | 2.5 | 25 | 60 | 4 |
| ESRR714 02505030 | 2.5 | 0.5 | 2.5 | 30 | 70 | 4 |
| ESRR714 03001008 | 3 | 0.1 | 3 | 8 | 45 | 6 |
| ESRR714 03001010 | 3 | 0.1 | 3 | 10 | 50 | 6 |
| ESRR714 03001012 | 3 | 0.1 | 3 | 12 | 50 | 6 |
| ESRR714 03001014 | 3 | 0.1 | 3 | 14 | 50 | 6 |
| ESRR714 03001016 | 3 | 0.1 | 3 | 16 | 55 | 6 |
| ESRR714 03001020 | 3 | 0.1 | 3 | 20 | 60 | 6 |
| ESRR714 03001025 | 3 | 0.1 | 3 | 25 | 65 | 6 |
| ESRR714 03001030 | 3 | 0.1 | 3 | 30 | 70 | 6 |
| ESRR714 03001035 | 3 | 0.1 | 3 | 35 | 75 | 6 |
| ESRR714 03001040 | 3 | 0.1 | 3 | 40 | 80 | 6 |
| ESRR714 03001045 | 3 | 0.1 | 3 | 45 | 90 | 6 |
| ESRR714 03002008 | 3 | 0.2 | 3 | 8 | 45 | 6 |
| ESRR714 03002010 | 3 | 0.2 | 3 | 10 | 50 | 6 |
| ESRR714 03002012 | 3 | 0.2 | 3 | 12 | 50 | 6 |
| ESRR714 03002014 | 3 | 0.2 | 3 | 14 | 50 | 6 |
| ESRR714 03002016 | 3 | 0.2 | 3 | 16 | 55 | 6 |
| ESRR714 03002020 | 3 | 0.2 | 3 | 20 | 60 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 03002025 | 3 | 0.2 | 3 | 25 | 65 | 6 |
| ESRR714 03002030 | 3 | 0.2 | 3 | 30 | 70 | 6 |
| ESRR714 03002035 | 3 | 0.2 | 3 | 35 | 75 | 6 |
| ESRR714 03002040 | 3 | 0.2 | 3 | 40 | 80 | 6 |
| ESRR714 03002045 | 3 | 0.2 | 3 | 45 | 90 | 6 |
| ESRR714 03003008 | 3 | 0.3 | 3 | 8 | 45 | 6 |
| ESRR714 03003010 | 3 | 0.3 | 3 | 10 | 50 | 6 |
| ESRR714 03003012 | 3 | 0.3 | 3 | 12 | 50 | 6 |
| ESRR714 03003014 | 3 | 0.3 | 3 | 14 | 50 | 6 |
| ESRR714 03003016 | 3 | 0.3 | 3 | 16 | 55 | 6 |
| ESRR714 03003020 | 3 | 0.3 | 3 | 20 | 60 | 6 |
| ESRR714 03003025 | 3 | 0.3 | 3 | 25 | 65 | 6 |
| ESRR714 03003030 | 3 | 0.3 | 3 | 30 | 70 | 6 |
| ESRR714 03003035 | 3 | 0.3 | 3 | 35 | 75 | 6 |
| ESRR714 03003040 | 3 | 0.3 | 3 | 40 | 80 | 6 |
| ESRR714 03003045 | 3 | 0.3 | 3 | 45 | 90 | 6 |
| ESRR714 03005008 | 3 | 0.5 | 3 | 8 | 45 | 6 |
| ESRR714 03005010 | 3 | 0.5 | 3 | 10 | 50 | 6 |
| ESRR714 03005012 | 3 | 0.5 | 3 | 12 | 50 | 6 |
| ESRR714 03005014 | 3 | 0.5 | 3 | 14 | 50 | 6 |
| ESRR714 03005016 | 3 | 0.5 | 3 | 16 | 55 | 6 |
| ESRR714 03005020 | 3 | 0.5 | 3 | 20 | 60 | 6 |
| ESRR714 03005025 | 3 | 0.5 | 3 | 25 | 65 | 6 |
| ESRR714 03005030 | 3 | 0.5 | 3 | 30 | 70 | 6 |
| ESRR714 03005035 | 3 | 0.5 | 3 | 35 | 75 | 6 |
| ESRR714 03005040 | 3 | 0.5 | 3 | 40 | 80 | 6 |
| ESRR714 03005045 | 3 | 0.5 | 3 | 45 | 90 | 6 |
| ESRR714 03005050 | 3 | 0.5 | 3 | 50 | 100 | 6 |
| ESRR714 03010008 | 3 | 1 | 3 | 8 | 45 | 6 |
| ESRR714 03010010 | 3 | 1 | 3 | 10 | 50 | 6 |
| ESRR714 03010012 | 3 | 1 | 3 | 12 | 50 | 6 |
| ESRR714 03010014 | 3 | 1 | 3 | 14 | 50 | 6 |
| ESRR714 03010016 | 3 | 1 | 3 | 16 | 55 | 6 |
| ESRR714 03010020 | 3 | 1 | 3 | 20 | 60 | 6 |
| ESRR714 03010025 | 3 | 1 | 3 | 25 | 65 | 6 |
| ESRR714 03010030 | 3 | 1 | 3 | 30 | 70 | 6 |
| ESRR714 03010035 | 3 | 1 | 3 | 35 | 75 | 6 |
| ESRR714 03010040 | 3 | 1 | 3 | 40 | 80 | 6 |
| ESRR714 03010045 | 3 | 1 | 3 | 45 | 90 | 6 |
| ESRR714 03010050 | 3 | 1 | 3 | 50 | 100 | 6 |
| ESRR714 04001010 | 4 | 0.1 | 4 | 10 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 04001012 | 4 | 0.1 | 4 | 12 | 50 | 6 |
| ESRR714 04001013 | 4 | 0.1 | 4 | 13 | 55 | 6 |
| ESRR714 04001016 | 4 | 0.1 | 4 | 16 | 55 | 6 |
| ESRR714 04001020 | 4 | 0.1 | 4 | 20 | 60 | 6 |
| ESRR714 04001025 | 4 | 0.1 | 4 | 25 | 65 | 6 |
| ESRR714 04001030 | 4 | 0.1 | 4 | 30 | 70 | 6 |
| ESRR714 04001035 | 4 | 0.1 | 4 | 35 | 75 | 6 |
| ESRR714 04001040 | 4 | 0.1 | 4 | 40 | 80 | 6 |
| ESRR714 04001045 | 4 | 0.1 | 4 | 45 | 90 | 6 |
| ESRR714 04001050 | 4 | 0.1 | 4 | 50 | 100 | 6 |
| ESRR714 04002010 | 4 | 0.2 | 4 | 10 | 50 | 6 |
| ESRR714 04002012 | 4 | 0.2 | 4 | 12 | 50 | 6 |
| ESRR714 04002013 | 4 | 0.2 | 4 | 13 | 55 | 6 |
| ESRR714 04002016 | 4 | 0.2 | 4 | 16 | 55 | 6 |
| ESRR714 04002020 | 4 | 0.2 | 4 | 20 | 60 | 6 |
| ESRR714 04002025 | 4 | 0.2 | 4 | 25 | 65 | 6 |
| ESRR714 04002030 | 4 | 0.2 | 4 | 30 | 70 | 6 |
| ESRR714 04002035 | 4 | 0.2 | 4 | 35 | 75 | 6 |
| ESRR714 04002040 | 4 | 0.2 | 4 | 40 | 80 | 6 |
| ESRR714 04002045 | 4 | 0.2 | 4 | 45 | 90 | 6 |
| ESRR714 04002050 | 4 | 0.2 | 4 | 50 | 100 | 6 |
| ESRR714 04003010 | 4 | 0.3 | 4 | 10 | 50 | 6 |
| ESRR714 04003012 | 4 | 0.3 | 4 | 12 | 50 | 6 |
| ESRR714 04003013 | 4 | 0.3 | 4 | 13 | 55 | 6 |
| ESRR714 04003016 | 4 | 0.3 | 4 | 16 | 55 | 6 |
| ESRR714 04003020 | 4 | 0.3 | 4 | 20 | 60 | 6 |
| ESRR714 04003025 | 4 | 0.3 | 4 | 25 | 65 | 6 |
| ESRR714 04003030 | 4 | 0.3 | 4 | 30 | 70 | 6 |
| ESRR714 04003035 | 4 | 0.3 | 4 | 35 | 75 | 6 |
| ESRR714 04003040 | 4 | 0.3 | 4 | 40 | 80 | 6 |
| ESRR714 04003045 | 4 | 0.3 | 4 | 45 | 90 | 6 |
| ESRR714 04003050 | 4 | 0.3 | 4 | 50 | 100 | 6 |
| ESRR714 04005010 | 4 | 0.5 | 4 | 10 | 50 | 6 |
| ESRR714 04005012 | 4 | 0.5 | 4 | 12 | 50 | 6 |
| ESRR714 04005013 | 4 | 0.5 | 4 | 13 | 55 | 6 |
| ESRR714 04005016 | 4 | 0.5 | 4 | 16 | 55 | 6 |
| ESRR714 04005020 | 4 | 0.5 | 4 | 20 | 60 | 6 |
| ESRR714 04005025 | 4 | 0.5 | 4 | 25 | 65 | 6 |
| ESRR714 04005030 | 4 | 0.5 | 4 | 30 | 70 | 6 |
| ESRR714 04005035 | 4 | 0.5 | 4 | 35 | 75 | 6 |
| ESRR714 04005040 | 4 | 0.5 | 4 | 40 | 80 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 04005045 | 4 | 0.5 | 4 | 45 | 90 | 6 |
| ESRR714 04005050 | 4 | 0.5 | 4 | 50 | 100 | 6 |
| ESRR714 04005055 | 4 | 0.5 | 4 | 55 | 100 | 6 |
| ESRR714 04010010 | 4 | 1 | 4 | 10 | 50 | 6 |
| ESRR714 04010012 | 4 | 1 | 4 | 12 | 50 | 6 |
| ESRR714 04010013 | 4 | 1 | 4 | 13 | 55 | 6 |
| ESRR714 04010016 | 4 | 1 | 4 | 16 | 55 | 6 |
| ESRR714 04010020 | 4 | 1 | 4 | 20 | 60 | 6 |
| ESRR714 04010025 | 4 | 1 | 4 | 25 | 65 | 6 |
| ESRR714 04010030 | 4 | 1 | 4 | 30 | 70 | 6 |
| ESRR714 04010035 | 4 | 1 | 4 | 35 | 75 | 6 |
| ESRR714 04010040 | 4 | 1 | 4 | 40 | 80 | 6 |
| ESRR714 04010045 | 4 | 1 | 4 | 45 | 90 | 6 |
| ESRR714 04010050 | 4 | 1 | 4 | 50 | 100 | 6 |
| ESRR714 04010055 | 4 | 1 | 4 | 55 | 100 | 6 |
| ESRR714 05001016 | 5 | 0.1 | 5 | 16 | 60 | 6 |
| ESRR714 05001030 | 5 | 0.1 | 5 | 30 | 70 | 6 |
| ESRR714 05001040 | 5 | 0.1 | 5 | 40 | 80 | 6 |
| ESRR714 05002016 | 5 | 0.2 | 5 | 16 | 60 | 6 |
| ESRR714 05002030 | 5 | 0.2 | 5 | 30 | 70 | 6 |
| ESRR714 05002040 | 5 | 0.2 | 5 | 40 | 80 | 6 |
| ESRR714 05003016 | 5 | 0.3 | 5 | 16 | 60 | 6 |
| ESRR714 05003030 | 5 | 0.3 | 5 | 30 | 70 | 6 |
| ESRR714 05003040 | 5 | 0.3 | 5 | 40 | 80 | 6 |
| ESRR714 05005016 | 5 | 0.5 | 5 | 16 | 60 | 6 |
| ESRR714 05005030 | 5 | 0.5 | 5 | 30 | 70 | 6 |
| ESRR714 05005040 | 5 | 0.5 | 5 | 40 | 80 | 6 |
| ESRR714 05005050 | 5 | 0.5 | 5 | 50 | 100 | 6 |
| ESRR714 05005060 | 5 | 0.5 | 5 | 60 | 110 | 6 |
| ESRR714 05010016 | 5 | 1 | 5 | 16 | 60 | 6 |
| ESRR714 05010030 | 5 | 1 | 5 | 30 | 70 | 6 |
| ESRR714 05010040 | 5 | 1 | 5 | 40 | 80 | 6 |
| ESRR714 05010050 | 5 | 1 | 5 | 50 | 100 | 6 |
| ESRR714 05010060 | 5 | 1 | 5 | 60 | 110 | 6 |
| ESRR714 05015015 | 5 | 1.5 | 5 | 15 | 60 | 6 |
| ESRR714 05020015 | 5 | 2 | 5 | 15 | 60 | 6 |
| ESRR714 06001020 | 6 | 0.1 | 7 | 20 | 60 | 6 |
| ESRR714 06001040 | 6 | 0.1 | 7 | 40 | 80 | 6 |
| ESRR714 06001050 | 6 | 0.1 | 7 | 50 | 100 | 6 |
| ESRR714 06002020 | 6 | 0.2 | 7 | 20 | 60 | 6 |
| ESRR714 06002040 | 6 | 0.2 | 7 | 40 | 80 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 06002050 | 6 | 0.2 | 7 | 50 | 100 | 6 |
| ESRR714 06003020 | 6 | 0.3 | 7 | 20 | 60 | 6 |
| ESRR714 06003030 | 6 | 0.3 | 7 | 30 | 70 | 6 |
| ESRR714 06003040 | 6 | 0.3 | 7 | 40 | 80 | 6 |
| ESRR714 06003050 | 6 | 0.3 | 7 | 50 | 100 | 6 |
| ESRR714 06005020 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| ESRR714 06005030 | 6 | 0.5 | 7 | 30 | 70 | 6 |
| ESRR714 06005040 | 6 | 0.5 | 7 | 40 | 80 | 6 |
| ESRR714 06005050 | 6 | 0.5 | 7 | 50 | 100 | 6 |
| ESRR714 06005060 | 6 | 0.5 | 7 | 60 | 110 | 6 |
| ESRR714 06010020 | 6 | 1 | 7 | 20 | 60 | 6 |
| ESRR714 06010030 | 6 | 1 | 7 | 30 | 70 | 6 |
| ESRR714 06010040 | 6 | 1 | 7 | 40 | 80 | 6 |
| ESRR714 06010050 | 6 | 1 | 7 | 50 | 100 | 6 |
| ESRR714 06010060 | 6 | 1 | 7 | 60 | 110 | 6 |
| ESRR714 06015020 | 6 | 1.5 | 7 | 20 | 60 | 6 |
| ESRR714 06015040 | 6 | 1.5 | 7 | 40 | 80 | 6 |
| ESRR714 06015050 | 6 | 1.5 | 7 | 50 | 100 | 6 |
| ESRR714 06020020 | 6 | 2 | 7 | 20 | 60 | 6 |
| ESRR714 06020030 | 6 | 2 | 7 | 30 | 70 | 6 |
| ESRR714 06020040 | 6 | 2 | 7 | 40 | 80 | 6 |
| ESRR714 06020050 | 6 | 2 | 7 | 50 | 100 | 6 |
| ESRR714 08001025 | 8 | 0.1 | 9 | 25 | 70 | 8 |
| ESRR714 08002022 | 8 | 0.2 | 9 | 22 | 65 | 8 |
| ESRR714 08002040 | 8 | 0.2 | 9 | 40 | 100 | 8 |
| ESRR714 08003022 | 8 | 0.3 | 9 | 22 | 65 | 8 |
| ESRR714 08003040 | 8 | 0.3 | 9 | 40 | 100 | 8 |
| ESRR714 08005022 | 8 | 0.5 | 9 | 22 | 65 | 8 |
| ESRR714 08005035 | 8 | 0.5 | 9 | 35 | 100 | 8 |
| ESRR714 08005040 | 8 | 0.5 | 9 | 40 | 100 | 8 |
| ESRR714 08005050 | 8 | 0.5 | 9 | 50 | 120 | 8 |
| ESRR714 08005060 | 8 | 0.5 | 9 | 60 | 120 | 8 |
| ESRR714 08010022 | 8 | 1 | 9 | 22 | 65 | 8 |
| ESRR714 08010035 | 8 | 1 | 9 | 35 | 100 | 8 |
| ESRR714 08010040 | 8 | 1 | 9 | 40 | 100 | 8 |
| ESRR714 08010050 | 8 | 1 | 9 | 50 | 120 | 8 |
| ESRR714 08010060 | 8 | 1 | 9 | 60 | 120 | 8 |
| ESRR714 08015022 | 8 | 1.5 | 9 | 22 | 65 | 8 |
| ESRR714 08015040 | 8 | 1.5 | 9 | 40 | 100 | 8 |
| ESRR714 08020022 | 8 | 2 | 9 | 22 | 65 | 8 |
| ESRR714 08020040 | 8 | 2 | 9 | 40 | 100 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRR714 | 4 FLUTES RIB RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 08020050 | 8 | 2 | 9 | 50 | 120 | 8 |
| ESRR714 10001030 | 10 | 0.1 | 11 | 30 | 75 | 10 |
| ESRR714 10002024 | 10 | 0.2 | 11 | 24 | 70 | 10 |
| ESRR714 10002040 | 10 | 0.2 | 11 | 40 | 100 | 10 |
| ESRR714 10003024 | 10 | 0.3 | 11 | 24 | 70 | 10 |
| ESRR714 10003040 | 10 | 0.3 | 11 | 40 | 100 | 10 |
| ESRR714 10005024 | 10 | 0.5 | 11 | 24 | 70 | 10 |
| ESRR714 10005040 | 10 | 0.5 | 11 | 40 | 100 | 10 |
| ESRR714 10005050 | 10 | 0.5 | 11 | 50 | 120 | 10 |
| ESRR714 10005060 | 10 | 0.5 | 11 | 60 | 120 | 10 |
| ESRR714 10010024 | 10 | 1 | 11 | 24 | 70 | 10 |
| ESRR714 10010040 | 10 | 1 | 11 | 40 | 100 | 10 |
| ESRR714 10010050 | 10 | 1 | 11 | 50 | 120 | 10 |
| ESRR714 10010060 | 10 | 1 | 11 | 60 | 120 | 10 |
| ESRR714 10015024 | 10 | 1.5 | 11 | 24 | 70 | 10 |
| ESRR714 10015040 | 10 | 1.5 | 11 | 40 | 100 | 10 |
| ESRR714 10020024 | 10 | 2 | 11 | 24 | 70 | 10 |
| ESRR714 10020040 | 10 | 2 | 11 | 40 | 100 | 10 |
| ESRR714 10020050 | 10 | 2 | 11 | 50 | 120 | 10 |
| ESRR714 10025024 | 10 | 2.5 | 11 | 24 | 70 | 10 |
| ESRR714 12002032 | 12 | 0.2 | 13 | 32 | 80 | 12 |

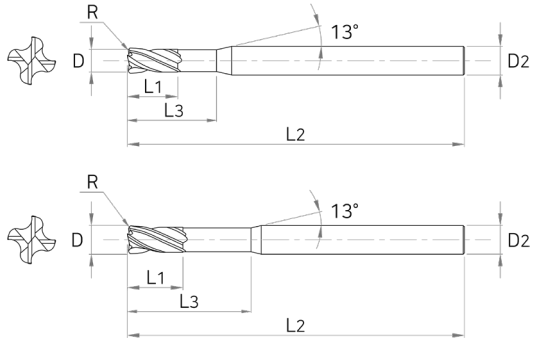
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRR714 12003026 | 12 | 0.3 | 13 | 26 | 80 | 12 |
| ESRR714 12003045 | 12 | 0.3 | 13 | 45 | 110 | 12 |
| ESRR714 12005026 | 12 | 0.5 | 13 | 26 | 80 | 12 |
| ESRR714 12005040 | 12 | 0.5 | 13 | 40 | 110 | 12 |
| ESRR714 12005060 | 12 | 0.5 | 13 | 60 | 130 | 12 |
| ESRR714 12010026 | 12 | 1 | 13 | 26 | 80 | 12 |
| ESRR714 12010040 | 12 | 1 | 13 | 40 | 110 | 12 |
| ESRR714 12010060 | 12 | 1 | 13 | 60 | 130 | 12 |
| ESRR714 12015026 | 12 | 1.5 | 13 | 26 | 80 | 12 |
| ESRR714 12020026 | 12 | 2 | 13 | 26 | 80 | 12 |
| ESRR714 12020040 | 12 | 2 | 13 | 40 | 110 | 12 |
| ESRR714 12030026 | 12 | 3 | 13 | 26 | 80 | 12 |
| ESRR714 16005035 | 16 | 0.5 | 20 | 35 | 100 | 16 |
| ESRR714 16005050 | 16 | 0.5 | 35 | 50 | 150 | 16 |
| ESRR714 16010035 | 16 | 1 | 20 | 35 | 100 | 16 |
| ESRR714 16010050 | 16 | 1 | 35 | 50 | 150 | 16 |
| ESRR714 20005040 | 20 | 0.5 | 25 | 40 | 100 | 20 |
| ESRR714 20005055 | 20 | 0.5 | 40 | 55 | 150 | 20 |
| ESRR714 20010040 | 20 | 1 | 25 | 40 | 100 | 20 |
| ESRR714 20010055 | 20 | 1 | 40 | 55 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESXR704 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h5 |

CARBIDE | AlTiN | 4 | M HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.590

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESXR704 01000504 | 1 | 0.05 | 1.5 | 4 | 45 | 4 |
| ESXR704 02000506 | 2 | 0.05 | 3 | 6 | 45 | 4 |
| ESXR704 02000507 | 2 | 0.05 | 2.5 | 7 | 50 | 4 |
| ESXR704 0200107 | 2 | 0.1 | 2.5 | 7 | 50 | 4 |
| ESXR704 0300107 | 3 | 0.1 | 4 | 7 | 45 | 6 |
| ESXR704 0300109 | 3 | 0.1 | 4 | 9 | 55 | 6 |
| ESXR704 0300209 | 3 | 0.2 | 4 | 9 | 55 | 6 |
| ESXR704 0300309 | 3 | 0.3 | 4 | 9 | 55 | 6 |
| ESXR704 0300312 | 3 | 0.3 | 4 | 12 | 55 | 6 |
| ESXR704 0300316 | 3 | 0.3 | 4 | 16 | 55 | 6 |
| ESXR704 0400109 | 4 | 0.1 | 5 | 9 | 45 | 6 |
| ESXR704 0400212 | 4 | 0.2 | 5 | 12 | 55 | 6 |
| ESXR704 0400212S4 | 4 | 0.2 | 5 | 12 | 55 | 4 |
| ESXR704 0400312 | 4 | 0.3 | 5 | 12 | 55 | 6 |
| ESXR704 0400316 | 4 | 0.3 | 5 | 16 | 55 | 6 |
| ESXR704 0400320 | 4 | 0.3 | 5 | 20 | 55 | 6 |
| ESXR704 0400512 | 4 | 0.5 | 5 | 12 | 55 | 6 |
| ESXR704 0400516 | 4 | 0.5 | 5 | 16 | 55 | 6 |
| ESXR704 0400516S4 | 4 | 0.5 | 5 | 16 | 55 | 4 |
| ESXR704 0400520 | 4 | 0.5 | 5 | 20 | 55 | 6 |
| ESXR704 0401012 | 4 | 1 | 5 | 12 | 55 | 6 |
| ESXR704 0500116 | 5 | 0.1 | 6 | 16 | 60 | 6 |
| ESXR704 0500216 | 5 | 0.2 | 6 | 16 | 60 | 6 |
| ESXR704 0500316 | 5 | 0.3 | 6 | 16 | 60 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESXR704 0500516 | 5 | 0.5 | 6 | 16 | 60 | 6 |
| ESXR704 0501016 | 5 | 1 | 6 | 16 | 60 | 6 |
| ESXR704 0600120 | 6 | 0.1 | 7 | 20 | 60 | 6 |
| ESXR704 0600214 | 6 | 0.2 | 7 | 14 | 50 | 6 |
| ESXR704 0600220 | 6 | 0.2 | 7 | 20 | 60 | 6 |
| ESXR704 0600320 | 6 | 0.3 | 7 | 20 | 60 | 6 |
| ESXR704 0600520 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| ESXR704 0601020 | 6 | 1 | 7 | 20 | 60 | 6 |
| ESXR704 0601520 | 6 | 1.5 | 7 | 20 | 60 | 6 |
| ESXR704 0800125 | 8 | 0.1 | 9 | 25 | 60 | 8 |
| ESXR704 0800218 | 8 | 0.2 | 9 | 18 | 60 | 8 |
| ESXR704 0800225 | 8 | 0.2 | 9 | 25 | 60 | 8 |
| ESXR704 0800325 | 8 | 0.3 | 9 | 25 | 60 | 8 |
| ESXR704 0800525 | 8 | 0.5 | 9 | 25 | 60 | 8 |
| ESXR704 0801025 | 8 | 1 | 9 | 25 | 60 | 8 |
| ESXR704 0801525 | 8 | 1.5 | 9 | 25 | 60 | 8 |
| ESXR704 0802025 | 8 | 2 | 9 | 25 | 60 | 8 |
| ESXR704 1000225 | 10 | 0.2 | 12 | 25 | 75 | 10 |
| ESXR704 1000232 | 10 | 0.2 | 11 | 32 | 75 | 10 |
| ESXR704 1000332 | 10 | 0.3 | 11 | 32 | 75 | 10 |
| ESXR704 1000532 | 10 | 0.5 | 11 | 32 | 75 | 10 |
| ESXR704 1001032 | 10 | 1 | 11 | 32 | 75 | 10 |
| ESXR704 1001532 | 10 | 1.5 | 11 | 32 | 75 | 10 |
| ESXR704 1002032 | 10 | 2 | 11 | 32 | 75 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESXR704 | 4 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESXR704 1200238 | 12 | 0.2 | 12 | 38 | 75 | 12 |
| ESXR704 1200330 | 12 | 0.3 | 15 | 30 | 75 | 12 |
| ESXR704 1200338 | 12 | 0.3 | 12 | 38 | 75 | 12 |
| ESXR704 1200538 | 12 | 0.5 | 12 | 38 | 75 | 12 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESXR704 1201038 | 12 | 1 | 12 | 38 | 75 | 12 |
| ESXR704 1201538 | 12 | 1.5 | 12 | 38 | 75 | 12 |
| ESXR704 1202038 | 12 | 2 | 12 | 38 | 75 | 12 |

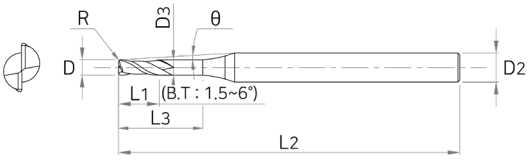


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.616

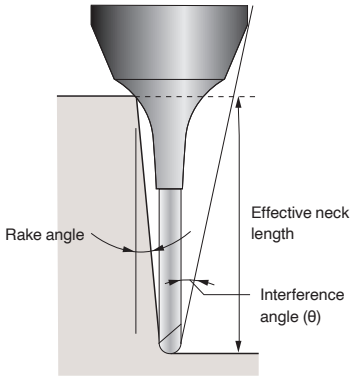
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNR2002-0.5-005 | 0.2 | 0.05 | 0.15 | 0.5 | 0.17 | 50 | 4 | 11.4 | 0.9 | 1 | 1 | 1.1 | 12 |
| ESLNR2002-1-005 | 0.2 | 0.05 | 0.15 | 1 | 0.17 | 50 | 4 | 10.9 | 1.6 | 1.7 | 1.9 | 2 | 2.3 |
| ESLNR2002-1.5-005 | 0.2 | 0.05 | 0.15 | 1.5 | 0.17 | 50 | 4 | 10.3 | 2.1 | 2.3 | 2.5 | 2.7 | 3 |
| ESLNR2002-2-005 | 0.2 | 0.05 | 0.15 | 2 | 0.17 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNR2003-1-005 | 0.3 | 0.05 | 0.25 | 1 | 0.27 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ESLNR2003-1.5-005 | 0.3 | 0.05 | 0.25 | 1.5 | 0.27 | 50 | 4 | 10.3 | 2.1 | 2.3 | 2.5 | 2.7 | 3 |
| ESLNR2003-2.5-005 | 0.3 | 0.05 | 0.25 | 2.5 | 0.27 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ESLNR2003-2-005 | 0.3 | 0.05 | 0.25 | 2 | 0.27 | 50 | 4 | 9.4 | 3.2 | 3.5 | 3.7 | 3.9 | 4.3 |
| ESLNR2003-3-005 | 0.3 | 0.05 | 0.25 | 3 | 0.27 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ESLNR2004-1-005 | 0.4 | 0.05 | 0.3 | 1 | 0.37 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ESLNR2004-1.5-005 | 0.4 | 0.05 | 0.3 | 1.5 | 0.37 | 50 | 4 | 10.3 | 2 | 2.1 | 2.2 | 2.3 | 2.5 |
| ESLNR2004-2-005 | 0.4 | 0.05 | 0.3 | 2 | 0.37 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ESLNR2004-2.5-005 | 0.4 | 0.05 | 0.3 | 2.5 | 0.37 | 50 | 4 | 9.4 | 3.2 | 3.5 | 3.7 | 3.9 | 4.3 |
| ESLNR2004-3-005 | 0.4 | 0.05 | 0.3 | 3 | 0.37 | 50 | 4 | 9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ESLNR2004-3.5-005 | 0.4 | 0.05 | 0.3 | 3.5 | 0.37 | 50 | 4 | 8.6 | 4.3 | 4.6 | 4.9 | 5.1 | 5.5 |
| ESLNR2004-4-005 | 0.4 | 0.05 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNR2004-2-01 | 0.4 | 0.1 | 0.3 | 2 | 0.37 | 50 | 4 | 9.8 | 2.7 | 2.9 | 3.1 | 3.3 | 3.6 |
| ESLNR2004-3-01 | 0.4 | 0.1 | 0.3 | 3 | 0.37 | 50 | 4 | 9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ESLNR2004-4-01 | 0.4 | 0.1 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.8 | 6.1 | 6.6 |
| ESLNR2005-1-005 | 0.5 | 0.05 | 0.35 | 1 | 0.47 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ESLNR2005-2-005 | 0.5 | 0.05 | 0.35 | 2 | 0.47 | 50 | 4 | 9.7 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ESLNR2005-3-005 | 0.5 | 0.05 | 0.35 | 3 | 0.47 | 50 | 4 | 8.9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ESLNR2005-4-005 | 0.5 | 0.05 | 0.35 | 4 | 0.47 | 50 | 4 | 8.2 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ESLNR2005-5-005 | 0.5 | 0.05 | 0.35 | 5 | 0.47 | 50 | 4 | 7.6 | 6.1 | 6.6 | 6.9 | 7.3 | 7.8 |

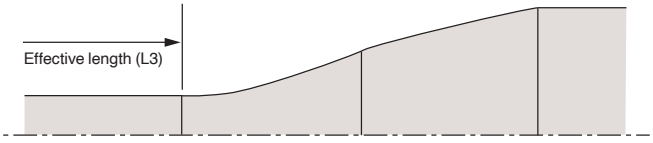
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNR2005-6-005 | 0.5 | 0.05 | 0.35 | 6 | 0.47 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNR2005-1-01 | 0.5 | 0.1 | 0.35 | 1 | 0.47 | 50 | 4 | 10.8 | 1.4 | 1.5 | 1.6 | 1.7 | 1.9 |
| ESLNR2005-2-01 | 0.5 | 0.1 | 0.35 | 2 | 0.47 | 50 | 4 | 9.8 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ESLNR2005-3-01 | 0.5 | 0.1 | 0.35 | 3 | 0.47 | 50 | 4 | 8.9 | 3.8 | 4 | 4.3 | 4.5 | 4.9 |
| ESLNR2005-4-01 | 0.5 | 0.1 | 0.35 | 4 | 0.47 | 50 | 4 | 8.2 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ESLNR2005-5-01 | 0.5 | 0.1 | 0.35 | 5 | 0.47 | 50 | 4 | 7.6 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ESLNR2005-6-01 | 0.5 | 0.1 | 0.35 | 6 | 0.47 | 50 | 4 | 7.1 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNR2006-2-01 | 0.6 | 0.1 | 0.4 | 2 | 0.57 | 50 | 4 | 9.7 | 2.5 | 2.6 | 2.8 | 2.9 | 3.1 |
| ESLNR2006-4-01 | 0.6 | 0.1 | 0.4 | 4 | 0.57 | 50 | 4 | 8.1 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ESLNR2006-6-01 | 0.6 | 0.1 | 0.4 | 6 | 0.57 | 50 | 4 | 7 | 7.2 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNR2006-8-01 | 0.6 | 0.1 | 0.4 | 8 | 0.57 | 50 | 4 | 6.1 | 9.3 | 9.9 | 10.3 | 10.7 | 11 |
| ESLNR2006-10-01 | 0.6 | 0.1 | 0.4 | 10 | 0.57 | 50 | 4 | 5.5 | 11.5 | 12.1 | 12.5 | 13 | 13.7 |
| ESLNR2008-4-01 | 0.8 | 0.1 | 0.5 | 4 | 0.77 | 50 | 4 | 8 | 4.8 | 5.2 | 5.4 | 5.7 | 6.1 |
| ESLNR2008-6-01 | 0.8 | 0.1 | 0.5 | 6 | 0.77 | 50 | 4 | 6.8 | 7 | 7.4 | 7.7 | 7.9 | 8.4 |
| ESLNR2008-8-01 | 0.8 | 0.1 | 0.5 | 8 | 0.77 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNR2008-12-01 | 0.8 | 0.1 | 0.5 | 12 | 0.77 | 50 | 4 | 4.7 | 13.6 | 14.2 | 14.7 | 15.2 | 16 |
| ESLNR2008-4-02 | 0.8 | 0.2 | 0.5 | 4 | 0.77 | 50 | 4 | 8 | 4.8 | 5.1 | 5.4 | 5.6 | 6.1 |
| ESLNR2008-6-02 | 0.8 | 0.2 | 0.5 | 6 | 0.77 | 50 | 4 | 6.9 | 7 | 7.3 | 7.7 | 7.9 | 8.4 |
| ESLNR2010-4-01 | 1 | 0.1 | 0.8 | 4 | 0.94 | 50 | 4 | 7.7 | 4.7 | 4.9 | 5.1 | 5.2 | 5.5 |
| ESLNR2010-6-01 | 1 | 0.1 | 0.8 | 6 | 0.94 | 50 | 4 | 6.6 | 7.1 | 7.4 | 7.7 | 8 | 8.5 |
| ESLNR2010-8-01 | 1 | 0.1 | 0.8 | 8 | 0.94 | 50 | 4 | 5.7 | 9.2 | 9.6 | 9.9 | 10.2 | 10.8 |
| ESLNR2010-10-01 | 1 | 0.1 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1 | 11.6 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNR2010-12-01 | 1 | 0.1 | 0.8 | 12 | 0.94 | 55 | 4 | 4.5 | 13.7 | 14.3 | 14.8 | 15.3 | 16 |
| ESLNR2010-16-01 | 1 | 0.1 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8 | 17.9 | 18.6 | 19.2 | 19.7 | 21.3 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNR2010-20-01 | 1 | 0.1 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2 | 22 | 22.8 | 23.5 | 24 | 26.7 |
| ESLNR2010-4-02 | 1 | 0.2 | 0.8 | 4 | 0.94 | 50 | 4 | 7.8 | 4.7 | 4.9 | 5.1 | 5.2 | 5.5 |
| ESLNR2010-6-02 | 1 | 0.2 | 0.8 | 6 | 0.94 | 50 | 4 | 6.6 | 7.1 | 7.4 | 7.7 | 8 | 8.5 |
| ESLNR2010-8-02 | 1 | 0.2 | 0.8 | 8 | 0.94 | 50 | 4 | 5.8 | 9.2 | 9.6 | 9.9 | 10.2 | 10.8 |
| ESLNR2010-10-02 | 1 | 0.2 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1 | 11.6 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNR2010-12-02 | 1 | 0.2 | 0.8 | 12 | 0.94 | 55 | 4 | 4.6 | 13.7 | 14.3 | 14.8 | 15.2 | 16 |
| ESLNR2010-16-02 | 1 | 0.2 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8 | 17.9 | 18.6 | 19.2 | 19.7 | 21.3 |
| ESLNR2010-20-02 | 1 | 0.2 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2 | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ESLNR2010-6-03 | 1 | 0.3 | 0.8 | 6 | 0.94 | 50 | 4 | 6.7 | 7.1 | 7.4 | 7.7 | 8 | 8.4 |
| ESLNR2010-10-03 | 1 | 0.3 | 0.8 | 10 | 0.94 | 50 | 4 | 5.1 | 11.5 | 12.1 | 12.6 | 13 | 13.7 |
| ESLNR2010-16-03 | 1 | 0.3 | 0.8 | 16 | 0.94 | 60 | 4 | 3.8 | 17.9 | 18.6 | 19.1 | 19.6 | 21.3 |
| ESLNR2010-20-03 | 1 | 0.3 | 0.8 | 20 | 0.94 | 60 | 4 | 3.2 | 22 | 22.8 | 23.5 | 24 | 26.6 |
| ESLNR2015-4-01 | 1.5 | 0.1 | 1.35 | 4 | 1.42 | 50 | 4 | 7.2 | 4.8 | 4.9 | 5.1 | 5.3 | 5.5 |
| ESLNR2015-8-01 | 1.5 | 0.1 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ESLNR2015-12-01 | 1.5 | 0.1 | 1.35 | 12 | 1.42 | 55 | 4 | 4 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ESLNR2015-15-01 | 1.5 | 0.1 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.6 | 18.1 | 18.6 | 20.1 |
| ESLNR2015-20-01 | 1.5 | 0.1 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNR2015-4-02 | 1.5 | 0.2 | 1.35 | 4 | 1.42 | 50 | 4 | 7.3 | 4.7 | 4.9 | 5.1 | 5.3 | 5.5 |
| ESLNR2015-8-02 | 1.5 | 0.2 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ESLNR2015-12-02 | 1.5 | 0.2 | 1.35 | 12 | 1.42 | 55 | 4 | 4.1 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ESLNR2015-15-02 | 1.5 | 0.2 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.5 | 18.1 | 18.6 | 20 |
| ESLNR2015-20-02 | 1.5 | 0.2 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNR2015-8-03 | 1.5 | 0.3 | 1.35 | 8 | 1.42 | 50 | 4 | 5.2 | 9.2 | 9.6 | 10 | 10.3 | 10.8 |
| ESLNR2015-15-03 | 1.5 | 0.3 | 1.35 | 15 | 1.42 | 55 | 4 | 3.5 | 16.9 | 17.5 | 18.1 | 18.6 | 20 |
| ESLNR2015-20-03 | 1.5 | 0.3 | 1.35 | 20 | 1.42 | 60 | 4 | 2.8 | 22.1 | 22.9 | 23.5 | 24 | - |
| ESLNR2020-6-02 | 2 | 0.2 | 1.7 | 6 | 1.92 | 50 | 4 | 5.4 | 6.8 | 7.1 | 7.3 | 7.5 | 8.1 |
| ESLNR2020-8-02 | 2 | 0.2 | 1.7 | 8 | 1.92 | 50 | 4 | 4.6 | 8.9 | 9.2 | 9.4 | 9.7 | 10.8 |
| ESLNR2020-12-02 | 2 | 0.2 | 1.7 | 12 | 1.92 | 55 | 4 | 3.5 | 13.4 | 13.9 | 14.3 | 14.7 | 16.1 |
| ESLNR2020-16-02 | 2 | 0.2 | 1.7 | 16 | 1.92 | 55 | 4 | 2.8 | 17.6 | 18.1 | 18.6 | 19.3 | - |
| ESLNR2020-20-02 | 2 | 0.2 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24.1 | - |
| ESLNR2020-25-02 | 2 | 0.2 | 1.7 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.2 | 28.8 | - | - |
| ESLNR2020-30-02 | 2 | 0.2 | 1.7 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.4 | - | - |
| ESLNR2020-8-03 | 2 | 0.3 | 1.7 | 8 | 1.92 | 50 | 4 | 4.6 | 8.9 | 9.2 | 9.4 | 9.7 | 10.7 |
| ESLNR2020-16-03 | 2 | 0.3 | 1.7 | 16 | 1.92 | 55 | 4 | 2.8 | 17.6 | 18.1 | 18.6 | 19.3 | - |
| ESLNR2020-20-03 | 2 | 0.3 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24 | - |
| ESLNR2020-6-05 | 2 | 0.5 | 1.7 | 6 | 1.92 | 50 | 4 | 5.5 | 6.8 | 7.1 | 7.3 | 7.4 | 8 |
| ESLNR2020-8-05 | 2 | 0.5 | 1.7 | 8 | 1.92 | 50 | 4 | 4.7 | 8.9 | 9.2 | 9.4 | 9.6 | 10.7 |
| ESLNR2020-12-05 | 2 | 0.5 | 1.7 | 12 | 1.92 | 55 | 4 | 3.5 | 13.4 | 13.9 | 14.3 | 14.6 | 16 |
| ESLNR2020-16-05 | 2 | 0.5 | 1.7 | 16 | 1.92 | 55 | 4 | 2.9 | 17.6 | 18.1 | 18.6 | 19.2 | - |
| ESLNR2020-20-05 | 2 | 0.5 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.9 | 23.5 | 24 | - |
| ESLNR2020-25-05 | 2 | 0.5 | 1.7 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.1 | 28.8 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNR20 | 2 FLUTES LONG NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNR2020-30-05 | 2 | 0.5 | 1.7 | 30 | 1.92 | 70 | 4 | 1.7 | 32.5 | 33.4 | 34.3 | - | - |
| ESLNR2020-8-08 | 2 | 0.8 | 1.7 | 8 | 1.92 | 50 | 4 | 4.8 | 8.9 | 9.2 | 9.4 | 9.6 | 10.6 |
| ESLNR2020-16-08 | 2 | 0.8 | 1.7 | 16 | 1.92 | 55 | 4 | 2.9 | 17.6 | 18.1 | 18.6 | 19.2 | - |
| ESLNR2020-20-08 | 2 | 0.8 | 1.7 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.8 | 23.5 | 24 | - |
| ESLNR2030-8-02 | 3 | 0.2 | 2.5 | 8 | 2.86 | 55 | 6 | 5.7 | 9 | 9.3 | 9.5 | 9.9 | 10.9 |
| ESLNR2030-12-02 | 3 | 0.2 | 2.5 | 12 | 2.86 | 60 | 6 | 4.5 | 13.1 | 13.5 | 14 | 14.7 | 16.2 |
| ESLNR2030-16-02 | 3 | 0.2 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.5 | 21.6 |
| ESLNR2030-20-02 | 3 | 0.2 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.9 |
| ESLNR2030-30-02 | 3 | 0.2 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ESLNR2030-35-02 | 3 | 0.2 | 2.5 | 35 | 2.86 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.2 | - |
| ESLNR2030-8-03 | 3 | 0.3 | 2.5 | 8 | 2.86 | 55 | 6 | 5.7 | 9 | 9.3 | 9.5 | 9.9 | 10.9 |
| ESLNR2030-16-03 | 3 | 0.3 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.4 | 21.5 |
| ESLNR2030-20-03 | 3 | 0.3 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.8 |
| ESLNR2030-30-03 | 3 | 0.3 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.2 | - |
| ESLNR2030-8-05 | 3 | 0.5 | 2.5 | 8 | 2.86 | 55 | 6 | 5.8 | 9 | 9.3 | 9.5 | 9.8 | 10.8 |
| ESLNR2030-12-05 | 3 | 0.5 | 2.5 | 12 | 2.86 | 60 | 6 | 4.6 | 13.1 | 13.5 | 13.9 | 14.6 | 16.2 |
| ESLNR2030-16-05 | 3 | 0.5 | 2.5 | 16 | 2.86 | 60 | 6 | 3.8 | 17.7 | 18.2 | 18.7 | 19.4 | 21.5 |
| ESLNR2030-20-05 | 3 | 0.5 | 2.5 | 20 | 2.86 | 65 | 6 | 3.2 | 21.8 | 22.4 | 23.1 | 24.2 | 26.8 |
| ESLNR2030-30-05 | 3 | 0.5 | 2.5 | 30 | 2.86 | 75 | 6 | 2.4 | 32.6 | 33.5 | 34.5 | 36.1 | - |
| ESLNR2030-35-05 | 3 | 0.5 | 2.5 | 35 | 2.86 | 80 | 6 | 2.1 | 37.7 | 38.7 | 40.2 | 42.1 | - |

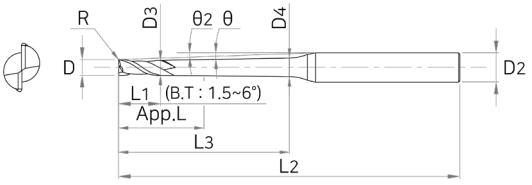


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.619

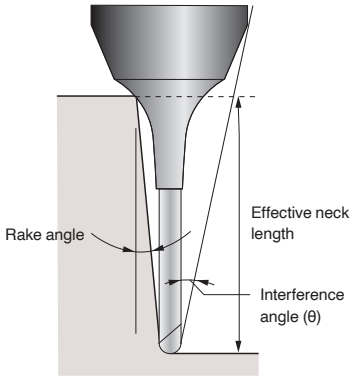
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNR2002-2-09005 | 0.2 | 0.05 | 0.15 | 2 | 0.9 | 0.17 | 0.23 | 50 | 4 | 1.1 | 10 | - | 2.8 | 3.1 | 3.4 | 3.9 |
| ESTNR2004-4-09005 | 0.4 | 0.05 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.4 | - | 4.9 | 5.3 | 5.7 | 6.3 |
| ESTNR2004-5-09005 | 0.4 | 0.05 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.8 | - | 5.9 | 6.4 | 6.8 | 7.5 |
| ESTNR2004-4-0901 | 0.4 | 0.1 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.5 | - | 4.9 | 5.3 | 5.7 | 6.3 |
| ESTNR2004-5-0901 | 0.4 | 0.1 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.9 | - | 5.9 | 6.4 | 6.8 | 7.5 |
| ESTNR2005-5-0901 | 0.5 | 0.1 | 0.35 | 5 | 0.9 | 0.47 | 0.62 | 50 | 4 | 1.3 | 7.8 | - | 5.9 | 6.4 | 6.8 | 7.5 |
| ESTNR2005-8-0901 | 0.5 | 0.1 | 0.35 | 8 | 0.9 | 0.47 | 0.71 | 50 | 4 | 1.3 | 6.4 | - | 9 | 9.7 | 10.2 | 11 |
| ESTNR2005-10-0901 | 0.5 | 0.1 | 0.35 | 10 | 0.9 | 0.47 | 0.77 | 55 | 4 | 1.3 | 5.8 | - | 11 | 11.8 | 12.4 | 13.2 |
| ESTNR2006-12-0901 | 0.6 | 0.1 | 0.4 | 12 | 0.9 | 0.57 | 0.93 | 55 | 4 | 1.35 | 5.1 | - | 13 | 13.9 | 14.5 | 15.5 |
| ESTNR2006-15-0901 | 0.6 | 0.1 | 0.4 | 15 | 0.9 | 0.57 | 13 | 55 | 4 | 1.35 | 4.5 | - | 16.1 | 17.1 | 17.8 | 18.8 |
| ESTNR2008-6-0402 | 0.8 | 0.2 | 0.5 | 6 | 0.4 | 0.77 | 0.85 | 50 | 4 | 2.64 | 7 | 6.6 | 7.1 | 7.5 | 7.8 | 8.3 |
| ESTNR2008-12-0902 | 0.8 | 0.2 | 0.5 | 12 | 0.9 | 0.77 | 1.13 | 55 | 4 | 1.45 | 5 | - | 13 | 13.9 | 14.5 | 15.5 |
| ESTNR2010-8-0402 | 1 | 0.2 | 0.8 | 8 | 0.4 | 0.94 | 14 | 55 | 6 | 5.09 | 7.4 | 8.8 | 9.3 | 9.7 | 10.1 | 10.6 |
| ESTNR2010-10-0902 | 1 | 0.2 | 0.8 | 10 | 0.9 | 0.94 | 1.23 | 55 | 6 | 5.09 | 6.8 | - | 11.2 | 11.9 | 12.4 | 13.3 |
| ESTNR2010-15-0902 | 1 | 0.2 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.6 | - | 16.3 | 17.2 | 17.8 | 18.8 |
| ESTNR2010-20-0902 | 1 | 0.2 | 0.8 | 20 | 0.9 | 0.94 | 1.54 | 65 | 6 | 2.7 | 4.8 | - | 21.3 | 22.4 | 23.2 | 24.7 |
| ESTNR2010-25-0902 | 1 | 0.2 | 0.8 | 25 | 0.9 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.1 | - | 26.4 | 27.6 | 28.5 | 30.9 |
| ESTNR2010-30-0902 | 1 | 0.2 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | - | 31.5 | 32.8 | 33.7 | 37 |
| ESTNR2010-35-0902 | 1 | 0.2 | 0.8 | 35 | 0.9 | 0.94 | 22 | 80 | 6 | 2.7 | 3.3 | - | 36.5 | 38 | 39 | 43.2 |
| ESTNR2010-8-0403 | 1 | 0.3 | 0.8 | 8 | 0.4 | 0.94 | 14 | 55 | 6 | 2.7 | 7.4 | 8.8 | 9.3 | 9.7 | 10 | 10.6 |
| ESTNR2010-15-0903 | 1 | 0.3 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.6 | - | 16.3 | 17.2 | 17.8 | 18.8 |
| ESTNR2010-25-0903 | 1 | 0.3 | 0.8 | 25 | 0.9 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.2 | - | 26.4 | 27.6 | 28.5 | 30.8 |
| ESTNR2010-30-0903 | 1 | 0.3 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | - | 31.5 | 32.8 | 33.7 | 37 |
| ESTNR2015-10-0402 | 1.5 | 0.2 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 7.07 | 6.4 | 11 | 11.5 | 11.9 | 12.3 | 13 |

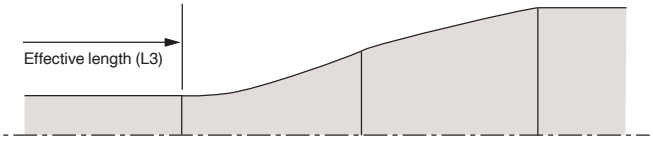
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNR2015-15-0902 | 1.5 | 0.2 | 1.35 | 15 | 0.9 | 1.42 | 1.85 | 60 | 6 | 7.07 | 5.3 | - | 16.4 | 17.3 | 17.9 | 18.9 |
| ESTNR2015-20-0902 | 1.5 | 0.2 | 1.35 | 20 | 0.9 | 1.42 | 21 | 65 | 6 | 3.89 | 4.5 | - | 21.5 | 22.5 | 23.2 | 24.9 |
| ESTNR2015-25-0902 | 1.5 | 0.2 | 1.35 | 25 | 0.9 | 1.42 | 2.16 | 70 | 6 | 3.89 | 3.9 | - | 26.6 | 27.7 | 28.5 | 31 |
| ESTNR2015-30-0902 | 1.5 | 0.2 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | - | 31.6 | 32.9 | 33.8 | 37.1 |
| ESTNR2015-10-0403 | 1.5 | 0.3 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 3.89 | 6.4 | 11 | 11.5 | 11.9 | 12.3 | 13 |
| ESTNR2015-20-0903 | 1.5 | 0.3 | 1.35 | 20 | 0.9 | 1.42 | 21 | 65 | 6 | 3.89 | 4.5 | - | 21.5 | 22.5 | 23.2 | 24.8 |
| ESTNR2015-25-0903 | 1.5 | 0.3 | 1.35 | 25 | 0.9 | 1.42 | 2.16 | 70 | 6 | 3.89 | 3.9 | - | 26.5 | 27.7 | 28.5 | 31 |
| ESTNR2015-30-0903 | 1.5 | 0.3 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | - | 31.6 | 32.9 | 33.8 | 37.1 |
| ESTNR2020-30-0902 | 2 | 0.2 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 7.42 | 3.1 | - | 31.6 | 32.9 | 33.8 | 37.2 |
| ESTNR2020-40-0902 | 2 | 0.2 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 7.42 | 2.5 | - | 41.8 | 43.3 | 44.6 | - |
| ESTNR2020-50-0902 | 2 | 0.2 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 7.42 | 2.1 | - | 51.9 | 53.6 | 55.7 | - |
| ESTNR2020-12-0403 | 2 | 0.3 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.5 | 13 | 13.6 | 14.1 | 14.5 | 15.6 |
| ESTNR2020-20-0903 | 2 | 0.3 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.1 | - | 21.5 | 22.5 | 23.2 | 24.9 |
| ESTNR2020-30-0903 | 2 | 0.3 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.1 | - | 31.6 | 32.9 | 33.8 | 37.1 |
| ESTNR2020-40-0903 | 2 | 0.3 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.5 | - | 41.7 | 43.3 | 44.6 | - |
| ESTNR2020-50-0903 | 2 | 0.3 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | - | 51.8 | 53.6 | 55.7 | - |
| ESTNR2020-8-0405 | 2 | 0.5 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 4.24 | 6.8 | 8.7 | 9 | 9.3 | 9.5 | 10.4 |
| ESTNR2020-12-0405 | 2 | 0.5 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 4.24 | 5.6 | 13 | 13.6 | 14.1 | 14.4 | 15.5 |
| ESTNR2020-16-0405 | 2 | 0.5 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 4.24 | 4.7 | 17 | 17.8 | 18.3 | 18.7 | 20.7 |
| ESTNR2020-20-0905 | 2 | 0.5 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | - | 21.5 | 22.5 | 23.2 | 24.8 |
| ESTNR2020-25-0905 | 2 | 0.5 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | - | 26.6 | 27.7 | 28.5 | 30.9 |
| ESTNR2020-30-0905 | 2 | 0.5 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.1 | - | 31.6 | 32.9 | 33.8 | 37.1 |
| ESTNR2020-40-0905 | 2 | 0.5 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.5 | - | 41.7 | 43.2 | 44.6 | - |
| ESTNR2020-50-0905 | 2 | 0.5 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | - | 51.8 | 53.6 | 55.6 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNR20 | 2 FLUTES TAPERED NECK RADIUS ENDMILL



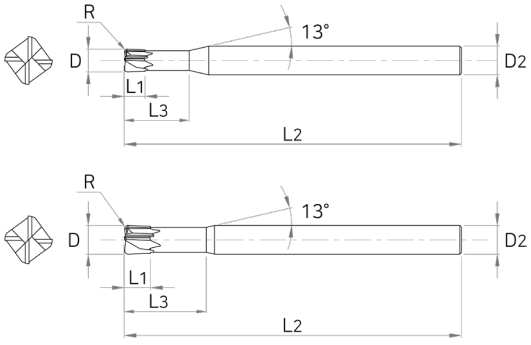
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNR2030-40-0902 | 3 | 0.2 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | - | 42 | 43.4 | - | - |
| ESTNR2030-50-0902 | 3 | 0.2 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.6 | - | 52.1 | 53.7 | - | - |
| ESTNR2030-60-0902 | 3 | 0.2 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | - | 62.2 | - | - | - |
| ESTNR2030-40-0903 | 3 | 0.3 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | - | 42 | 43.4 | - | - |
| ESTNR2030-50-0903 | 3 | 0.3 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | - | 52.1 | 53.7 | - | - |
| ESTNR2030-60-0903 | 3 | 0.3 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | - | 62.2 | - | - | - |
| ESTNR2030-40-0905 | 3 | 0.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | - | 42 | 43.4 | - | - |
| ESTNR2030-50-0905 | 3 | 0.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | - | 52.1 | 53.7 | - | - |
| ESTNR2030-60-0905 | 3 | 0.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | - | 62.1 | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESPM4 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~20 | 0~-0.015 | |

CARBIDE | AlTiN | 4 | 0° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.621

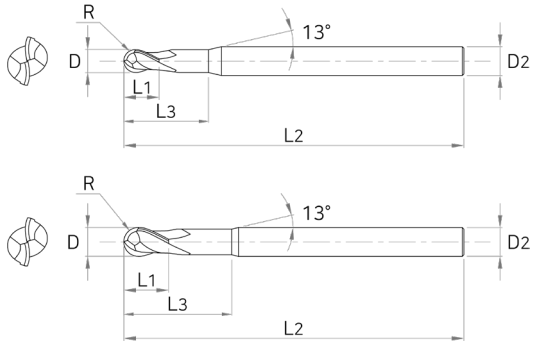
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESPM4 030-05 | 3 | 0.5 | 1.2 | 8 | 50 | 6 |
| ESPM4 040-05 | 4 | 0.5 | 1.5 | 10 | 50 | 6 |
| ESPM4 060-05 | 6 | 0.5 | 2.5 | 12 | 60 | 6 |
| ESPM4 060-10 | 6 | 1 | 2.5 | 12 | 60 | 6 |
| ESPM4 060-15 | 6 | 1.5 | 2.5 | 12 | 60 | 6 |
| ESPM4 060-15L | 6 | 1.5 | 2.5 | 12 | 90 | 6 |
| ESPM4 080-10 | 8 | 1 | 3.5 | 16 | 60 | 8 |
| ESPM4 080-20 | 8 | 2 | 3.5 | 16 | 60 | 8 |
| ESPM4 080-20L | 8 | 2 | 3.5 | 16 | 100 | 8 |
| ESPM4 100-10 | 10 | 1 | 4 | 20 | 70 | 10 |
| ESPM4 100-20 | 10 | 2 | 4 | 20 | 70 | 10 |
| ESPM4 100-20L | 10 | 2 | 4 | 20 | 100 | 10 |
| ESPM4 120-20 | 12 | 2 | 5 | 25 | 80 | 12 |
| ESPM4 120-30 | 12 | 3 | 5 | 25 | 80 | 12 |
| ESPM4 120-30L | 12 | 3 | 5 | 25 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESB702 | 2 FLUTES NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.622

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESB702 001 | 0.1 | 0.05 | 0.15 | - | 40 | 4 |
| ESB702 002 | 0.2 | 0.1 | 0.3 | - | 40 | 4 |
| ESB702 003 | 0.3 | 0.15 | 0.5 | - | 40 | 4 |
| ESB702 004 | 0.4 | 0.2 | 0.6 | - | 40 | 4 |
| ESB702 005 | 0.5 | 0.25 | 0.7 | - | 40 | 4 |
| ESB702 006 | 0.6 | 0.3 | 0.9 | - | 40 | 4 |
| ESB702 007 | 0.7 | 0.35 | 1.1 | - | 40 | 4 |
| ESB702 008 | 0.8 | 0.4 | 1.2 | - | 40 | 4 |
| ESB702 009 | 0.9 | 0.45 | 1.4 | - | 40 | 4 |
| ESB702 010 | 1 | 0.5 | 1.5 | 3 | 50 | 6 |
| ESB702 010S4 | 1 | 0.5 | 1.5 | - | 45 | 4 |
| ESB702 015 | 1.5 | 0.75 | 2 | 4 | 50 | 6 |
| ESB702 015S4 | 1.5 | 0.75 | 2 | - | 45 | 4 |
| ESB702 020 | 2 | 1 | 2.5 | 5 | 50 | 6 |
| ESB702 020S4 | 2 | 1 | 2.5 | - | 45 | 4 |
| ESB702 025 | 2.5 | 1.25 | 3 | 7 | 50 | 6 |
| ESB702 030 | 3 | 1.5 | 4 | 10 | 60 | 6 |

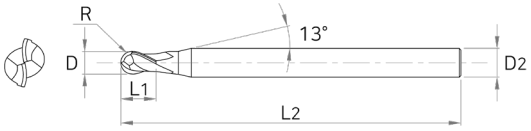
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESB702 030S | 3 | 1.5 | 4 | 10 | 50 | 6 |
| ESB702 030S4 | 3 | 1.5 | 4 | - | 45 | 4 |
| ESB702 031 | 3 | 1.5 | 4 | 10 | 70 | 6 |
| ESB702 040 | 4 | 2 | 5 | 10 | 60 | 6 |
| ESB702 040S | 4 | 2 | 5 | 10 | 50 | 6 |
| ESB702 040S4 | 4 | 2 | 5 | - | 45 | 4 |
| ESB702 041 | 4 | 2 | 5 | 10 | 70 | 6 |
| ESB702 050 | 5 | 2.5 | 6 | 12 | 60 | 6 |
| ESB702 060 | 6 | 3 | 7 | 12 | 60 | 6 |
| ESB702 061 | 6 | 3 | 7 | 12 | 90 | 6 |
| ESB702 080 | 8 | 4 | 9 | 15 | 70 | 8 |
| ESB702 081 | 8 | 4 | 9 | 15 | 100 | 8 |
| ESB702 100 | 10 | 5 | 11 | 25 | 75 | 10 |
| ESB702 101 | 10 | 5 | 11 | 25 | 100 | 10 |
| ESB702 120 | 12 | 6 | 12 | 25 | 80 | 12 |
| ESB702 121 | 12 | 6 | 12 | 25 | 110 | 12 |

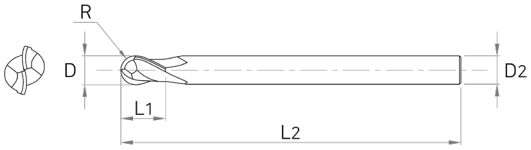
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

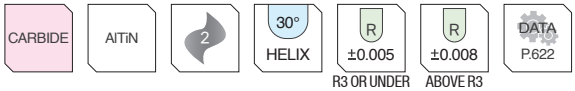
# ESB712 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |




| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESB712 010 | 1 | 0.5 | 2.5 | 50 | 6 |
| ESB712 010S | 1 | 0.5 | 1.5 | 40 | 6 |
| ESB712 010S4 | 1 | 0.5 | 2.5 | 50 | 4 |
| ESB712 012 | 1.2 | 0.6 | 3 | 50 | 6 |
| ESB712 015 | 1.5 | 0.75 | 4 | 50 | 6 |
| ESB712 015S | 1.5 | 0.75 | 2.5 | 40 | 6 |
| ESB712 015S4 | 1.5 | 0.75 | 4 | 50 | 4 |
| ESB712 020 | 2 | 1 | 5 | 50 | 6 |
| ESB712 020S | 2 | 1 | 3 | 40 | 6 |
| ESB712 020S4 | 2 | 1 | 5 | 50 | 4 |
| ESB712 025 | 2.5 | 1.25 | 7 | 60 | 6 |
| ESB712 030 | 3 | 1.5 | 8 | 60 | 6 |
| ESB712 030S | 3 | 1.5 | 4.5 | 50 | 6 |

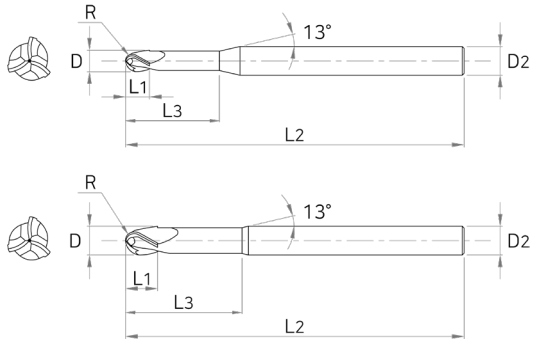
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ESB712 030S4 | 3 | 1.5 | 8 | 60 | 4 |
| ESB712 040 | 4 | 2 | 8 | 70 | 6 |
| ESB712 040S | 4 | 2 | 6 | 50 | 6 |
| ESB712 050 | 5 | 2.5 | 10 | 80 | 6 |
| ESB712 050S | 5 | 2.5 | 7.5 | 50 | 6 |
| ESB712 060 | 6 | 3 | 12 | 90 | 6 |
| ESB712 060S | 6 | 3 | 9 | 50 | 6 |
| ESB712 080S | 8 | 4 | 12 | 50 | 8 |
| ESB712 081 | 8 | 4 | 14 | 100 | 8 |
| ESB712 100 | 10 | 5 | 18 | 100 | 10 |
| ESB712 100S | 10 | 5 | 15 | 60 | 10 |
| ESB712 120 | 12 | 6 | 22 | 110 | 12 |
| ESB712 120S | 12 | 6 | 18 | 60 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESB703 | 3 FLUTES NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.623

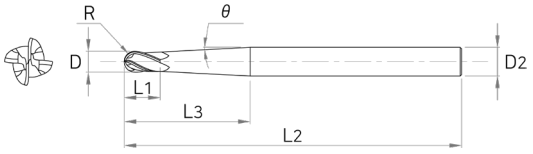
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESB703 020 | 2 | 1 | 2.5 | 5 | 50 | 6 |
| ESB703 025 | 2.5 | 1.25 | 3 | 7 | 50 | 6 |
| ESB703 030 | 3 | 1.5 | 4 | 10 | 60 | 6 |
| ESB703 030S | 3 | 1.5 | 4 | 10 | 50 | 6 |
| ESB703 031 | 3 | 1.5 | 4 | 10 | 70 | 6 |
| ESB703 040 | 4 | 2 | 5 | 10 | 60 | 6 |
| ESB703 040S | 4 | 2 | 5 | 10 | 50 | 6 |
| ESB703 041 | 4 | 2 | 5 | 10 | 70 | 6 |
| ESB703 050 | 5 | 2.5 | 6 | 12 | 60 | 6 |
| ESB703 060 | 6 | 3 | 7 | 12 | 60 | 6 |
| ESB703 061 | 6 | 3 | 7 | 12 | 90 | 6 |
| ESB703 080 | 8 | 4 | 9 | 15 | 70 | 8 |
| ESB703 081 | 8 | 4 | 9 | 15 | 100 | 8 |
| ESB703 100 | 10 | 5 | 11 | 25 | 75 | 10 |
| ESB703 101 | 10 | 5 | 11 | 25 | 100 | 10 |
| ESB703 120 | 12 | 6 | 12 | 25 | 80 | 12 |
| ESB703 121 | 12 | 6 | 12 | 25 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESB734 | 3 FLUTES NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 4 | 15° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.623

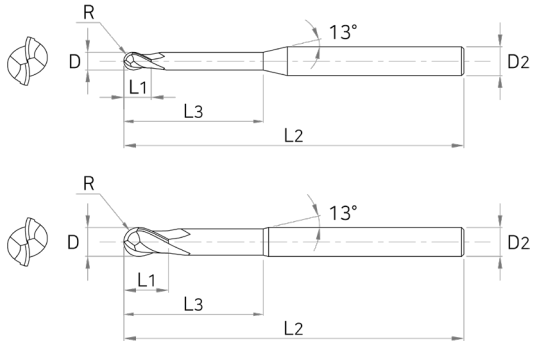
| EDP No | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L2 | D2 |
| ESB734 020-2.5 | 2 | 1 | 2.5 | 2 | 25 | 60 | 4 |
| ESB734 020-3.5 | 2 | 1 | 3.5 | 2 | 18 | 60 | 4 |
| ESB734 025-2.5 | 2.5 | 1.25 | 2.5 | 3 | 20 | 60 | 4 |
| ESB734 025-3.0 | 2.5 | 1.25 | 3 | 3 | 17 | 60 | 4 |
| ESB734 030-2.0 | 3 | 1.5 | 2 | 3 | 46 | 70 | 6 |
| ESB734 030-2.5 | 3 | 1.5 | 2.5 | 3 | 37 | 70 | 6 |
| ESB734 040-2.0 | 4 | 2 | 2 | 4 | 33 | 70 | 6 |
| ESB734 040-2.5 | 4 | 2 | 2.5 | 4 | 27 | 70 | 6 |
| ESB734 050-2.5 | 5 | 2.5 | 2.5 | 5 | 16 | 70 | 6 |
| ESB734 060-1.5 | 6 | 3 | 1.5 | 6 | 44 | 100 | 8 |
| ESB734 060-2.5 | 6 | 3 | 2.5 | 6 | 29 | 100 | 8 |
| ESB734 080-1.5 | 8 | 4 | 1.5 | 8 | 46 | 100 | 10 |
| ESB734 080-2.5 | 8 | 4 | 2.5 | 8 | 31 | 100 | 10 |
| ESB734 100-1.5 | 10 | 5 | 1.5 | 10 | 48 | 110 | 12 |
| ESB734 100-2.5 | 10 | 5 | 2.5 | 10 | 33 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRB712 | 2 FLUTES RIB BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.008 ABOVE R3 | DATA P.624

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 001002 | 0.1 | 0.05 | 0.1 | 0.2 | 40 | 4 |
| ESRB712 001003 | 0.1 | 0.05 | 0.1 | 0.3 | 40 | 4 |
| ESRB712 001005 | 0.1 | 0.05 | 0.1 | 0.5 | 40 | 4 |
| ESRB712 00101 | 0.1 | 0.05 | 0.1 | 1 | 40 | 4 |
| ESRB712 002005 | 0.2 | 0.1 | 0.2 | 0.5 | 40 | 4 |
| ESRB712 002015 | 0.2 | 0.1 | 0.2 | 1.5 | 40 | 4 |
| ESRB712 00201 | 0.2 | 0.1 | 0.2 | 1 | 40 | 4 |
| ESRB712 00202 | 0.2 | 0.1 | 0.2 | 2 | 40 | 4 |
| ESRB712 00203 | 0.2 | 0.1 | 0.2 | 3 | 40 | 4 |
| ESRB712 003015 | 0.3 | 0.15 | 0.3 | 1.5 | 40 | 4 |
| ESRB712 00301 | 0.3 | 0.15 | 0.3 | 1 | 40 | 4 |
| ESRB712 003025 | 0.3 | 0.15 | 0.3 | 2.5 | 40 | 4 |
| ESRB712 00302 | 0.3 | 0.15 | 0.3 | 2 | 40 | 4 |
| ESRB712 00303 | 0.3 | 0.15 | 0.3 | 3 | 40 | 4 |
| ESRB712 00304 | 0.3 | 0.15 | 0.3 | 4 | 40 | 4 |
| ESRB712 00305 | 0.3 | 0.15 | 0.3 | 5 | 40 | 4 |
| ESRB712 004015 | 0.4 | 0.2 | 0.4 | 1.5 | 40 | 4 |
| ESRB712 00401 | 0.4 | 0.2 | 0.4 | 1 | 40 | 4 |
| ESRB712 004025 | 0.4 | 0.2 | 0.4 | 2.5 | 40 | 4 |
| ESRB712 00402 | 0.4 | 0.2 | 0.4 | 2 | 40 | 4 |
| ESRB712 00403 | 0.4 | 0.2 | 0.4 | 3 | 40 | 4 |
| ESRB712 00404 | 0.4 | 0.2 | 0.4 | 4 | 40 | 4 |
| ESRB712 00405 | 0.4 | 0.2 | 0.4 | 5 | 40 | 4 |
| ESRB712 00406 | 0.4 | 0.2 | 0.4 | 6 | 40 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 00408 | 0.4 | 0.2 | 0.4 | 8 | 40 | 4 |
| ESRB712 00410 | 0.4 | 0.2 | 0.4 | 10 | 40 | 4 |
| ESRB712 005015 | 0.5 | 0.25 | 0.5 | 1.5 | 45 | 4 |
| ESRB712 00501 | 0.5 | 0.25 | 0.5 | 1 | 45 | 4 |
| ESRB712 00501S6 | 0.5 | 0.25 | 0.5 | 1 | 45 | 6 |
| ESRB712 005025 | 0.5 | 0.25 | 0.5 | 2.5 | 45 | 4 |
| ESRB712 00502 | 0.5 | 0.25 | 0.5 | 2 | 45 | 4 |
| ESRB712 00502S6 | 0.5 | 0.25 | 0.5 | 2 | 45 | 6 |
| ESRB712 00503 | 0.5 | 0.25 | 0.5 | 3 | 45 | 4 |
| ESRB712 00504 | 0.5 | 0.25 | 0.5 | 4 | 45 | 4 |
| ESRB712 00504S6 | 0.5 | 0.25 | 0.5 | 4 | 45 | 6 |
| ESRB712 00505 | 0.5 | 0.25 | 0.5 | 5 | 45 | 4 |
| ESRB712 00506 | 0.5 | 0.25 | 0.5 | 6 | 45 | 4 |
| ESRB712 00508 | 0.5 | 0.25 | 0.5 | 8 | 45 | 4 |
| ESRB712 00510 | 0.5 | 0.25 | 0.5 | 10 | 45 | 4 |
| ESRB712 00512 | 0.5 | 0.25 | 0.5 | 12 | 45 | 4 |
| ESRB712 00514 | 0.5 | 0.25 | 0.5 | 14 | 45 | 4 |
| ESRB712 00516 | 0.5 | 0.25 | 0.5 | 16 | 45 | 4 |
| ESRB712 00601 | 0.6 | 0.3 | 0.6 | 1 | 45 | 4 |
| ESRB712 00601S6 | 0.6 | 0.3 | 0.6 | 1 | 45 | 6 |
| ESRB712 00602 | 0.6 | 0.3 | 0.6 | 2 | 45 | 4 |
| ESRB712 00602S6 | 0.6 | 0.3 | 0.6 | 2 | 45 | 6 |
| ESRB712 00603 | 0.6 | 0.3 | 0.6 | 3 | 45 | 4 |
| ESRB712 00603S6 | 0.6 | 0.3 | 0.6 | 3 | 45 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRB712 | 2 FLUTES RIB BALL ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 00604 | 0.6 | 0.3 | 0.6 | 4 | 45 | 4 |
| ESRB712 00604S6 | 0.6 | 0.3 | 0.6 | 4 | 45 | 6 |
| ESRB712 00605 | 0.6 | 0.3 | 0.6 | 5 | 45 | 4 |
| ESRB712 00605S6 | 0.6 | 0.3 | 0.6 | 5 | 45 | 6 |
| ESRB712 00606 | 0.6 | 0.3 | 0.6 | 6 | 45 | 4 |
| ESRB712 00606S6 | 0.6 | 0.3 | 0.6 | 6 | 45 | 6 |
| ESRB712 00608 | 0.6 | 0.3 | 0.6 | 8 | 45 | 4 |
| ESRB712 00608S6 | 0.6 | 0.3 | 0.6 | 8 | 45 | 6 |
| ESRB712 00610 | 0.6 | 0.3 | 0.6 | 10 | 45 | 4 |
| ESRB712 00610S6 | 0.6 | 0.3 | 0.6 | 10 | 45 | 6 |
| ESRB712 00612 | 0.6 | 0.3 | 0.6 | 12 | 45 | 4 |
| ESRB712 00612S6 | 0.6 | 0.3 | 0.6 | 12 | 45 | 6 |
| ESRB712 00614 | 0.6 | 0.3 | 0.6 | 14 | 45 | 4 |
| ESRB712 00614S6 | 0.6 | 0.3 | 0.6 | 14 | 45 | 6 |
| ESRB712 00616 | 0.6 | 0.3 | 0.6 | 16 | 45 | 4 |
| ESRB712 00616S6 | 0.6 | 0.3 | 0.6 | 16 | 50 | 6 |
| ESRB712 00702 | 0.7 | 0.35 | 0.7 | 2 | 45 | 4 |
| ESRB712 00704 | 0.7 | 0.35 | 0.7 | 4 | 45 | 4 |
| ESRB712 00706 | 0.7 | 0.35 | 0.7 | 6 | 45 | 4 |
| ESRB712 00708 | 0.7 | 0.35 | 0.7 | 8 | 45 | 4 |
| ESRB712 00710 | 0.7 | 0.35 | 0.7 | 10 | 45 | 4 |
| ESRB712 00712 | 0.7 | 0.35 | 0.7 | 12 | 45 | 4 |
| ESRB712 00801 | 0.8 | 0.4 | 0.8 | 1 | 45 | 4 |
| ESRB712 00801S6 | 0.8 | 0.4 | 0.8 | 1 | 45 | 6 |
| ESRB712 00802 | 0.8 | 0.4 | 0.8 | 2 | 45 | 4 |
| ESRB712 00802S6 | 0.8 | 0.4 | 0.8 | 2 | 45 | 6 |
| ESRB712 00803 | 0.8 | 0.4 | 0.8 | 3 | 45 | 4 |
| ESRB712 00803S6 | 0.8 | 0.4 | 0.8 | 3 | 45 | 6 |
| ESRB712 00804 | 0.8 | 0.4 | 0.8 | 4 | 45 | 4 |
| ESRB712 00804S6 | 0.8 | 0.4 | 0.8 | 4 | 45 | 6 |
| ESRB712 00805 | 0.8 | 0.4 | 0.8 | 5 | 45 | 4 |
| ESRB712 00805S6 | 0.8 | 0.4 | 0.8 | 5 | 45 | 6 |
| ESRB712 00806 | 0.8 | 0.4 | 0.8 | 6 | 45 | 4 |
| ESRB712 00806S6 | 0.8 | 0.4 | 0.8 | 6 | 45 | 6 |
| ESRB712 00808 | 0.8 | 0.4 | 0.8 | 8 | 45 | 4 |
| ESRB712 00808S6 | 0.8 | 0.4 | 0.8 | 8 | 45 | 6 |
| ESRB712 00810 | 0.8 | 0.4 | 0.8 | 10 | 45 | 4 |
| ESRB712 00810S6 | 0.8 | 0.4 | 0.8 | 10 | 45 | 6 |
| ESRB712 00812 | 0.8 | 0.4 | 0.8 | 12 | 45 | 4 |
| ESRB712 00812S6 | 0.8 | 0.4 | 0.8 | 12 | 45 | 6 |
| ESRB712 00814 | 0.8 | 0.4 | 0.8 | 14 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 00814S6 | 0.8 | 0.4 | 0.8 | 14 | 45 | 6 |
| ESRB712 00816 | 0.8 | 0.4 | 0.8 | 16 | 45 | 4 |
| ESRB712 00816S6 | 0.8 | 0.4 | 0.8 | 16 | 50 | 6 |
| ESRB712 00820 | 0.8 | 0.4 | 0.8 | 20 | 50 | 4 |
| ESRB712 00820S6 | 0.8 | 0.4 | 0.8 | 20 | 55 | 6 |
| ESRB712 00904 | 0.9 | 0.45 | 0.9 | 4 | 45 | 4 |
| ESRB712 00906 | 0.9 | 0.45 | 0.9 | 6 | 45 | 4 |
| ESRB712 00908 | 0.9 | 0.45 | 0.9 | 8 | 45 | 4 |
| ESRB712 00910 | 0.9 | 0.45 | 0.9 | 10 | 45 | 4 |
| ESRB712 01002 | 1 | 0.5 | 1 | 2 | 50 | 4 |
| ESRB712 01002S6 | 1 | 0.5 | 1 | 2 | 50 | 6 |
| ESRB712 01003 | 1 | 0.5 | 1 | 3 | 50 | 4 |
| ESRB712 01003S6 | 1 | 0.5 | 1 | 3 | 50 | 6 |
| ESRB712 01004 | 1 | 0.5 | 1 | 4 | 50 | 4 |
| ESRB712 01004S6 | 1 | 0.5 | 1 | 4 | 50 | 6 |
| ESRB712 01005 | 1 | 0.5 | 1 | 5 | 50 | 4 |
| ESRB712 01005S6 | 1 | 0.5 | 1 | 5 | 50 | 6 |
| ESRB712 01006 | 1 | 0.5 | 1 | 6 | 50 | 4 |
| ESRB712 01006S6 | 1 | 0.5 | 1 | 6 | 50 | 6 |
| ESRB712 01007 | 1 | 0.5 | 1 | 7 | 50 | 4 |
| ESRB712 01007S6 | 1 | 0.5 | 1 | 7 | 50 | 6 |
| ESRB712 01008 | 1 | 0.5 | 1 | 8 | 50 | 4 |
| ESRB712 01008S6 | 1 | 0.5 | 1 | 8 | 50 | 6 |
| ESRB712 01009 | 1 | 0.5 | 1 | 9 | 50 | 4 |
| ESRB712 01009S6 | 1 | 0.5 | 1 | 9 | 50 | 6 |
| ESRB712 01010 | 1 | 0.5 | 1 | 10 | 50 | 4 |
| ESRB712 01010S6 | 1 | 0.5 | 1 | 10 | 50 | 6 |
| ESRB712 01012 | 1 | 0.5 | 1 | 12 | 50 | 4 |
| ESRB712 01012S6 | 1 | 0.5 | 1 | 12 | 50 | 6 |
| ESRB712 01014 | 1 | 0.5 | 1 | 14 | 50 | 4 |
| ESRB712 01014S6 | 1 | 0.5 | 1 | 14 | 50 | 6 |
| ESRB712 01016 | 1 | 0.5 | 1 | 16 | 50 | 4 |
| ESRB712 01016S6 | 1 | 0.5 | 1 | 16 | 50 | 6 |
| ESRB712 01018 | 1 | 0.5 | 1 | 18 | 50 | 4 |
| ESRB712 01018S6 | 1 | 0.5 | 1 | 18 | 50 | 6 |
| ESRB712 01020 | 1 | 0.5 | 1 | 20 | 55 | 4 |
| ESRB712 01020S6 | 1 | 0.5 | 1 | 20 | 55 | 6 |
| ESRB712 01022 | 1 | 0.5 | 1 | 22 | 60 | 4 |
| ESRB712 01022S6 | 1 | 0.5 | 1 | 22 | 60 | 6 |
| ESRB712 01026 | 1 | 0.5 | 1 | 26 | 60 | 4 |
| ESRB712 01026S6 | 1 | 0.5 | 1 | 26 | 60 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRB712 | 2 FLUTES RIB BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 01030 | 1 | 0.5 | 1 | 30 | 70 | 4 |
| ESRB712 01030S6 | 1 | 0.5 | 1 | 30 | 70 | 6 |
| ESRB712 01040 | 1 | 0.5 | 1 | 40 | 80 | 4 |
| ESRB712 01050 | 1 | 0.5 | 1 | 50 | 100 | 4 |
| ESRB712 01204 | 1.2 | 0.6 | 1.2 | 4 | 50 | 4 |
| ESRB712 01206 | 1.2 | 0.6 | 1.2 | 6 | 50 | 4 |
| ESRB712 01208 | 1.2 | 0.6 | 1.2 | 8 | 50 | 4 |
| ESRB712 01210 | 1.2 | 0.6 | 1.2 | 10 | 50 | 4 |
| ESRB712 01212 | 1.2 | 0.6 | 1.2 | 12 | 50 | 4 |
| ESRB712 01216 | 1.2 | 0.6 | 1.2 | 16 | 50 | 4 |
| ESRB712 01220 | 1.2 | 0.6 | 1.2 | 20 | 50 | 4 |
| ESRB712 01226 | 1.2 | 0.6 | 1.2 | 26 | 60 | 4 |
| ESRB712 01406 | 1.4 | 0.7 | 1.4 | 6 | 50 | 4 |
| ESRB712 01408 | 1.4 | 0.7 | 1.4 | 8 | 50 | 4 |
| ESRB712 01410 | 1.4 | 0.7 | 1.4 | 10 | 50 | 4 |
| ESRB712 01412 | 1.4 | 0.7 | 1.4 | 12 | 50 | 4 |
| ESRB712 01416 | 1.4 | 0.7 | 1.4 | 16 | 50 | 4 |
| ESRB712 01503 | 1.5 | 0.75 | 1.5 | 3 | 50 | 4 |
| ESRB712 01503S6 | 1.5 | 0.75 | 1.5 | 3 | 50 | 6 |
| ESRB712 01504 | 1.5 | 0.75 | 1.5 | 4 | 50 | 4 |
| ESRB712 01504S6 | 1.5 | 0.75 | 1.5 | 4 | 50 | 6 |
| ESRB712 01505 | 1.5 | 0.75 | 1.5 | 5 | 50 | 4 |
| ESRB712 01506 | 1.5 | 0.75 | 1.5 | 6 | 50 | 4 |
| ESRB712 01506S6 | 1.5 | 0.75 | 1.5 | 6 | 50 | 6 |
| ESRB712 01507 | 1.5 | 0.75 | 1.5 | 7 | 50 | 4 |
| ESRB712 01508 | 1.5 | 0.75 | 1.5 | 8 | 50 | 4 |
| ESRB712 01508S6 | 1.5 | 0.75 | 1.5 | 8 | 50 | 6 |
| ESRB712 01510 | 1.5 | 0.75 | 1.5 | 10 | 50 | 4 |
| ESRB712 01510S6 | 1.5 | 0.75 | 1.5 | 10 | 50 | 6 |
| ESRB712 01512 | 1.5 | 0.75 | 1.5 | 12 | 50 | 4 |
| ESRB712 01512S6 | 1.5 | 0.75 | 1.5 | 12 | 50 | 6 |
| ESRB712 01514 | 1.5 | 0.75 | 1.5 | 14 | 50 | 4 |
| ESRB712 01514S6 | 1.5 | 0.75 | 1.5 | 14 | 50 | 6 |
| ESRB712 01516 | 1.5 | 0.75 | 1.5 | 16 | 50 | 4 |
| ESRB712 01516S6 | 1.5 | 0.75 | 1.5 | 16 | 50 | 6 |
| ESRB712 01518 | 1.5 | 0.75 | 1.5 | 18 | 50 | 4 |
| ESRB712 01518S6 | 1.5 | 0.75 | 1.5 | 18 | 50 | 6 |
| ESRB712 01520 | 1.5 | 0.75 | 1.5 | 20 | 55 | 4 |
| ESRB712 01520S6 | 1.5 | 0.75 | 1.5 | 20 | 55 | 6 |
| ESRB712 01522 | 1.5 | 0.75 | 1.5 | 22 | 60 | 4 |
| ESRB712 01522S6 | 1.5 | 0.75 | 1.5 | 22 | 60 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 01526 | 1.5 | 0.75 | 1.5 | 26 | 60 | 4 |
| ESRB712 01526S6 | 1.5 | 0.75 | 1.5 | 26 | 60 | 6 |
| ESRB712 01530 | 1.5 | 0.75 | 1.5 | 30 | 70 | 4 |
| ESRB712 01530S6 | 1.5 | 0.75 | 1.5 | 30 | 70 | 6 |
| ESRB712 01535 | 1.5 | 0.75 | 1.5 | 35 | 70 | 4 |
| ESRB712 01535S6 | 1.5 | 0.75 | 1.5 | 35 | 70 | 6 |
| ESRB712 01540 | 1.5 | 0.75 | 1.5 | 40 | 80 | 4 |
| ESRB712 01540S6 | 1.5 | 0.75 | 1.5 | 40 | 80 | 6 |
| ESRB712 01604 | 1.6 | 0.8 | 1.6 | 4 | 50 | 4 |
| ESRB712 01606 | 1.6 | 0.8 | 1.6 | 6 | 50 | 4 |
| ESRB712 01608 | 1.6 | 0.8 | 1.6 | 8 | 50 | 4 |
| ESRB712 01610 | 1.6 | 0.8 | 1.6 | 10 | 50 | 4 |
| ESRB712 01612 | 1.6 | 0.8 | 1.6 | 12 | 50 | 4 |
| ESRB712 01616 | 1.6 | 0.8 | 1.6 | 16 | 50 | 4 |
| ESRB712 01620 | 1.6 | 0.8 | 1.6 | 20 | 50 | 4 |
| ESRB712 01804 | 1.8 | 0.9 | 1.8 | 4 | 50 | 4 |
| ESRB712 01806 | 1.8 | 0.9 | 1.8 | 6 | 50 | 4 |
| ESRB712 01808 | 1.8 | 0.9 | 1.8 | 8 | 50 | 4 |
| ESRB712 01810 | 1.8 | 0.9 | 1.8 | 10 | 50 | 4 |
| ESRB712 01812 | 1.8 | 0.9 | 1.8 | 12 | 50 | 4 |
| ESRB712 01816 | 1.8 | 0.9 | 1.8 | 16 | 50 | 4 |
| ESRB712 01820 | 1.8 | 0.9 | 1.8 | 20 | 50 | 4 |
| ESRB712 02004 | 2 | 1 | 2 | 4 | 50 | 4 |
| ESRB712 02004S6 | 2 | 1 | 2 | 4 | 50 | 6 |
| ESRB712 02006 | 2 | 1 | 2 | 6 | 50 | 4 |
| ESRB712 02006S6 | 2 | 1 | 2 | 6 | 50 | 6 |
| ESRB712 02008 | 2 | 1 | 2 | 8 | 50 | 4 |
| ESRB712 02008S6 | 2 | 1 | 2 | 8 | 50 | 6 |
| ESRB712 02010 | 2 | 1 | 2 | 10 | 50 | 4 |
| ESRB712 02010S6 | 2 | 1 | 2 | 10 | 50 | 6 |
| ESRB712 02012 | 2 | 1 | 2 | 12 | 50 | 4 |
| ESRB712 02012S6 | 2 | 1 | 2 | 12 | 50 | 6 |
| ESRB712 02014 | 2 | 1 | 2 | 14 | 50 | 4 |
| ESRB712 02014S6 | 2 | 1 | 2 | 14 | 50 | 6 |
| ESRB712 02016 | 2 | 1 | 2 | 16 | 50 | 4 |
| ESRB712 02016S6 | 2 | 1 | 2 | 16 | 50 | 6 |
| ESRB712 02018 | 2 | 1 | 2 | 18 | 55 | 4 |
| ESRB712 02018S6 | 2 | 1 | 2 | 18 | 55 | 6 |
| ESRB712 02020 | 2 | 1 | 2 | 20 | 55 | 4 |
| ESRB712 02020S6 | 2 | 1 | 2 | 20 | 55 | 6 |
| ESRB712 02022 | 2 | 1 | 2 | 22 | 60 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRB712 | 2 FLUTES RIB BALL ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 02022S6 | 2 | 1 | 2 | 22 | 60 | 6 |
| ESRB712 02026 | 2 | 1 | 2 | 26 | 60 | 4 |
| ESRB712 02026S6 | 2 | 1 | 2 | 26 | 60 | 6 |
| ESRB712 02030 | 2 | 1 | 2 | 30 | 70 | 4 |
| ESRB712 02030S6 | 2 | 1 | 2 | 30 | 70 | 6 |
| ESRB712 02035 | 2 | 1 | 2 | 35 | 70 | 4 |
| ESRB712 02035S6 | 2 | 1 | 2 | 35 | 70 | 6 |
| ESRB712 02040 | 2 | 1 | 2 | 40 | 80 | 4 |
| ESRB712 02040S6 | 2 | 1 | 2 | 40 | 80 | 6 |
| ESRB712 02045 | 2 | 1 | 2 | 45 | 90 | 4 |
| ESRB712 02045S6 | 2 | 1 | 2 | 45 | 90 | 6 |
| ESRB712 02050 | 2 | 1 | 2 | 50 | 100 | 4 |
| ESRB712 02050S6 | 2 | 1 | 2 | 50 | 100 | 6 |
| ESRB712 02060 | 2 | 1 | 2 | 60 | 110 | 4 |
| ESRB712 02508 | 2.5 | 1.25 | 2.5 | 8 | 50 | 4 |
| ESRB712 02510 | 2.5 | 1.25 | 2.5 | 10 | 50 | 4 |
| ESRB712 02512 | 2.5 | 1.25 | 2.5 | 12 | 50 | 4 |
| ESRB712 02516 | 2.5 | 1.25 | 2.5 | 16 | 50 | 4 |
| ESRB712 02520 | 2.5 | 1.25 | 2.5 | 20 | 50 | 4 |
| ESRB712 02522 | 2.5 | 1.25 | 2.5 | 22 | 60 | 4 |
| ESRB712 02526 | 2.5 | 1.25 | 2.5 | 26 | 60 | 4 |
| ESRB712 02530 | 2.5 | 1.25 | 2.5 | 30 | 70 | 4 |
| ESRB712 02535 | 2.5 | 1.25 | 2.5 | 35 | 70 | 4 |
| ESRB712 02540 | 2.5 | 1.25 | 2.5 | 40 | 80 | 4 |
| ESRB712 02545 | 2.5 | 1.25 | 2.5 | 45 | 90 | 4 |
| ESRB712 02550 | 2.5 | 1.25 | 2.5 | 50 | 100 | 4 |
| ESRB712 03006 | 3 | 1.5 | 3 | 6 | 50 | 6 |
| ESRB712 03008 | 3 | 1.5 | 3 | 8 | 50 | 6 |
| ESRB712 03010 | 3 | 1.5 | 3 | 10 | 50 | 6 |
| ESRB712 03012 | 3 | 1.5 | 3 | 12 | 50 | 6 |
| ESRB712 03014 | 3 | 1.5 | 3 | 14 | 60 | 6 |
| ESRB712 03016 | 3 | 1.5 | 3 | 16 | 60 | 6 |
| ESRB712 03018 | 3 | 1.5 | 3 | 18 | 60 | 6 |
| ESRB712 03020 | 3 | 1.5 | 3 | 20 | 60 | 6 |
| ESRB712 03022 | 3 | 1.5 | 3 | 22 | 65 | 6 |
| ESRB712 03026 | 3 | 1.5 | 3 | 26 | 65 | 6 |
| ESRB712 03030 | 3 | 1.5 | 3 | 30 | 70 | 6 |
| ESRB712 03035 | 3 | 1.5 | 3 | 35 | 70 | 6 |
| ESRB712 03040 | 3 | 1.5 | 3 | 40 | 80 | 6 |
| ESRB712 03045 | 3 | 1.5 | 3 | 45 | 90 | 6 |
| ESRB712 03050 | 3 | 1.5 | 3 | 50 | 100 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 03060 | 3 | 1.5 | 3 | 60 | 100 | 6 |
| ESRB712 03510 | 3.5 | 1.75 | 3 | 10 | 50 | 6 |
| ESRB712 03516 | 3.5 | 1.75 | 3 | 16 | 60 | 6 |
| ESRB712 03520 | 3.5 | 1.75 | 3 | 20 | 60 | 6 |
| ESRB712 03526 | 3.5 | 1.75 | 3 | 26 | 65 | 6 |
| ESRB712 03530 | 3.5 | 1.75 | 3 | 30 | 70 | 6 |
| ESRB712 04008 | 4 | 2 | 4 | 8 | 50 | 6 |
| ESRB712 04010 | 4 | 2 | 4 | 10 | 50 | 6 |
| ESRB712 04012 | 4 | 2 | 4 | 12 | 50 | 6 |
| ESRB712 04014 | 4 | 2 | 4 | 14 | 60 | 6 |
| ESRB712 04016 | 4 | 2 | 4 | 16 | 60 | 6 |
| ESRB712 04018 | 4 | 2 | 4 | 18 | 60 | 6 |
| ESRB712 04020 | 4 | 2 | 4 | 20 | 60 | 6 |
| ESRB712 04022 | 4 | 2 | 4 | 22 | 65 | 6 |
| ESRB712 04026 | 4 | 2 | 4 | 26 | 65 | 6 |
| ESRB712 04030 | 4 | 2 | 4 | 30 | 70 | 6 |
| ESRB712 04035 | 4 | 2 | 4 | 35 | 70 | 6 |
| ESRB712 04040 | 4 | 2 | 4 | 40 | 80 | 6 |
| ESRB712 04045 | 4 | 2 | 4 | 45 | 90 | 6 |
| ESRB712 04050 | 4 | 2 | 4 | 50 | 100 | 6 |
| ESRB712 04055 | 4 | 2 | 4 | 55 | 100 | 6 |
| ESRB712 04060 | 4 | 2 | 4 | 60 | 100 | 6 |
| ESRB712 05015 | 5 | 2.5 | 6 | 15 | 60 | 6 |
| ESRB712 05020 | 5 | 2.5 | 6 | 20 | 60 | 6 |
| ESRB712 05026 | 5 | 2.5 | 6 | 26 | 65 | 6 |
| ESRB712 05030 | 5 | 2.5 | 6 | 30 | 70 | 6 |
| ESRB712 05035 | 5 | 2.5 | 6 | 35 | 70 | 6 |
| ESRB712 05040 | 5 | 2.5 | 6 | 40 | 80 | 6 |
| ESRB712 05045 | 5 | 2.5 | 6 | 45 | 90 | 6 |
| ESRB712 05050 | 5 | 2.5 | 6 | 50 | 100 | 6 |
| ESRB712 05055 | 5 | 2.5 | 6 | 55 | 100 | 6 |
| ESRB712 05060 | 5 | 2.5 | 6 | 60 | 100 | 6 |
| ESRB712 0602090 | 6 | 3 | 12 | 20 | 90 | 6 |
| ESRB712 06020 | 6 | 3 | 8 | 20 | 60 | 6 |
| ESRB712 0603090 | 6 | 3 | 12 | 30 | 90 | 6 |
| ESRB712 06030 | 6 | 3 | 8 | 30 | 60 | 6 |
| ESRB712 08025100 | 8 | 4 | 14 | 25 | 100 | 8 |
| ESRB712 08025 | 8 | 4 | 10 | 25 | 70 | 8 |
| ESRB712 08035100 | 8 | 4 | 14 | 35 | 100 | 8 |
| ESRB712 08035 | 8 | 4 | 10 | 35 | 70 | 8 |
| ESRB712 10030100 | 10 | 5 | 18 | 30 | 100 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESRB712 | 2 FLUTES RIB BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 10030 | 10 | 5 | 12 | 30 | 75 | 10 |
| ESRB712 10040100 | 10 | 5 | 18 | 40 | 100 | 10 |
| ESRB712 10040 | 10 | 5 | 12 | 40 | 75 | 10 |
| ESRB712 12032110 | 12 | 6 | 22 | 32 | 110 | 12 |

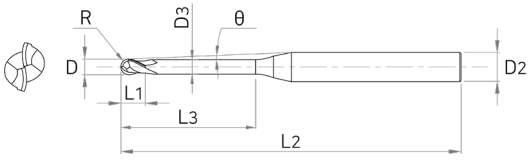
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ESRB712 12032 | 12 | 6 | 14 | 32 | 80 | 12 |
| ESRB712 12045110 | 12 | 6 | 22 | 45 | 110 | 12 |
| ESRB712 12045 | 12 | 6 | 14 | 45 | 80 | 12 |
| | | | | | | |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h5 |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.005 All Sizes | DATA P.629

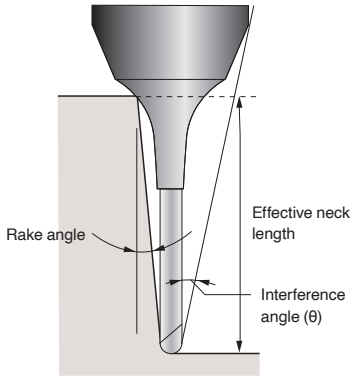
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNB2001-0.2 | 0.1 | 0.05 | 0.08 | 0.2 | 0.08 | 45 | 4 | 11.8 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 |
| ESLNB2001-0.3 | 0.1 | 0.05 | 0.08 | 0.3 | 0.08 | 45 | 4 | 11.7 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |
| ESLNB2001-0.5 | 0.1 | 0.05 | 0.08 | 0.5 | 0.08 | 45 | 4 | 11.4 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 |
| ESLNB2002-0.5 | 0.2 | 0.1 | 0.15 | 0.5 | 0.17 | 50 | 4 | 11.5 | 1.2 | 1.3 | 1.5 | 1.6 | 2 |
| ESLNB2002-1 | 0.2 | 0.1 | 0.15 | 1 | 0.17 | 50 | 4 | 10.9 | 1.7 | 1.9 | 2.1 | 2.3 | 2.7 |
| ESLNB2002-1.5 | 0.2 | 0.1 | 0.15 | 1.5 | 0.17 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.8 | 3 | 3.4 |
| ESLNB2002-2 | 0.2 | 0.1 | 0.15 | 2 | 0.17 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4.1 |
| ESLNB2002-2.5 | 0.2 | 0.1 | 0.15 | 2.5 | 0.17 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ESLNB2002-3.0 | 0.2 | 0.1 | 0.15 | 3 | 0.17 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 |
| ESLNB2003-1 | 0.3 | 0.15 | 0.25 | 1 | 0.27 | 50 | 4 | 10.9 | 1.7 | 1.9 | 2.1 | 2.3 | 2.7 |
| ESLNB2003-1.5 | 0.3 | 0.15 | 0.25 | 1.5 | 0.27 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.7 | 3 | 3.4 |
| ESLNB2003-2 | 0.3 | 0.15 | 0.25 | 2 | 0.27 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4 |
| ESLNB2003-2.5 | 0.3 | 0.15 | 0.25 | 2.5 | 0.27 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ESLNB2003-3 | 0.3 | 0.15 | 0.25 | 3 | 0.27 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ESLNB2004-1 | 0.4 | 0.2 | 0.3 | 1 | 0.37 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.7 |
| ESLNB2004-1.5 | 0.4 | 0.2 | 0.3 | 1.5 | 0.37 | 50 | 4 | 10.4 | 2.3 | 2.5 | 2.7 | 2.9 | 3.4 |
| ESLNB2004-2 | 0.4 | 0.2 | 0.3 | 2 | 0.37 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.4 | 3.6 | 4 |
| ESLNB2004-2.5 | 0.4 | 0.2 | 0.3 | 2.5 | 0.37 | 50 | 4 | 9.5 | 3.4 | 3.7 | 4 | 4.2 | 4.7 |
| ESLNB2004-3 | 0.4 | 0.2 | 0.3 | 3 | 0.37 | 50 | 4 | 9.1 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ESLNB2004-3.5 | 0.4 | 0.2 | 0.3 | 3.5 | 0.37 | 50 | 4 | 8.7 | 4.5 | 4.8 | 5.2 | 5.4 | 6 |
| ESLNB2004-4 | 0.4 | 0.2 | 0.3 | 4 | 0.37 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ESLNB2004-4.5 | 0.4 | 0.2 | 0.3 | 4.5 | 0.37 | 50 | 4 | 8 | 5.6 | 6 | 6.3 | 6.6 | 7.2 |
| ESLNB2005-1 | 0.5 | 0.25 | 0.35 | 1 | 0.47 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.6 |
| ESLNB2005-2 | 0.5 | 0.25 | 0.35 | 2 | 0.47 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.6 | 4 |

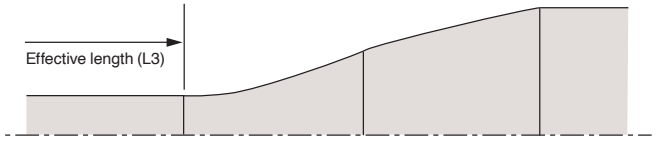
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNB2005-3 | 0.5 | 0.25 | 0.35 | 3 | 0.47 | 50 | 4 | 9 | 3.9 | 4.3 | 4.6 | 4.8 | 5.3 |
| ESLNB2005-4 | 0.5 | 0.25 | 0.35 | 4 | 0.47 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ESLNB2005-5 | 0.5 | 0.25 | 0.35 | 5 | 0.47 | 50 | 4 | 7.7 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ESLNB2005-6 | 0.5 | 0.25 | 0.35 | 6 | 0.47 | 50 | 4 | 7.1 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ESLNB2005-8 | 0.5 | 0.25 | 0.35 | 8 | 0.47 | 50 | 4 | 6.3 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNB2006-1 | 0.6 | 0.3 | 0.4 | 1 | 0.57 | 50 | 4 | 11 | 1.7 | 1.9 | 2.1 | 2.3 | 2.6 |
| ESLNB2006-2 | 0.6 | 0.3 | 0.4 | 2 | 0.57 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.6 | 4 |
| ESLNB2006-3 | 0.6 | 0.3 | 0.4 | 3 | 0.57 | 50 | 4 | 9 | 3.9 | 4.3 | 4.5 | 4.8 | 5.3 |
| ESLNB2006-4 | 0.6 | 0.3 | 0.4 | 4 | 0.57 | 50 | 4 | 8.3 | 5 | 5.4 | 5.7 | 6 | 6.6 |
| ESLNB2006-5 | 0.6 | 0.3 | 0.4 | 5 | 0.57 | 50 | 4 | 7.6 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ESLNB2006-6 | 0.6 | 0.3 | 0.4 | 6 | 0.57 | 50 | 4 | 7.1 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ESLNB2006-7 | 0.6 | 0.3 | 0.4 | 7 | 0.57 | 50 | 4 | 6.6 | 8.3 | 8.8 | 9.2 | 9.5 | 10.2 |
| ESLNB2006-8 | 0.6 | 0.3 | 0.4 | 8 | 0.57 | 50 | 4 | 6.2 | 9.3 | 9.9 | 10.3 | 10.7 | 11.4 |
| ESLNB2006-9 | 0.6 | 0.3 | 0.4 | 9 | 0.57 | 50 | 4 | 5.8 | 10.4 | 10.9 | 11.4 | 11.8 | 12.5 |
| ESLNB2006-10 | 0.6 | 0.3 | 0.4 | 10 | 0.57 | 50 | 4 | 5.5 | 11.4 | 12 | 12.5 | 12.9 | 13.7 |
| ESLNB2006-12 | 0.6 | 0.3 | 0.4 | 12 | 0.57 | 50 | 4 | 5 | 13.6 | 14.2 | 14.7 | 15.2 | 16 |
| ESLNB2008-2 | 0.8 | 0.4 | 0.5 | 2 | 0.77 | 50 | 4 | 9.9 | 2.8 | 3.1 | 3.3 | 3.5 | 4 |
| ESLNB2008-4 | 0.8 | 0.4 | 0.5 | 4 | 0.77 | 50 | 4 | 8.2 | 5 | 5.4 | 5.7 | 6 | 6.5 |
| ESLNB2008-5 | 0.8 | 0.4 | 0.5 | 5 | 0.77 | 50 | 4 | 7.5 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ESLNB2008-6 | 0.8 | 0.4 | 0.5 | 6 | 0.77 | 50 | 4 | 7 | 7.2 | 7.6 | 8 | 8.4 | 9 |
| ESLNB2008-8 | 0.8 | 0.4 | 0.5 | 8 | 0.77 | 50 | 4 | 6.1 | 9.3 | 9.8 | 10.3 | 10.7 | 11.3 |
| ESLNB2008-10 | 0.8 | 0.4 | 0.5 | 10 | 0.77 | 50 | 4 | 5.4 | 11.4 | 12 | 12.5 | 12.9 | 13.7 |
| ESLNB2010-2 | 1 | 0.5 | 0.8 | 2 | 0.96 | 50 | 4 | 9.9 | 2.9 | 3.1 | 3.3 | 3.5 | 4 |
| ESLNB2010-3 | 1 | 0.5 | 0.8 | 3 | 0.96 | 50 | 4 | 8.9 | 4 | 4.3 | 4.5 | 4.8 | 5.3 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNB2010-4 | 1 | 0.5 | 0.8 | 4 | 0.96 | 50 | 4 | 8.1 | 5 | 5.4 | 5.7 | 6 | 6.5 |
| ESLNB2010-5 | 1 | 0.5 | 0.8 | 5 | 0.96 | 50 | 4 | 7.4 | 6.1 | 6.5 | 6.9 | 7.2 | 7.8 |
| ESLNB2010-6 | 1 | 0.5 | 0.8 | 6 | 0.96 | 50 | 4 | 6.8 | 7.2 | 7.7 | 8 | 8.4 | 9 |
| ESLNB2010-7 | 1 | 0.5 | 0.8 | 7 | 0.96 | 50 | 4 | 6.3 | 8.3 | 8.8 | 9.2 | 9.5 | 10.2 |
| ESLNB2010-8 | 1 | 0.5 | 0.8 | 8 | 0.96 | 50 | 4 | 5.9 | 9.3 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2010-9 | 1 | 0.5 | 0.8 | 9 | 0.96 | 50 | 4 | 5.5 | 10.4 | 11 | 11.4 | 11.8 | 12.5 |
| ESLNB2010-10 | 1 | 0.5 | 0.8 | 10 | 0.96 | 50 | 4 | 5.2 | 11.5 | 12 | 12.5 | 12.9 | 13.7 |
| ESLNB2010-12 | 1 | 0.5 | 0.8 | 12 | 0.96 | 55 | 4 | 4.6 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ESLNB2010-14 | 1 | 0.5 | 0.8 | 14 | 0.96 | 55 | 4 | 4.2 | 15.7 | 16.4 | 16.9 | 17.4 | 18.5 |
| ESLNB2010-16 | 1 | 0.5 | 0.8 | 16 | 0.96 | 55 | 4 | 3.8 | 17.8 | 18.5 | 19.1 | 19.6 | 21.2 |
| ESLNB2010-18 | 1 | 0.5 | 0.8 | 18 | 0.96 | 60 | 4 | 3.5 | 19.9 | 20.7 | 21.3 | 21.8 | 23.8 |
| ESLNB2010-20 | 1 | 0.5 | 0.8 | 20 | 0.96 | 60 | 4 | 3.3 | 22 | 22.8 | 23.4 | 24 | 26.5 |
| ESLNB2012-4 | 1.2 | 0.6 | 1.1 | 4 | 1.15 | 50 | 4 | 7.9 | 5.1 | 5.4 | 5.7 | 6 | 6.5 |
| ESLNB2012-6 | 1.2 | 0.6 | 1.1 | 6 | 1.15 | 50 | 4 | 6.6 | 7.2 | 7.7 | 8 | 8.4 | 9 |
| ESLNB2012-8 | 1.2 | 0.6 | 1.1 | 8 | 1.15 | 50 | 4 | 5.7 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2012-10 | 1.2 | 0.6 | 1.1 | 10 | 1.15 | 50 | 4 | 5 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ESLNB2012-12 | 1.2 | 0.6 | 1.1 | 12 | 1.15 | 55 | 4 | 4.5 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ESLNB2014-8 | 1.4 | 0.7 | 1.3 | 8 | 1.34 | 50 | 4 | 5.5 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2014-12 | 1.4 | 0.7 | 1.3 | 12 | 1.34 | 55 | 4 | 4.3 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ESLNB2014-16 | 1.4 | 0.7 | 1.3 | 16 | 1.34 | 55 | 4 | 3.5 | 17.8 | 18.5 | 19.1 | 19.6 | 21.2 |
| ESLNB2015-4 | 1.5 | 0.75 | 1.35 | 4 | 1.44 | 50 | 4 | 7.7 | 5.1 | 5.4 | 5.7 | 6 | 6.5 |
| ESLNB2015-6 | 1.5 | 0.75 | 1.35 | 6 | 1.44 | 50 | 4 | 6.4 | 7.3 | 7.7 | 8 | 8.4 | 9 |
| ESLNB2015-8 | 1.5 | 0.75 | 1.35 | 8 | 1.44 | 50 | 4 | 5.4 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2015-10 | 1.5 | 0.75 | 1.35 | 10 | 1.44 | 50 | 4 | 4.7 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ESLNB2015-12 | 1.5 | 0.75 | 1.35 | 12 | 1.44 | 55 | 4 | 4.2 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ESLNB2015-14 | 1.5 | 0.75 | 1.35 | 14 | 1.44 | 55 | 4 | 3.8 | 15.7 | 16.4 | 16.9 | 17.4 | 18.5 |
| ESLNB2015-16 | 1.5 | 0.75 | 1.35 | 16 | 1.44 | 55 | 4 | 3.4 | 17.8 | 18.5 | 19.1 | 19.6 | 21.1 |
| ESLNB2015-20 | 1.5 | 0.75 | 1.35 | 20 | 1.44 | 60 | 4 | 2.9 | 22 | 22.8 | 23.4 | 24 | - |
| ESLNB2016-8 | 1.6 | 0.8 | 1.4 | 8 | 1.54 | 50 | 4 | 5.3 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2016-10 | 1.6 | 0.8 | 1.4 | 10 | 1.54 | 55 | 4 | 4.6 | 11.5 | 12.1 | 12.5 | 12.9 | 13.7 |
| ESLNB2016-12 | 1.6 | 0.8 | 1.4 | 12 | 1.54 | 55 | 4 | 4.1 | 13.6 | 14.2 | 14.7 | 15.2 | 15.9 |
| ESLNB2016-16 | 1.6 | 0.8 | 1.4 | 16 | 1.54 | 55 | 4 | 3.3 | 17.8 | 18.5 | 19.1 | 19.6 | 21.1 |
| ESLNB2016-20 | 1.6 | 0.8 | 1.4 | 20 | 1.54 | 60 | 4 | 2.8 | 22 | 22.8 | 23.4 | 24 | - |
| ESLNB2018-8 | 1.8 | 0.9 | 1.6 | 8 | 1.73 | 50 | 4 | 5.1 | 9.4 | 9.9 | 10.3 | 10.7 | 11.3 |
| ESLNB2018-12 | 1.8 | 0.9 | 1.6 | 12 | 1.73 | 55 | 4 | 3.9 | 13.7 | 14.3 | 14.7 | 15.2 | 15.9 |
| ESLNB2018-16 | 1.8 | 0.9 | 1.6 | 16 | 1.73 | 55 | 4 | 3.1 | 17.9 | 18.6 | 19.1 | 19.6 | 21.1 |
| ESLNB2018-20 | 1.8 | 0.9 | 1.6 | 20 | 1.73 | 60 | 4 | 2.6 | 22 | 22.8 | 23.4 | 24 | - |
| ESLNB2020-3 | 2 | 1 | 1.7 | 3 | 1.92 | 50 | 4 | 8.3 | 4.1 | 4.4 | 4.6 | 4.8 | 5.2 |
| ESLNB2020-4 | 2 | 1 | 3 | 4 | 1.92 | 50 | 4 | 7.3 | 5.2 | 5.5 | 5.8 | 6 | 6.5 |
| ESLNB2020-6 | 2 | 1 | 3 | 6 | 1.92 | 50 | 4 | 5.8 | 7.3 | 7.7 | 8.1 | 8.4 | 9 |
| ESLNB2020-8 | 2 | 1 | 3 | 8 | 1.92 | 50 | 4 | 4.9 | 9.5 | 9.9 | 10.3 | 10.7 | 11.3 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESLNB20 | 2 FLUTES LONG NECK BALL ENDMILL

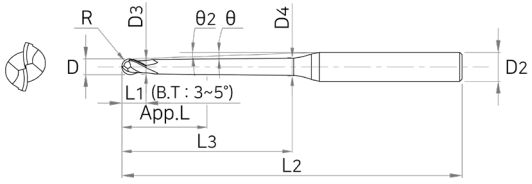
| EDP No | SIZES (mm) | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | D3 | L2 | D2 | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESLNB2020-10 | 2 | 1 | 3 | 10 | 1.92 | 50 | 4 | 4.2 | 11.6 | 12.1 | 12.6 | 12.9 | 13.6 |
| ESLNB2020-12 | 2 | 1 | 3 | 12 | 1.92 | 55 | 4 | 3.7 | 13.7 | 14.3 | 14.8 | 15.2 | 15.9 |
| ESLNB2020-14 | 2 | 1 | 3 | 14 | 1.92 | 55 | 4 | 3.2 | 15.8 | 16.4 | 16.9 | 17.4 | 18.5 |
| ESLNB2020-16 | 2 | 1 | 3 | 16 | 1.92 | 55 | 4 | 2.9 | 17.9 | 18.6 | 19.1 | 19.6 | - |
| ESLNB2020-18 | 2 | 1 | 3 | 18 | 1.92 | 60 | 4 | 2.7 | 20 | 20.7 | 21.3 | 21.8 | - |
| ESLNB2020-20 | 2 | 1 | 3 | 20 | 1.92 | 60 | 4 | 2.4 | 22.1 | 22.8 | 23.4 | 24 | - |
| ESLNB2020-22 | 2 | 1 | 3 | 22 | 1.92 | 60 | 4 | 2.3 | 24.1 | 24.9 | 25.6 | 26.3 | - |
| ESLNB2020-25 | 2 | 1 | 3 | 25 | 1.92 | 65 | 4 | 2 | 27.3 | 28.1 | 28.8 | - | - |
| ESLNB2020-30 | 2 | 1 | 3 | 30 | 1.92 | 70 | 4 | 1.7 | 32.4 | 33.4 | 34.2 | - | - |
| ESLNB2020-35 | 2 | 1 | 3 | 35 | 1.92 | 75 | 4 | 1.5 | 37.6 | 38.6 | - | - | - |
| ESLNB2020-40 | 2 | 1 | 3 | 40 | 1.92 | 80 | 4 | 1.4 | 42.8 | 43.8 | - | - | - |
| ESLNB2025-10 | 2.5 | 1.25 | 4 | 10 | 2.4 | 50 | 4 | 3.4 | 11.6 | 12.1 | 12.6 | 13 | 13.6 |
| ESLNB2025-16 | 2.5 | 1.25 | 4 | 16 | 2.4 | 55 | 4 | 2.3 | 17.9 | 18.6 | 19.1 | 19.6 | - |
| ESLNB2025-20 | 2.5 | 1.25 | 4 | 20 | 2.4 | 60 | 4 | 1.9 | 22.1 | 22.8 | 23.5 | - | - |
| ESLNB2030-8 | 3 | 1.5 | 4 | 8 | 2.88 | 55 | 6 | 6.2 | 9.6 | 10 | 10.4 | 10.7 | 11.3 |
| ESLNB2030-10 | 3 | 1.5 | 4 | 10 | 2.88 | 55 | 6 | 5.5 | 11.7 | 12.2 | 12.6 | 13 | 13.6 |
| ESLNB2030-13 | 3 | 1.5 | 4 | 13 | 2.88 | 60 | 6 | 4.6 | 14.8 | 15.4 | 15.9 | 16.3 | 17.1 |
| ESLNB2030-16 | 3 | 1.5 | 4 | 16 | 2.88 | 60 | 6 | 4 | 18 | 18.6 | 19.1 | 19.6 | 21.1 |
| ESLNB2030-18 | 3 | 1.5 | 4 | 18 | 2.88 | 60 | 6 | 3.6 | 20 | 20.7 | 21.3 | 21.8 | 23.7 |
| ESLNB2030-20 | 3 | 1.5 | 4 | 20 | 2.88 | 65 | 6 | 3.4 | 22.1 | 22.9 | 23.5 | 24 | 26.4 |
| ESLNB2030-25 | 3 | 1.5 | 4 | 25 | 2.88 | 70 | 6 | 2.8 | 27.3 | 28.2 | 28.8 | 29.9 | - |
| ESLNB2030-30 | 3 | 1.5 | 4 | 30 | 2.88 | 75 | 6 | 2.2 | 37.7 | 38.7 | 40 | 41.9 | - |
| ESLNB2030-35 | 3 | 1.5 | 4 | 35 | 2.88 | 80 | 6 | 4.5 | 11.6 | 12.1 | 12.5 | 12.9 | 13.5 |
| ESLNB2040-10 | 4 | 2 | 5 | 10 | 3.9 | 55 | 6 | 3.6 | 14.7 | 15.3 | 15.8 | 16.2 | 17 |
| ESLNB2040-13 | 4 | 2 | 5 | 13 | 3.9 | 60 | 6 | 3.1 | 17.9 | 18.5 | 19.1 | 19.5 | 20.9 |
| ESLNB2040-16 | 4 | 2 | 5 | 16 | 3.9 | 60 | 6 | 2.5 | 22.1 | 22.8 | 23.4 | 23.9 | - |
| ESLNB2040-20 | 4 | 2 | 5 | 20 | 3.9 | 65 | 6 | 2.1 | 27.3 | 28.1 | 28.8 | 29.8 | - |
| ESLNB2040-25 | 4 | 2 | 5 | 25 | 3.9 | 70 | 6 | 1.8 | 32.4 | 33.4 | 34.2 | - | - |
| ESLNB2040-30 | 4 | 2 | 5 | 30 | 3.9 | 75 | 6 | 1.6 | 37.6 | 38.6 | 39.9 | - | - |
| ESLNB2040-35 | 4 | 2 | 5 | 35 | 3.9 | 80 | 6 | 1.4 | 42.8 | 43.8 | - | - | - |
| ESLNB2040-40 | 4 | 2 | 5 | 40 | 3.9 | 80 | 6 | 1.2 | 47.9 | 49.1 | - | - | - |
| ESLNB2040-45 | 4 | 2 | 5 | 45 | 3.9 | 90 | 6 | 1.1 | 53.1 | 54.5 | - | - | - |
| ESLNB2040-50 | 4 | 2 | 5 | 50 | 3.9 | 100 | 6 | 1.4 | 22 | 22.8 | - | - | - |
| ESLNB2050-20 | 5 | 2.5 | 6 | 20 | 4.9 | 65 | 6 | 1.2 | 27.2 | 28.1 | - | - | - |
| ESLNB2050-25 | 5 | 2.5 | 6 | 25 | 4.9 | 70 | 6 | 1 | 32.4 | - | - | - | - |
| ESLNB2050-30 | 5 | 2.5 | 6 | 30 | 4.9 | 75 | 6 | 0.8 | 42.8 | - | - | - | - |
| ESLNB2050-35 | 5 | 2.5 | 6 | 35 | 4.9 | 80 | 6 | 0.7 | 42.8 | - | - | - | - |
| ESLNB2050-40 | 5 | 2.5 | 6 | 40 | 4.9 | 90 | 6 | - | - | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.012 | h5 |
| D8~12 | 0~-0.015 | |

CARBIDE | AlTiN | 2 | 30° HELIX | R ±0.01 R3 OR UNDER | R ±0.015 ABOVE R3 | DATA P.630

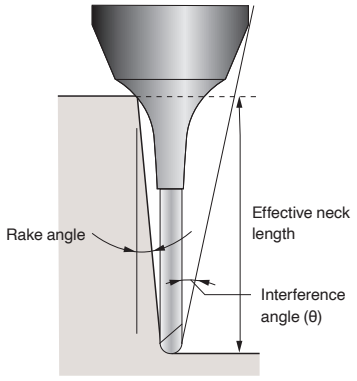
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB2002-1-04 | 0.2 | 0.1 | 0.15 | 1 | 0.4 | 0.17 | 0.18 | 50 | 4 | 1.35 | 10.9 | 1.5 | 1.7 | 1.8 | 2 | 2.3 |
| ESTNB2002-1.5-04 | 0.2 | 0.1 | 0.15 | 1.5 | 0.4 | 0.17 | 0.19 | 50 | 4 | 1.77 | 10.4 | 2 | 2.2 | 2.4 | 2.6 | 2.9 |
| ESTNB2002-2-09 | 0.2 | 0.1 | 0.15 | 2 | 0.9 | 0.17 | 0.23 | 50 | 4 | 1.1 | 10.1 | - | 2.8 | 3.1 | 3.4 | 3.9 |
| ESTNB2002-2.5-09 | 0.2 | 0.1 | 0.15 | 2.5 | 0.9 | 0.17 | 0.24 | 50 | 4 | 1.1 | 9.6 | - | 3.3 | 3.7 | 4 | 4.5 |
| ESTNB2003-2-04 | 0.3 | 0.15 | 0.25 | 2 | 0.4 | 0.28 | 0.29 | 50 | 4 | 2.19 | 10 | 2.5 | 2.8 | 3 | 3.2 | 3.5 |
| ESTNB2003-3-09 | 0.3 | 0.15 | 0.25 | 3 | 0.9 | 0.28 | 0.36 | 50 | 4 | 1.2 | 9.3 | - | 3.8 | 4.2 | 4.5 | 5.1 |
| ESTNB2003-4-09 | 0.3 | 0.15 | 0.25 | 4 | 0.9 | 0.28 | 0.39 | 50 | 4 | 1.2 | 8.6 | - | 4.8 | 5.3 | 5.7 | 6.3 |
| ESTNB2004-2-04 | 0.4 | 0.2 | 0.3 | 2 | 0.4 | 0.37 | 0.39 | 50 | 4 | 2.2 | 10 | 2.5 | 2.8 | 3 | 3.2 | 3.5 |
| ESTNB2004-3-04 | 0.4 | 0.2 | 0.3 | 3 | 0.4 | 0.37 | 0.41 | 50 | 4 | 2.44 | 9.1 | 3.6 | 3.9 | 4.1 | 4.4 | 4.8 |
| ESTNB2004-4-04 | 0.4 | 0.2 | 0.3 | 4 | 0.4 | 0.37 | 0.42 | 50 | 4 | 2.44 | 8.4 | 4.7 | 5.2 | 5.6 | 5.9 | 6.5 |
| ESTNB2004-4-09 | 0.4 | 0.2 | 0.3 | 4 | 0.9 | 0.37 | 0.49 | 50 | 4 | 1.25 | 8.5 | - | 4.8 | 5.3 | 5.7 | 6.3 |
| ESTNB2004-5-04 | 0.4 | 0.2 | 0.3 | 5 | 0.4 | 0.37 | 0.44 | 50 | 4 | 2.44 | 7.8 | 5.7 | 6.3 | 6.7 | 7.1 | 7.7 |
| ESTNB2004-5-09 | 0.4 | 0.2 | 0.3 | 5 | 0.9 | 0.37 | 0.52 | 50 | 4 | 1.25 | 7.9 | - | 5.9 | 6.4 | 6.8 | 7.5 |
| ESTNB2005-4-04 | 0.5 | 0.25 | 0.35 | 4 | 0.4 | 0.47 | 0.52 | 50 | 4 | 2.49 | 8.4 | 4.6 | 5 | 5.3 | 5.5 | 5.9 |
| ESTNB2005-8-09 | 0.5 | 0.25 | 0.35 | 8 | 0.9 | 0.47 | 0.71 | 50 | 4 | 1.3 | 6.5 | - | 8.9 | 9.6 | 10.1 | 10.9 |
| ESTNB2005-12-09 | 0.5 | 0.25 | 0.35 | 12 | 0.9 | 0.47 | 0.84 | 50 | 4 | 1.3 | 5.3 | - | 13 | 13.9 | 14.5 | 15.4 |
| ESTNB20054-2-04 | 0.54 | 0.27 | 0.37 | 2 | 0.4 | 0.52 | 0.54 | 50 | 4 | 1.8 | 10 | 2.3 | 2.5 | 2.7 | 2.8 | 3 |
| ESTNB20054-4-04 | 0.54 | 0.27 | 0.37 | 4 | 0.4 | 0.52 | 0.57 | 50 | 4 | 1.8 | 8.4 | 4.5 | 4.9 | 5.2 | 5.5 | 5.9 |
| ESTNB20054-5-04 | 0.54 | 0.27 | 0.37 | 5 | 0.4 | 0.52 | 0.59 | 50 | 4 | 1.8 | 7.8 | 5.5 | 6 | 6.3 | 6.6 | 7.1 |
| ESTNB20054-6-04 | 0.54 | 0.27 | 0.37 | 6 | 0.4 | 0.52 | 0.6 | 50 | 4 | 1.8 | 7.2 | 6.7 | 7.3 | 7.8 | 8.2 | 8.8 |
| ESTNB20054-6.5-04 | 0.54 | 0.27 | 0.37 | 6.5 | 0.4 | 0.52 | 0.61 | 50 | 4 | 1.8 | 7 | 7.2 | 7.9 | 8.3 | 8.7 | 9.4 |
| ESTNB20054-7-04 | 0.54 | 0.27 | 0.37 | 7 | 0.4 | 0.52 | 0.61 | 50 | 4 | 1.8 | 6.8 | 7.7 | 8.4 | 8.9 | 9.3 | 10 |
| ESTNB2006-2-04 | 0.6 | 0.3 | 0.4 | 2 | 0.4 | 0.57 | 0.59 | 50 | 4 | 2.17 | 10 | 2.4 | 2.5 | 2.7 | 2.8 | 3 |
| ESTNB2006-4-04 | 0.6 | 0.3 | 0.4 | 4 | 0.4 | 0.57 | 0.62 | 50 | 4 | 2.54 | 8.4 | 4.6 | 5 | 5.2 | 5.5 | 5.9 |

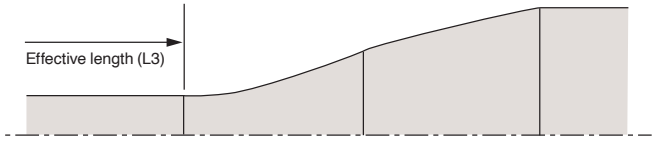
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB2006-6-04 | 0.6 | 0.3 | 0.4 | 6 | 0.4 | 0.57 | 0.65 | 50 | 4 | 2.54 | 7.2 | 6.8 | 7.4 | 7.8 | 8.2 | 8.8 |
| ESTNB2006-6-09 | 0.6 | 0.3 | 0.4 | 6 | 0.9 | 0.57 | 0.75 | 50 | 4 | 1.35 | 7.3 | - | 6.9 | 7.5 | 7.9 | 8.6 |
| ESTNB2006-8-09 | 0.6 | 0.3 | 0.4 | 8 | 0.9 | 0.57 | 0.81 | 50 | 4 | 1.35 | 6.4 | - | 8.9 | 9.6 | 10.1 | 10.9 |
| ESTNB2006-10-04 | 0.6 | 0.3 | 0.4 | 10 | 0.4 | 0.57 | 0.7 | 50 | 4 | 2.54 | 5.6 | 10.8 | 11.7 | 12.2 | 12.7 | 13.5 |
| ESTNB2006-10-09 | 0.6 | 0.3 | 0.4 | 10 | 0.9 | 0.57 | 0.87 | 50 | 4 | 1.35 | 5.7 | - | 11 | 11.8 | 12.3 | 13.2 |
| ESTNB2006-12-09 | 0.6 | 0.3 | 0.4 | 12 | 0.9 | 0.57 | 0.93 | 55 | 4 | 1.35 | 5.2 | - | 13 | 13.9 | 14.5 | 15.4 |
| ESTNB2006-15-04 | 0.6 | 0.3 | 0.4 | 15 | 0.4 | 0.57 | 0.77 | 55 | 4 | 2.54 | 4.4 | 15.9 | 17 | 17.6 | 18.2 | 19.2 |
| ESTNB2006-15-09 | 0.6 | 0.3 | 0.4 | 15 | 0.9 | 0.57 | 1.03 | 55 | 4 | 1.35 | 4.5 | - | 16.1 | 17.1 | 17.7 | 18.8 |
| ESTNB2008-4-04 | 0.8 | 0.4 | 0.5 | 4 | 0.4 | 0.77 | 0.82 | 50 | 4 | 2.64 | 8.3 | 4.6 | 4.9 | 5.2 | 5.5 | 5.9 |
| ESTNB2008-6-04 | 0.8 | 0.4 | 0.5 | 6 | 0.4 | 0.77 | 0.85 | 50 | 4 | 2.64 | 7.1 | 6.6 | 7.1 | 7.5 | 7.7 | 8.3 |
| ESTNB2008-8-09 | 0.8 | 0.4 | 0.5 | 8 | 0.9 | 0.77 | 1.01 | 50 | 4 | 1.45 | 6.3 | - | 8.9 | 9.6 | 10.1 | 10.9 |
| ESTNB2008-12-09 | 0.8 | 0.4 | 0.5 | 12 | 0.9 | 0.77 | 1.13 | 55 | 4 | 1.45 | 5 | - | 13 | 13.9 | 14.5 | 15.4 |
| ESTNB2008-16-09 | 0.8 | 0.4 | 0.5 | 16 | 0.9 | 0.77 | 1.26 | 55 | 4 | 1.45 | 4.2 | - | 17.1 | 18.1 | 18.8 | 19.9 |
| ESTNB2009-4-04 | 0.9 | 0.45 | 0.6 | 4 | 0.4 | 0.86 | 0.91 | 50 | 4 | 3.46 | 8.2 | 4.5 | 4.7 | 4.9 | 5.1 | 5.4 |
| ESTNB2009-8-04 | 0.9 | 0.45 | 0.6 | 8 | 0.4 | 0.86 | 0.96 | 55 | 4 | 3.46 | 6.1 | 8.7 | 9.3 | 9.7 | 10 | 10.6 |
| ESTNB2009-12-04 | 0.9 | 0.45 | 0.6 | 12 | 0.4 | 0.86 | 1.02 | 55 | 4 | 3.46 | 4.8 | 12.9 | 13.8 | 14.4 | 14.9 | 15.7 |
| ESTNB2009-16-04 | 0.9 | 0.45 | 0.6 | 16 | 0.4 | 0.86 | 1.08 | 60 | 4 | 3.46 | 4 | 17 | 18 | 18.7 | 19.3 | 20.5 |
| ESTNB2009-18-04 | 0.9 | 0.45 | 0.6 | 18 | 0.4 | 0.86 | 1.1 | 65 | 4 | 3.46 | 3.7 | 19.1 | 20.1 | 20.9 | 21.5 | 23.1 |
| ESTNB2009-20-04 | 0.9 | 0.45 | 0.6 | 20 | 0.4 | 0.86 | 1.13 | 65 | 4 | 3.46 | 3.4 | 21.1 | 22.2 | 23 | 23.6 | 25.6 |
| ESTNB2009-22-04 | 0.9 | 0.45 | 0.6 | 22 | 0.4 | 0.86 | 1.16 | 65 | 4 | 3.46 | 3.2 | 23.1 | 24.3 | 25.1 | 25.8 | 28.2 |
| ESTNB2009-24-04 | 0.9 | 0.45 | 0.6 | 24 | 0.4 | 0.86 | 1.19 | 70 | 4 | 3.46 | 3 | 25.2 | 26.4 | 27.2 | 27.9 | - |
| ESTNB2010-6-04 | 1 | 0.5 | 0.8 | 6 | 0.4 | 0.94 | 1.01 | 50 | 6 | 5.09 | 8.3 | 6.8 | 7.2 | 7.5 | 7.8 | 8.3 |
| ESTNB2010-8-04 | 1 | 0.5 | 0.8 | 8 | 0.4 | 0.94 | 1.04 | 55 | 6 | 5.09 | 7.5 | 8.8 | 9.3 | 9.7 | 10 | 10.6 |
| ESTNB2010-10-04 | 1 | 0.5 | 0.8 | 10 | 0.4 | 0.94 | 1.07 | 55 | 6 | 5.09 | 6.8 | 11 | 11.7 | 12.3 | 12.7 | 13.5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB2010-10-09 | 1 | 0.5 | 0.8 | 10 | 0.9 | 0.94 | 1.23 | 55 | 6 | 2.7 | 6.9 | - | 11.2 | 11.9 | 12.4 | 13.2 |
| ESTNB2010-15-09 | 1 | 0.5 | 0.8 | 15 | 0.9 | 0.94 | 1.39 | 60 | 6 | 2.7 | 5.7 | - | 16.2 | 17.1 | 17.8 | 18.8 |
| ESTNB2010-20-04 | 1 | 0.5 | 0.8 | 20 | 0.4 | 0.94 | 1.21 | 65 | 6 | 5.09 | 4.7 | 21.2 | 22.3 | 23 | 23.6 | 25.7 |
| ESTNB2010-20-09 | 1 | 0.5 | 0.8 | 20 | 0.4 | 0.94 | 1.54 | 65 | 6 | 2.7 | 4.8 | - | 21.3 | 22.4 | 23.1 | 24.6 |
| ESTNB2010-25-09 | 1 | 0.5 | 0.8 | 25 | 0.4 | 0.94 | 1.7 | 70 | 6 | 2.7 | 4.2 | - | 26.4 | 27.6 | 28.4 | 30.8 |
| ESTNB2010-30-04 | 1 | 0.5 | 0.8 | 30 | 0.4 | 0.94 | 1.35 | 75 | 6 | 5.09 | 3.6 | 31.3 | 32.7 | 33.6 | 34.8 | 38.5 |
| ESTNB2010-30-09 | 1 | 0.5 | 0.8 | 30 | 0.9 | 0.94 | 1.86 | 75 | 6 | 2.7 | 3.7 | - | 31.4 | 32.8 | 33.7 | 36.9 |
| ESTNB2010-35-09 | 1 | 0.5 | 0.8 | 35 | 0.9 | 0.94 | 2.02 | 80 | 6 | 2.7 | 3.3 | - | 36.5 | 38 | 39 | 43.1 |
| ESTNB2010-40-09 | 1 | 0.5 | 0.8 | 40 | 0.9 | 0.94 | 2.17 | 85 | 6 | 2.7 | 3 | - | 41.6 | 43.2 | 44.4 | - |
| ESTNB2010-50-09 | 1 | 0.5 | 0.8 | 50 | 0.9 | 0.94 | 2.49 | 95 | 6 | 2.7 | 2.5 | - | 51.7 | 53.5 | 55.5 | - |
| ESTNB2010-60-09 | 1 | 0.5 | 0.8 | 60 | 0.9 | 0.94 | 2.8 | 105 | 6 | 2.7 | 2.2 | - | 61.8 | 63.8 | 66.6 | - |
| ESTNB2010-70-09 | 1 | 0.5 | 0.8 | 70 | 0.9 | 0.94 | 3.11 | 115 | 6 | 2.7 | 1.9 | - | 71.9 | 74 | - | - |
| ESTNB2015-8-04 | 1.5 | 0.75 | 1.35 | 8 | 0.4 | 1.42 | 1.51 | 55 | 6 | 7.07 | 7.3 | 8.9 | 9.4 | 9.7 | 10 | 10.6 |
| ESTNB2015-10-04 | 1.5 | 0.75 | 1.35 | 10 | 0.4 | 1.42 | 1.54 | 55 | 6 | 7.07 | 6.6 | 10.9 | 11.5 | 11.9 | 12.2 | 12.9 |
| ESTNB2015-12-04 | 1.5 | 0.75 | 1.35 | 12 | 0.4 | 1.42 | 1.57 | 55 | 6 | 7.07 | 6 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ESTNB2015-15-09 | 1.5 | 0.75 | 1.35 | 15 | 0.9 | 1.42 | 1.85 | 60 | 6 | 3.89 | 5.4 | - | 16.4 | 17.2 | 17.8 | 18.8 |
| ESTNB2015-20-09 | 1.5 | 0.75 | 1.35 | 20 | 0.9 | 1.42 | 2.01 | 65 | 6 | 3.89 | 4.5 | - | 21.4 | 22.4 | 23.2 | 24.7 |
| ESTNB2015-30-09 | 1.5 | 0.75 | 1.35 | 30 | 0.9 | 1.42 | 2.32 | 75 | 6 | 3.89 | 3.4 | - | 31.5 | 32.9 | 33.7 | 37 |
| ESTNB2018-4-04 | 1.8 | 0.9 | 1.6 | 4 | 0.4 | 1.73 | 1.76 | 50 | 6 | 4.38 | 9.2 | 4.6 | 4.8 | 4.9 | 5.1 | 5.4 |
| ESTNB2018-8-04 | 1.8 | 0.9 | 1.6 | 8 | 0.4 | 1.73 | 1.82 | 50 | 6 | 6.61 | 7.1 | 8.6 | 9 | 9.2 | 9.4 | 10.2 |
| ESTNB2018-12-04 | 1.8 | 0.9 | 1.6 | 12 | 0.4 | 1.73 | 1.88 | 55 | 6 | 6.61 | 5.8 | 12.9 | 13.5 | 14 | 14.4 | 15.4 |
| ESTNB2018-16-04 | 1.8 | 0.9 | 1.6 | 16 | 0.4 | 1.73 | 1.93 | 60 | 6 | 6.61 | 4.9 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ESTNB2018-20-04 | 1.8 | 0.9 | 1.6 | 20 | 0.4 | 1.73 | 1.99 | 65 | 6 | 6.61 | 4.3 | 21.2 | 22.3 | 23 | 23.6 | 25.6 |
| ESTNB2018-24-04 | 1.8 | 0.9 | 1.6 | 24 | 0.4 | 1.73 | 2.04 | 65 | 6 | 6.61 | 3.8 | 25.3 | 26.5 | 27.3 | 27.9 | 30.8 |
| ESTNB2018-28-04 | 1.8 | 0.9 | 1.6 | 28 | 0.4 | 1.73 | 2.1 | 70 | 6 | 6.61 | 3.4 | 29.4 | 30.6 | 31.5 | 32.4 | 35.9 |
| ESTNB2018-32-04 | 1.8 | 0.9 | 1.6 | 32 | 0.4 | 1.73 | 2.15 | 70 | 6 | 6.61 | 3 | 33.4 | 34.8 | 35.7 | 37.1 | - |
| ESTNB2018-36-04 | 1.8 | 0.9 | 1.6 | 36 | 0.4 | 1.73 | 2.21 | 75 | 6 | 6.61 | 2.8 | 37.5 | 38.9 | 39.9 | 41.7 | - |
| ESTNB2018-38-04 | 1.8 | 0.9 | 1.6 | 38 | 0.4 | 1.73 | 2.24 | 80 | 6 | 6.61 | 2.7 | 39.5 | 41 | 42 | 44 | - |
| ESTNB2018-40-04 | 1.8 | 0.9 | 1.6 | 40 | 0.4 | 1.73 | 2.27 | 80 | 6 | 6.61 | 2.6 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ESTNB2020-8-04 | 2 | 1 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 7.42 | 7 | 8.7 | 9 | 9.2 | 9.5 | 10.2 |
| ESTNB2020-12-04 | 2 | 1 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.7 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ESTNB2020-16-04 | 2 | 1 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 7.42 | 4.8 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ESTNB2020-20-04 | 2 | 1 | 1.7 | 20 | 0.4 | 1.92 | 2.18 | 65 | 6 | 7.42 | 4.1 | 21.3 | 22.3 | 23 | 23.6 | 25.6 |
| ESTNB2020-20-09 | 2 | 1 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | - | 21.4 | 22.4 | 23.2 | 24.6 |
| ESTNB2020-25-09 | 2 | 1 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | - | 26.5 | 27.7 | 28.5 | 30.8 |
| ESTNB2020-30-04 | 2 | 1 | 1.7 | 30 | 0.4 | 1.92 | 2.32 | 70 | 6 | 7.42 | 3.1 | 31.4 | 32.7 | 33.6 | 34.8 | 38.5 |
| ESTNB2020-30-09 | 2 | 1 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.2 | - | 31.6 | 32.9 | 33.7 | 36.9 |
| ESTNB2020-35-09 | 2 | 1 | 1.7 | 35 | 0.9 | 1.92 | 2.97 | 75 | 6 | 4.24 | 2.8 | - | 36.6 | 38 | 39 | - |
| ESTNB2020-40-04 | 2 | 1 | 1.7 | 40 | 0.4 | 1.92 | 2.46 | 80 | 6 | 7.42 | 2.5 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ESTNB2020-40-09 | 2 | 1 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.6 | - | 41.7 | 43.2 | 44.5 | - |
| ESTNB2020-50-09 | 2 | 1 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | - | 51.5 | 53.5 | 55.5 | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB20 | 2 FLUTES TAPERED NECK BALL ENDMILL

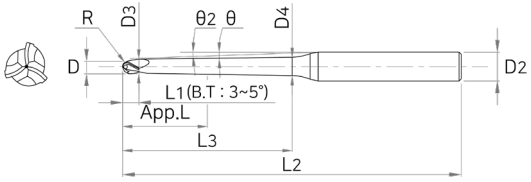
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB2020-60-09 | 2 | 1 | 1.7 | 60 | 0.9 | 1.92 | 3.75 | 100 | 6 | 4.24 | 1.8 | - | 61.9 | 63.8 | - | - |
| ESTNB2020-70-09 | 2 | 1 | 1.7 | 70 | 0.9 | 1.92 | 4.07 | 110 | 6 | 4.24 | 1.8 | - | 72 | 74.1 | - | - |
| ESTNB2030-8-04 | 3 | 1.5 | 2.5 | 8 | 0.4 | 2.86 | 2.94 | 50 | 6 | 8.5 | 6.3 | 8.8 | 9.1 | 9.3 | 9.5 | 10.3 |
| ESTNB2030-16-04 | 3 | 1.5 | 2.5 | 16 | 0.4 | 2.86 | 3.05 | 55 | 6 | 12.52 | 4.1 | 17.2 | 17.8 | 18.3 | 18.7 | 20.6 |
| ESTNB2030-20-04 | 3 | 1.5 | 2.5 | 20 | 0.4 | 2.86 | 3.1 | 60 | 6 | 12.52 | 3.4 | 21.2 | 22 | 22.6 | 23.3 | 25.7 |
| ESTNB2030-30-04 | 3 | 1.5 | 2.5 | 30 | 0.4 | 2.86 | 3.24 | 70 | 6 | 12.52 | 2.5 | 31.6 | 32.8 | 33.7 | 34.9 | - |
| ESTNB2030-30-09 | 3 | 1.5 | 2.5 | 30 | 0.9 | 2.86 | 3.72 | 70 | 6 | 6.95 | 2.6 | - | 31.8 | 33 | 33.8 | - |
| ESTNB2030-40-04 | 3 | 1.5 | 2.5 | 40 | 0.4 | 2.86 | 3.38 | 80 | 6 | 12.52 | 2 | 41.7 | 43.2 | 44.3 | - | - |
| ESTNB2030-40-09 | 3 | 1.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | - | 41.9 | 43.3 | - | - |
| ESTNB2030-50-09 | 3 | 1.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | - | 52 | 53.6 | - | - |
| ESTNB2030-60-09 | 3 | 1.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | - | 62.1 | - | - | - |
| ESTNB2030-70-09 | 3 | 1.5 | 2.5 | 70 | 0.9 | 2.86 | 4.98 | 110 | 6 | 6.95 | 1.2 | - | 72.1 | - | - | - |
| ESTNB2040-20-10 | 4 | 2 | 8 | 20 | 1 | 3.86 | 4.28 | 70 | 8 | 12.01 | 5 | 20.5 | 21.6 | 22.3 | 22.8 | 23.5 |
| ESTNB2040-30-10 | 4 | 2 | 8 | 30 | 1 | 3.86 | 4.63 | 80 | 8 | 12.01 | 3.51 | 22 | 31.6 | 32.5 | 33.2 | 34.16 |
| ESTNB2040-40-10 | 4 | 2 | 8 | 40 | 1 | 3.86 | 4.98 | 90 | 8 | 12.01 | 2.7 | 22 | 42 | 43.4 | 44.3 | - |
| ESTNB2040-50-10 | 4 | 2 | 8 | 50 | 1 | 3.86 | 5.33 | 100 | 8 | 12.01 | 2.2 | 22 | 52 | 53.6 | 54.7 | - |
| ESTNB2040-60-10 | 4 | 2 | 8 | 60 | 1 | 3.86 | 5.68 | 110 | 8 | 12.01 | 1.9 | 22 | 62 | 63.8 | - | - |
| ESTNB2050-30-10 | 5 | 2.5 | 10 | 30 | 1 | 4.86 | 5.56 | 80 | 8 | 14.01 | 2.8 | 25.5 | 31.7 | 32.6 | 33.2 | - |
| ESTNB2050-40-10 | 5 | 2.5 | 10 | 40 | 1 | 4.86 | 5.91 | 90 | 8 | 14.01 | 2.1 | 25.5 | 41.7 | 42.8 | 43.5 | - |
| ESTNB2050-60-10 | 5 | 2.5 | 10 | 60 | 1 | 4.86 | 6.61 | 110 | 8 | 14.01 | 1.5 | 25.5 | 62.1 | - | - | - |
| ESTNB2060-30-10 | 6 | 3 | 12 | 30 | 1 | 5.86 | 6.49 | 80 | 8 | 16.01 | 1.9 | 29 | 31.8 | 32.6 | - | - |
| ESTNB2060-40-10 | 6 | 3 | 12 | 40 | 1 | 5.86 | 6.84 | 90 | 8 | 16.01 | 1.5 | 29 | 41.8 | - | - | - |
| ESTNB2060-50-10 | 6 | 3 | 12 | 50 | 1 | 5.86 | 7.19 | 100 | 8 | 16.01 | 1.2 | 29 | 51.8 | - | - | - |
| ESTNB2060-60-10 | 6 | 3 | 12 | 60 | 1 | 5.86 | 7.54 | 110 | 10 | 16.01 | 1.9 | 29 | 62.2 | 63.9 | - | - |
| ESTNB2060-70-10 | 6 | 3 | 12 | 70 | 1 | 5.86 | 7.89 | 120 | 10 | 16.01 | 1.7 | 29 | 72.2 | 74.1 | - | - |
| ESTNB2060-80-10 | 6 | 3 | 12 | 80 | 1 | 5.86 | 8.23 | 130 | 10 | 16.01 | 1.5 | 29 | 82.2 | - | - | - |
| ESTNB2080-50-10 | 8 | 4 | 14 | 50 | 1 | 7.86 | 9.12 | 110 | 10 | 18.01 | 1.2 | 32 | 51.9 | - | - | - |
| ESTNB2080-60-10 | 8 | 4 | 14 | 60 | 1 | 7.86 | 9.47 | 120 | 10 | 18.01 | 1 | 32 | - | - | - | - |
| ESTNB2080-70-10 | 8 | 4 | 14 | 70 | 1 | 7.86 | 9.82 | 130 | 10 | 18.01 | 0.9 | 32 | - | - | - | - |
| ESTNB2080-80-10 | 8 | 4 | 14 | 80 | 1 | 7.86 | 10.16 | 140 | 12 | 18.01 | 1.5 | 32 | 82.3 | - | - | - |
| ESTNB2100-60-10 | 10 | 5 | 18 | 60 | 1 | 9.86 | 11.33 | 130 | 12 | 22.01 | 1.1 | 39 | 62.1 | - | - | - |
| ESTNB2100-75-10 | 10 | 5 | 18 | 75 | 1 | 9.86 | 11.85 | 140 | 12 | 22.01 | 0.9 | 39 | - | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.015 | h5 |

CARBIDE | AlTiN | 3 | 30° HELIX | R ±0.005 All Sizes | DATA P.633

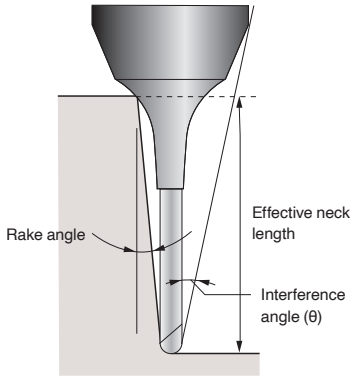
| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB3020-8-04 | 2 | 1 | 1.7 | 8 | 0.4 | 1.92 | 2.01 | 50 | 6 | 7.42 | 7 | 8.7 | 9 | 9.2 | 9.5 | 10.2 |
| ESTNB3020-12-04 | 2 | 1 | 1.7 | 12 | 0.4 | 1.92 | 2.06 | 55 | 6 | 7.42 | 5.7 | 13 | 13.6 | 14 | 14.4 | 15.4 |
| ESTNB3020-16-04 | 2 | 1 | 1.7 | 16 | 0.4 | 1.92 | 2.12 | 60 | 6 | 7.42 | 4.8 | 17 | 17.7 | 18.3 | 18.7 | 20.5 |
| ESTNB3020-20-04 | 2 | 1 | 1.7 | 20 | 0.4 | 1.92 | 2.18 | 65 | 6 | 7.42 | 4.1 | 21.3 | 22.3 | 23 | 23.6 | 25.6 |
| ESTNB3020-20-09 | 2 | 1 | 1.7 | 20 | 0.9 | 1.92 | 2.5 | 65 | 6 | 4.24 | 4.2 | - | 21.4 | 22.4 | 23.2 | 24.6 |
| ESTNB3020-25-09 | 2 | 1 | 1.7 | 25 | 0.9 | 1.92 | 2.65 | 65 | 6 | 4.24 | 3.6 | - | 26.5 | 27.7 | 28.5 | 30.8 |
| ESTNB3020-30-04 | 2 | 1 | 1.7 | 30 | 0.4 | 1.92 | 2.32 | 70 | 6 | 7.42 | 3.1 | 31.4 | 32.7 | 33.6 | 34.8 | 38.5 |
| ESTNB3020-30-09 | 2 | 1 | 1.7 | 30 | 0.9 | 1.92 | 2.81 | 70 | 6 | 4.24 | 3.2 | - | 31.6 | 32.9 | 33.7 | 36.9 |
| ESTNB3020-35-09 | 2 | 1 | 1.7 | 35 | 0.9 | 1.92 | 2.97 | 75 | 6 | 4.24 | 2.8 | - | 36.6 | 38 | 39 | - |
| ESTNB3020-40-04 | 2 | 1 | 1.7 | 40 | 0.4 | 1.92 | 2.46 | 80 | 6 | 7.42 | 2.5 | 41.5 | 43.1 | 44.2 | 46.3 | - |
| ESTNB3020-40-09 | 2 | 1 | 1.7 | 40 | 0.9 | 1.92 | 3.12 | 80 | 6 | 4.24 | 2.6 | - | 41.7 | 43.2 | 44.5 | - |
| ESTNB3020-50-09 | 2 | 1 | 1.7 | 50 | 0.9 | 1.92 | 3.44 | 90 | 6 | 4.24 | 2.1 | - | 51.8 | 53.5 | 55.5 | - |
| ESTNB3020-60-09 | 2 | 1 | 1.7 | 60 | 0.9 | 1.92 | 3.75 | 100 | 6 | 4.24 | 1.8 | - | 61.9 | 63.8 | - | - |
| ESTNB3020-70-09 | 2 | 1 | 1.7 | 70 | 0.9 | 1.92 | 4.07 | 110 | 6 | 4.24 | 1.6 | - | 72 | 74.1 | - | - |
| ESTNB3030-8-04 | 3 | 1.5 | 2.5 | 8 | 0.4 | 2.86 | 2.94 | 50 | 6 | 8.5 | 6.3 | 8.8 | 9.1 | 9.3 | 9.5 | 10.3 |
| ESTNB3030-16-04 | 3 | 1.5 | 2.5 | 16 | 0.4 | 2.86 | 3.05 | 55 | 6 | 12.52 | 4.1 | 17.2 | 17.8 | 18.3 | 18.7 | 20.6 |
| ESTNB3030-20-04 | 3 | 1.5 | 2.5 | 20 | 0.4 | 2.86 | 3.1 | 60 | 6 | 12.52 | 3.4 | 21.2 | 22 | 22.6 | 23.3 | 25.7 |
| ESTNB3030-30-04 | 3 | 1.5 | 2.5 | 30 | 0.4 | 2.86 | 3.24 | 70 | 6 | 12.52 | 2.5 | 31.6 | 32.8 | 33.7 | 34.9 | - |
| ESTNB3030-30-09 | 3 | 1.5 | 2.5 | 30 | 0.9 | 2.86 | 3.72 | 70 | 6 | 6.95 | 2.6 | - | 31.8 | 33 | 33.8 | - |
| ESTNB3030-40-04 | 3 | 1.5 | 2.5 | 40 | 0.4 | 2.86 | 3.38 | 80 | 6 | 12.52 | 2 | 41.7 | 43.2 | 44.3 | - | - |
| ESTNB3030-40-09 | 3 | 1.5 | 2.5 | 40 | 0.9 | 2.86 | 4.04 | 80 | 6 | 6.95 | 2 | - | 41.9 | 43.3 | - | - |
| ESTNB3030-50-09 | 3 | 1.5 | 2.5 | 50 | 0.9 | 2.86 | 4.35 | 90 | 6 | 6.95 | 1.7 | - | 52 | 53.6 | - | - |
| ESTNB3030-60-09 | 3 | 1.5 | 2.5 | 60 | 0.9 | 2.86 | 4.67 | 100 | 6 | 6.95 | 1.4 | - | 62.1 | - | - | - |
| ESTNB3030-70-09 | 3 | 1.5 | 2.5 | 70 | 0.9 | 2.86 | 4.98 | 110 | 6 | 6.95 | 1.2 | - | 72.1 | - | - | - |

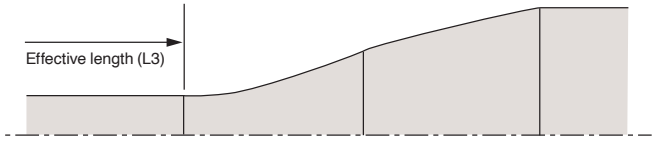
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

○ : GOOD ◎ : EXCELLENT

# ESTNB30 | 3 FLUTES TAPERED NECK BALL ENDMILL




※ The marked effective neck length is the default value to prevent interference with the workpiece.
Proper control of the processing environment is required

| EDP No | SIZES (mm) | | | | | | | | | | | Effective length by inclination angle | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | θ2 | D3 | D4 | L2 | D2 | App.L | θ | 0.5° | 1° | 1.5° | 2° | 3° |
| ESTNB3040-20-10 | 4 | 2 | 8 | 20 | 1 | 3.86 | 4.28 | 70 | 8 | 12.01 | 5 | 20.5 | 21.6 | 22.3 | 22.8 | 23.5 |
| ESTNB3040-30-10 | 4 | 2 | 8 | 30 | 1 | 3.86 | 4.63 | 80 | 8 | 12.01 | 3.6 | 22 | 31.6 | 32.5 | 33.2 | 34.1 |
| ESTNB3040-40-10 | 4 | 2 | 8 | 40 | 1 | 3.86 | 4.98 | 90 | 8 | 12.01 | 2.7 | 22 | 42 | 43.4 | 44.3 | - |
| ESTNB3040-50-10 | 4 | 2 | 8 | 50 | 1 | 3.86 | 5.33 | 100 | 8 | 12.01 | 2.2 | 22 | 52 | 53.6 | 54.7 | - |
| ESTNB3040-60-10 | 4 | 2 | 8 | 60 | 1 | 3.86 | 5.68 | 110 | 8 | 12.01 | 1.9 | 22 | 62 | 63.8 | - | - |
| ESTNB3050-30-10 | 5 | 2.5 | 10 | 30 | 1 | 4.86 | 5.56 | 80 | 8 | 14.01 | 2.8 | 25.5 | 31.7 | 32.6 | 33.2 | - |
| ESTNB3050-40-10 | 5 | 2.5 | 10 | 40 | 1 | 4.86 | 5.91 | 90 | 8 | 14.01 | 2.1 | 25.5 | 41.7 | 42.8 | 43.5 | - |
| ESTNB3050-60-10 | 5 | 2.5 | 10 | 60 | 1 | 4.86 | 6.61 | 110 | 8 | 12.52 | 1.5 | 25.5 | 62.1 | - | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | ○ | ◎ | ◎ | ○ | | | | | |

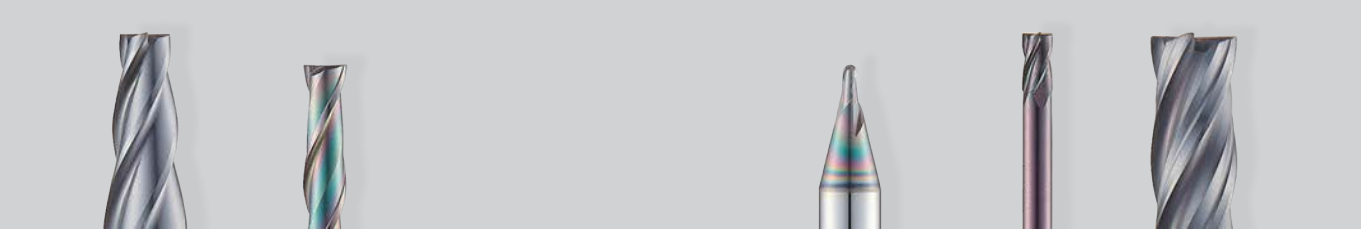
○ : GOOD ◎ : EXCELLENT

# U-WING ENDMILL

Mid Hardness HRc 30 ~ 50

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | UE502 | | 2 FLUTES SQUARE ENDMILL | D0.1 | D25 | 160 |
| | 2F | UE512 | | 2 FLUTES LONG NECK SQUARE ENDMILL | D0.1 | D12 | 162 |
| | 2F | UE522 | | 2 FLUTES SQUARE ENDMILL | D1 | D25 | 165 |
| | 2F | UXE502 | | 2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS | D0.1 | D20 | 168 |
| | 4F | UE504H | | 4 FLUTES 45° HELIX SQUARE ENDMILL | D1 | D20 | 170 |
| | 4F | UE514 | | 4 FLUTES LONG NECK SQUARE ENDMILL | D1 | D12 | 171 |
| | 4F | UE524 | | 4 FLUTES SQUARE ENDMILL | D1 | D25 | 173 |
| | 4F | ULE504 | | 4 FLUTES AUTOMATIC CNC SQUARE ENDMILL | D3 | D16 | 176 |
| | 4F | UE504 | | 4 FLUTES SQUARE ENDMILL | D0.8 | D25 | 177 |
| | 4F | UXE504 | | 4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS | D1 | D20 | 178 |
| | 6F | UE506 | | 6 FLUTES SQUARE ENDMILL | D6 | D20 | 180 |
| | 2F | UTE502 | | 2 FLUTES TAPERED SQUARE ENDMILL | D0.3 | D10 | 181 |
| | 4F | UTE504 | | 4 FLUTES TAPERED SQUARE ENDMILL | D0.8 | D10 | 183 |
| RADIUS | 2F | UR502 | | 2 FLUTES RADIUS ENDMILL | D0.2 | D20 | 186 |
| | 2F | UR512 | | 2 FLUTES NECK TYPE RADIUS ENDMILL | D0.2 | D20 | 190 |
| | 2F | UR542 | | 2 FLUTES TAPERED NECK RADIUS ENDMILL | D0.2 | D4 | 196 |
| | 4F | UR504 | | 4 FLUTES RADIUS ENDMILL | D3 | D20 | 207 |
| | 4F | UR544 | | 4 FLUTES TAPERED NECK RADIUS ENDMILL | D1 | D4 | 209 |
| | 4F | UXR504 | | 4 FLUTES MULTI HELIX RADIUS ENDMILL | D1 | D20 | 216 |
| | 4F | UXR514 | | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL | D1 | D20 | 219 |
| | 6F | UR506 | | 6 FLUTES RADIUS ENDMILL | D6 | D20 | 224 |
| | 3F | UDR503 | | 3 FLUTES DOUBLE RADIUS ENDMILL | D6 | D20 | 225 |
| | 4F | USPM4 | | 4 FLUTES RADIUS ENDMILL FOR HIGH SPEED MACHINING | D1 | D20 | 226 |
| | 4F | UTR504 | | 4 FLUTES TAPERED RADIUS ENDMILL | D0.8 | D2.5 | 228 |
| BALL | 2F | UB502 | | 2 FLUTES BALL ENDMILL | R0.1 | R25 | 233 |
| | 2F | UB502-P | | 2 FLUTES HIGH PRECISION BALL ENDMILL | R0.1 | R12 | 236 |
| | 2F | UB512 | | 2 FLUTES LONG NECK BALL ENDMILL | R0.1 | R12 | 237 |
| | 2F | UB512 S6 | | 2 FLUTES LONG NECK BALL ENDMILL (SHANK 6) | R0.5 | R2 | 241 |
| | 2F | UB532 | | 2 FLUTES LOLLIPOP STYLE BALL ENDMILL | R3 | R12 | 243 |



## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| BALL | 2F | UB542 | | 2 FLUTES TAPERED NECK BALL ENDMILL | R0.1 | R12 | 244 |
| | 2F | USB502 | | 2 FLUTES STRAIGHT BALL ENDMILL | R3 | R20 | 256 |
| | 3F | UB503 | | 3 FLUTES BALL ENDMILL | R1 | R12 | 257 |
| | 4F | UB504 | | 4 FLUTES BALL ENDMILL | R1 | R12 | 258 |
| | 2F | UTB502 | | 2 FLUTES TAPERED BALL ENDMILL | R0.3 | R2 | 259 |
| ROUGHING | 3~5F | UF50 | | 3~5 FLUTES CHIP BRAKER ROUGHING ENDMILL | D3 | D25 | 261 |
| | 3~5F | UF51 | | 3~5 FLUTES PITCH ROUGHING ENDMILL | D3 | D25 | 262 |
| | 3~5F | UF51-H | | 3~5 FLUTES 45° HELIX FINE PITCH ROUGHING ENDMILL | D3 | D25 | 263 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

U R 5 0 2 030 10 25 - S3

| Section | Geometry | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R | Neck Length | OAL | Detailed characteristics |
|---|---|---|---|---|---|---|---|---|---|
| U : U-Wing | B : Ball | 5 : Grade | 0 : Straight | 2 : 2 Flute | 0.1 | 0.05 | 0.2 | 35 | P : Precision Tolerance |
| | SB : Straight Ball | | 1 : Neck | 3 : 3 Flute | ~ | ~ | | | S3 ~S6 : Shank Dia |
| | E : Square | | 2 : Long Shank | 4 : 4 Flute | 25 | 5 | 100 | 300 | H : High Helix |
| | R : Radius | | 3 : Lollipop | 5 : 5 Flute | | | | | |
| | SPM : Speed Power Mill | | 4 : Tapered Neck | 6 : 6 Flute | | | | | |
| | XE : Heavy Cut Square | | | | | | | | |
| | XR : Multi Helix Radius | | | | | | | | |
| | TE : Tapered Square | | | | | | | | |
| | TR : Tapered Radius | | | | | | | | |
| | TB : Tapered Ball | | | | | | | | |
| | DR : Double Radius | | | | | | | | |
| | F : Roughing | | | | | | | | |
| | LE : Square (Lathe) | | | | | | | | |

Ex) 2 Flute / Cutting Dia Ø3 / Corner R 1.0 / Neck Length 6mm / Shank Dia 4 / 50 Grade / Corner Radius Neck Type U-Wing Endmill

# U-WING ENDMILL

Mid Hardness HRc 30 ~ 50

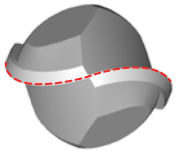
## Characteristics

· Suitable for processing mold steel, mid hardness steel HRc 30~50
· New coatings excellent for wear resistance and lubrication
· Excellent for complex mold processing by securing various specifications and rib types

## Features

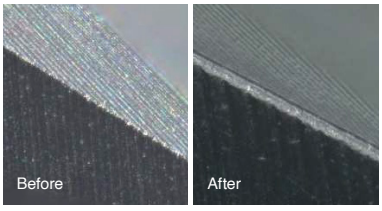
· Suitable for mid hardness steel, mold steel processing from HRc30-50
· Improvement of wear resistance and increased lubricity through AlCrN-based Coating
· Strengthened cutting edge of ball end mills with ultra-fine material
· Enhanced chipping resistance of flat end mill through application of high toughness material
· Range of shapes and specifications suitable for complex mold processing
· Suitable for precision processing by applying high precision tolerances on h5 shank, cutting diameter and radius

### S curved gash shape

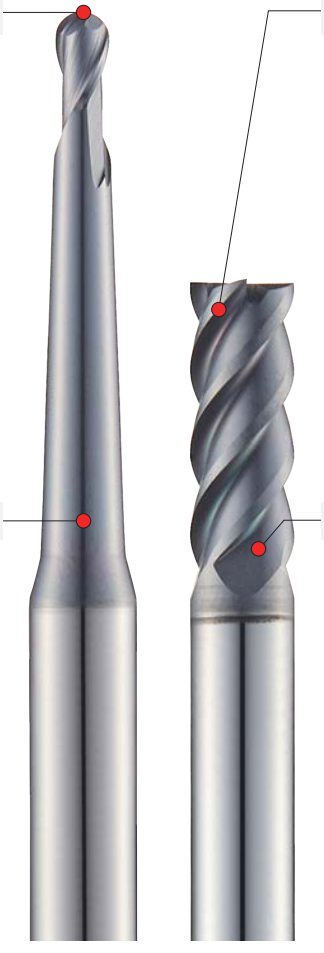


1) Improved cutting and wear resistance by dispersing processing loads

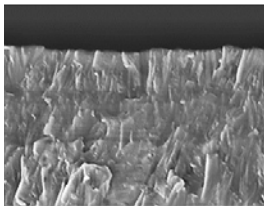
### Cutting edge




1) Improved chipping resistance
2) New cutting edge to cope with a variety of mold processing and improved performance and tool life



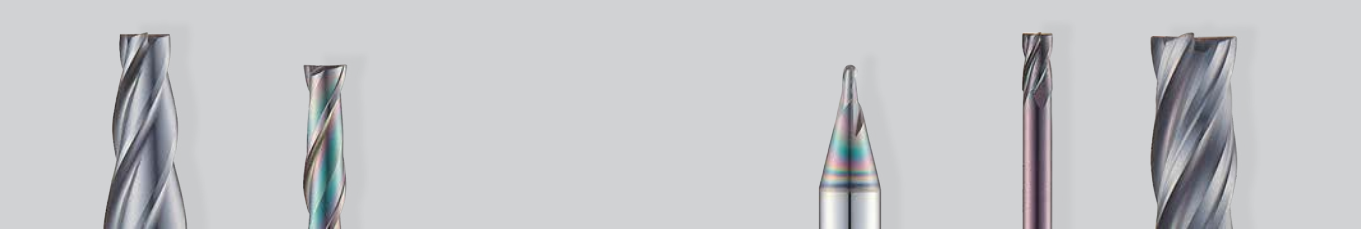
### AlCrN based new coating



1) Improved the wear-resistance & oxidation resistance
2) Reinforced the lubrication by containing the Cr
3) Improved heat resistance

### Adopted new raw material

1) Separated raw material by geometry to maximize tool characteristics and to increase versatility

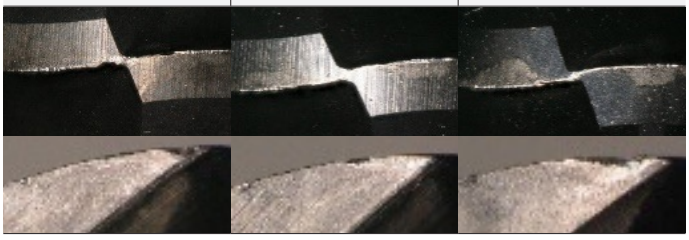


## Case Study

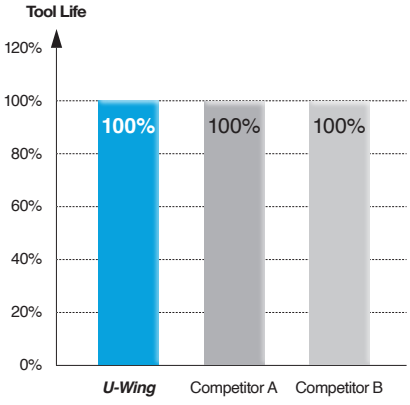
### 2F R3.0 BALL ENDMILL

**STAVAX**

| *U-Wing* | Competitor A | Competitor B |
|---|---|---|

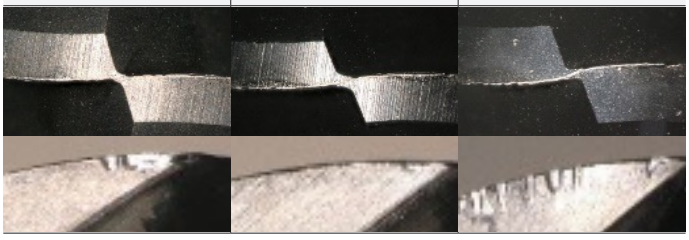


· Cutting Condition
· Profiling, rpm : 8,340, feed : 2,830, ap : 0.18, ae : 0.3, Note : Wet Machining

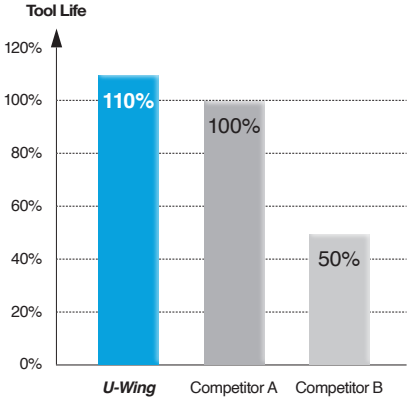



**KP4M**

| *U-Wing* | Competitor A | Competitor B |
|---|---|---|

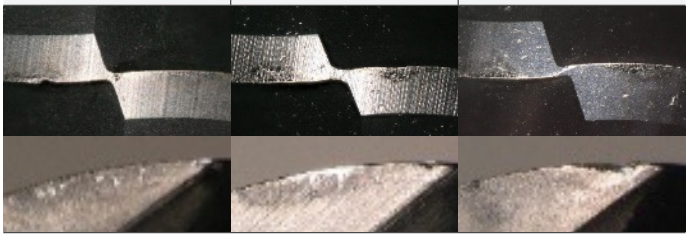


· Cutting Condition
· Profiling, rpm : 8,040, feed : 2,410, ap : 0.18, ae : 0.3, Note : Wet Machining

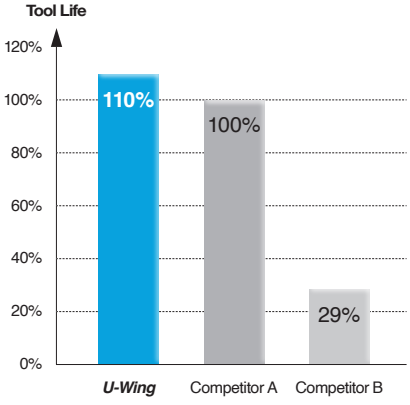



**NAK80**

| *U-Wing* | Competitor A | Competitor B |
|---|---|---|



· Cutting Condition
· Profiling, rpm : 7,128, feed : 2,420, ap : 0.18, ae : 0.3, Note : Wet Machining



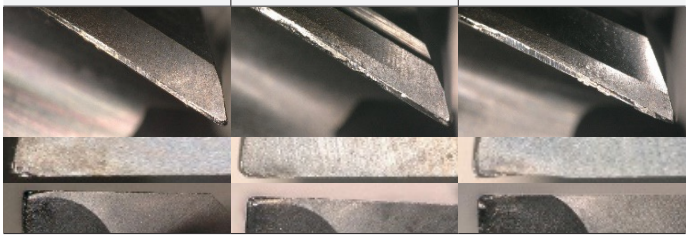
# U-WING ENDMILL

Mid Hardness HRc 30 ~ 50

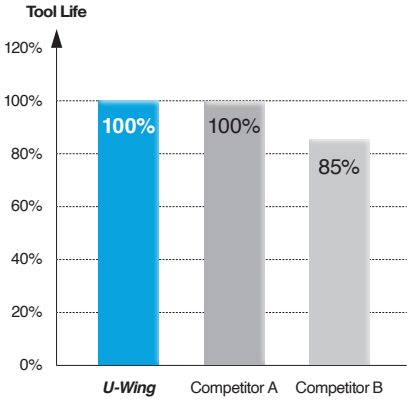
## Case Study

### 4F D6.0 SQUARE ENDMILL

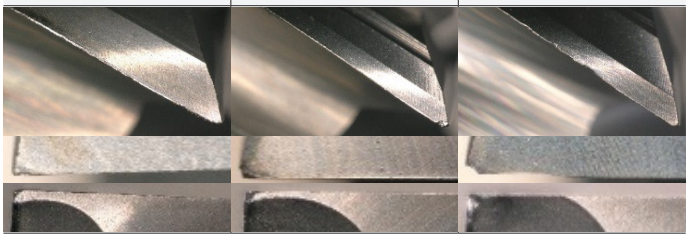
**STAVAX**

| *U-Wing* | Competitor A | Competitor B |
|---|---|---|
|  | | |

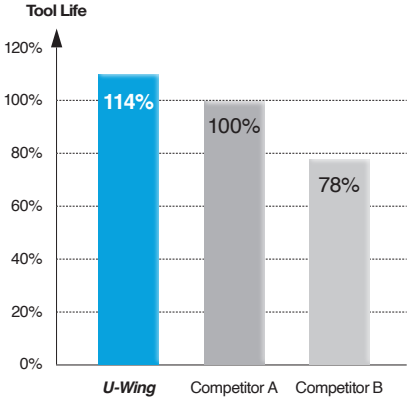
· Cutting Condition
· Shouldering, rpm : 2,840, feed : 340, ap : 6, ae : 0.3, Note : Wet Machining



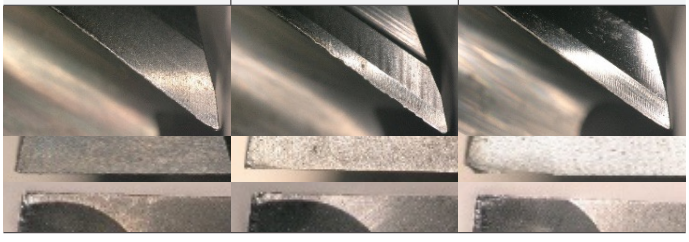

**KP4M**

| *U-Wing* | Competitor A | Competitor B |
|---|---|---|
|  | | |

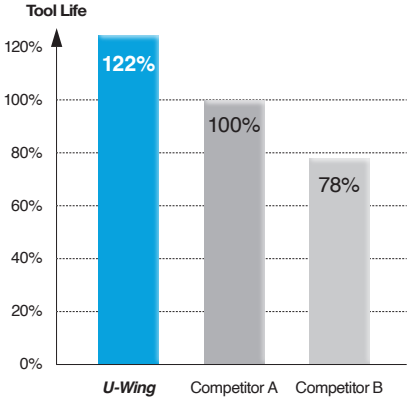
· Cutting Condition
· Shouldering, rpm : 5,560, feed : 660, ap : 6, ae : 0.3, Note : Wet Machining

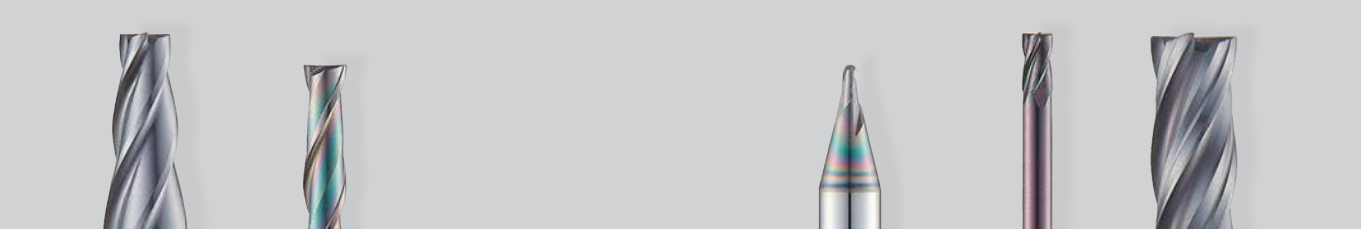



**NAK80**

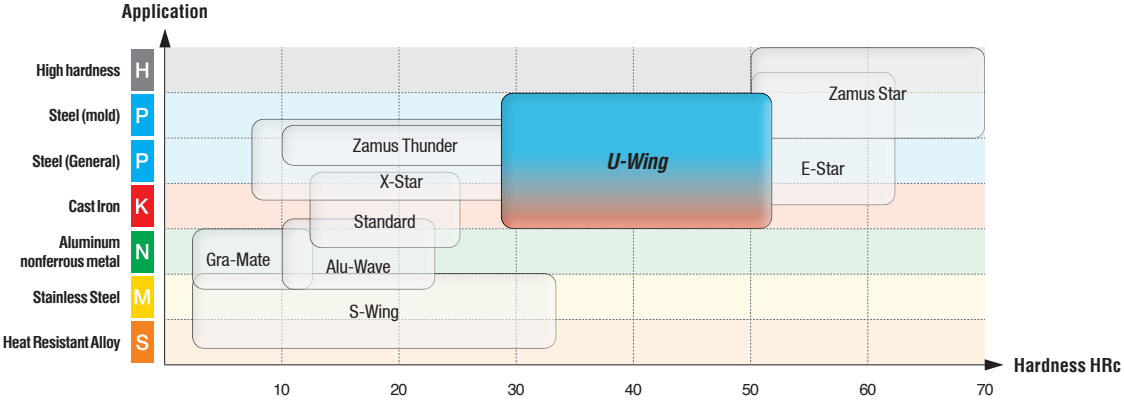
| *U-Wing* | Competitor A | Competitor B |
|---|---|---|
|  | | |

· Cutting Condition
· Shouldering, rpm : 3,360, feed : 400, ap : 6, ae : 0.3, Note : Wet Machining

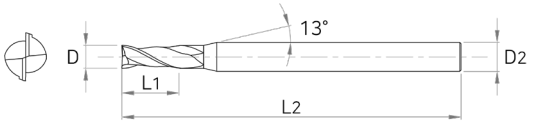


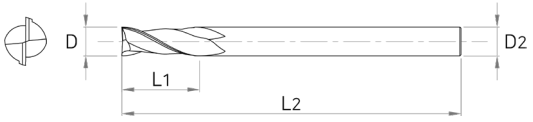


## Applications



# UE502 | 2 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D6.5 ~ 25 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.636

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE502 001S3 | 0.1 | 0.2 | 40 | 3 |
| UE502 001 | 0.1 | 0.2 | 40 | 4 |
| UE502 0015 | 0.15 | 0.3 | 40 | 4 |
| UE502 002S3 | 0.2 | 0.4 | 40 | 3 |
| UE502 002 | 0.2 | 0.4 | 40 | 4 |
| UE502 0025 | 0.25 | 0.5 | 40 | 4 |
| UE502 003S3 | 0.3 | 0.6 | 40 | 3 |
| UE502 003 | 0.3 | 0.6 | 40 | 4 |
| UE502 0035 | 0.35 | 0.7 | 40 | 4 |
| UE502 004S3 | 0.4 | 0.8 | 40 | 3 |
| UE502 004 | 0.4 | 0.8 | 40 | 4 |
| UE502 0045 | 0.45 | 0.9 | 40 | 4 |
| UE502 005S3 | 0.5 | 1 | 40 | 3 |
| UE502 005 | 0.5 | 1 | 40 | 4 |
| UE502 0055 | 0.55 | 1.1 | 40 | 4 |
| UE502 006S3 | 0.6 | 1.2 | 40 | 3 |
| UE502 006 | 0.6 | 1.2 | 40 | 4 |
| UE502 0065 | 0.65 | 1.3 | 40 | 4 |
| UE502 007S3 | 0.7 | 1.4 | 40 | 3 |
| UE502 007 | 0.7 | 1.4 | 40 | 4 |
| UE502 0075 | 0.75 | 1.5 | 40 | 4 |
| UE502 008S3 | 0.8 | 1.6 | 40 | 3 |
| UE502 008 | 0.8 | 1.6 | 40 | 4 |
| UE502 0085 | 0.85 | 1.7 | 40 | 4 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE502 009S3 | 0.9 | 1.8 | 40 | 3 |
| UE502 009 | 0.9 | 1.8 | 40 | 4 |
| UE502 0095 | 0.95 | 2 | 40 | 4 |
| UE502 010S3 | 1 | 2.5 | 50 | 3 |
| UE502 010S4 | 1 | 2.5 | 50 | 4 |
| UE502 010 | 1 | 2.5 | 50 | 6 |
| UE502 011S4 | 1.1 | 3 | 50 | 4 |
| UE502 012S3 | 1.2 | 3 | 50 | 3 |
| UE502 012S4 | 1.2 | 3 | 50 | 4 |
| UE502 012 | 1.2 | 3 | 50 | 6 |
| UE502 013S4 | 1.3 | 3 | 50 | 4 |
| UE502 014S4 | 1.4 | 4 | 50 | 4 |
| UE502 015S3 | 1.5 | 4 | 50 | 3 |
| UE502 015S4 | 1.5 | 4 | 50 | 4 |
| UE502 015 | 1.5 | 4 | 50 | 6 |
| UE502 016S4 | 1.6 | 4 | 50 | 4 |
| UE502 017S4 | 1.7 | 4 | 50 | 4 |
| UE502 018S4 | 1.8 | 5 | 50 | 4 |
| UE502 019S4 | 1.9 | 5 | 50 | 4 |
| UE502 020S3 | 2 | 6 | 50 | 3 |
| UE502 020S4 | 2 | 6 | 50 | 4 |
| UE502 020 | 2 | 6 | 50 | 6 |
| UE502 021S4 | 2.1 | 6 | 50 | 4 |
| UE502 022S4 | 2.2 | 6 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE502 | 2 FLUTES SQUARE ENDMILL

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE502 023S4 | 2.3 | 6 | 50 | 4 |
| UE502 024S4 | 2.4 | 6 | 50 | 4 |
| UE502 025S3 | 2.5 | 7 | 50 | 3 |
| UE502 025 | 2.5 | 7 | 50 | 6 |
| UE502 025S4 | 2.5 | 8 | 50 | 4 |
| UE502 026S4 | 2.6 | 8 | 50 | 4 |
| UE502 027S4 | 2.7 | 8 | 50 | 4 |
| UE502 028S4 | 2.8 | 8 | 50 | 4 |
| UE502 029S4 | 2.9 | 8 | 50 | 4 |
| UE502 030S3 | 3 | 8 | 50 | 3 |
| UE502 030S4 | 3 | 8 | 50 | 4 |
| UE502 030 | 3 | 8 | 50 | 6 |
| UE502 035S4 | 3.5 | 10 | 50 | 4 |
| UE502 035 | 3.5 | 10 | 50 | 6 |
| UE502 040080S4 | 4 | 10 | 80 | 4 |
| UE502 040S4 | 4 | 10 | 50 | 4 |
| UE502 040 | 4 | 10 | 50 | 6 |
| UE502 045 | 4.5 | 14 | 50 | 6 |
| UE502 050 | 5 | 15 | 60 | 6 |
| UE502 055 | 5.5 | 15 | 60 | 6 |
| UE502 060 | 6 | 15 | 60 | 6 |
| UE502 065 | 6.5 | 18 | 60 | 8 |
| UE502 070 | 7 | 20 | 60 | 8 |
| UE502 075 | 7.5 | 20 | 60 | 8 |
| UE502 080 | 8 | 20 | 70 | 8 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE502 085 | 8.5 | 22 | 70 | 10 |
| UE502 090 | 9 | 22 | 70 | 10 |
| UE502 095 | 9.5 | 24 | 70 | 10 |
| UE502 100 | 10 | 25 | 75 | 10 |
| UE502 105 | 10.5 | 26 | 75 | 12 |
| UE502 110 | 11 | 30 | 75 | 12 |
| UE502 115 | 11.5 | 30 | 80 | 12 |
| UE502 120 | 12 | 30 | 80 | 12 |
| UE502 130 | 13 | 35 | 100 | 12 |
| UE502 140S16 | 14 | 35 | 100 | 16 |
| UE502 140 | 14 | 35 | 100 | 14 |
| UE502 140S12 | 14 | 35 | 100 | 12 |
| UE502 150 | 15 | 38 | 100 | 16 |
| UE502 160 | 16 | 40 | 100 | 16 |
| UE502 170 | 17 | 42 | 100 | 16 |
| UE502 180 | 18 | 45 | 100 | 18 |
| UE502 180S16 | 18 | 45 | 100 | 16 |
| UE502 190 | 19 | 45 | 100 | 20 |
| UE502 200 | 20 | 45 | 100 | 20 |
| UE502 210 | 21 | 45 | 100 | 20 |
| UE502 220 | 22 | 45 | 100 | 20 |
| UE502 230 | 23 | 50 | 120 | 25 |
| UE502 240 | 24 | 50 | 120 | 25 |
| UE502 250 | 25 | 50 | 120 | 25 |

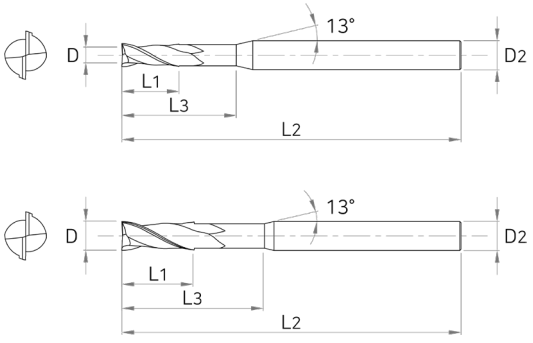


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

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| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 001003 | 0.1 | 0.15 | 0.3 | 40 | 4 |
| UE512 001005 | 0.1 | 0.15 | 0.5 | 40 | 4 |
| UE512 00101 | 0.1 | 0.15 | 1 | 40 | 4 |
| UE512 002005 | 0.2 | 0.3 | 0.5 | 40 | 4 |
| UE512 00201 | 0.2 | 0.3 | 1 | 40 | 4 |
| UE512 002015 | 0.2 | 0.3 | 1.5 | 40 | 4 |
| UE512 00202 | 0.2 | 0.3 | 2 | 40 | 4 |
| UE512 00301 | 0.3 | 0.5 | 1 | 40 | 4 |
| UE512 003015 | 0.3 | 0.5 | 1.5 | 40 | 4 |
| UE512 00302 | 0.3 | 0.5 | 2 | 40 | 4 |
| UE512 003025 | 0.3 | 0.5 | 2.5 | 40 | 4 |
| UE512 00303 | 0.3 | 0.5 | 3 | 40 | 4 |
| UE512 00304 | 0.3 | 0.5 | 4 | 40 | 4 |
| UE512 00305 | 0.3 | 0.5 | 5 | 40 | 4 |
| UE512 00401 | 0.4 | 0.6 | 1 | 40 | 4 |
| UE512 004015 | 0.4 | 0.6 | 1.5 | 40 | 4 |
| UE512 00402 | 0.4 | 0.6 | 2 | 40 | 4 |
| UE512 004025 | 0.4 | 0.6 | 2.5 | 40 | 4 |
| UE512 00403 | 0.4 | 0.6 | 3 | 40 | 4 |
| UE512 00404 | 0.4 | 0.6 | 4 | 40 | 4 |
| UE512 00405 | 0.4 | 0.6 | 5 | 40 | 4 |
| UE512 00406 | 0.4 | 0.6 | 6 | 40 | 4 |
| UE512 00408 | 0.4 | 0.6 | 8 | 40 | 4 |
| UE512 00410 | 0.4 | 0.6 | 10 | 40 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 00501 | 0.5 | 0.7 | 1 | 45 | 4 |
| UE512 005015 | 0.5 | 0.7 | 1.5 | 45 | 4 |
| UE512 00502 | 0.5 | 0.7 | 2 | 45 | 4 |
| UE512 005025 | 0.5 | 0.7 | 2.5 | 45 | 4 |
| UE512 00503 | 0.5 | 0.7 | 3 | 45 | 4 |
| UE512 00504 | 0.5 | 0.7 | 4 | 45 | 4 |
| UE512 00505 | 0.5 | 0.7 | 5 | 45 | 4 |
| UE512 00506 | 0.5 | 0.7 | 6 | 45 | 4 |
| UE512 00508 | 0.5 | 0.7 | 8 | 45 | 4 |
| UE512 00510 | 0.5 | 0.7 | 10 | 45 | 4 |
| UE512 00512 | 0.5 | 0.7 | 12 | 45 | 4 |
| UE512 00514 | 0.5 | 0.7 | 14 | 45 | 4 |
| UE512 00516 | 0.5 | 0.7 | 16 | 45 | 4 |
| UE512 00602 | 0.6 | 0.9 | 2 | 45 | 4 |
| UE512 00603 | 0.6 | 0.9 | 3 | 45 | 4 |
| UE512 00604 | 0.6 | 0.9 | 4 | 45 | 4 |
| UE512 00605 | 0.6 | 0.9 | 5 | 45 | 4 |
| UE512 00606 | 0.6 | 0.9 | 6 | 45 | 4 |
| UE512 00608 | 0.6 | 0.9 | 8 | 45 | 4 |
| UE512 00610 | 0.6 | 0.9 | 10 | 45 | 4 |
| UE512 00612 | 0.6 | 0.9 | 12 | 45 | 4 |
| UE512 00614 | 0.6 | 0.9 | 14 | 45 | 4 |
| UE512 00616 | 0.6 | 0.9 | 16 | 45 | 4 |
| UE512 00702 | 0.7 | 1.2 | 2 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 00704 | 0.7 | 1.2 | 4 | 45 | 4 |
| UE512 00706 | 0.7 | 1.2 | 6 | 45 | 4 |
| UE512 00708 | 0.7 | 1.2 | 8 | 45 | 4 |
| UE512 00710 | 0.7 | 1.2 | 10 | 45 | 4 |
| UE512 00712 | 0.7 | 1.2 | 12 | 45 | 4 |
| UE512 00802 | 0.8 | 1.2 | 2 | 45 | 4 |
| UE512 00803 | 0.8 | 1.2 | 3 | 45 | 4 |
| UE512 00804 | 0.8 | 1.2 | 4 | 45 | 4 |
| UE512 00805 | 0.8 | 1.2 | 5 | 45 | 4 |
| UE512 00806 | 0.8 | 1.2 | 6 | 45 | 4 |
| UE512 00808 | 0.8 | 1.2 | 8 | 45 | 4 |
| UE512 00810 | 0.8 | 1.2 | 10 | 45 | 4 |
| UE512 00812 | 0.8 | 1.2 | 12 | 45 | 4 |
| UE512 00814 | 0.8 | 1.2 | 14 | 45 | 4 |
| UE512 00816 | 0.8 | 1.2 | 16 | 45 | 4 |
| UE512 00820 | 0.8 | 1.2 | 20 | 45 | 4 |
| UE512 00906 | 0.9 | 1.3 | 6 | 45 | 4 |
| UE512 00908 | 0.9 | 1.3 | 8 | 45 | 4 |
| UE512 00910 | 0.9 | 1.3 | 10 | 45 | 4 |
| UE512 01002 | 1 | 1.5 | 2 | 50 | 4 |
| UE512 01003 | 1 | 1.5 | 3 | 50 | 4 |
| UE512 01004 | 1 | 1.5 | 4 | 50 | 4 |
| UE512 01005 | 1 | 1.5 | 5 | 50 | 4 |
| UE512 01006 | 1 | 1.5 | 6 | 50 | 4 |
| UE512 01007 | 1 | 1.5 | 7 | 50 | 4 |
| UE512 01008 | 1 | 1.5 | 8 | 50 | 4 |
| UE512 01010 | 1 | 1.5 | 10 | 50 | 4 |
| UE512 01012 | 1 | 1.5 | 12 | 50 | 4 |
| UE512 01014 | 1 | 1.5 | 14 | 50 | 4 |
| UE512 01016 | 1 | 1.5 | 16 | 50 | 4 |
| UE512 01018 | 1 | 1.5 | 18 | 50 | 4 |
| UE512 01020 | 1 | 1.5 | 20 | 50 | 4 |
| UE512 01022 | 1 | 1.5 | 22 | 60 | 4 |
| UE512 01026 | 1 | 1.5 | 26 | 60 | 4 |
| UE512 01030 | 1 | 1.5 | 30 | 70 | 4 |
| UE512 01040 | 1 | 1.5 | 40 | 80 | 4 |
| UE512 01050 | 1 | 1.5 | 50 | 100 | 4 |
| UE512 01204 | 1.2 | 1.8 | 4 | 50 | 4 |
| UE512 01206 | 1.2 | 1.8 | 6 | 50 | 4 |
| UE512 01208 | 1.2 | 1.8 | 8 | 50 | 4 |
| UE512 01210 | 1.2 | 1.8 | 10 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 01212 | 1.2 | 1.8 | 12 | 50 | 4 |
| UE512 01214 | 1.2 | 1.8 | 14 | 50 | 4 |
| UE512 01216 | 1.2 | 1.8 | 16 | 50 | 4 |
| UE512 01220 | 1.2 | 1.8 | 20 | 50 | 4 |
| UE512 01226 | 1.2 | 1.8 | 26 | 60 | 4 |
| UE512 01230 | 1.2 | 1.8 | 30 | 70 | 4 |
| UE512 01406 | 1.4 | 2.1 | 6 | 50 | 4 |
| UE512 01408 | 1.4 | 2.1 | 8 | 50 | 4 |
| UE512 01410 | 1.4 | 2.1 | 10 | 50 | 4 |
| UE512 01414 | 1.4 | 2.1 | 14 | 50 | 4 |
| UE512 01416 | 1.4 | 2.1 | 16 | 50 | 4 |
| UE512 01420 | 1.4 | 2.1 | 20 | 50 | 4 |
| UE512 01504 | 1.5 | 2.3 | 4 | 50 | 4 |
| UE512 01505 | 1.5 | 2.3 | 5 | 50 | 4 |
| UE512 01506 | 1.5 | 2.3 | 6 | 50 | 4 |
| UE512 01507 | 1.5 | 2.3 | 7 | 50 | 4 |
| UE512 01508 | 1.5 | 2.3 | 8 | 50 | 4 |
| UE512 01510 | 1.5 | 2.3 | 10 | 50 | 4 |
| UE512 01512 | 1.5 | 2.3 | 12 | 50 | 4 |
| UE512 01514 | 1.5 | 2.3 | 14 | 50 | 4 |
| UE512 01516 | 1.5 | 2.3 | 16 | 50 | 4 |
| UE512 01518 | 1.5 | 2.3 | 18 | 50 | 4 |
| UE512 01520 | 1.5 | 2.3 | 20 | 50 | 4 |
| UE512 01522 | 1.5 | 2.3 | 22 | 60 | 4 |
| UE512 01526 | 1.5 | 2.3 | 26 | 60 | 4 |
| UE512 01530 | 1.5 | 2.3 | 30 | 70 | 4 |
| UE512 01608 | 1.6 | 2.3 | 8 | 50 | 4 |
| UE512 01610 | 1.6 | 2.3 | 10 | 50 | 4 |
| UE512 01612 | 1.6 | 2.3 | 12 | 50 | 4 |
| UE512 01616 | 1.6 | 2.3 | 16 | 50 | 4 |
| UE512 01620 | 1.6 | 2.3 | 20 | 50 | 4 |
| UE512 01808 | 1.8 | 2.7 | 8 | 50 | 4 |
| UE512 01810 | 1.8 | 2.7 | 10 | 50 | 4 |
| UE512 01812 | 1.8 | 2.7 | 12 | 50 | 4 |
| UE512 01816 | 1.8 | 2.7 | 16 | 50 | 4 |
| UE512 01820 | 1.8 | 2.7 | 20 | 50 | 4 |
| UE512 02006 | 2 | 3 | 6 | 50 | 4 |
| UE512 02008 | 2 | 3 | 8 | 50 | 4 |
| UE512 02010 | 2 | 3 | 10 | 50 | 4 |
| UE512 02012 | 2 | 3 | 12 | 50 | 4 |
| UE512 02014 | 2 | 3 | 14 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE512 | 2 FLUTES LONG NECK SQUARE ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 02016 | 2 | 3 | 16 | 50 | 4 |
| UE512 02018 | 2 | 3 | 18 | 50 | 4 |
| UE512 02020 | 2 | 3 | 20 | 50 | 4 |
| UE512 02022 | 2 | 3 | 22 | 60 | 4 |
| UE512 02026 | 2 | 3 | 26 | 60 | 4 |
| UE512 02030 | 2 | 3 | 30 | 70 | 4 |
| UE512 02035 | 2 | 3 | 35 | 70 | 4 |
| UE512 02040 | 2 | 3 | 40 | 80 | 4 |
| UE512 02045 | 2 | 3 | 45 | 90 | 4 |
| UE512 02050 | 2 | 3 | 50 | 100 | 4 |
| UE512 02060 | 2 | 3 | 60 | 110 | 4 |
| UE512 02508 | 2.5 | 4 | 8 | 50 | 4 |
| UE512 02510 | 2.5 | 4 | 10 | 50 | 4 |
| UE512 02512 | 2.5 | 4 | 12 | 50 | 4 |
| UE512 02514 | 2.5 | 4 | 14 | 50 | 4 |
| UE512 02516 | 2.5 | 4 | 16 | 50 | 4 |
| UE512 02518 | 2.5 | 4 | 18 | 50 | 4 |
| UE512 02520 | 2.5 | 4 | 20 | 50 | 4 |
| UE512 02522 | 2.5 | 4 | 22 | 60 | 4 |
| UE512 02526 | 2.5 | 4 | 26 | 60 | 4 |
| UE512 02530 | 2.5 | 4 | 30 | 70 | 4 |
| UE512 02535 | 2.5 | 4 | 35 | 70 | 4 |
| UE512 02540 | 2.5 | 4 | 40 | 80 | 4 |
| UE512 02545 | 2.5 | 4 | 45 | 90 | 4 |
| UE512 02550 | 2.5 | 4 | 50 | 100 | 4 |
| UE512 03006 | 3 | 4.5 | 6 | 50 | 6 |
| UE512 03008 | 3 | 4.5 | 8 | 50 | 6 |
| UE512 03010 | 3 | 4.5 | 10 | 50 | 6 |
| UE512 03012 | 3 | 4.5 | 12 | 50 | 6 |
| UE512 03014 | 3 | 4.5 | 14 | 60 | 6 |
| UE512 03016 | 3 | 4.5 | 16 | 60 | 6 |
| UE512 03018 | 3 | 4.5 | 18 | 60 | 6 |
| UE512 03020 | 3 | 4.5 | 20 | 60 | 6 |
| UE512 03022 | 3 | 4.5 | 22 | 65 | 6 |
| UE512 03026 | 3 | 4.5 | 26 | 65 | 6 |
| UE512 03030 | 3 | 4.5 | 30 | 70 | 6 |
| UE512 03035 | 3 | 4.5 | 35 | 70 | 6 |
| UE512 03040 | 3 | 4.5 | 40 | 80 | 6 |
| UE512 03045 | 3 | 4.5 | 45 | 90 | 6 |

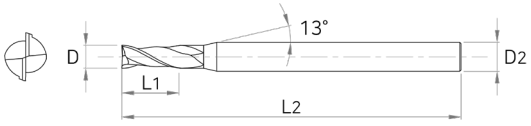
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE512 03050 | 3 | 4.5 | 50 | 100 | 6 |
| UE512 03060 | 3 | 4.5 | 60 | 100 | 6 |
| UE512 04008 | 4 | 6 | 8 | 50 | 6 |
| UE512 04010 | 4 | 6 | 10 | 50 | 6 |
| UE512 04012 | 4 | 6 | 12 | 50 | 6 |
| UE512 04014 | 4 | 6 | 14 | 60 | 6 |
| UE512 04016 | 4 | 6 | 16 | 60 | 6 |
| UE512 04018 | 4 | 6 | 18 | 60 | 6 |
| UE512 04020 | 4 | 6 | 20 | 60 | 6 |
| UE512 04022 | 4 | 6 | 22 | 65 | 6 |
| UE512 04026 | 4 | 6 | 26 | 65 | 6 |
| UE512 04030 | 4 | 6 | 30 | 70 | 6 |
| UE512 04035 | 4 | 6 | 35 | 70 | 6 |
| UE512 04040 | 4 | 6 | 40 | 80 | 6 |
| UE512 04045 | 4 | 6 | 45 | 90 | 6 |
| UE512 04050 | 4 | 6 | 50 | 100 | 6 |
| UE512 04060 | 4 | 6 | 60 | 100 | 6 |
| UE512 05016 | 5 | 8 | 16 | 60 | 6 |
| UE512 05020 | 5 | 8 | 20 | 60 | 6 |
| UE512 05026 | 5 | 8 | 26 | 65 | 6 |
| UE512 05030 | 5 | 8 | 30 | 70 | 6 |
| UE512 05035 | 5 | 8 | 35 | 75 | 6 |
| UE512 05040 | 5 | 8 | 40 | 80 | 6 |
| UE512 05050 | 5 | 8 | 50 | 90 | 6 |
| UE512 05060 | 5 | 8 | 60 | 100 | 6 |
| UE512 06015 | 6 | 9 | 15 | 60 | 6 |
| UE512 06020 | 6 | 9 | 20 | 60 | 6 |
| UE512 06030 | 6 | 9 | 30 | 70 | 6 |
| UE512 06032 | 6 | 9 | 32 | 90 | 6 |
| UE512 08025 | 8 | 12 | 25 | 70 | 8 |
| UE512 08030 | 8 | 12 | 30 | 80 | 8 |
| UE512 08042 | 8 | 12 | 42 | 100 | 8 |
| UE512 10030 | 10 | 15 | 30 | 75 | 10 |
| UE512 10035 | 10 | 15 | 35 | 80 | 10 |
| UE512 10045 | 10 | 15 | 45 | 100 | 10 |
| UE512 12035 | 12 | 20 | 35 | 80 | 12 |
| UE512 12040 | 12 | 20 | 40 | 90 | 12 |
| UE512 12050 | 12 | 20 | 50 | 110 | 12 |

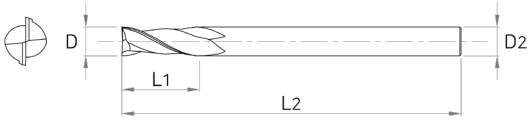
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE522 | 2 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D6.5 ~ 25 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.642

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 01003 | 1 | 3 | 60 | 6 |
| UE522 01004 | 1 | 4 | 60 | 6 |
| UE522 01005 | 1 | 5 | 60 | 6 |
| UE522 01006 | 1 | 6 | 60 | 6 |
| UE522 01007 | 1 | 7 | 60 | 6 |
| UE522 01008 | 1 | 8 | 60 | 6 |
| UE522 01010 | 1 | 10 | 60 | 6 |
| UE522 01012 | 1 | 12 | 60 | 6 |
| UE522 01204 | 1.2 | 4 | 60 | 6 |
| UE522 01206 | 1.2 | 6 | 60 | 6 |
| UE522 01208 | 1.2 | 8 | 60 | 6 |
| UE522 01210 | 1.2 | 10 | 60 | 6 |
| UE522 01212 | 1.2 | 12 | 60 | 6 |
| UE522 01506 | 1.5 | 6 | 60 | 6 |
| UE522 01508 | 1.5 | 8 | 60 | 6 |
| UE522 01510 | 1.5 | 10 | 60 | 6 |
| UE522 01512 | 1.5 | 12 | 60 | 6 |
| UE522 01514 | 1.5 | 14 | 60 | 6 |
| UE522 01516 | 1.5 | 16 | 60 | 6 |
| UE522 02008 | 2 | 8 | 60 | 6 |
| UE522 02010 | 2 | 10 | 60 | 6 |
| UE522 02012 | 2 | 12 | 60 | 6 |
| UE522 02014 | 2 | 14 | 60 | 6 |
| UE522 02016 | 2 | 16 | 60 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 02510 | 2.5 | 10 | 60 | 6 |
| UE522 02512 | 2.5 | 12 | 60 | 6 |
| UE522 02516 | 2.5 | 16 | 60 | 6 |
| UE522 02520 | 2.5 | 20 | 60 | 6 |
| UE522 02526 | 2.5 | 26 | 60 | 6 |
| UE522 03010 | 3 | 10 | 70 | 6 |
| UE522 03012 | 3 | 12 | 70 | 6 |
| UE522 03014 | 3 | 14 | 70 | 6 |
| UE522 03016 | 3 | 16 | 70 | 6 |
| UE522 03016S3 | 3 | 16 | 100 | 3 |
| UE522 03020 | 3 | 20 | 70 | 6 |
| UE522 03026 | 3 | 26 | 70 | 6 |
| UE522 03030 | 3 | 30 | 70 | 6 |
| UE522 04012 | 4 | 12 | 70 | 6 |
| UE522 04016 | 4 | 16 | 70 | 6 |
| UE522 04020 | 4 | 20 | 70 | 6 |
| UE522 04020S4 | 4 | 20 | 100 | 4 |
| UE522 04026 | 4 | 26 | 70 | 6 |
| UE522 04030 | 4 | 30 | 70 | 6 |
| UE522 05015 | 5 | 15 | 70 | 6 |
| UE522 05020 | 5 | 20 | 70 | 6 |
| UE522 05025100 | 5 | 25 | 100 | 6 |
| UE522 05025 | 5 | 25 | 70 | 6 |
| UE522 05030 | 5 | 30 | 80 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE522 | 2 FLUTES SQUARE ENDMILL

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 05035 | 5 | 35 | 90 | 6 |
| UE522 05040 | 5 | 40 | 100 | 6 |
| UE522 06015080 | 6 | 15 | 80 | 6 |
| UE522 06015 | 6 | 15 | 60 | 6 |
| UE522 06020090 | 6 | 20 | 90 | 6 |
| UE522 06020 | 6 | 20 | 70 | 6 |
| UE522 06025 | 6 | 25 | 75 | 6 |
| UE522 06030150 | 6 | 30 | 150 | 6 |
| UE522 06030100 | 6 | 30 | 100 | 6 |
| UE522 06030 | 6 | 30 | 80 | 6 |
| UE522 06035 | 6 | 35 | 90 | 6 |
| UE522 06040120 | 6 | 40 | 120 | 6 |
| UE522 06040 | 6 | 40 | 90 | 6 |
| UE522 06045 | 6 | 45 | 150 | 6 |
| UE522 07035 | 7 | 35 | 85 | 8 |
| UE522 08020 | 8 | 20 | 100 | 8 |
| UE522 08025 | 8 | 25 | 80 | 8 |
| UE522 08030100 | 8 | 30 | 100 | 8 |
| UE522 08030 | 8 | 30 | 80 | 8 |
| UE522 08035 | 8 | 35 | 90 | 8 |
| UE522 08040150 | 8 | 40 | 150 | 8 |
| UE522 08040120 | 8 | 40 | 120 | 8 |
| UE522 08040 | 8 | 40 | 90 | 8 |
| UE522 08045 | 8 | 45 | 100 | 8 |
| UE522 08050150 | 8 | 50 | 150 | 8 |
| UE522 08050 | 8 | 50 | 100 | 8 |
| UE522 09045 | 9 | 45 | 100 | 10 |
| UE522 10025 | 10 | 25 | 100 | 10 |
| UE522 10030100 | 10 | 30 | 100 | 10 |
| UE522 10030 | 10 | 30 | 80 | 10 |
| UE522 10035 | 10 | 35 | 90 | 10 |
| UE522 10040120 | 10 | 40 | 120 | 10 |
| UE522 10040 | 10 | 40 | 90 | 10 |
| UE522 10045 | 10 | 45 | 100 | 10 |
| UE522 10050200 | 10 | 50 | 200 | 10 |
| UE522 10050150 | 10 | 50 | 150 | 10 |
| UE522 10050 | 10 | 50 | 100 | 10 |
| UE522 10055 | 10 | 55 | 150 | 10 |
| UE522 10060200 | 10 | 60 | 200 | 10 |
| UE522 10060155 | 10 | 60 | 155 | 10 |
| UE522 10060 | 10 | 60 | 110 | 10 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 11050 | 11 | 50 | 110 | 12 |
| UE522 12035 | 12 | 35 | 90 | 12 |
| UE522 12040120 | 12 | 40 | 120 | 12 |
| UE522 12040 | 12 | 40 | 100 | 12 |
| UE522 12045 | 12 | 45 | 130 | 12 |
| UE522 12050150 | 12 | 50 | 150 | 12 |
| UE522 12050 | 12 | 50 | 100 | 12 |
| UE522 12055 | 12 | 55 | 110 | 12 |
| UE522 12060200 | 12 | 60 | 200 | 12 |
| UE522 12060150 | 12 | 60 | 150 | 12 |
| UE522 12060 | 12 | 60 | 110 | 12 |
| UE522 12065 | 12 | 65 | 150 | 12 |
| UE522 12070200 | 12 | 70 | 200 | 12 |
| UE522 12070 | 12 | 70 | 120 | 12 |
| UE522 14040 | 14 | 40 | 110 | 16 |
| UE522 14050 | 14 | 50 | 110 | 16 |
| UE522 14060150 | 14 | 60 | 150 | 16 |
| UE522 14060 | 14 | 60 | 120 | 16 |
| UE522 16040150 | 16 | 40 | 150 | 16 |
| UE522 16040 | 16 | 40 | 120 | 16 |
| UE522 16050150 | 16 | 50 | 150 | 16 |
| UE522 16050 | 16 | 50 | 110 | 16 |
| UE522 16060 | 16 | 60 | 120 | 16 |
| UE522 16070200 | 16 | 70 | 200 | 16 |
| UE522 16070150 | 16 | 70 | 150 | 16 |
| UE522 16070 | 16 | 70 | 130 | 16 |
| UE522 16080 | 16 | 80 | 150 | 16 |
| UE522 16090 | 16 | 90 | 150 | 16 |
| UE522 160110 | 16 | 110 | 200 | 16 |
| UE522 160120 | 16 | 120 | 250 | 16 |
| UE522 18050 | 18 | 50 | 120 | 20 |
| UE522 18060 | 18 | 60 | 120 | 18 |
| UE522 18070 | 18 | 70 | 130 | 20 |
| UE522 180100 | 18 | 100 | 200 | 20 |
| UE522 20050150 | 20 | 50 | 150 | 20 |
| UE522 20050 | 20 | 50 | 110 | 20 |
| UE522 20060 | 20 | 60 | 130 | 20 |
| UE522 20070 | 20 | 70 | 130 | 20 |
| UE522 20080 | 20 | 80 | 150 | 20 |
| UE522 20090200 | 20 | 90 | 200 | 20 |
| UE522 20090 | 20 | 90 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE522 | 2 FLUTES SQUARE ENDMILL

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 200110 | 20 | 110 | 200 | 20 |
| UE522 200120 | 20 | 120 | 250 | 20 |
| UE522 22075 | 22 | 75 | 150 | 20 |
| UE522 220110 | 22 | 110 | 200 | 20 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE522 25070 | 25 | 70 | 150 | 25 |
| UE522 25090 | 25 | 90 | 150 | 25 |
| UE522 250110 | 25 | 110 | 200 | 25 |
| UE522 250120 | 25 | 120 | 250 | 25 |



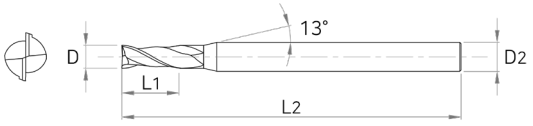
## ■ Applicable Working Material

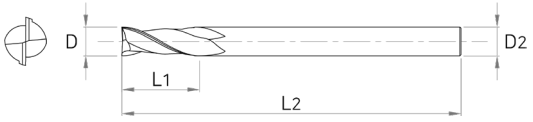
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXE502

## 2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS




### ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 7 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.636

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE502 001001 | 0.1 | 0.1 | 40 | 4 |
| UXE502 001 | 0.1 | 0.2 | 40 | 4 |
| UXE502 001003 | 0.1 | 0.3 | 40 | 4 |
| UXE502 002002 | 0.2 | 0.2 | 40 | 4 |
| UXE502 002 | 0.2 | 0.4 | 40 | 4 |
| UXE502 002006 | 0.2 | 0.6 | 40 | 4 |
| UXE502 003003 | 0.3 | 0.3 | 40 | 4 |
| UXE502 003 | 0.3 | 0.6 | 40 | 4 |
| UXE502 003009 | 0.3 | 0.9 | 40 | 4 |
| UXE502 004004 | 0.4 | 0.4 | 40 | 4 |
| UXE502 004 | 0.4 | 0.8 | 40 | 4 |
| UXE502 004012 | 0.4 | 1.2 | 40 | 4 |
| UXE502 005005 | 0.5 | 0.5 | 40 | 4 |
| UXE502 005 | 0.5 | 1 | 40 | 4 |
| UXE502 005015 | 0.5 | 1.5 | 40 | 4 |
| UXE502 006006 | 0.6 | 0.6 | 40 | 4 |
| UXE502 006 | 0.6 | 1.2 | 40 | 4 |
| UXE502 006018 | 0.6 | 1.8 | 40 | 4 |
| UXE502 007007 | 0.7 | 0.7 | 40 | 4 |
| UXE502 007 | 0.7 | 1.4 | 40 | 4 |
| UXE502 007021 | 0.7 | 2.1 | 40 | 4 |
| UXE502 008008 | 0.8 | 0.8 | 40 | 4 |
| UXE502 008 | 0.8 | 1.6 | 40 | 4 |
| UXE502 008024 | 0.8 | 2.4 | 40 | 4 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE502 009009 | 0.9 | 0.9 | 40 | 4 |
| UXE502 009 | 0.9 | 1.8 | 40 | 4 |
| UXE502 009027 | 0.9 | 2.7 | 40 | 4 |
| UXE502 01001 | 1 | 1 | 40 | 6 |
| UXE502 01002 | 1 | 2 | 40 | 6 |
| UXE502 010 | 1 | 2.5 | 50 | 6 |
| UXE502 01003 | 1 | 3 | 50 | 6 |
| UXE502 01004 | 1 | 4 | 50 | 6 |
| UXE502 01006 | 1 | 6 | 50 | 6 |
| UXE502 01202 | 1.2 | 2 | 40 | 6 |
| UXE502 012 | 1.2 | 3 | 50 | 6 |
| UXE502 01204 | 1.2 | 4 | 50 | 6 |
| UXE502 01206 | 1.2 | 6 | 50 | 6 |
| UXE502 015015 | 1.5 | 1.5 | 40 | 6 |
| UXE502 01503 | 1.5 | 3 | 40 | 6 |
| UXE502 015 | 1.5 | 4 | 50 | 6 |
| UXE502 01506 | 1.5 | 6 | 50 | 6 |
| UXE502 01508 | 1.5 | 8 | 50 | 6 |
| UXE502 01510 | 1.5 | 10 | 50 | 6 |
| UXE502 02002 | 2 | 2 | 40 | 6 |
| UXE502 02004 | 2 | 4 | 40 | 6 |
| UXE502 020 | 2 | 6 | 50 | 6 |
| UXE502 02008 | 2 | 8 | 50 | 6 |
| UXE502 02010 | 2 | 10 | 50 | 6 |

### ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXE502 | 2 FLUTES SQUARE ENDMILL FOR HEAVY CUTS

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE502 02012 | 2 | 12 | 50 | 6 |
| UXE502 025025 | 2.5 | 2.5 | 40 | 6 |
| UXE502 02505 | 2.5 | 5 | 40 | 6 |
| UXE502 025 | 2.5 | 7 | 50 | 6 |
| UXE502 02510 | 2.5 | 10 | 50 | 6 |
| UXE502 02512 | 2.5 | 12 | 50 | 6 |
| UXE502 03003 | 3 | 3 | 40 | 6 |
| UXE502 03006 | 3 | 6 | 40 | 6 |
| UXE502 030 | 3 | 8 | 50 | 6 |
| UXE502 03010 | 3 | 10 | 50 | 6 |
| UXE502 03012 | 3 | 12 | 50 | 6 |
| UXE502 03014 | 3 | 14 | 50 | 6 |
| UXE502 03510 | 3.5 | 10 | 50 | 6 |
| UXE502 04004 | 4 | 4 | 40 | 6 |
| UXE502 04008 | 4 | 8 | 40 | 6 |
| UXE502 040 | 4 | 10 | 50 | 6 |
| UXE502 04012 | 4 | 12 | 50 | 6 |
| UXE502 04014 | 4 | 14 | 50 | 6 |
| UXE502 04016 | 4 | 16 | 50 | 6 |
| UXE502 04511 | 4.5 | 11 | 50 | 6 |
| UXE502 05005 | 5 | 5 | 50 | 6 |
| UXE502 05010 | 5 | 10 | 50 | 6 |
| UXE502 050 | 5 | 15 | 60 | 6 |
| UXE502 05020 | 5 | 20 | 60 | 6 |
| UXE502 05025 | 5 | 25 | 60 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE502 05513 | 5.5 | 13 | 50 | 6 |
| UXE502 06006 | 6 | 6 | 50 | 6 |
| UXE502 06012 | 6 | 12 | 50 | 6 |
| UXE502 060 | 6 | 15 | 60 | 6 |
| UXE502 06020 | 6 | 20 | 60 | 6 |
| UXE502 06025 | 6 | 25 | 60 | 6 |
| UXE502 06513 | 6.5 | 13 | 60 | 8 |
| UXE502 07018 | 7 | 18 | 60 | 8 |
| UXE502 08016 | 8 | 16 | 60 | 8 |
| UXE502 080 | 8 | 20 | 70 | 8 |
| UXE502 08025 | 8 | 25 | 70 | 8 |
| UXE502 08030 | 8 | 30 | 70 | 8 |
| UXE502 10022 | 10 | 22 | 65 | 10 |
| UXE502 100 | 10 | 25 | 75 | 10 |
| UXE502 10030 | 10 | 30 | 75 | 10 |
| UXE502 10035 | 10 | 35 | 75 | 10 |
| UXE502 12026 | 12 | 26 | 70 | 12 |
| UXE502 120 | 12 | 30 | 80 | 12 |
| UXE502 12035 | 12 | 35 | 80 | 12 |
| UXE502 12040 | 12 | 40 | 80 | 12 |
| UXE502 140 | 14 | 35 | 100 | 16 |
| UXE502 160 | 16 | 32 | 100 | 16 |
| UXE502 16040 | 16 | 40 | 100 | 16 |
| UXE502 180 | 18 | 45 | 100 | 20 |
| UXE502 200 | 20 | 45 | 100 | 20 |

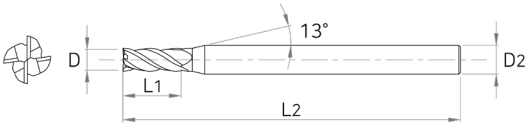


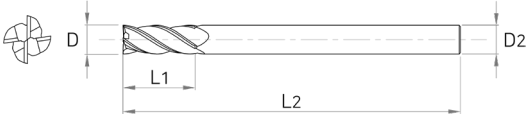
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE504H | 4 FLUTES 45° HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 45° HELIX | DATA P.643

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE504H 010 | 1 | 2.5 | 50 | 6 |
| UE504H 01004 | 1 | 4 | 60 | 6 |
| UE504H 01006 | 1 | 6 | 60 | 6 |
| UE504H 015 | 1.5 | 4 | 50 | 6 |
| UE504H 01506 | 1.5 | 6 | 60 | 6 |
| UE504H 01508 | 1.5 | 8 | 60 | 6 |
| UE504H 020 | 2 | 6 | 50 | 6 |
| UE504H 02008 | 2 | 8 | 60 | 6 |
| UE504H 02010 | 2 | 10 | 60 | 6 |
| UE504H 030 | 3 | 8 | 50 | 6 |
| UE504H 03010 | 3 | 10 | 70 | 6 |
| UE504H 03012 | 3 | 12 | 70 | 6 |
| UE504H 03016 | 3 | 16 | 70 | 6 |
| UE504H 040 | 4 | 10 | 50 | 6 |
| UE504H 04012 | 4 | 12 | 70 | 6 |
| UE504H 04016 | 4 | 16 | 70 | 6 |
| UE504H 04020 | 4 | 20 | 70 | 6 |
| UE504H 050 | 5 | 15 | 50 | 6 |
| UE504H 05030 | 5 | 30 | 80 | 6 |
| UE504H 060 | 6 | 15 | 60 | 6 |
| UE504H 06020 | 6 | 20 | 70 | 6 |

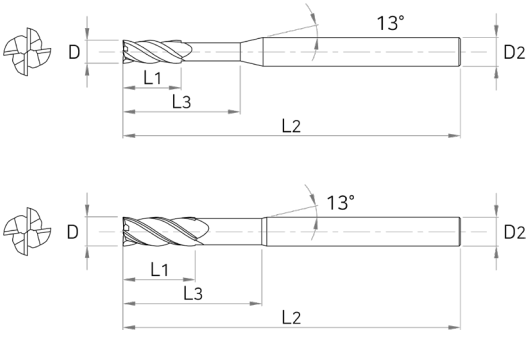
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE504H 06030 | 6 | 30 | 80 | 6 |
| UE504H 080 | 8 | 20 | 70 | 8 |
| UE504H 08030 | 8 | 30 | 80 | 8 |
| UE504H 08035 | 8 | 35 | 90 | 8 |
| UE504H 08040 | 8 | 40 | 90 | 8 |
| UE504H 100 | 10 | 25 | 75 | 10 |
| UE504H 10030 | 10 | 30 | 80 | 10 |
| UE504H 10040 | 10 | 40 | 90 | 10 |
| UE504H 10050 | 10 | 50 | 100 | 10 |
| UE504H 120 | 12 | 30 | 80 | 12 |
| UE504H 12040 | 12 | 40 | 90 | 12 |
| UE504H 12050 | 12 | 50 | 100 | 12 |
| UE504H 12060 | 12 | 60 | 110 | 12 |
| UE504H 160 | 16 | 40 | 100 | 16 |
| UE504H 16050 | 16 | 50 | 110 | 16 |
| UE504H 16060 | 16 | 60 | 120 | 16 |
| UE504H 160110 | 16 | 110 | 200 | 16 |
| UE504H 200 | 20 | 45 | 100 | 20 |
| UE504H 20060 | 20 | 60 | 120 | 20 |
| UE504H 20070 | 20 | 70 | 130 | 20 |
| UE504H 200110 | 20 | 110 | 200 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE514 | 4 FLUTES LONG NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 25 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 35° HELIX | DATA P.644

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE514 01002 | 1 | 1.5 | 2 | 50 | 4 |
| UE514 01003 | 1 | 1.5 | 3 | 50 | 4 |
| UE514 01004 | 1 | 1.5 | 4 | 50 | 4 |
| UE514 01005 | 1 | 1.5 | 5 | 50 | 4 |
| UE514 01006 | 1 | 1.5 | 6 | 50 | 4 |
| UE514 01007 | 1 | 1.5 | 7 | 50 | 4 |
| UE514 01008 | 1 | 1.5 | 8 | 50 | 4 |
| UE514 01010 | 1 | 1.5 | 10 | 50 | 4 |
| UE514 01012 | 1 | 1.5 | 12 | 50 | 4 |
| UE514 01014 | 1 | 1.5 | 14 | 50 | 4 |
| UE514 01016 | 1 | 1.5 | 16 | 50 | 4 |
| UE514 01018 | 1 | 1.5 | 18 | 50 | 4 |
| UE514 01020 | 1 | 1.5 | 20 | 50 | 4 |
| UE514 01022 | 1 | 1.5 | 22 | 60 | 4 |
| UE514 01026 | 1 | 1.5 | 26 | 60 | 4 |
| UE514 01030 | 1 | 1.5 | 30 | 70 | 4 |
| UE514 01040 | 1 | 1.5 | 40 | 80 | 4 |
| UE514 01050 | 1 | 1.5 | 50 | 100 | 4 |
| UE514 01204 | 1.2 | 1.8 | 4 | 50 | 4 |
| UE514 01206 | 1.2 | 1.8 | 6 | 50 | 4 |
| UE514 01208 | 1.2 | 1.8 | 8 | 50 | 4 |
| UE514 01210 | 1.2 | 1.8 | 10 | 50 | 4 |
| UE514 01212 | 1.2 | 1.8 | 12 | 50 | 4 |
| UE514 01214 | 1.2 | 1.8 | 14 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE514 01216 | 1.2 | 1.8 | 16 | 50 | 4 |
| UE514 01220 | 1.2 | 1.8 | 20 | 50 | 4 |
| UE514 01226 | 1.2 | 1.8 | 26 | 60 | 4 |
| UE514 01230 | 1.2 | 1.8 | 30 | 70 | 4 |
| UE514 01504 | 1.5 | 2.3 | 4 | 50 | 4 |
| UE514 01505 | 1.5 | 2.3 | 5 | 50 | 4 |
| UE514 01506 | 1.5 | 2.3 | 6 | 50 | 4 |
| UE514 01507 | 1.5 | 2.3 | 7 | 50 | 4 |
| UE514 01508 | 1.5 | 2.3 | 8 | 50 | 4 |
| UE514 01510 | 1.5 | 2.3 | 10 | 50 | 4 |
| UE514 01512 | 1.5 | 2.3 | 12 | 50 | 4 |
| UE514 01514 | 1.5 | 2.3 | 14 | 50 | 4 |
| UE514 01516 | 1.5 | 2.3 | 16 | 50 | 4 |
| UE514 01518 | 1.5 | 2.3 | 18 | 50 | 4 |
| UE514 01520 | 1.5 | 2.3 | 20 | 50 | 4 |
| UE514 01522 | 1.5 | 2.3 | 22 | 60 | 4 |
| UE514 01526 | 1.5 | 2.3 | 26 | 60 | 4 |
| UE514 01530 | 1.5 | 2.3 | 30 | 70 | 4 |
| UE514 02006 | 2 | 3 | 6 | 50 | 4 |
| UE514 02008 | 2 | 3 | 8 | 50 | 4 |
| UE514 02010 | 2 | 3 | 10 | 50 | 4 |
| UE514 02012 | 2 | 3 | 12 | 50 | 4 |
| UE514 02014 | 2 | 3 | 14 | 50 | 4 |
| UE514 02016 | 2 | 3 | 16 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE514 | 4 FLUTES LONG NECK SQUARE ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE514 02018 | 2 | 3 | 18 | 50 | 4 |
| UE514 02020 | 2 | 3 | 20 | 50 | 4 |
| UE514 02022 | 2 | 3 | 22 | 60 | 4 |
| UE514 02026 | 2 | 3 | 26 | 60 | 4 |
| UE514 02030 | 2 | 3 | 30 | 70 | 4 |
| UE514 02035 | 2 | 3 | 35 | 70 | 4 |
| UE514 02040 | 2 | 3 | 40 | 80 | 4 |
| UE514 02045 | 2 | 3 | 45 | 90 | 4 |
| UE514 02050 | 2 | 3 | 50 | 100 | 4 |
| UE514 02060 | 2 | 3 | 60 | 110 | 4 |
| UE514 02508 | 2.5 | 4 | 8 | 50 | 4 |
| UE514 02510 | 2.5 | 4 | 10 | 50 | 4 |
| UE514 02512 | 2.5 | 4 | 12 | 50 | 4 |
| UE514 02514 | 2.5 | 4 | 14 | 50 | 4 |
| UE514 02516 | 2.5 | 4 | 16 | 50 | 4 |
| UE514 02518 | 2.5 | 4 | 18 | 50 | 4 |
| UE514 02520 | 2.5 | 4 | 20 | 50 | 4 |
| UE514 02522 | 2.5 | 4 | 22 | 60 | 4 |
| UE514 02526 | 2.5 | 4 | 26 | 60 | 4 |
| UE514 02530 | 2.5 | 4 | 30 | 70 | 4 |
| UE514 02535 | 2.5 | 4 | 35 | 70 | 4 |
| UE514 02540 | 2.5 | 4 | 40 | 80 | 4 |
| UE514 02545 | 2.5 | 4 | 45 | 90 | 4 |
| UE514 02550 | 2.5 | 4 | 50 | 100 | 4 |
| UE514 03006 | 3 | 4.5 | 6 | 50 | 6 |
| UE514 03008 | 3 | 4.5 | 8 | 50 | 6 |
| UE514 03010 | 3 | 4.5 | 10 | 50 | 6 |
| UE514 03012 | 3 | 4.5 | 12 | 50 | 6 |
| UE514 03014 | 3 | 4.5 | 14 | 60 | 6 |
| UE514 03016 | 3 | 4.5 | 16 | 60 | 6 |
| UE514 03018 | 3 | 4.5 | 18 | 60 | 6 |
| UE514 03020 | 3 | 4.5 | 20 | 60 | 6 |
| UE514 03022 | 3 | 4.5 | 22 | 65 | 6 |
| UE514 03026 | 3 | 4.5 | 26 | 65 | 6 |
| UE514 03030 | 3 | 4.5 | 30 | 70 | 6 |
| UE514 03035 | 3 | 4.5 | 35 | 70 | 6 |
| UE514 03040 | 3 | 4.5 | 40 | 80 | 6 |
| UE514 03045 | 3 | 4.5 | 45 | 90 | 6 |

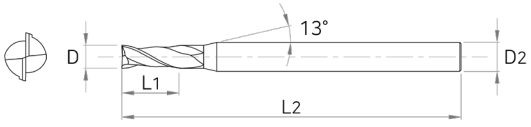
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| UE514 03050 | 3 | 4.5 | 50 | 100 | 6 |
| UE514 03060 | 3 | 4.5 | 60 | 100 | 6 |
| UE514 04008 | 4 | 4.5 | 8 | 50 | 6 |
| UE514 04010 | 4 | 4.5 | 10 | 50 | 6 |
| UE514 04012 | 4 | 4.5 | 12 | 50 | 6 |
| UE514 04014 | 4 | 4.5 | 14 | 60 | 6 |
| UE514 04016 | 4 | 4.5 | 16 | 60 | 6 |
| UE514 04018 | 4 | 4.5 | 18 | 60 | 6 |
| UE514 04020 | 4 | 4.5 | 20 | 60 | 6 |
| UE514 04022 | 4 | 4.5 | 22 | 65 | 6 |
| UE514 04026 | 4 | 4.5 | 26 | 65 | 6 |
| UE514 04030 | 4 | 4.5 | 30 | 70 | 6 |
| UE514 04035 | 4 | 4.5 | 35 | 70 | 6 |
| UE514 04040 | 4 | 4.5 | 40 | 80 | 6 |
| UE514 04045 | 4 | 4.5 | 45 | 90 | 6 |
| UE514 04050 | 4 | 4.5 | 50 | 100 | 6 |
| UE514 04060 | 4 | 4.5 | 60 | 100 | 6 |
| UE514 05016 | 5 | 8 | 16 | 60 | 6 |
| UE514 05020 | 5 | 8 | 20 | 60 | 6 |
| UE514 05026 | 5 | 8 | 26 | 65 | 6 |
| UE514 05030 | 5 | 8 | 30 | 70 | 6 |
| UE514 05035 | 5 | 8 | 35 | 75 | 6 |
| UE514 05040 | 5 | 8 | 40 | 80 | 6 |
| UE514 05050 | 5 | 8 | 50 | 90 | 6 |
| UE514 05060 | 5 | 8 | 60 | 100 | 6 |
| UE514 06015 | 6 | 9 | 15 | 60 | 6 |
| UE514 06020 | 6 | 9 | 20 | 60 | 6 |
| UE514 06030 | 6 | 9 | 30 | 70 | 6 |
| UE514 06032 | 6 | 9 | 32 | 90 | 6 |
| UE514 08025 | 8 | 12 | 25 | 70 | 8 |
| UE514 08030 | 8 | 12 | 30 | 80 | 8 |
| UE514 08042 | 8 | 12 | 42 | 100 | 8 |
| UE514 10030 | 10 | 15 | 30 | 75 | 10 |
| UE514 10035 | 10 | 15 | 35 | 80 | 10 |
| UE514 10045 | 10 | 15 | 45 | 100 | 10 |
| UE514 12035 | 12 | 20 | 35 | 80 | 12 |
| UE514 12040 | 12 | 20 | 40 | 90 | 12 |
| UE514 12050 | 12 | 20 | 50 | 110 | 12 |

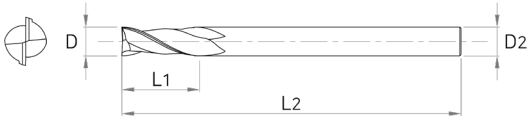
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE524 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 25 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 35° HELIX | DATA P.645

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 01003 | 1 | 3 | 60 | 6 |
| UE524 01004 | 1 | 4 | 60 | 6 |
| UE524 01005 | 1 | 5 | 60 | 6 |
| UE524 01006 | 1 | 6 | 60 | 6 |
| UE524 01007 | 1 | 7 | 60 | 6 |
| UE524 01008 | 1 | 8 | 60 | 6 |
| UE524 01010 | 1 | 10 | 60 | 6 |
| UE524 01012 | 1 | 12 | 60 | 6 |
| UE524 01204 | 1.2 | 4 | 60 | 6 |
| UE524 01206 | 1.2 | 6 | 60 | 6 |
| UE524 01208 | 1.2 | 8 | 60 | 6 |
| UE524 01210 | 1.2 | 10 | 60 | 6 |
| UE524 01212 | 1.2 | 12 | 60 | 6 |
| UE524 01506 | 1.5 | 6 | 60 | 6 |
| UE524 01508 | 1.5 | 8 | 60 | 6 |
| UE524 01510 | 1.5 | 10 | 60 | 6 |
| UE524 01512 | 1.5 | 12 | 60 | 6 |
| UE524 01514 | 1.5 | 14 | 60 | 6 |
| UE524 01516 | 1.5 | 16 | 60 | 6 |
| UE524 01520 | 1.5 | 20 | 60 | 6 |
| UE524 01526 | 1.5 | 26 | 60 | 6 |
| UE524 02008 | 2 | 8 | 60 | 6 |
| UE524 02008S4 | 2 | 8 | 40 | 4 |
| UE524 02010 | 2 | 10 | 60 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 02012 | 2 | 12 | 60 | 6 |
| UE524 02014 | 2 | 14 | 60 | 6 |
| UE524 02016 | 2 | 16 | 60 | 6 |
| UE524 02510 | 2.5 | 10 | 60 | 6 |
| UE524 02512 | 2.5 | 12 | 60 | 6 |
| UE524 02516 | 2.5 | 16 | 60 | 6 |
| UE524 02520 | 2.5 | 20 | 60 | 6 |
| UE524 02526 | 2.5 | 26 | 60 | 6 |
| UE524 03010 | 3 | 10 | 70 | 6 |
| UE524 03012 | 3 | 12 | 70 | 6 |
| UE524 03014 | 3 | 14 | 70 | 6 |
| UE524 03016 | 3 | 16 | 70 | 6 |
| UE524 03016S3 | 3 | 16 | 100 | 3 |
| UE524 03020 | 3 | 20 | 70 | 6 |
| UE524 03026 | 3 | 26 | 70 | 6 |
| UE524 03030 | 3 | 30 | 70 | 6 |
| UE524 03035 | 3 | 35 | 90 | 6 |
| UE524 04012 | 4 | 12 | 70 | 6 |
| UE524 04016 | 4 | 16 | 70 | 6 |
| UE524 04020 | 4 | 20 | 70 | 6 |
| UE524 04020S4 | 4 | 20 | 100 | 4 |
| UE524 04026 | 4 | 26 | 70 | 6 |
| UE524 04030 | 4 | 30 | 70 | 6 |
| UE524 05015 | 5 | 15 | 70 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE524 | 4 FLUTES SQUARE ENDMILL



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 05020 | 5 | 20 | 70 | 6 |
| UE524 05025100 | 5 | 25 | 100 | 6 |
| UE524 05025 | 5 | 25 | 70 | 6 |
| UE524 05030 | 5 | 30 | 80 | 6 |
| UE524 05035 | 5 | 35 | 90 | 6 |
| UE524 05040 | 5 | 40 | 100 | 6 |
| UE524 06015080 | 6 | 15 | 80 | 6 |
| UE524 06015 | 6 | 15 | 60 | 6 |
| UE524 06020090 | 6 | 20 | 90 | 6 |
| UE524 06020 | 6 | 20 | 70 | 6 |
| UE524 06025 | 6 | 25 | 75 | 6 |
| UE524 06030150 | 6 | 30 | 150 | 6 |
| UE524 06030100 | 6 | 30 | 100 | 6 |
| UE524 06030 | 6 | 30 | 80 | 6 |
| UE524 06035 | 6 | 35 | 90 | 6 |
| UE524 06040120 | 6 | 40 | 120 | 6 |
| UE524 06040 | 6 | 40 | 90 | 6 |
| UE524 06045 | 6 | 45 | 150 | 6 |
| UE524 07035 | 7 | 35 | 85 | 8 |
| UE524 08020 | 8 | 20 | 100 | 8 |
| UE524 08025 | 8 | 25 | 80 | 8 |
| UE524 08030100 | 8 | 30 | 100 | 8 |
| UE524 08030 | 8 | 30 | 80 | 8 |
| UE524 08035 | 8 | 35 | 90 | 8 |
| UE524 08040150 | 8 | 40 | 150 | 8 |
| UE524 08040120 | 8 | 40 | 120 | 8 |
| UE524 08040 | 8 | 40 | 90 | 8 |
| UE524 08045 | 8 | 45 | 100 | 8 |
| UE524 08050150 | 8 | 50 | 150 | 8 |
| UE524 08050 | 8 | 50 | 100 | 8 |
| UE524 08060 | 8 | 60 | 155 | 8 |
| UE524 08080 | 8 | 80 | 200 | 8 |
| UE524 09045 | 9 | 45 | 100 | 10 |
| UE524 10025 | 10 | 25 | 100 | 10 |
| UE524 100100 | 10 | 30 | 100 | 10 |
| UE524 10030 | 10 | 30 | 80 | 10 |
| UE524 10035 | 10 | 35 | 90 | 10 |
| UE524 10040120 | 10 | 40 | 120 | 10 |
| UE524 10040 | 10 | 40 | 90 | 10 |
| UE524 10045 | 10 | 45 | 100 | 10 |
| UE524 10050200 | 10 | 50 | 200 | 10 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 10050150 | 10 | 50 | 150 | 10 |
| UE524 10050 | 10 | 50 | 100 | 10 |
| UE524 10055 | 10 | 55 | 150 | 10 |
| UE524 10060200 | 10 | 60 | 200 | 10 |
| UE524 10060155 | 10 | 60 | 155 | 10 |
| UE524 10060 | 10 | 60 | 110 | 10 |
| UE524 10080200 | 10 | 80 | 200 | 10 |
| UE524 11050 | 11 | 50 | 110 | 12 |
| UE524 12030 | 12 | 30 | 110 | 12 |
| UE524 12035 | 12 | 35 | 90 | 12 |
| UE524 12040120 | 12 | 40 | 120 | 12 |
| UE524 12040 | 12 | 40 | 100 | 12 |
| UE524 12045 | 12 | 45 | 130 | 12 |
| UE524 12050150 | 12 | 50 | 150 | 12 |
| UE524 12050 | 12 | 50 | 100 | 12 |
| UE524 12055 | 12 | 55 | 110 | 12 |
| UE524 12060200 | 12 | 60 | 200 | 12 |
| UE524 12060150 | 12 | 60 | 150 | 12 |
| UE524 12060 | 12 | 60 | 110 | 12 |
| UE524 12065 | 12 | 65 | 150 | 12 |
| UE524 12070200 | 12 | 70 | 200 | 12 |
| UE524 12070 | 12 | 70 | 120 | 12 |
| UE524 12080 | 12 | 80 | 200 | 12 |
| UE524 14040 | 14 | 40 | 110 | 16 |
| UE524 14050 | 14 | 50 | 110 | 16 |
| UE524 14060 | 14 | 60 | 150 | 16 |
| UE524 16040 | 16 | 40 | 150 | 16 |
| UE524 16050150 | 16 | 50 | 150 | 16 |
| UE524 16050 | 16 | 50 | 110 | 16 |
| UE524 16060 | 16 | 60 | 120 | 16 |
| UE524 16070200 | 16 | 70 | 200 | 16 |
| UE524 16070150 | 16 | 70 | 150 | 16 |
| UE524 16070 | 16 | 70 | 130 | 16 |
| UE524 16080 | 16 | 80 | 150 | 16 |
| UE524 16090 | 16 | 90 | 150 | 16 |
| UE524 160100 | 16 | 100 | 200 | 16 |
| UE524 160110 | 16 | 110 | 200 | 16 |
| UE524 160120 | 16 | 120 | 250 | 16 |
| UE524 18050 | 18 | 50 | 120 | 20 |
| UE524 18070 | 18 | 70 | 130 | 20 |
| UE524 180100 | 18 | 100 | 200 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE524 | 4 FLUTES SQUARE ENDMILL

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 20050150 | 20 | 50 | 150 | 20 |
| UE524 20050 | 20 | 50 | 110 | 20 |
| UE524 20060 | 20 | 60 | 130 | 20 |
| UE524 20070 | 20 | 70 | 130 | 20 |
| UE524 20080 | 20 | 80 | 150 | 20 |
| UE524 20090200 | 20 | 90 | 200 | 20 |
| UE524 20090 | 20 | 90 | 150 | 20 |
| UE524 200100 | 20 | 100 | 200 | 20 |
| UE524 200110 | 20 | 110 | 200 | 20 |
| UE524 200120 | 20 | 120 | 250 | 20 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE524 200130 | 20 | 130 | 250 | 20 |
| UE524 22075 | 22 | 75 | 150 | 20 |
| UE524 220110 | 22 | 110 | 200 | 20 |
| UE524 25070 | 25 | 70 | 150 | 25 |
| UE524 25090 | 25 | 90 | 150 | 25 |
| UE524 250100 | 25 | 100 | 200 | 25 |
| UE524 250110 | 25 | 110 | 200 | 25 |
| UE524 250120 | 25 | 120 | 250 | 25 |
| UE524 250150 | 25 | 150 | 250 | 25 |

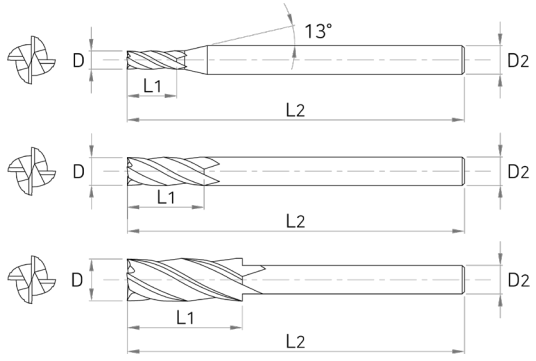


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ULE504 | 4 FLUTES AUTOMATIC CNC SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 16 | 0 ~ -0.02 | h5 |

CARBIDE | AlCrN | 4 | 30° HELIX | DATA P.646

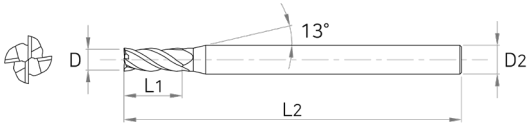
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ULE504 030S04 | 3 | 3 | 35 | 4 |
| ULE504 040S04 | 4 | 4 | 35 | 4 |
| ULE504 060S06 | 6 | 6 | 35 | 6 |
| ULE504 070S07 | 7 | 20 | 45 | 7 |
| ULE504 080S08 | 8 | 8 | 45 | 8 |
| ULE504 080S06 | 8 | 8 | 35 | 6 |
| ULE504 080S07 | 8 | 15 | 45 | 7 |
| ULE504 090S07 | 9 | 15 | 45 | 7 |
| ULE504 100S06 | 10 | 10 | 35 | 6 |
| ULE504 100S10 | 10 | 15 | 45 | 10 |
| ULE504 100S07 | 10 | 15 | 45 | 7 |
| ULE504 110S07 | 11 | 15 | 45 | 7 |
| ULE504 120S10 | 12 | 12 | 45 | 10 |
| ULE504 120S06 | 12 | 12 | 35 | 6 |
| ULE504 120S07 | 12 | 15 | 45 | 7 |
| ULE504 120-25S10 | 12 | 25 | 55 | 10 |
| ULE504 130S10 | 13 | 25 | 55 | 10 |
| ULE504 140S10 | 14 | 25 | 55 | 10 |
| ULE504 140S07 | 14 | 25 | 55 | 7 |
| ULE504 160S10 | 16 | 25 | 60 | 10 |

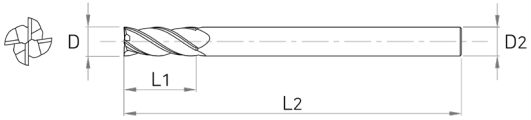
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE504 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.8 ~ 25 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | DATA P.647

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE504 008 | 0.8 | 1.6 | 40 | 4 |
| UE504 009 | 0.9 | 1.8 | 40 | 4 |
| UE504 010 | 1 | 2.5 | 50 | 6 |
| UE504 012 | 1.2 | 3 | 50 | 6 |
| UE504 015 | 1.5 | 4 | 50 | 6 |
| UE504 020 | 2 | 6 | 50 | 6 |
| UE504 025 | 2.5 | 7 | 50 | 6 |
| UE504 030 | 3 | 8 | 50 | 6 |
| UE504 035 | 3.5 | 10 | 50 | 6 |
| UE504 040 | 4 | 10 | 50 | 6 |
| UE504 045 | 4.5 | 14 | 50 | 6 |
| UE504 050 | 5 | 15 | 60 | 6 |
| UE504 055 | 5.5 | 15 | 60 | 6 |
| UE504 060 | 6 | 15 | 60 | 6 |
| UE504 065 | 6.5 | 18 | 60 | 8 |
| UE504 070 | 7 | 20 | 60 | 8 |
| UE504 075 | 7.5 | 20 | 60 | 8 |
| UE504 080 | 8 | 20 | 70 | 8 |
| UE504 085 | 8.5 | 22 | 70 | 10 |
| UE504 090 | 9 | 22 | 70 | 10 |
| UE504 095 | 9.5 | 24 | 70 | 10 |
| UE504 100 | 10 | 25 | 75 | 10 |

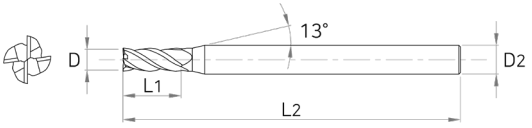
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE504 105 | 10.5 | 26 | 75 | 12 |
| UE504 110 | 11 | 30 | 75 | 12 |
| UE504 115 | 11.5 | 30 | 80 | 12 |
| UE504 120 | 12 | 30 | 80 | 12 |
| UE504 125 | 12.5 | 30 | 80 | 12 |
| UE504 130 | 13 | 35 | 100 | 12 |
| UE504 140 | 14 | 35 | 100 | 16 |
| UE504 140S14 | 14 | 35 | 100 | 14 |
| UE504 140S12 | 14 | 35 | 100 | 12 |
| UE504 150 | 15 | 38 | 100 | 16 |
| UE504 160 | 16 | 40 | 100 | 16 |
| UE504 170 | 17 | 42 | 100 | 16 |
| UE504 180 | 18 | 45 | 100 | 18 |
| UE504 180S16 | 18 | 45 | 100 | 16 |
| UE504 190 | 19 | 45 | 100 | 20 |
| UE504 200 | 20 | 45 | 100 | 20 |
| UE504 210 | 21 | 45 | 100 | 20 |
| UE504 220 | 22 | 45 | 100 | 20 |
| UE504 230 | 23 | 50 | 120 | 25 |
| UE504 240 | 24 | 50 | 120 | 25 |
| UE504 250 | 25 | 50 | 120 | 25 |

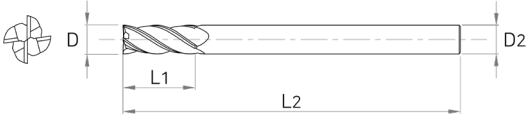
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXE504 | 4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 25 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | DATA P.647

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE504 01001 | 1 | 1 | 40 | 6 |
| UXE504 01002 | 1 | 2 | 40 | 6 |
| UXE504 010 | 1 | 2.5 | 50 | 6 |
| UXE504 01003 | 1 | 3 | 50 | 6 |
| UXE504 01004 | 1 | 4 | 50 | 6 |
| UXE504 01006 | 1 | 6 | 50 | 6 |
| UXE504 01202 | 1.2 | 2 | 40 | 6 |
| UXE504 012 | 1.2 | 3 | 50 | 6 |
| UXE504 01204 | 1.2 | 4 | 50 | 6 |
| UXE504 01206 | 1.2 | 6 | 50 | 6 |
| UXE504 015015 | 1.5 | 1.5 | 40 | 6 |
| UXE504 01503 | 1.5 | 3 | 40 | 6 |
| UXE504 015 | 1.5 | 4 | 50 | 6 |
| UXE504 01506 | 1.5 | 6 | 50 | 6 |
| UXE504 01508 | 1.5 | 8 | 50 | 6 |
| UXE504 01510 | 1.5 | 10 | 50 | 6 |
| UXE504 02002 | 2 | 2 | 40 | 6 |
| UXE504 02004 | 2 | 4 | 40 | 6 |
| UXE504 020 | 2 | 6 | 50 | 6 |
| UXE504 02008 | 2 | 8 | 50 | 6 |
| UXE504 02010 | 2 | 10 | 50 | 6 |
| UXE504 02012 | 2 | 12 | 50 | 6 |
| UXE504 025025 | 2.5 | 2.5 | 40 | 6 |
| UXE504 02505 | 2.5 | 5 | 40 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE504 025 | 2.5 | 7 | 50 | 6 |
| UXE504 02510 | 2.5 | 10 | 50 | 6 |
| UXE504 02512 | 2.5 | 12 | 50 | 6 |
| UXE504 03003 | 3 | 3 | 40 | 6 |
| UXE504 03006 | 3 | 6 | 40 | 6 |
| UXE504 030 | 3 | 8 | 50 | 6 |
| UXE504 03010 | 3 | 10 | 50 | 6 |
| UXE504 03012 | 3 | 12 | 50 | 6 |
| UXE504 03014 | 3 | 14 | 50 | 6 |
| UXE504 04004 | 4 | 4 | 40 | 6 |
| UXE504 04008 | 4 | 8 | 40 | 6 |
| UXE504 040 | 4 | 10 | 50 | 6 |
| UXE504 04012 | 4 | 12 | 50 | 6 |
| UXE504 04014 | 4 | 14 | 50 | 6 |
| UXE504 04016 | 4 | 16 | 50 | 6 |
| UXE504 05005 | 5 | 5 | 50 | 6 |
| UXE504 05010 | 5 | 10 | 50 | 6 |
| UXE504 050 | 5 | 15 | 60 | 6 |
| UXE504 05020 | 5 | 20 | 60 | 6 |
| UXE504 05025 | 5 | 25 | 60 | 6 |
| UXE504 06006 | 6 | 6 | 50 | 6 |
| UXE504 06012 | 6 | 12 | 50 | 6 |
| UXE504 060 | 6 | 15 | 60 | 6 |
| UXE504 06020 | 6 | 20 | 60 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXE504 | 4 FLUTES SQUARE ENDMILL FOR HEAVY CUTS

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE504 06025 | 6 | 25 | 60 | 6 |
| UXE504 08016 | 8 | 16 | 60 | 8 |
| UXE504 080 | 8 | 20 | 70 | 8 |
| UXE504 08025 | 8 | 25 | 70 | 8 |
| UXE504 08030 | 8 | 30 | 70 | 8 |
| UXE504 10022 | 10 | 22 | 65 | 10 |
| UXE504 100 | 10 | 25 | 75 | 10 |
| UXE504 10030 | 10 | 30 | 75 | 10 |
| UXE504 10035 | 10 | 35 | 75 | 10 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UXE504 12026 | 12 | 26 | 70 | 12 |
| UXE504 120 | 12 | 30 | 80 | 12 |
| UXE504 12035 | 12 | 35 | 80 | 12 |
| UXE504 12040 | 12 | 40 | 80 | 12 |
| UXE504 140 | 14 | 35 | 100 | 16 |
| UXE504 16032 | 16 | 32 | 100 | 16 |
| UXE504 160 | 16 | 40 | 100 | 16 |
| UXE504 180 | 18 | 45 | 100 | 20 |
| UXE504 200 | 20 | 45 | 100 | 20 |

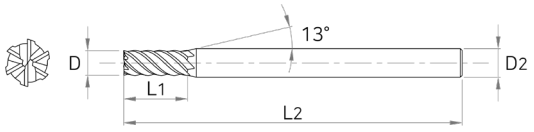


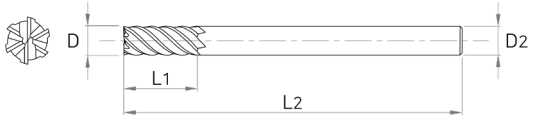
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UE506 | 6 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 ~ 25 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 6 | 45° HELIX | DATA P.647

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE506 060 | 6 | 15 | 60 | 6 |
| UE506 06020 | 6 | 20 | 70 | 6 |
| UE506 06030110 | 6 | 30 | 110 | 6 |
| UE506 06030 | 6 | 30 | 80 | 6 |
| UE506 070 | 7 | 18 | 60 | 8 |
| UE506 080 | 8 | 20 | 70 | 8 |
| UE506 08030 | 8 | 30 | 80 | 8 |
| UE506 08035 | 8 | 35 | 90 | 8 |
| UE506 08040130 | 8 | 40 | 130 | 8 |
| UE506 08040 | 8 | 40 | 90 | 8 |
| UE506 090 | 9 | 22 | 70 | 10 |
| UE506 100 | 10 | 25 | 75 | 10 |
| UE506 10030 | 10 | 30 | 80 | 10 |
| UE506 10040 | 10 | 40 | 90 | 10 |
| UE506 10050150 | 10 | 50 | 150 | 10 |
| UE506 10050 | 10 | 50 | 100 | 10 |
| UE506 110 | 11 | 26 | 75 | 12 |
| UE506 120 | 12 | 30 | 80 | 12 |
| UE506 12040 | 12 | 40 | 90 | 12 |
| UE506 12050 | 12 | 50 | 100 | 12 |

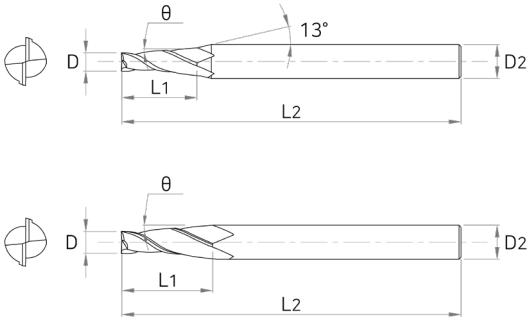
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| UE506 12060150 | 12 | 60 | 150 | 12 |
| UE506 12060 | 12 | 60 | 110 | 12 |
| UE506 130 | 13 | 32 | 85 | 14 |
| UE506 140 | 14 | 32 | 85 | 14 |
| UE506 160 | 16 | 40 | 100 | 16 |
| UE506 16050 | 16 | 50 | 110 | 16 |
| UE506 16060 | 16 | 60 | 120 | 16 |
| UE506 16090 | 16 | 90 | 150 | 16 |
| UE506 160110250 | 16 | 110 | 250 | 16 |
| UE506 160110 | 16 | 110 | 200 | 16 |
| UE506 180 | 18 | 44 | 100 | 18 |
| UE506 200 | 20 | 45 | 100 | 20 |
| UE506 20060 | 20 | 60 | 120 | 20 |
| UE506 20070 | 20 | 70 | 130 | 20 |
| UE506 200110300 | 20 | 110 | 300 | 20 |
| UE506 200110250 | 20 | 110 | 250 | 20 |
| UE506 200110 | 20 | 110 | 200 | 20 |
| UE506 250 | 25 | 50 | 120 | 25 |
| UE506 251 | 25 | 92 | 180 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTE502 | 2 FLUTES TAPERED SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 2 | 30° HELIX | DATA P.648

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE502 00302 | 0.3 | 2 | 1.2 | 40 | 4 |
| UTE502 003015 | 0.3 | 1.5 | 1.2 | 40 | 4 |
| UTE502 00301 | 0.3 | 1 | 1.2 | 40 | 4 |
| UTE502 003005 | 0.3 | 0.5 | 1.2 | 40 | 4 |
| UTE502 00310 | 0.3 | 10 | 1.5 | 40 | 4 |
| UTE502 00307 | 0.3 | 7 | 1.5 | 40 | 4 |
| UTE502 00305 | 0.3 | 5 | 1.5 | 40 | 4 |
| UTE502 00303 | 0.3 | 3 | 1.5 | 40 | 4 |
| UTE502 00403 | 0.4 | 3 | 1.6 | 40 | 4 |
| UTE502 00402 | 0.4 | 2 | 1.6 | 40 | 4 |
| UTE502 004015 | 0.4 | 1.5 | 1.6 | 40 | 4 |
| UTE502 00401 | 0.4 | 1 | 1.6 | 40 | 4 |
| UTE502 004005 | 0.4 | 0.5 | 1.6 | 40 | 4 |
| UTE502 00410 | 0.4 | 10 | 2 | 40 | 4 |
| UTE502 00407 | 0.4 | 7 | 2 | 40 | 4 |
| UTE502 00405 | 0.4 | 5 | 2 | 40 | 4 |
| UTE502 00503 | 0.5 | 3 | 2 | 45 | 4 |
| UTE502 00502 | 0.5 | 2 | 2 | 45 | 4 |
| UTE502 005015 | 0.5 | 1.5 | 2 | 45 | 4 |
| UTE502 00501 | 0.5 | 1 | 2 | 45 | 4 |
| UTE502 005005 | 0.5 | 0.5 | 2 | 45 | 4 |
| UTE502 00510 | 0.5 | 10 | 2.5 | 45 | 4 |
| UTE502 00507 | 0.5 | 7 | 2.5 | 45 | 4 |
| UTE502 00505 | 0.5 | 5 | 2.5 | 45 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE502 00603 | 0.6 | 3 | 2.4 | 45 | 4 |
| UTE502 00602 | 0.6 | 2 | 2.4 | 45 | 4 |
| UTE502 006015 | 0.6 | 1.5 | 2.4 | 45 | 4 |
| UTE502 00601 | 0.6 | 1 | 2.4 | 45 | 4 |
| UTE502 006005 | 0.6 | 0.5 | 2.4 | 45 | 4 |
| UTE502 00610 | 0.6 | 10 | 3 | 45 | 4 |
| UTE502 00607 | 0.6 | 7 | 3 | 45 | 4 |
| UTE502 00605 | 0.6 | 5 | 3 | 45 | 4 |
| UTE502 00703 | 0.7 | 3 | 2.8 | 45 | 4 |
| UTE502 00702 | 0.7 | 2 | 2.8 | 45 | 4 |
| UTE502 007015 | 0.7 | 1.5 | 2.8 | 45 | 4 |
| UTE502 00701 | 0.7 | 1 | 2.8 | 45 | 4 |
| UTE502 007005 | 0.7 | 0.5 | 2.8 | 45 | 4 |
| UTE502 00710 | 0.7 | 10 | 3.5 | 45 | 4 |
| UTE502 00707 | 0.7 | 7 | 3.5 | 45 | 4 |
| UTE502 00705 | 0.7 | 5 | 3.5 | 45 | 4 |
| UTE502 00803 | 0.8 | 3 | 3.2 | 45 | 4 |
| UTE502 00802 | 0.8 | 2 | 3.2 | 45 | 4 |
| UTE502 008015 | 0.8 | 1.5 | 3.2 | 45 | 4 |
| UTE502 00801 | 0.8 | 1 | 3.2 | 45 | 4 |
| UTE502 008005 | 0.8 | 0.5 | 3.2 | 45 | 4 |
| UTE502 00810 | 0.8 | 10 | 4 | 45 | 4 |
| UTE502 00807 | 0.8 | 7 | 4 | 45 | 4 |
| UTE502 00805 | 0.8 | 5 | 4 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTE502 | 2 FLUTES TAPERED SQUARE ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE502 010015 | 1 | 1.5 | 4 | 50 | 4 |
| UTE502 01001 | 1 | 1 | 4 | 50 | 4 |
| UTE502 010005 | 1 | 0.5 | 4 | 50 | 4 |
| UTE502 01003 | 1 | 3 | 6 | 50 | 4 |
| UTE502 01002 | 1 | 2 | 6 | 50 | 4 |
| UTE502 01010 | 1 | 10 | 8 | 50 | 4 |
| UTE502 01007 | 1 | 7 | 8 | 50 | 4 |
| UTE502 01005 | 1 | 5 | 8 | 50 | 4 |
| UTE502 015015 | 1.5 | 1.5 | 6 | 50 | 4 |
| UTE502 01501 | 1.5 | 1 | 6 | 50 | 4 |
| UTE502 015005 | 1.5 | 0.5 | 6 | 50 | 4 |
| UTE502 01503 | 1.5 | 3 | 8 | 50 | 4 |
| UTE502 01502 | 1.5 | 2 | 8 | 50 | 4 |
| UTE502 01510 | 1.5 | 10 | 10 | 50 | 6 |
| UTE502 01507 | 1.5 | 7 | 10 | 50 | 4 |
| UTE502 01505 | 1.5 | 5 | 10 | 50 | 4 |
| UTE502 020015 | 2 | 1.5 | 8 | 50 | 4 |
| UTE502 02001 | 2 | 1 | 8 | 50 | 4 |
| UTE502 020005 | 2 | 0.5 | 8 | 50 | 4 |
| UTE502 02003 | 2 | 3 | 10 | 50 | 4 |
| UTE502 02002 | 2 | 2 | 10 | 50 | 4 |
| UTE502 02010 | 2 | 10 | 12 | 50 | 8 |
| UTE502 02007 | 2 | 7 | 12 | 50 | 6 |
| UTE502 02005 | 2 | 5 | 12 | 50 | 6 |
| UTE502 025015 | 2.5 | 1.5 | 10 | 50 | 6 |
| UTE502 02501 | 2.5 | 1 | 10 | 50 | 6 |
| UTE502 025005 | 2.5 | 0.5 | 10 | 50 | 6 |
| UTE502 02503 | 2.5 | 3 | 12 | 50 | 6 |
| UTE502 02502 | 2.5 | 2 | 12 | 50 | 6 |
| UTE502 02510 | 2.5 | 10 | 14 | 50 | 8 |
| UTE502 02507 | 2.5 | 7 | 14 | 50 | 6 |
| UTE502 02505 | 2.5 | 5 | 14 | 50 | 6 |
| UTE502 030015 | 3 | 1.5 | 12 | 50 | 6 |
| UTE502 03001 | 3 | 1 | 12 | 50 | 6 |
| UTE502 030005 | 3 | 0.5 | 12 | 50 | 6 |
| UTE502 03003 | 3 | 3 | 14 | 50 | 6 |
| UTE502 03002 | 3 | 2 | 14 | 50 | 6 |
| UTE502 03010 | 3 | 10 | 16 | 50 | 10 |
| UTE502 03007 | 3 | 7 | 16 | 50 | 8 |
| UTE502 03005 | 3 | 5 | 16 | 50 | 6 |

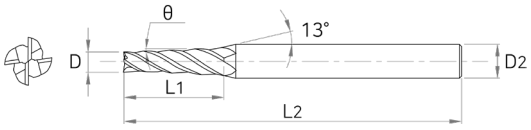
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE502 04007 | 4 | 7 | 16 | 65 | 8 |
| UTE502 04002 | 4 | 2 | 16 | 60 | 6 |
| UTE502 040015 | 4 | 1.5 | 16 | 60 | 6 |
| UTE502 04001 | 4 | 1 | 16 | 60 | 6 |
| UTE502 040005 | 4 | 0.5 | 16 | 60 | 6 |
| UTE502 04010 | 4 | 10 | 17 | 65 | 10 |
| UTE502 04003 | 4 | 3 | 19 | 60 | 6 |
| UTE502 04005 | 4 | 5 | 22 | 65 | 8 |
| UTE502 06010 | 6 | 10 | 17 | 75 | 12 |
| UTE502 06003 | 6 | 3 | 19 | 65 | 8 |
| UTE502 06002 | 6 | 2 | 20 | 65 | 8 |
| UTE502 060015 | 6 | 1.5 | 20 | 65 | 8 |
| UTE502 06001 | 6 | 1 | 20 | 65 | 8 |
| UTE502 060005 | 6 | 0.5 | 20 | 65 | 8 |
| UTE502 06005 | 6 | 5 | 22 | 75 | 10 |
| UTE502 06007 | 6 | 7 | 24 | 75 | 12 |
| UTE502 07005 | 7 | 5 | 28 | 80 | 12 |
| UTE502 07003 | 7 | 3 | 28 | 80 | 10 |
| UTE502 07002 | 7 | 2 | 28 | 80 | 10 |
| UTE502 070015 | 7 | 1.5 | 28 | 70 | 10 |
| UTE502 07001 | 7 | 1 | 28 | 70 | 8 |
| UTE502 070005 | 7 | 0.5 | 28 | 70 | 8 |
| UTE502 08002 | 8 | 2 | 28 | 90 | 10 |
| UTE502 08007 | 8 | 7 | 32 | 90 | 16 |
| UTE502 08010 | 8 | 10 | 34 | 100 | 20 |
| UTE502 080015 | 8 | 1.5 | 35 | 90 | 10 |
| UTE502 08001 | 8 | 1 | 35 | 90 | 10 |
| UTE502 080005 | 8 | 0.5 | 35 | 90 | 10 |
| UTE502 08003 | 8 | 3 | 38 | 90 | 12 |
| UTE502 08005 | 8 | 5 | 45 | 100 | 16 |
| UTE502 08010S25 | 8 | 10 | 48 | 150 | 25 |
| UTE502 10005 | 10 | 5 | 34 | 100 | 16 |
| UTE502 100015 | 10 | 1.5 | 38 | 90 | 12 |
| UTE502 10007 | 10 | 7 | 40 | 90 | 20 |
| UTE502 10003 | 10 | 3 | 40 | 100 | 16 |
| UTE502 10002 | 10 | 2 | 40 | 75 | 16 |
| UTE502 10001 | 10 | 1 | 40 | 90 | 12 |
| UTE502 100005 | 10 | 0.5 | 40 | 90 | 12 |
| UTE502 10010 | 10 | 10 | 42 | 100 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.8 ~ 10 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 30° HELIX | DATA P..649

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 00802004 | 0.8 | 2 | 4 | 45 | 4 |
| UTE504 00801504 | 0.8 | 1.5 | 4 | 45 | 4 |
| UTE504 00801004 | 0.8 | 1 | 4 | 45 | 4 |
| UTE504 00800504 | 0.8 | 0.5 | 4 | 45 | 4 |
| UTE504 00802006 | 0.8 | 2 | 6 | 45 | 4 |
| UTE504 00801506 | 0.8 | 1.5 | 6 | 45 | 4 |
| UTE504 00801006 | 0.8 | 1 | 6 | 45 | 4 |
| UTE504 00800506 | 0.8 | 0.5 | 6 | 45 | 4 |
| UTE504 00802008 | 0.8 | 2 | 8 | 45 | 4 |
| UTE504 00801508 | 0.8 | 1.5 | 8 | 45 | 4 |
| UTE504 00801008 | 0.8 | 1 | 8 | 45 | 4 |
| UTE504 00800508 | 0.8 | 0.5 | 8 | 45 | 4 |
| UTE504 00802010 | 0.8 | 2 | 10 | 45 | 4 |
| UTE504 00801510 | 0.8 | 1.5 | 10 | 45 | 4 |
| UTE504 00801010 | 0.8 | 1 | 10 | 45 | 4 |
| UTE504 00800510 | 0.8 | 0.5 | 10 | 45 | 4 |
| UTE504 00802012 | 0.8 | 2 | 12 | 45 | 4 |
| UTE504 00801512 | 0.8 | 1.5 | 12 | 45 | 4 |
| UTE504 00801012 | 0.8 | 1 | 12 | 45 | 4 |
| UTE504 00800512 | 0.8 | 0.5 | 12 | 45 | 4 |
| UTE504 01003004 | 1 | 3 | 4 | 50 | 4 |
| UTE504 01002004 | 1 | 2 | 4 | 50 | 4 |
| UTE504 01001504 | 1 | 1.5 | 4 | 50 | 4 |
| UTE504 01001004 | 1 | 1 | 4 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 01000504 | 1 | 0.5 | 4 | 50 | 4 |
| UTE504 01003006 | 1 | 3 | 6 | 50 | 4 |
| UTE504 01002006 | 1 | 2 | 6 | 50 | 4 |
| UTE504 01001506 | 1 | 1.5 | 6 | 50 | 4 |
| UTE504 01001006 | 1 | 1 | 6 | 50 | 4 |
| UTE504 01000506 | 1 | 0.5 | 6 | 50 | 4 |
| UTE504 01003008 | 1 | 3 | 8 | 50 | 4 |
| UTE504 01002008 | 1 | 2 | 8 | 50 | 4 |
| UTE504 01001508 | 1 | 1.5 | 8 | 50 | 4 |
| UTE504 01001008 | 1 | 1 | 8 | 50 | 4 |
| UTE504 01000508 | 1 | 0.5 | 8 | 50 | 4 |
| UTE504 01003010 | 1 | 3 | 10 | 50 | 4 |
| UTE504 01002010 | 1 | 2 | 10 | 50 | 4 |
| UTE504 01001510 | 1 | 1.5 | 10 | 50 | 4 |
| UTE504 01001010 | 1 | 1 | 10 | 50 | 4 |
| UTE504 01000510 | 1 | 0.5 | 10 | 50 | 4 |
| UTE504 01003012 | 1 | 3 | 12 | 50 | 4 |
| UTE504 01002012 | 1 | 2 | 12 | 50 | 4 |
| UTE504 01001512 | 1 | 1.5 | 12 | 50 | 4 |
| UTE504 01001012 | 1 | 1 | 12 | 50 | 4 |
| UTE504 01000512 | 1 | 0.5 | 12 | 50 | 4 |
| UTE504 01003016 | 1 | 3 | 16 | 50 | 4 |
| UTE504 01002016 | 1 | 2 | 16 | 50 | 4 |
| UTE504 01001516 | 1 | 1.5 | 16 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 01001016 | 1 | 1 | 16 | 50 | 4 |
| UTE504 01000516 | 1 | 0.5 | 16 | 50 | 4 |
| UTE504 01203006 | 1.2 | 3 | 6 | 50 | 4 |
| UTE504 01202006 | 1.2 | 2 | 6 | 50 | 4 |
| UTE504 01201506 | 1.2 | 1.5 | 6 | 50 | 4 |
| UTE504 01201006 | 1.2 | 1 | 6 | 50 | 4 |
| UTE504 01200506 | 1.2 | 0.5 | 6 | 50 | 4 |
| UTE504 01203008 | 1.2 | 3 | 8 | 50 | 4 |
| UTE504 01202008 | 1.2 | 2 | 8 | 50 | 4 |
| UTE504 01201508 | 1.2 | 1.5 | 8 | 50 | 4 |
| UTE504 01201008 | 1.2 | 1 | 8 | 50 | 4 |
| UTE504 01200508 | 1.2 | 0.5 | 8 | 50 | 4 |
| UTE504 01203010 | 1.2 | 3 | 10 | 50 | 4 |
| UTE504 01202010 | 1.2 | 2 | 10 | 50 | 4 |
| UTE504 01201510 | 1.2 | 1.5 | 10 | 50 | 4 |
| UTE504 01201010 | 1.2 | 1 | 10 | 50 | 4 |
| UTE504 01200510 | 1.2 | 0.5 | 10 | 50 | 4 |
| UTE504 01203012 | 1.2 | 3 | 12 | 50 | 4 |
| UTE504 01202012 | 1.2 | 2 | 12 | 50 | 4 |
| UTE504 01201512 | 1.2 | 1.5 | 12 | 50 | 4 |
| UTE504 01201012 | 1.2 | 1 | 12 | 50 | 4 |
| UTE504 01200512 | 1.2 | 0.5 | 12 | 50 | 4 |
| UTE504 01203016 | 1.2 | 3 | 16 | 50 | 4 |
| UTE504 01202016 | 1.2 | 2 | 16 | 50 | 4 |
| UTE504 01201516 | 1.2 | 1.5 | 16 | 50 | 4 |
| UTE504 01201016 | 1.2 | 1 | 16 | 50 | 4 |
| UTE504 01200516 | 1.2 | 0.5 | 16 | 50 | 4 |
| UTE504 01503006 | 1.5 | 3 | 6 | 50 | 4 |
| UTE504 01502006 | 1.5 | 2 | 6 | 50 | 4 |
| UTE504 01501506 | 1.5 | 1.5 | 6 | 50 | 4 |
| UTE504 01501006 | 1.5 | 1 | 6 | 50 | 4 |
| UTE504 01500506 | 1.5 | 0.5 | 6 | 50 | 4 |
| UTE504 01503008 | 1.5 | 3 | 8 | 50 | 4 |
| UTE504 01502008 | 1.5 | 2 | 8 | 50 | 4 |
| UTE504 01501508 | 1.5 | 1.5 | 8 | 50 | 4 |
| UTE504 01501008 | 1.5 | 1 | 8 | 50 | 4 |
| UTE504 01500508 | 1.5 | 0.5 | 8 | 50 | 4 |
| UTE504 01503010 | 1.5 | 3 | 10 | 50 | 4 |
| UTE504 01502010 | 1.5 | 2 | 10 | 50 | 4 |
| UTE504 01501510 | 1.5 | 1.5 | 10 | 50 | 4 |
| UTE504 01501010 | 1.5 | 1 | 10 | 50 | 4 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 01500510 | 1.5 | 0.5 | 10 | 50 | 4 |
| UTE504 01503012 | 1.5 | 3 | 12 | 50 | 4 |
| UTE504 01502012 | 1.5 | 2 | 12 | 50 | 4 |
| UTE504 01501512 | 1.5 | 1.5 | 12 | 50 | 4 |
| UTE504 01501012 | 1.5 | 1 | 12 | 50 | 4 |
| UTE504 01500512 | 1.5 | 0.5 | 12 | 50 | 4 |
| UTE504 01503016 | 1.5 | 3 | 16 | 50 | 4 |
| UTE504 01502016 | 1.5 | 2 | 16 | 50 | 4 |
| UTE504 01501516 | 1.5 | 1.5 | 16 | 50 | 4 |
| UTE504 01501016 | 1.5 | 1 | 16 | 50 | 4 |
| UTE504 01500516 | 1.5 | 0.5 | 16 | 50 | 4 |
| UTE504 01503020 | 1.5 | 3 | 20 | 60 | 4 |
| UTE504 01502020 | 1.5 | 2 | 20 | 60 | 4 |
| UTE504 01501520 | 1.5 | 1.5 | 20 | 60 | 4 |
| UTE504 01501020 | 1.5 | 1 | 20 | 60 | 4 |
| UTE504 01500520 | 1.5 | 0.5 | 20 | 60 | 4 |
| UTE504 02003008 | 2 | 3 | 8 | 50 | 4 |
| UTE504 02002008 | 2 | 2 | 8 | 50 | 4 |
| UTE504 02001508 | 2 | 1.5 | 8 | 50 | 4 |
| UTE504 02001008 | 2 | 1 | 8 | 50 | 4 |
| UTE504 02000508 | 2 | 0.5 | 8 | 50 | 4 |
| UTE504 02003010 | 2 | 3 | 10 | 50 | 4 |
| UTE504 02002010 | 2 | 2 | 10 | 50 | 4 |
| UTE504 02001510 | 2 | 1.5 | 10 | 50 | 4 |
| UTE504 02001010 | 2 | 1 | 10 | 50 | 4 |
| UTE504 02000510 | 2 | 0.5 | 10 | 50 | 4 |
| UTE504 02003012 | 2 | 3 | 12 | 50 | 4 |
| UTE504 02002012 | 2 | 2 | 12 | 50 | 4 |
| UTE504 02001512 | 2 | 1.5 | 12 | 50 | 4 |
| UTE504 02001012 | 2 | 1 | 12 | 50 | 4 |
| UTE504 02000512 | 2 | 0.5 | 12 | 50 | 4 |
| UTE504 02003016 | 2 | 3 | 16 | 50 | 4 |
| UTE504 02002016 | 2 | 2 | 16 | 50 | 4 |
| UTE504 02001516 | 2 | 1.5 | 16 | 50 | 4 |
| UTE504 02001016 | 2 | 1 | 16 | 50 | 4 |
| UTE504 02000516 | 2 | 0.5 | 16 | 50 | 4 |
| UTE504 02003020 | 2 | 3 | 20 | 60 | 6 |
| UTE504 02002020 | 2 | 2 | 20 | 60 | 4 |
| UTE504 02001520 | 2 | 1.5 | 20 | 60 | 4 |
| UTE504 02001020 | 2 | 1 | 20 | 60 | 4 |
| UTE504 02000520 | 2 | 0.5 | 20 | 60 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTE504 | 4 FLUTES TAPERED SQUARE ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 02003025 | 2 | 3 | 25 | 60 | 6 |
| UTE504 02002025 | 2 | 2 | 25 | 60 | 4 |
| UTE504 02001525 | 2 | 1.5 | 25 | 60 | 4 |
| UTE504 02001025 | 2 | 1 | 25 | 60 | 4 |
| UTE504 02000525 | 2 | 0.5 | 25 | 60 | 4 |
| UTE504 02503010 | 2.5 | 3 | 10 | 50 | 4 |
| UTE504 02502010 | 2.5 | 2 | 10 | 50 | 4 |
| UTE504 02501510 | 2.5 | 1.5 | 10 | 50 | 4 |
| UTE504 02501010 | 2.5 | 1 | 10 | 50 | 4 |
| UTE504 02500510 | 2.5 | 0.5 | 10 | 50 | 4 |
| UTE504 02503012 | 2.5 | 3 | 12 | 50 | 4 |
| UTE504 02502012 | 2.5 | 2 | 12 | 50 | 4 |
| UTE504 02501512 | 2.5 | 1.5 | 12 | 50 | 4 |
| UTE504 02501012 | 2.5 | 1 | 12 | 50 | 4 |
| UTE504 02500512 | 2.5 | 0.5 | 12 | 50 | 4 |
| UTE504 02503016 | 2.5 | 3 | 16 | 50 | 6 |
| UTE504 02502016 | 2.5 | 2 | 16 | 50 | 4 |
| UTE504 02501516 | 2.5 | 1.5 | 16 | 50 | 4 |
| UTE504 02501016 | 2.5 | 1 | 16 | 50 | 4 |
| UTE504 02500516 | 2.5 | 0.5 | 16 | 50 | 4 |
| UTE504 02503020 | 2.5 | 3 | 20 | 60 | 6 |
| UTE504 02502020 | 2.5 | 2 | 20 | 60 | 4 |
| UTE504 02501520 | 2.5 | 1.5 | 20 | 60 | 4 |
| UTE504 02501020 | 2.5 | 1 | 20 | 60 | 4 |
| UTE504 02500520 | 2.5 | 0.5 | 20 | 60 | 4 |
| UTE504 02503025 | 2.5 | 3 | 25 | 60 | 6 |
| UTE504 02502025 | 2.5 | 2 | 25 | 60 | 6 |
| UTE504 02501525 | 2.5 | 1.5 | 25 | 60 | 4 |
| UTE504 02501025 | 2.5 | 1 | 25 | 60 | 4 |
| UTE504 02500525 | 2.5 | 0.5 | 25 | 60 | 4 |
| UTE504 02503030 | 2.5 | 3 | 30 | 60 | 6 |
| UTE504 02502030 | 2.5 | 2 | 30 | 60 | 6 |
| UTE504 02501530 | 2.5 | 1.5 | 30 | 60 | 6 |
| UTE504 02501030 | 2.5 | 1 | 30 | 60 | 4 |
| UTE504 02500530 | 2.5 | 0.5 | 30 | 60 | 4 |
| UTE504 030015 | 3 | 1.5 | 12 | 50 | 6 |
| UTE504 03001 | 3 | 1 | 12 | 50 | 6 |
| UTE504 030005 | 3 | 0.5 | 12 | 50 | 6 |
| UTE504 03003 | 3 | 3 | 14 | 50 | 6 |
| UTE504 03002 | 3 | 2 | 14 | 50 | 6 |
| UTE504 03010 | 3 | 10 | 16 | 50 | 10 |

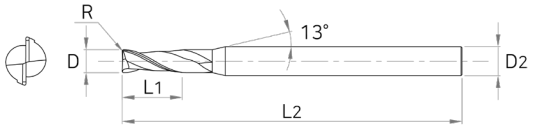
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| UTE504 03007 | 3 | 7 | 16 | 50 | 8 |
| UTE504 03005 | 3 | 5 | 16 | 50 | 6 |
| UTE504 04007 | 4 | 7 | 16 | 65 | 8 |
| UTE504 04002 | 4 | 2 | 16 | 60 | 6 |
| UTE504 040015 | 4 | 1.5 | 16 | 60 | 6 |
| UTE504 04001 | 4 | 1 | 16 | 60 | 6 |
| UTE504 040005 | 4 | 0.5 | 16 | 60 | 6 |
| UTE504 04010 | 4 | 10 | 17 | 65 | 10 |
| UTE504 04003 | 4 | 3 | 19 | 60 | 6 |
| UTE504 04005 | 4 | 5 | 22 | 65 | 8 |
| UTE504 06010 | 6 | 10 | 17 | 75 | 12 |
| UTE504 06003 | 6 | 3 | 19 | 65 | 8 |
| UTE504 06002 | 6 | 2 | 20 | 65 | 8 |
| UTE504 060015 | 6 | 1.5 | 20 | 65 | 8 |
| UTE504 06001 | 6 | 1 | 20 | 65 | 8 |
| UTE504 060005 | 6 | 0.5 | 20 | 65 | 8 |
| UTE504 06005 | 6 | 5 | 22 | 75 | 10 |
| UTE504 06007 | 6 | 7 | 24 | 75 | 12 |
| UTE504 07005 | 7 | 5 | 28 | 80 | 12 |
| UTE504 07003 | 7 | 3 | 28 | 80 | 10 |
| UTE504 07002 | 7 | 2 | 28 | 80 | 10 |
| UTE504 070015 | 7 | 1.5 | 28 | 70 | 10 |
| UTE504 07001 | 7 | 1 | 28 | 70 | 8 |
| UTE504 070005 | 7 | 0.5 | 28 | 70 | 8 |
| UTE504 08002 | 8 | 2 | 28 | 90 | 10 |
| UTE504 08007 | 8 | 7 | 32 | 90 | 16 |
| UTE504 08010 | 8 | 10 | 34 | 100 | 20 |
| UTE504 080015 | 8 | 1.5 | 35 | 90 | 10 |
| UTE504 08001 | 8 | 1 | 35 | 90 | 10 |
| UTE504 080005 | 8 | 0.5 | 35 | 90 | 10 |
| UTE504 08003 | 8 | 3 | 38 | 90 | 12 |
| UTE504 08005 | 8 | 5 | 45 | 100 | 16 |
| UTE504 10005 | 10 | 5 | 34 | 100 | 16 |
| UTE504 100015 | 10 | 1.5 | 38 | 90 | 12 |
| UTE504 10007 | 10 | 7 | 40 | 90 | 20 |
| UTE504 10003 | 10 | 3 | 40 | 100 | 16 |
| UTE504 10002 | 10 | 2 | 40 | 90 | 16 |
| UTE504 10001 | 10 | 1 | 40 | 90 | 12 |
| UTE504 100005 | 10 | 0.5 | 40 | 90 | 12 |
| UTE504 10010 | 10 | 10 | 42 | 100 | 25 |

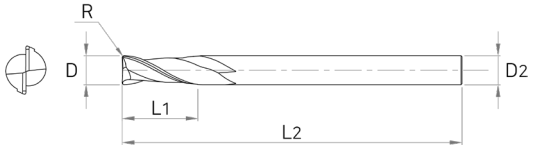
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR502 | 2 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.2 ~ 6 | 0 ~ -0.012 | h5 |
| D7 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 R6 OR UNDER | R ±0.015 ABOVE R6 | DATA P.650

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 002002 | 0.2 | 0.02 | 0.4 | 40 | 4 |
| UR502 002005 | 0.2 | 0.05 | 0.4 | 40 | 4 |
| UR502 003002 | 0.3 | 0.02 | 0.6 | 40 | 4 |
| UR502 003005 | 0.3 | 0.05 | 0.6 | 40 | 4 |
| UR502 004005 | 0.4 | 0.05 | 0.8 | 40 | 4 |
| UR502 00401 | 0.4 | 0.1 | 0.8 | 40 | 4 |
| UR502 005005 | 0.5 | 0.05 | 1 | 40 | 4 |
| UR502 00501 | 0.5 | 0.1 | 1 | 40 | 4 |
| UR502 006005 | 0.6 | 0.05 | 1.2 | 40 | 4 |
| UR502 00601 | 0.6 | 0.1 | 1.2 | 40 | 4 |
| UR502 00602 | 0.6 | 0.2 | 1.2 | 40 | 4 |
| UR502 007005 | 0.7 | 0.05 | 1.4 | 40 | 4 |
| UR502 00701 | 0.7 | 0.1 | 1.4 | 40 | 4 |
| UR502 00702 | 0.7 | 0.2 | 1.4 | 40 | 4 |
| UR502 008005 | 0.8 | 0.05 | 1.6 | 40 | 4 |
| UR502 00801 | 0.8 | 0.1 | 1.6 | 40 | 4 |
| UR502 00802 | 0.8 | 0.2 | 1.6 | 40 | 4 |
| UR502 009005 | 0.9 | 0.05 | 1.8 | 40 | 4 |
| UR502 00901 | 0.9 | 0.1 | 1.8 | 40 | 4 |
| UR502 010005 | 1 | 0.05 | 2.5 | 50 | 6 |
| UR502 01001 | 1 | 0.1 | 2.5 | 50 | 6 |
| UR502 01002 | 1 | 0.2 | 2.5 | 50 | 6 |
| UR502 01003 | 1 | 0.3 | 2.5 | 50 | 6 |
| UR502 012005 | 1.2 | 0.05 | 3 | 50 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 01201 | 1.2 | 0.1 | 3 | 50 | 6 |
| UR502 01202 | 1.2 | 0.2 | 3 | 50 | 6 |
| UR502 01203 | 1.2 | 0.3 | 3 | 50 | 6 |
| UR502 015005 | 1.5 | 0.05 | 4 | 50 | 6 |
| UR502 01501 | 1.5 | 0.1 | 4 | 50 | 6 |
| UR502 01502 | 1.5 | 0.2 | 4 | 50 | 6 |
| UR502 01503 | 1.5 | 0.3 | 4 | 50 | 6 |
| UR502 01505 | 1.5 | 0.5 | 4 | 50 | 6 |
| UR502 02001 | 2 | 0.1 | 6 | 50 | 6 |
| UR502 02002 | 2 | 0.2 | 6 | 50 | 6 |
| UR502 02003 | 2 | 0.3 | 6 | 50 | 6 |
| UR502 02005 | 2 | 0.5 | 6 | 50 | 6 |
| UR502 02501 | 2.5 | 0.1 | 7 | 60 | 6 |
| UR502 02502 | 2.5 | 0.2 | 7 | 60 | 6 |
| UR502 02503 | 2.5 | 0.3 | 7 | 60 | 6 |
| UR502 02505 | 2.5 | 0.5 | 7 | 60 | 6 |
| UR502 03001 | 3 | 0.1 | 8 | 60 | 6 |
| UR502 03002 | 3 | 0.2 | 8 | 60 | 6 |
| UR502 03003 | 3 | 0.3 | 8 | 60 | 6 |
| UR502 03005 | 3 | 0.5 | 8 | 60 | 6 |
| UR502 03010 | 3 | 1 | 8 | 60 | 6 |
| UR502 03501 | 3.5 | 0.1 | 10 | 70 | 6 |
| UR502 03502 | 3.5 | 0.2 | 10 | 70 | 6 |
| UR502 03503 | 3.5 | 0.3 | 10 | 70 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR502 | 2 FLUTES RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 03505 | 3.5 | 0.5 | 10 | 70 | 6 |
| UR502 04001 | 4 | 0.1 | 10 | 70 | 6 |
| UR502 04001100S4 | 4 | 0.1 | 10 | 100 | 4 |
| UR502 04001S4 | 4 | 0.1 | 10 | 70 | 4 |
| UR502 04002 | 4 | 0.2 | 10 | 70 | 6 |
| UR502 04002100S4 | 4 | 0.2 | 10 | 100 | 4 |
| UR502 04002S4 | 4 | 0.2 | 10 | 70 | 4 |
| UR502 04003 | 4 | 0.3 | 10 | 70 | 6 |
| UR502 04003100S4 | 4 | 0.3 | 10 | 100 | 4 |
| UR502 04003S4 | 4 | 0.3 | 10 | 70 | 4 |
| UR502 04005 | 4 | 0.5 | 10 | 70 | 6 |
| UR502 04005100S4 | 4 | 0.5 | 10 | 100 | 4 |
| UR502 04005S4 | 4 | 0.5 | 10 | 70 | 4 |
| UR502 04010 | 4 | 1 | 10 | 70 | 6 |
| UR502 04010100S4 | 4 | 1 | 10 | 100 | 4 |
| UR502 04010S4 | 4 | 1 | 10 | 70 | 4 |
| UR502 04501 | 4.5 | 0.1 | 11 | 80 | 6 |
| UR502 04502 | 4.5 | 0.2 | 11 | 80 | 6 |
| UR502 04503 | 4.5 | 0.3 | 11 | 80 | 6 |
| UR502 04505 | 4.5 | 0.5 | 11 | 80 | 6 |
| UR502 05001 | 5 | 0.1 | 13 | 90 | 6 |
| UR502 05002 | 5 | 0.2 | 13 | 90 | 6 |
| UR502 05003 | 5 | 0.3 | 13 | 90 | 6 |
| UR502 05005 | 5 | 0.5 | 13 | 90 | 6 |
| UR502 05010 | 5 | 1 | 13 | 90 | 6 |
| UR502 05501 | 5.5 | 0.1 | 13 | 90 | 6 |
| UR502 05502 | 5.5 | 0.2 | 13 | 90 | 6 |
| UR502 05503 | 5.5 | 0.3 | 13 | 90 | 6 |
| UR502 05505 | 5.5 | 0.5 | 13 | 90 | 6 |
| UR502 05510 | 5.5 | 1 | 13 | 90 | 6 |
| UR502 06001 | 6 | 0.1 | 15 | 90 | 6 |
| UR502 06002 | 6 | 0.2 | 15 | 90 | 6 |
| UR502 06003 | 6 | 0.3 | 15 | 90 | 6 |
| UR502 0600360 | 6 | 0.3 | 15 | 60 | 6 |
| UR502 06005 | 6 | 0.5 | 15 | 90 | 6 |
| UR502 06005110 | 6 | 0.5 | 15 | 110 | 6 |
| UR502 06005130 | 6 | 0.5 | 15 | 130 | 6 |
| UR502 0600560 | 6 | 0.5 | 15 | 60 | 6 |
| UR502 06010 | 6 | 1 | 15 | 90 | 6 |
| UR502 06010110 | 6 | 1 | 15 | 110 | 6 |
| UR502 06010130 | 6 | 1 | 15 | 130 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 0601060 | 6 | 1 | 15 | 60 | 6 |
| UR502 06015 | 6 | 1.5 | 15 | 90 | 6 |
| UR502 06020 | 6 | 2 | 15 | 90 | 6 |
| UR502 07001 | 7 | 0.1 | 16 | 90 | 8 |
| UR502 07002 | 7 | 0.2 | 16 | 90 | 8 |
| UR502 07003 | 7 | 0.3 | 16 | 90 | 8 |
| UR502 07005 | 7 | 0.5 | 16 | 90 | 8 |
| UR502 07010 | 7 | 1 | 16 | 90 | 8 |
| UR502 07020 | 7 | 2 | 16 | 90 | 8 |
| UR502 08001 | 8 | 0.1 | 20 | 100 | 8 |
| UR502 08002 | 8 | 0.2 | 20 | 100 | 8 |
| UR502 08003 | 8 | 0.3 | 20 | 100 | 8 |
| UR502 0800370 | 8 | 0.3 | 20 | 70 | 8 |
| UR502 08005 | 8 | 0.5 | 20 | 100 | 8 |
| UR502 08005120 | 8 | 0.5 | 20 | 120 | 8 |
| UR502 08005150 | 8 | 0.5 | 20 | 150 | 8 |
| UR502 0800570 | 8 | 0.5 | 20 | 70 | 8 |
| UR502 08010 | 8 | 1 | 20 | 100 | 8 |
| UR502 08010120 | 8 | 1 | 20 | 120 | 8 |
| UR502 08010150 | 8 | 1 | 20 | 150 | 8 |
| UR502 0801070 | 8 | 1 | 20 | 70 | 8 |
| UR502 08015 | 8 | 1.5 | 20 | 100 | 8 |
| UR502 08020 | 8 | 2 | 20 | 100 | 8 |
| UR502 08025 | 8 | 2.5 | 20 | 100 | 8 |
| UR502 08030 | 8 | 3 | 20 | 100 | 8 |
| UR502 10001 | 10 | 0.1 | 25 | 100 | 10 |
| UR502 10002 | 10 | 0.2 | 25 | 100 | 10 |
| UR502 10003 | 10 | 0.3 | 25 | 100 | 10 |
| UR502 1000375 | 10 | 0.3 | 25 | 75 | 10 |
| UR502 10005 | 10 | 0.5 | 25 | 100 | 10 |
| UR502 10005130 | 10 | 0.5 | 25 | 130 | 10 |
| UR502 10005150 | 10 | 0.5 | 25 | 150 | 10 |
| UR502 1000575 | 10 | 0.5 | 25 | 75 | 10 |
| UR502 10010 | 10 | 1 | 25 | 100 | 10 |
| UR502 10010130 | 10 | 1 | 25 | 130 | 10 |
| UR502 10010150 | 10 | 1 | 25 | 150 | 10 |
| UR502 1001075 | 10 | 1 | 25 | 75 | 10 |
| UR502 10015 | 10 | 1.5 | 25 | 100 | 10 |
| UR502 10020 | 10 | 2 | 25 | 100 | 10 |
| UR502 10025 | 10 | 2.5 | 25 | 100 | 10 |
| UR502 10030 | 10 | 3 | 25 | 100 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR502 | 2 FLUTES RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 03505 | 3.5 | 0.5 | 10 | 70 | 6 |
| UR502 04001 | 4 | 0.1 | 10 | 70 | 6 |
| UR502 04001100S4 | 4 | 0.1 | 10 | 100 | 4 |
| UR502 04001S4 | 4 | 0.1 | 10 | 70 | 4 |
| UR502 04002 | 4 | 0.2 | 10 | 70 | 6 |
| UR502 04002100S4 | 4 | 0.2 | 10 | 100 | 4 |
| UR502 04002S4 | 4 | 0.2 | 10 | 70 | 4 |
| UR502 04003 | 4 | 0.3 | 10 | 70 | 6 |
| UR502 04003100S4 | 4 | 0.3 | 10 | 100 | 4 |
| UR502 04003S4 | 4 | 0.3 | 10 | 70 | 4 |
| UR502 04005 | 4 | 0.5 | 10 | 70 | 6 |
| UR502 04005100S4 | 4 | 0.5 | 10 | 100 | 4 |
| UR502 04005S4 | 4 | 0.5 | 10 | 70 | 4 |
| UR502 04010 | 4 | 1 | 10 | 70 | 6 |
| UR502 04010100S4 | 4 | 1 | 10 | 100 | 4 |
| UR502 04010S4 | 4 | 1 | 10 | 70 | 4 |
| UR502 04501 | 4.5 | 0.1 | 11 | 80 | 6 |
| UR502 04502 | 4.5 | 0.2 | 11 | 80 | 6 |
| UR502 04503 | 4.5 | 0.3 | 11 | 80 | 6 |
| UR502 04505 | 4.5 | 0.5 | 11 | 80 | 6 |
| UR502 05001 | 5 | 0.1 | 13 | 90 | 6 |
| UR502 05002 | 5 | 0.2 | 13 | 90 | 6 |
| UR502 05003 | 5 | 0.3 | 13 | 90 | 6 |
| UR502 05005 | 5 | 0.5 | 13 | 90 | 6 |
| UR502 05010 | 5 | 1 | 13 | 90 | 6 |
| UR502 05501 | 5.5 | 0.1 | 13 | 90 | 6 |
| UR502 05502 | 5.5 | 0.2 | 13 | 90 | 6 |
| UR502 05503 | 5.5 | 0.3 | 13 | 90 | 6 |
| UR502 05505 | 5.5 | 0.5 | 13 | 90 | 6 |
| UR502 05510 | 5.5 | 1 | 13 | 90 | 6 |
| UR502 06001 | 6 | 0.1 | 15 | 90 | 6 |
| UR502 06002 | 6 | 0.2 | 15 | 90 | 6 |
| UR502 06003 | 6 | 0.3 | 15 | 90 | 6 |
| UR502 0600360 | 6 | 0.3 | 15 | 60 | 6 |
| UR502 06005 | 6 | 0.5 | 15 | 90 | 6 |
| UR502 06005110 | 6 | 0.5 | 15 | 110 | 6 |
| UR502 06005130 | 6 | 0.5 | 15 | 130 | 6 |
| UR502 0600560 | 6 | 0.5 | 15 | 60 | 6 |
| UR502 06010 | 6 | 1 | 15 | 90 | 6 |
| UR502 06010110 | 6 | 1 | 15 | 110 | 6 |
| UR502 06010130 | 6 | 1 | 15 | 130 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 0601060 | 6 | 1 | 15 | 60 | 6 |
| UR502 06015 | 6 | 1.5 | 15 | 90 | 6 |
| UR502 06020 | 6 | 2 | 15 | 90 | 6 |
| UR502 07001 | 7 | 0.1 | 16 | 90 | 8 |
| UR502 07002 | 7 | 0.2 | 16 | 90 | 8 |
| UR502 07003 | 7 | 0.3 | 16 | 90 | 8 |
| UR502 07005 | 7 | 0.5 | 16 | 90 | 8 |
| UR502 07010 | 7 | 1 | 16 | 90 | 8 |
| UR502 07020 | 7 | 2 | 16 | 90 | 8 |
| UR502 08001 | 8 | 0.1 | 20 | 100 | 8 |
| UR502 08002 | 8 | 0.2 | 20 | 100 | 8 |
| UR502 08003 | 8 | 0.3 | 20 | 100 | 8 |
| UR502 0800370 | 8 | 0.3 | 20 | 70 | 8 |
| UR502 08005 | 8 | 0.5 | 20 | 100 | 8 |
| UR502 08005120 | 8 | 0.5 | 20 | 120 | 8 |
| UR502 08005150 | 8 | 0.5 | 20 | 150 | 8 |
| UR502 0800570 | 8 | 0.5 | 20 | 70 | 8 |
| UR502 08010 | 8 | 1 | 20 | 100 | 8 |
| UR502 08010120 | 8 | 1 | 20 | 120 | 8 |
| UR502 08010150 | 8 | 1 | 20 | 150 | 8 |
| UR502 0801070 | 8 | 1 | 20 | 70 | 8 |
| UR502 08015 | 8 | 1.5 | 20 | 100 | 8 |
| UR502 08020 | 8 | 2 | 20 | 100 | 8 |
| UR502 08025 | 8 | 2.5 | 20 | 100 | 8 |
| UR502 08030 | 8 | 3 | 20 | 100 | 8 |
| UR502 10001 | 10 | 0.1 | 25 | 100 | 10 |
| UR502 10002 | 10 | 0.2 | 25 | 100 | 10 |
| UR502 10003 | 10 | 0.3 | 25 | 100 | 10 |
| UR502 1000375 | 10 | 0.3 | 25 | 75 | 10 |
| UR502 10005 | 10 | 0.5 | 25 | 100 | 10 |
| UR502 10005130 | 10 | 0.5 | 25 | 130 | 10 |
| UR502 10005150 | 10 | 0.5 | 25 | 150 | 10 |
| UR502 1000575 | 10 | 0.5 | 25 | 75 | 10 |
| UR502 10010 | 10 | 1 | 25 | 100 | 10 |
| UR502 10010130 | 10 | 1 | 25 | 130 | 10 |
| UR502 10010150 | 10 | 1 | 25 | 150 | 10 |
| UR502 1001075 | 10 | 1 | 25 | 75 | 10 |
| UR502 10015 | 10 | 1.5 | 25 | 100 | 10 |
| UR502 10020 | 10 | 2 | 25 | 100 | 10 |
| UR502 10025 | 10 | 2.5 | 25 | 100 | 10 |
| UR502 10030 | 10 | 3 | 25 | 100 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR502 | 2 FLUTES RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 10040 | 10 | 4 | 25 | 100 | 10 |
| UR502 11002 | 11 | 0.2 | 25 | 110 | 12 |
| UR502 11003 | 11 | 0.3 | 25 | 110 | 12 |
| UR502 11005 | 11 | 0.5 | 25 | 110 | 12 |
| UR502 11010 | 11 | 1 | 25 | 110 | 12 |
| UR502 11020 | 11 | 2 | 25 | 110 | 12 |
| UR502 12001 | 12 | 0.1 | 30 | 110 | 12 |
| UR502 12002 | 12 | 0.2 | 30 | 110 | 12 |
| UR502 12003 | 12 | 0.3 | 30 | 110 | 12 |
| UR502 1200380 | 12 | 0.3 | 30 | 80 | 12 |
| UR502 12005 | 12 | 0.5 | 30 | 110 | 12 |
| UR502 12005130 | 12 | 0.5 | 30 | 130 | 12 |
| UR502 12005150 | 12 | 0.5 | 30 | 150 | 12 |
| UR502 1200580 | 12 | 0.5 | 30 | 80 | 12 |
| UR502 12010 | 12 | 1 | 30 | 110 | 12 |
| UR502 12010130 | 12 | 1 | 30 | 130 | 12 |
| UR502 12010150 | 12 | 1 | 30 | 150 | 12 |
| UR502 1201080 | 12 | 1 | 30 | 80 | 12 |
| UR502 12015 | 12 | 1.5 | 30 | 110 | 12 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR502 12020 | 12 | 2 | 30 | 110 | 12 |
| UR502 12025 | 12 | 2.5 | 30 | 110 | 12 |
| UR502 12030 | 12 | 3 | 30 | 110 | 12 |
| UR502 12040 | 12 | 4 | 30 | 110 | 12 |
| UR502 12050 | 12 | 5 | 30 | 110 | 12 |
| UR502 14005 | 14 | 0.5 | 30 | 150 | 16 |
| UR502 14010 | 14 | 1 | 30 | 150 | 16 |
| UR502 14020 | 14 | 2 | 30 | 150 | 16 |
| UR502 16005 | 16 | 0.5 | 32 | 150 | 16 |
| UR502 16010 | 16 | 1 | 32 | 150 | 16 |
| UR502 16015 | 16 | 1.5 | 32 | 150 | 16 |
| UR502 16020 | 16 | 2 | 32 | 150 | 16 |
| UR502 16030 | 16 | 3 | 32 | 150 | 16 |
| UR502 20005 | 20 | 0.5 | 38 | 150 | 20 |
| UR502 20010 | 20 | 1 | 38 | 150 | 20 |
| UR502 20015 | 20 | 1.5 | 38 | 150 | 20 |
| UR502 20020 | 20 | 2 | 38 | 150 | 20 |
| UR502 20030 | 20 | 3 | 38 | 150 | 20 |

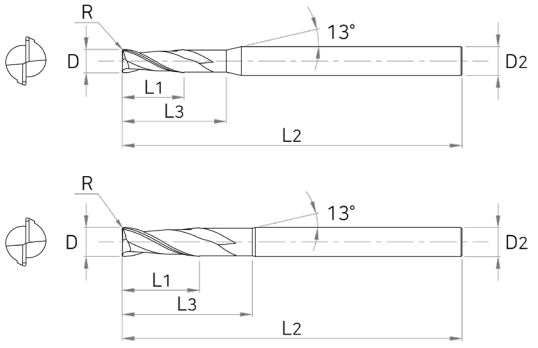


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.2 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 R6 OR UNDER | R ±0.015 ABOVE R6 | DATA P.651

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 002002005 | 0.2 | 0.02 | 0.3 | 0.5 | 40 | 4 |
| UR512 00200201 | 0.2 | 0.02 | 0.3 | 1 | 40 | 4 |
| UR512 002002015 | 0.2 | 0.02 | 0.3 | 1.5 | 40 | 4 |
| UR512 00200202 | 0.2 | 0.02 | 0.3 | 2 | 40 | 4 |
| UR512 002005005 | 0.2 | 0.05 | 0.3 | 0.5 | 40 | 4 |
| UR512 00200501 | 0.2 | 0.05 | 0.3 | 1 | 40 | 4 |
| UR512 002005015 | 0.2 | 0.05 | 0.3 | 1.5 | 40 | 4 |
| UR512 00200502 | 0.2 | 0.05 | 0.3 | 2 | 40 | 4 |
| UR512 00300201 | 0.3 | 0.02 | 0.5 | 1 | 40 | 4 |
| UR512 00300202 | 0.3 | 0.02 | 0.5 | 2 | 40 | 4 |
| UR512 00300203 | 0.3 | 0.02 | 0.5 | 3 | 40 | 4 |
| UR512 00300501 | 0.3 | 0.05 | 0.5 | 1 | 40 | 4 |
| UR512 00300502 | 0.3 | 0.05 | 0.5 | 2 | 40 | 4 |
| UR512 00300503 | 0.3 | 0.05 | 0.5 | 3 | 40 | 4 |
| UR512 00400501 | 0.4 | 0.05 | 0.6 | 1 | 40 | 4 |
| UR512 004005015 | 0.4 | 0.05 | 0.6 | 1.5 | 40 | 4 |
| UR512 00400502 | 0.4 | 0.05 | 0.6 | 2 | 40 | 4 |
| UR512 004005025 | 0.4 | 0.05 | 0.6 | 2.5 | 40 | 4 |
| UR512 00400503 | 0.4 | 0.05 | 0.6 | 3 | 40 | 4 |
| UR512 00400504 | 0.4 | 0.05 | 0.6 | 4 | 40 | 4 |
| UR512 0040101 | 0.4 | 0.1 | 0.6 | 1 | 40 | 4 |
| UR512 00401015 | 0.4 | 0.1 | 0.6 | 1.5 | 40 | 4 |
| UR512 0040102 | 0.4 | 0.1 | 0.6 | 2 | 40 | 4 |
| UR512 00401025 | 0.4 | 0.1 | 0.6 | 2.5 | 40 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0040103 | 0.4 | 0.1 | 0.6 | 3 | 40 | 4 |
| UR512 0040104 | 0.4 | 0.1 | 0.6 | 4 | 40 | 4 |
| UR512 00500501 | 0.5 | 0.05 | 0.7 | 1 | 45 | 4 |
| UR512 005005015 | 0.5 | 0.05 | 0.7 | 1.5 | 45 | 4 |
| UR512 00500502 | 0.5 | 0.05 | 0.7 | 2 | 45 | 4 |
| UR512 005005025 | 0.5 | 0.05 | 0.7 | 2.5 | 45 | 4 |
| UR512 00500503 | 0.5 | 0.05 | 0.7 | 3 | 45 | 4 |
| UR512 00500504 | 0.5 | 0.05 | 0.7 | 4 | 45 | 4 |
| UR512 00500505 | 0.5 | 0.05 | 0.7 | 5 | 45 | 4 |
| UR512 00500506 | 0.5 | 0.05 | 0.7 | 6 | 45 | 4 |
| UR512 0050101 | 0.5 | 0.1 | 0.7 | 1 | 45 | 4 |
| UR512 00501015 | 0.5 | 0.1 | 0.7 | 1.5 | 45 | 4 |
| UR512 0050102 | 0.5 | 0.1 | 0.7 | 2 | 45 | 4 |
| UR512 00501025 | 0.5 | 0.1 | 0.7 | 2.5 | 45 | 4 |
| UR512 0050103 | 0.5 | 0.1 | 0.7 | 3 | 45 | 4 |
| UR512 0050104 | 0.5 | 0.1 | 0.7 | 4 | 45 | 4 |
| UR512 0050105 | 0.5 | 0.1 | 0.7 | 5 | 45 | 4 |
| UR512 0050106 | 0.5 | 0.1 | 0.7 | 6 | 45 | 4 |
| UR512 00600502 | 0.6 | 0.05 | 0.9 | 2 | 45 | 4 |
| UR512 00600503 | 0.6 | 0.05 | 0.9 | 3 | 45 | 4 |
| UR512 00600504 | 0.6 | 0.05 | 0.9 | 4 | 45 | 4 |
| UR512 00600506 | 0.6 | 0.05 | 0.9 | 6 | 45 | 4 |
| UR512 00600508 | 0.6 | 0.05 | 0.9 | 8 | 45 | 4 |
| UR512 00600510 | 0.6 | 0.05 | 0.9 | 10 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0060102 | 0.6 | 0.1 | 0.9 | 2 | 45 | 4 |
| UR512 0060103 | 0.6 | 0.1 | 0.9 | 3 | 45 | 4 |
| UR512 0060104 | 0.6 | 0.1 | 0.9 | 4 | 45 | 4 |
| UR512 0060106 | 0.6 | 0.1 | 0.9 | 6 | 45 | 4 |
| UR512 0060108 | 0.6 | 0.1 | 0.9 | 8 | 45 | 4 |
| UR512 0060110 | 0.6 | 0.1 | 0.9 | 10 | 45 | 4 |
| UR512 0060202 | 0.6 | 0.2 | 0.9 | 2 | 45 | 4 |
| UR512 0060203 | 0.6 | 0.2 | 0.9 | 3 | 45 | 4 |
| UR512 0060204 | 0.6 | 0.2 | 0.9 | 4 | 45 | 4 |
| UR512 0060206 | 0.6 | 0.2 | 0.9 | 6 | 45 | 4 |
| UR512 0060208 | 0.6 | 0.2 | 0.9 | 8 | 45 | 4 |
| UR512 0060210 | 0.6 | 0.2 | 0.9 | 10 | 45 | 4 |
| UR512 00700502 | 0.7 | 0.05 | 1.2 | 2 | 45 | 4 |
| UR512 00700504 | 0.7 | 0.05 | 1.2 | 4 | 45 | 4 |
| UR512 00700506 | 0.7 | 0.05 | 1.2 | 6 | 45 | 4 |
| UR512 00700508 | 0.7 | 0.05 | 1.2 | 8 | 45 | 4 |
| UR512 00700510 | 0.7 | 0.05 | 1.2 | 10 | 45 | 4 |
| UR512 0070102 | 0.7 | 0.1 | 1.2 | 2 | 45 | 4 |
| UR512 0070104 | 0.7 | 0.1 | 1.2 | 4 | 45 | 4 |
| UR512 0070106 | 0.7 | 0.1 | 1.2 | 6 | 45 | 4 |
| UR512 0070108 | 0.7 | 0.1 | 1.2 | 8 | 45 | 4 |
| UR512 0070110 | 0.7 | 0.1 | 1.2 | 10 | 45 | 4 |
| UR512 0070202 | 0.7 | 0.2 | 1.2 | 2 | 45 | 4 |
| UR512 0070204 | 0.7 | 0.2 | 1.2 | 4 | 45 | 4 |
| UR512 0070206 | 0.7 | 0.2 | 1.2 | 6 | 45 | 4 |
| UR512 0070208 | 0.7 | 0.2 | 1.2 | 8 | 45 | 4 |
| UR512 0070210 | 0.7 | 0.2 | 1.2 | 10 | 45 | 4 |
| UR512 00800502 | 0.8 | 0.05 | 1.2 | 2 | 45 | 4 |
| UR512 00800503 | 0.8 | 0.05 | 1.2 | 3 | 45 | 4 |
| UR512 00800504 | 0.8 | 0.05 | 1.2 | 4 | 45 | 4 |
| UR512 00800506 | 0.8 | 0.05 | 1.2 | 6 | 45 | 4 |
| UR512 00800508 | 0.8 | 0.05 | 1.2 | 8 | 45 | 4 |
| UR512 00800510 | 0.8 | 0.05 | 1.2 | 10 | 45 | 4 |
| UR512 0080102 | 0.8 | 0.1 | 1.2 | 2 | 45 | 4 |
| UR512 0080103 | 0.8 | 0.1 | 1.2 | 3 | 45 | 4 |
| UR512 0080104 | 0.8 | 0.1 | 1.2 | 4 | 45 | 4 |
| UR512 0080106 | 0.8 | 0.1 | 1.2 | 6 | 45 | 4 |
| UR512 0080108 | 0.8 | 0.1 | 1.2 | 8 | 45 | 4 |
| UR512 0080110 | 0.8 | 0.1 | 1.2 | 10 | 45 | 4 |
| UR512 0080202 | 0.8 | 0.2 | 1.2 | 2 | 45 | 4 |
| UR512 0080203 | 0.8 | 0.2 | 1.2 | 3 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0080204 | 0.8 | 0.2 | 1.2 | 4 | 45 | 4 |
| UR512 0080206 | 0.8 | 0.2 | 1.2 | 6 | 45 | 4 |
| UR512 0080208 | 0.8 | 0.2 | 1.2 | 8 | 45 | 4 |
| UR512 0080210 | 0.8 | 0.2 | 1.2 | 10 | 45 | 4 |
| UR512 01000503 | 1 | 0.05 | 1.5 | 3 | 50 | 4 |
| UR512 01000504 | 1 | 0.05 | 1.5 | 4 | 50 | 4 |
| UR512 01000506 | 1 | 0.05 | 1.5 | 6 | 50 | 4 |
| UR512 01000508 | 1 | 0.05 | 1.5 | 8 | 50 | 4 |
| UR512 01000510 | 1 | 0.05 | 1.5 | 10 | 50 | 4 |
| UR512 01000512 | 1 | 0.05 | 1.5 | 12 | 50 | 4 |
| UR512 01000514 | 1 | 0.05 | 1.5 | 14 | 50 | 4 |
| UR512 01000516 | 1 | 0.05 | 1.5 | 16 | 50 | 4 |
| UR512 01000520 | 1 | 0.05 | 1.5 | 20 | 50 | 4 |
| UR512 0100103 | 1 | 0.1 | 1.5 | 3 | 50 | 4 |
| UR512 0100104 | 1 | 0.1 | 1.5 | 4 | 50 | 4 |
| UR512 0100106 | 1 | 0.1 | 1.5 | 6 | 50 | 4 |
| UR512 0100108 | 1 | 0.1 | 1.5 | 8 | 50 | 4 |
| UR512 0100110 | 1 | 0.1 | 1.5 | 10 | 50 | 4 |
| UR512 0100112 | 1 | 0.1 | 1.5 | 12 | 50 | 4 |
| UR512 0100114 | 1 | 0.1 | 1.5 | 14 | 50 | 4 |
| UR512 0100116 | 1 | 0.1 | 1.5 | 16 | 50 | 4 |
| UR512 0100120 | 1 | 0.1 | 1.5 | 20 | 50 | 4 |
| UR512 0100203 | 1 | 0.2 | 1.5 | 3 | 50 | 4 |
| UR512 0100204 | 1 | 0.2 | 1.5 | 4 | 50 | 4 |
| UR512 0100206 | 1 | 0.2 | 1.5 | 6 | 50 | 4 |
| UR512 0100208 | 1 | 0.2 | 1.5 | 8 | 50 | 4 |
| UR512 0100210 | 1 | 0.2 | 1.5 | 10 | 50 | 4 |
| UR512 0100212 | 1 | 0.2 | 1.5 | 12 | 50 | 4 |
| UR512 0100214 | 1 | 0.2 | 1.5 | 14 | 50 | 4 |
| UR512 0100216 | 1 | 0.2 | 1.5 | 16 | 50 | 4 |
| UR512 0100220 | 1 | 0.2 | 1.5 | 20 | 50 | 4 |
| UR512 0100303 | 1 | 0.3 | 1.5 | 3 | 50 | 4 |
| UR512 0100304 | 1 | 0.3 | 1.5 | 4 | 50 | 4 |
| UR512 0100306 | 1 | 0.3 | 1.5 | 6 | 50 | 4 |
| UR512 0100308 | 1 | 0.3 | 1.5 | 8 | 50 | 4 |
| UR512 0100310 | 1 | 0.3 | 1.5 | 10 | 50 | 4 |
| UR512 0100312 | 1 | 0.3 | 1.5 | 12 | 50 | 4 |
| UR512 0100314 | 1 | 0.3 | 1.5 | 14 | 50 | 4 |
| UR512 0100316 | 1 | 0.3 | 1.5 | 16 | 50 | 4 |
| UR512 0100320 | 1 | 0.3 | 1.5 | 20 | 50 | 4 |
| UR512 01200503 | 1.2 | 0.05 | 1.8 | 3 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 01200504 | 1.2 | 0.05 | 1.8 | 4 | 50 | 4 |
| UR512 01200506 | 1.2 | 0.05 | 1.8 | 6 | 50 | 4 |
| UR512 01200508 | 1.2 | 0.05 | 1.8 | 8 | 50 | 4 |
| UR512 01200510 | 1.2 | 0.05 | 1.8 | 10 | 50 | 4 |
| UR512 01200512 | 1.2 | 0.05 | 1.8 | 12 | 50 | 4 |
| UR512 01200516 | 1.2 | 0.05 | 1.8 | 16 | 50 | 4 |
| UR512 01200520 | 1.2 | 0.05 | 1.8 | 20 | 50 | 4 |
| UR512 0120103 | 1.2 | 0.1 | 1.8 | 3 | 50 | 4 |
| UR512 0120104 | 1.2 | 0.1 | 1.8 | 4 | 50 | 4 |
| UR512 0120106 | 1.2 | 0.1 | 1.8 | 6 | 50 | 4 |
| UR512 0120108 | 1.2 | 0.1 | 1.8 | 8 | 50 | 4 |
| UR512 0120110 | 1.2 | 0.1 | 1.8 | 10 | 50 | 4 |
| UR512 0120112 | 1.2 | 0.1 | 1.8 | 12 | 50 | 4 |
| UR512 0120116 | 1.2 | 0.1 | 1.8 | 16 | 50 | 4 |
| UR512 0120120 | 1.2 | 0.1 | 1.8 | 20 | 50 | 4 |
| UR512 0120203 | 1.2 | 0.2 | 1.8 | 3 | 50 | 4 |
| UR512 0120204 | 1.2 | 0.2 | 1.8 | 4 | 50 | 4 |
| UR512 0120206 | 1.2 | 0.2 | 1.8 | 6 | 50 | 4 |
| UR512 0120208 | 1.2 | 0.2 | 1.8 | 8 | 50 | 4 |
| UR512 0120210 | 1.2 | 0.2 | 1.8 | 10 | 50 | 4 |
| UR512 0120212 | 1.2 | 0.2 | 1.8 | 12 | 50 | 4 |
| UR512 0120216 | 1.2 | 0.2 | 1.8 | 16 | 50 | 4 |
| UR512 0120220 | 1.2 | 0.2 | 1.8 | 20 | 50 | 4 |
| UR512 0120303 | 1.2 | 0.3 | 1.8 | 3 | 50 | 4 |
| UR512 0120304 | 1.2 | 0.3 | 1.8 | 4 | 50 | 4 |
| UR512 0120306 | 1.2 | 0.3 | 1.8 | 6 | 50 | 4 |
| UR512 0120308 | 1.2 | 0.3 | 1.8 | 8 | 50 | 4 |
| UR512 0120310 | 1.2 | 0.3 | 1.8 | 10 | 50 | 4 |
| UR512 0120312 | 1.2 | 0.3 | 1.8 | 12 | 50 | 4 |
| UR512 0120316 | 1.2 | 0.3 | 1.8 | 16 | 50 | 4 |
| UR512 0120320 | 1.2 | 0.3 | 1.8 | 20 | 50 | 4 |
| UR512 01500504 | 1.5 | 0.05 | 2.3 | 4 | 50 | 4 |
| UR512 01500506 | 1.5 | 0.05 | 2.3 | 6 | 50 | 4 |
| UR512 01500508 | 1.5 | 0.05 | 2.3 | 8 | 50 | 4 |
| UR512 01500510 | 1.5 | 0.05 | 2.3 | 10 | 50 | 4 |
| UR512 01500512 | 1.5 | 0.05 | 2.3 | 12 | 50 | 4 |
| UR512 01500514 | 1.5 | 0.05 | 2.3 | 14 | 50 | 4 |
| UR512 01500516 | 1.5 | 0.05 | 2.3 | 16 | 50 | 4 |
| UR512 01500520 | 1.5 | 0.05 | 2.3 | 20 | 50 | 4 |
| UR512 01500522 | 1.5 | 0.05 | 2.3 | 22 | 60 | 4 |
| UR512 01500526 | 1.5 | 0.05 | 2.3 | 26 | 60 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0150104 | 1.5 | 0.1 | 2.3 | 4 | 50 | 4 |
| UR512 0150106 | 1.5 | 0.1 | 2.3 | 6 | 50 | 4 |
| UR512 0150108 | 1.5 | 0.1 | 2.3 | 8 | 50 | 4 |
| UR512 0150110 | 1.5 | 0.1 | 2.3 | 10 | 50 | 4 |
| UR512 0150112 | 1.5 | 0.1 | 2.3 | 12 | 50 | 4 |
| UR512 0150114 | 1.5 | 0.1 | 2.3 | 14 | 50 | 4 |
| UR512 0150116 | 1.5 | 0.1 | 2.3 | 16 | 50 | 4 |
| UR512 0150120 | 1.5 | 0.1 | 2.3 | 20 | 50 | 4 |
| UR512 0150122 | 1.5 | 0.1 | 2.3 | 22 | 60 | 4 |
| UR512 0150126 | 1.5 | 0.1 | 2.3 | 26 | 60 | 4 |
| UR512 0150204 | 1.5 | 0.2 | 2.3 | 4 | 50 | 4 |
| UR512 0150206 | 1.5 | 0.2 | 2.3 | 6 | 50 | 4 |
| UR512 0150208 | 1.5 | 0.2 | 2.3 | 8 | 50 | 4 |
| UR512 0150210 | 1.5 | 0.2 | 2.3 | 10 | 50 | 4 |
| UR512 0150212 | 1.5 | 0.2 | 2.3 | 12 | 50 | 4 |
| UR512 0150214 | 1.5 | 0.2 | 2.3 | 14 | 50 | 4 |
| UR512 0150216 | 1.5 | 0.2 | 2.3 | 16 | 50 | 4 |
| UR512 0150220 | 1.5 | 0.2 | 2.3 | 20 | 50 | 4 |
| UR512 0150222 | 1.5 | 0.2 | 2.3 | 22 | 60 | 4 |
| UR512 0150226 | 1.5 | 0.2 | 2.3 | 26 | 60 | 4 |
| UR512 0150304 | 1.5 | 0.3 | 2.3 | 4 | 50 | 4 |
| UR512 0150306 | 1.5 | 0.3 | 2.3 | 6 | 50 | 4 |
| UR512 0150308 | 1.5 | 0.3 | 2.3 | 8 | 50 | 4 |
| UR512 0150310 | 1.5 | 0.3 | 2.3 | 10 | 50 | 4 |
| UR512 0150312 | 1.5 | 0.3 | 2.3 | 12 | 50 | 4 |
| UR512 0150314 | 1.5 | 0.3 | 2.3 | 14 | 50 | 4 |
| UR512 0150316 | 1.5 | 0.3 | 2.3 | 16 | 50 | 4 |
| UR512 0150320 | 1.5 | 0.3 | 2.3 | 20 | 50 | 4 |
| UR512 0150322 | 1.5 | 0.3 | 2.3 | 22 | 60 | 4 |
| UR512 0150326 | 1.5 | 0.3 | 2.3 | 26 | 60 | 4 |
| UR512 0150504 | 1.5 | 0.5 | 2.3 | 4 | 50 | 4 |
| UR512 0150506 | 1.5 | 0.5 | 2.3 | 6 | 50 | 4 |
| UR512 0150508 | 1.5 | 0.5 | 2.3 | 8 | 50 | 4 |
| UR512 0150510 | 1.5 | 0.5 | 2.3 | 10 | 50 | 4 |
| UR512 0150512 | 1.5 | 0.5 | 2.3 | 12 | 50 | 4 |
| UR512 0150514 | 1.5 | 0.5 | 2.3 | 14 | 50 | 4 |
| UR512 0150516 | 1.5 | 0.5 | 2.3 | 16 | 50 | 4 |
| UR512 0150520 | 1.5 | 0.5 | 2.3 | 20 | 50 | 4 |
| UR512 0150522 | 1.5 | 0.5 | 2.3 | 22 | 60 | 4 |
| UR512 0150526 | 1.5 | 0.5 | 2.3 | 26 | 60 | 4 |
| UR512 0200106 | 2 | 0.1 | 3 | 6 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0200108 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| UR512 0200110 | 2 | 0.1 | 3 | 10 | 50 | 4 |
| UR512 0200112 | 2 | 0.1 | 3 | 12 | 50 | 4 |
| UR512 0200114 | 2 | 0.1 | 3 | 14 | 50 | 4 |
| UR512 0200116 | 2 | 0.1 | 3 | 16 | 50 | 4 |
| UR512 0200120 | 2 | 0.1 | 3 | 20 | 50 | 4 |
| UR512 0200122 | 2 | 0.1 | 3 | 22 | 60 | 4 |
| UR512 0200126 | 2 | 0.1 | 3 | 26 | 60 | 4 |
| UR512 0200130 | 2 | 0.1 | 3 | 30 | 70 | 4 |
| UR512 0200206 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| UR512 0200208 | 2 | 0.2 | 3 | 8 | 50 | 4 |
| UR512 0200210 | 2 | 0.2 | 3 | 10 | 50 | 4 |
| UR512 0200212 | 2 | 0.2 | 3 | 12 | 50 | 4 |
| UR512 0200214 | 2 | 0.2 | 3 | 14 | 50 | 4 |
| UR512 0200216 | 2 | 0.2 | 3 | 16 | 50 | 4 |
| UR512 0200220 | 2 | 0.2 | 3 | 20 | 50 | 4 |
| UR512 0200222 | 2 | 0.2 | 3 | 22 | 60 | 4 |
| UR512 0200226 | 2 | 0.2 | 3 | 26 | 60 | 4 |
| UR512 0200230 | 2 | 0.2 | 3 | 30 | 70 | 4 |
| UR512 0200306 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| UR512 0200308 | 2 | 0.3 | 3 | 8 | 50 | 4 |
| UR512 0200310 | 2 | 0.3 | 3 | 10 | 50 | 4 |
| UR512 0200312 | 2 | 0.3 | 3 | 12 | 50 | 4 |
| UR512 0200314 | 2 | 0.3 | 3 | 14 | 50 | 4 |
| UR512 0200316 | 2 | 0.3 | 3 | 16 | 50 | 4 |
| UR512 0200320 | 2 | 0.3 | 3 | 20 | 50 | 4 |
| UR512 0200322 | 2 | 0.3 | 3 | 22 | 60 | 4 |
| UR512 0200326 | 2 | 0.3 | 3 | 26 | 60 | 4 |
| UR512 0200330 | 2 | 0.3 | 3 | 30 | 70 | 4 |
| UR512 0200506 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| UR512 0200508 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| UR512 0200510 | 2 | 0.5 | 3 | 10 | 50 | 4 |
| UR512 0200512 | 2 | 0.5 | 3 | 12 | 50 | 4 |
| UR512 0200514 | 2 | 0.5 | 3 | 14 | 50 | 4 |
| UR512 0200516 | 2 | 0.5 | 3 | 16 | 50 | 4 |
| UR512 0200520 | 2 | 0.5 | 3 | 20 | 50 | 4 |
| UR512 0200522 | 2 | 0.5 | 3 | 22 | 60 | 4 |
| UR512 0200526 | 2 | 0.5 | 3 | 26 | 60 | 4 |
| UR512 0200530 | 2 | 0.5 | 3 | 30 | 70 | 4 |
| UR512 0250108 | 2.5 | 0.1 | 4 | 8 | 50 | 4 |
| UR512 0250110 | 2.5 | 0.1 | 4 | 10 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0250112 | 2.5 | 0.1 | 4 | 12 | 50 | 4 |
| UR512 0250114 | 2.5 | 0.1 | 4 | 14 | 50 | 4 |
| UR512 0250116 | 2.5 | 0.1 | 4 | 16 | 50 | 4 |
| UR512 0250120 | 2.5 | 0.1 | 4 | 20 | 50 | 4 |
| UR512 0250126 | 2.5 | 0.1 | 4 | 26 | 60 | 4 |
| UR512 0250130 | 2.5 | 0.1 | 4 | 30 | 70 | 4 |
| UR512 0250208 | 2.5 | 0.2 | 4 | 8 | 50 | 4 |
| UR512 0250210 | 2.5 | 0.2 | 4 | 10 | 50 | 4 |
| UR512 0250212 | 2.5 | 0.2 | 4 | 12 | 50 | 4 |
| UR512 0250214 | 2.5 | 0.2 | 4 | 14 | 50 | 4 |
| UR512 0250216 | 2.5 | 0.2 | 4 | 16 | 50 | 4 |
| UR512 0250220 | 2.5 | 0.2 | 4 | 20 | 50 | 4 |
| UR512 0250226 | 2.5 | 0.2 | 4 | 26 | 60 | 4 |
| UR512 0250230 | 2.5 | 0.2 | 4 | 30 | 70 | 4 |
| UR512 0250308 | 2.5 | 0.3 | 4 | 8 | 50 | 4 |
| UR512 0250310 | 2.5 | 0.3 | 4 | 10 | 50 | 4 |
| UR512 0250312 | 2.5 | 0.3 | 4 | 12 | 50 | 4 |
| UR512 0250314 | 2.5 | 0.3 | 4 | 14 | 50 | 4 |
| UR512 0250316 | 2.5 | 0.3 | 4 | 16 | 50 | 4 |
| UR512 0250320 | 2.5 | 0.3 | 4 | 20 | 50 | 4 |
| UR512 0250326 | 2.5 | 0.3 | 4 | 26 | 60 | 4 |
| UR512 0250330 | 2.5 | 0.3 | 4 | 30 | 70 | 4 |
| UR512 0250508 | 2.5 | 0.5 | 4 | 8 | 50 | 4 |
| UR512 0250510 | 2.5 | 0.5 | 4 | 10 | 50 | 4 |
| UR512 0250512 | 2.5 | 0.5 | 4 | 12 | 50 | 4 |
| UR512 0250514 | 2.5 | 0.5 | 4 | 14 | 50 | 4 |
| UR512 0250516 | 2.5 | 0.5 | 4 | 16 | 50 | 4 |
| UR512 0250520 | 2.5 | 0.5 | 4 | 20 | 50 | 4 |
| UR512 0250526 | 2.5 | 0.5 | 4 | 26 | 60 | 4 |
| UR512 0250530 | 2.5 | 0.5 | 4 | 30 | 70 | 4 |
| UR512 0300108 | 3 | 0.1 | 4.5 | 8 | 50 | 6 |
| UR512 0300110 | 3 | 0.1 | 4.5 | 10 | 50 | 6 |
| UR512 0300112 | 3 | 0.1 | 4.5 | 12 | 50 | 6 |
| UR512 0300114 | 3 | 0.1 | 4.5 | 14 | 60 | 6 |
| UR512 0300116 | 3 | 0.1 | 4.5 | 16 | 60 | 6 |
| UR512 0300120 | 3 | 0.1 | 4.5 | 20 | 60 | 6 |
| UR512 0300126 | 3 | 0.1 | 4.5 | 26 | 65 | 6 |
| UR512 0300130 | 3 | 0.1 | 4.5 | 30 | 70 | 6 |
| UR512 0300135 | 3 | 0.1 | 4.5 | 35 | 70 | 6 |
| UR512 0300140 | 3 | 0.1 | 4.5 | 40 | 80 | 6 |
| UR512 0300208 | 3 | 0.2 | 4.5 | 8 | 50 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0300210 | 3 | 0.2 | 4.5 | 10 | 50 | 6 |
| UR512 0300212 | 3 | 0.2 | 4.5 | 12 | 50 | 6 |
| UR512 0300214 | 3 | 0.2 | 4.5 | 14 | 60 | 6 |
| UR512 0300216 | 3 | 0.2 | 4.5 | 16 | 60 | 6 |
| UR512 0300220 | 3 | 0.2 | 4.5 | 20 | 60 | 6 |
| UR512 0300226 | 3 | 0.2 | 4.5 | 26 | 65 | 6 |
| UR512 0300230 | 3 | 0.2 | 4.5 | 30 | 70 | 6 |
| UR512 0300235 | 3 | 0.2 | 4.5 | 35 | 70 | 6 |
| UR512 0300240 | 3 | 0.2 | 4.5 | 40 | 80 | 6 |
| UR512 0300308 | 3 | 0.3 | 4.5 | 8 | 50 | 6 |
| UR512 0300310 | 3 | 0.3 | 4.5 | 10 | 50 | 6 |
| UR512 0300312 | 3 | 0.3 | 4.5 | 12 | 50 | 6 |
| UR512 0300314 | 3 | 0.3 | 4.5 | 14 | 60 | 6 |
| UR512 0300316 | 3 | 0.3 | 4.5 | 16 | 60 | 6 |
| UR512 0300320 | 3 | 0.3 | 4.5 | 20 | 60 | 6 |
| UR512 0300326 | 3 | 0.3 | 4.5 | 26 | 65 | 6 |
| UR512 0300330 | 3 | 0.3 | 4.5 | 30 | 70 | 6 |
| UR512 0300335 | 3 | 0.3 | 4.5 | 35 | 70 | 6 |
| UR512 0300340 | 3 | 0.3 | 4.5 | 40 | 80 | 6 |
| UR512 0300508 | 3 | 0.5 | 4.5 | 8 | 50 | 6 |
| UR512 0300510 | 3 | 0.5 | 4.5 | 10 | 50 | 6 |
| UR512 0300512 | 3 | 0.5 | 4.5 | 12 | 50 | 6 |
| UR512 0300514 | 3 | 0.5 | 4.5 | 14 | 60 | 6 |
| UR512 0300516 | 3 | 0.5 | 4.5 | 16 | 60 | 6 |
| UR512 0300520 | 3 | 0.5 | 4.5 | 20 | 60 | 6 |
| UR512 0300526 | 3 | 0.5 | 4.5 | 26 | 65 | 6 |
| UR512 0300530 | 3 | 0.5 | 4.5 | 30 | 70 | 6 |
| UR512 0300535 | 3 | 0.5 | 4.5 | 35 | 70 | 6 |
| UR512 0300540 | 3 | 0.5 | 4.5 | 40 | 80 | 6 |
| UR512 0301008 | 3 | 1 | 4.5 | 8 | 50 | 6 |
| UR512 0301010 | 3 | 1 | 4.5 | 10 | 50 | 6 |
| UR512 0301012 | 3 | 1 | 4.5 | 12 | 50 | 6 |
| UR512 0301014 | 3 | 1 | 4.5 | 14 | 60 | 6 |
| UR512 0301016 | 3 | 1 | 4.5 | 16 | 60 | 6 |
| UR512 0301020 | 3 | 1 | 4.5 | 20 | 60 | 6 |
| UR512 0301026 | 3 | 1 | 4.5 | 26 | 65 | 6 |
| UR512 0301030 | 3 | 1 | 4.5 | 30 | 70 | 6 |
| UR512 0301035 | 3 | 1 | 4.5 | 35 | 70 | 6 |
| UR512 0301040 | 3 | 1 | 4.5 | 40 | 80 | 6 |
| UR512 0400110 | 4 | 0.1 | 6 | 10 | 50 | 6 |
| UR512 0400112 | 4 | 0.1 | 6 | 12 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0400114 | 4 | 0.1 | 6 | 14 | 60 | 6 |
| UR512 0400116 | 4 | 0.1 | 6 | 16 | 60 | 6 |
| UR512 0400120 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| UR512 0400126 | 4 | 0.1 | 6 | 26 | 65 | 6 |
| UR512 0400130 | 4 | 0.1 | 6 | 30 | 65 | 6 |
| UR512 0400135 | 4 | 0.1 | 6 | 35 | 70 | 6 |
| UR512 0400140 | 4 | 0.1 | 6 | 40 | 80 | 6 |
| UR512 0400145 | 4 | 0.1 | 6 | 45 | 90 | 6 |
| UR512 0400150 | 4 | 0.1 | 6 | 50 | 100 | 6 |
| UR512 0400210 | 4 | 0.2 | 6 | 10 | 50 | 6 |
| UR512 0400212 | 4 | 0.2 | 6 | 12 | 50 | 6 |
| UR512 0400214 | 4 | 0.2 | 6 | 14 | 60 | 6 |
| UR512 0400216 | 4 | 0.2 | 6 | 16 | 60 | 6 |
| UR512 0400220 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| UR512 0400226 | 4 | 0.2 | 6 | 26 | 65 | 6 |
| UR512 0400230 | 4 | 0.2 | 6 | 30 | 65 | 6 |
| UR512 0400235 | 4 | 0.2 | 6 | 35 | 70 | 6 |
| UR512 0400240 | 4 | 0.2 | 6 | 40 | 80 | 6 |
| UR512 0400245 | 4 | 0.2 | 6 | 45 | 90 | 6 |
| UR512 0400250 | 4 | 0.2 | 6 | 50 | 100 | 6 |
| UR512 0400310 | 4 | 0.3 | 6 | 10 | 50 | 6 |
| UR512 0400312 | 4 | 0.3 | 6 | 12 | 50 | 6 |
| UR512 0400314 | 4 | 0.3 | 6 | 14 | 60 | 6 |
| UR512 0400316 | 4 | 0.3 | 6 | 16 | 60 | 6 |
| UR512 0400320 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| UR512 0400326 | 4 | 0.3 | 6 | 26 | 65 | 6 |
| UR512 0400330 | 4 | 0.3 | 6 | 30 | 65 | 6 |
| UR512 0400335 | 4 | 0.3 | 6 | 35 | 70 | 6 |
| UR512 0400340 | 4 | 0.3 | 6 | 40 | 80 | 6 |
| UR512 0400345 | 4 | 0.3 | 6 | 45 | 90 | 6 |
| UR512 0400350 | 4 | 0.3 | 6 | 50 | 100 | 6 |
| UR512 0400510 | 4 | 0.5 | 6 | 10 | 50 | 6 |
| UR512 0400512 | 4 | 0.5 | 6 | 12 | 50 | 6 |
| UR512 0400514 | 4 | 0.5 | 6 | 14 | 60 | 6 |
| UR512 0400516 | 4 | 0.5 | 6 | 16 | 60 | 6 |
| UR512 0400520 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| UR512 0400526 | 4 | 0.5 | 6 | 26 | 65 | 6 |
| UR512 0400530 | 4 | 0.5 | 6 | 30 | 65 | 6 |
| UR512 0400535 | 4 | 0.5 | 6 | 35 | 70 | 6 |
| UR512 0400540 | 4 | 0.5 | 6 | 40 | 80 | 6 |
| UR512 0400545 | 4 | 0.5 | 6 | 45 | 90 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR512 | 2 FLUTES NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 0400550 | 4 | 0.5 | 6 | 50 | 100 | 6 |
| UR512 0401010 | 4 | 1 | 6 | 10 | 50 | 6 |
| UR512 0401012 | 4 | 1 | 6 | 12 | 50 | 6 |
| UR512 0401014 | 4 | 1 | 6 | 14 | 60 | 6 |
| UR512 0401016 | 4 | 1 | 6 | 16 | 60 | 6 |
| UR512 0401020 | 4 | 1 | 6 | 20 | 60 | 6 |
| UR512 0401026 | 4 | 1 | 6 | 26 | 65 | 6 |
| UR512 0401030 | 4 | 1 | 6 | 30 | 65 | 6 |
| UR512 0401035 | 4 | 1 | 6 | 35 | 70 | 6 |
| UR512 0401040 | 4 | 1 | 6 | 40 | 80 | 6 |
| UR512 0401045 | 4 | 1 | 6 | 45 | 90 | 6 |
| UR512 0401050 | 4 | 1 | 6 | 50 | 100 | 6 |
| UR512 05001 | 5 | 0.1 | 8 | 15 | 60 | 6 |
| UR512 05002 | 5 | 0.2 | 8 | 15 | 60 | 6 |
| UR512 05003 | 5 | 0.3 | 8 | 15 | 60 | 6 |
| UR512 05005 | 5 | 0.5 | 8 | 15 | 60 | 6 |
| UR512 05010 | 5 | 1 | 8 | 15 | 60 | 6 |
| UR512 05015 | 5 | 1.5 | 8 | 15 | 60 | 6 |
| UR512 05020 | 5 | 2 | 8 | 15 | 60 | 6 |
| UR512 06001 | 6 | 0.1 | 9 | 20 | 60 | 6 |
| UR512 06002 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| UR512 06003 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| UR512 0600390 | 6 | 0.3 | 15 | 30 | 90 | 6 |
| UR512 06005 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| UR512 0600590 | 6 | 0.5 | 15 | 30 | 90 | 6 |
| UR512 06010 | 6 | 1 | 9 | 20 | 60 | 6 |
| UR512 0601090 | 6 | 1 | 15 | 30 | 90 | 6 |
| UR512 06015 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| UR512 06020 | 6 | 2 | 9 | 20 | 60 | 6 |
| UR512 08001 | 8 | 0.1 | 12 | 25 | 70 | 8 |
| UR512 08002 | 8 | 0.2 | 12 | 25 | 70 | 8 |
| UR512 08003 | 8 | 0.3 | 12 | 25 | 70 | 8 |
| UR512 08003100 | 8 | 0.3 | 20 | 35 | 100 | 8 |

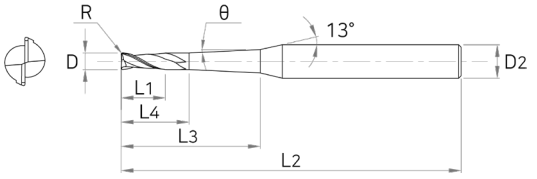
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UR512 08005 | 8 | 0.5 | 12 | 25 | 70 | 8 |
| UR512 08005100 | 8 | 0.5 | 20 | 35 | 100 | 8 |
| UR512 08010 | 8 | 1 | 12 | 25 | 70 | 8 |
| UR512 08010100 | 8 | 1 | 20 | 35 | 100 | 8 |
| UR512 08015 | 8 | 1.5 | 12 | 25 | 70 | 8 |
| UR512 08020 | 8 | 2 | 12 | 25 | 70 | 8 |
| UR512 10001 | 10 | 0.1 | 15 | 30 | 75 | 10 |
| UR512 10002 | 10 | 0.2 | 15 | 30 | 75 | 10 |
| UR512 10003 | 10 | 0.3 | 15 | 30 | 75 | 10 |
| UR512 10003100 | 10 | 0.3 | 25 | 40 | 100 | 10 |
| UR512 10005 | 10 | 0.5 | 15 | 30 | 75 | 10 |
| UR512 10005100 | 10 | 0.5 | 25 | 40 | 100 | 10 |
| UR512 10010 | 10 | 1 | 15 | 30 | 75 | 10 |
| UR512 10010100 | 10 | 1 | 25 | 40 | 100 | 10 |
| UR512 10015 | 10 | 1.5 | 15 | 30 | 75 | 10 |
| UR512 10020 | 10 | 2 | 15 | 30 | 75 | 10 |
| UR512 12002 | 12 | 0.2 | 18 | 32 | 80 | 12 |
| UR512 12003 | 12 | 0.3 | 18 | 32 | 80 | 12 |
| UR512 12003110 | 12 | 0.3 | 30 | 45 | 110 | 12 |
| UR512 12005 | 12 | 0.5 | 18 | 32 | 80 | 12 |
| UR512 12005110 | 12 | 0.5 | 30 | 45 | 110 | 12 |
| UR512 12010 | 12 | 1 | 18 | 32 | 80 | 12 |
| UR512 12010110 | 12 | 1 | 30 | 45 | 110 | 12 |
| UR512 12015 | 12 | 1.5 | 18 | 32 | 80 | 12 |
| UR512 12020 | 12 | 2 | 18 | 32 | 80 | 12 |
| UR512 16005 | 16 | 0.5 | 20 | 35 | 100 | 16 |
| UR512 16005150 | 16 | 0.5 | 35 | 50 | 150 | 16 |
| UR512 16010 | 16 | 1 | 20 | 35 | 100 | 16 |
| UR512 16010150 | 16 | 1 | 35 | 50 | 150 | 16 |
| UR512 20005 | 20 | 0.5 | 25 | 40 | 100 | 20 |
| UR512 20005150 | 20 | 0.5 | 40 | 55 | 150 | 20 |
| UR512 20010 | 20 | 1 | 25 | 40 | 100 | 20 |
| UR512 20010150 | 20 | 1 | 40 | 55 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.652

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 0020050101 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 1 | 40 | 4 |
| UR542 0020050102 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 2 | 40 | 4 |
| UR542 0020050103 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 3 | 40 | 4 |
| UR542 0020050201 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 1 | 40 | 4 |
| UR542 0020050202 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 2 | 40 | 4 |
| UR542 0020050203 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 3 | 40 | 4 |
| UR542 0030050102 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 2 | 40 | 4 |
| UR542 0030050103 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 3 | 40 | 4 |
| UR542 0030050104 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 4 | 40 | 4 |
| UR542 0030050105 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 5 | 40 | 4 |
| UR542 0030050202 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 2 | 40 | 4 |
| UR542 0030050203 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 3 | 40 | 4 |
| UR542 0030050204 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 4 | 40 | 4 |
| UR542 0030050205 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 5 | 40 | 4 |
| UR542 0040050102 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 0040050103 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 0040050104 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 0040050105 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 0040050106 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 0040050202 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 0040050203 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 0040050204 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 0040050205 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 0040050206 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 6 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 004010102 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010103 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 004010104 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 004010105 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 004010106 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 004010202 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010203 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 0040050204 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 0040050205 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 0040050206 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 004010102 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010103 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 004010104 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 004010105 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 004010106 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 004010202 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010203 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 004010204 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 004010205 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 004010206 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 0050050104 | 0.5 | 0.05 | 1 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 0050050106 | 0.5 | 0.05 | 1 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 0050050108 | 0.5 | 0.05 | 1 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 0050050110 | 0.5 | 0.05 | 1 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 0050050204 | 0.5 | 0.05 | 2 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 0050050206 | 0.5 | 0.05 | 2 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 0050050208 | 0.5 | 0.05 | 2 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 0050050210 | 0.5 | 0.05 | 2 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 005010104 | 0.5 | 0.1 | 1 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 005010106 | 0.5 | 0.1 | 1 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 005010108 | 0.5 | 0.1 | 1 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 005010110 | 0.5 | 0.1 | 1 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 005010204 | 0.5 | 0.1 | 2 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 005010206 | 0.5 | 0.1 | 2 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 005010208 | 0.5 | 0.1 | 2 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 005010210 | 0.5 | 0.1 | 2 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 006010104 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 4 | 50 | 4 |
| UR542 006010106 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 0020050101 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 1 | 40 | 4 |
| UR542 0020050102 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 2 | 40 | 4 |
| UR542 0020050103 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 3 | 40 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 006010106 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 0020050101 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 1 | 40 | 4 |
| UR542 0020050102 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 2 | 40 | 4 |
| UR542 0020050103 | 0.2 | 0.05 | 1 | 0.3 | 0.4 | 3 | 40 | 4 |
| UR542 0020050201 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 1 | 40 | 4 |
| UR542 0020050202 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 2 | 40 | 4 |
| UR542 0020050203 | 0.2 | 0.05 | 2 | 0.3 | 0.4 | 3 | 40 | 4 |
| UR542 0030050102 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 2 | 40 | 4 |
| UR542 0030050103 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 3 | 40 | 4 |
| UR542 0030050104 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 4 | 40 | 4 |
| UR542 0030050105 | 0.3 | 0.05 | 1 | 0.5 | 0.6 | 5 | 40 | 4 |
| UR542 0030050202 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 2 | 40 | 4 |
| UR542 0030050203 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 3 | 40 | 4 |
| UR542 0030050204 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 4 | 40 | 4 |
| UR542 0030050205 | 0.3 | 0.05 | 2 | 0.5 | 0.6 | 5 | 40 | 4 |
| UR542 0040050102 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 0040050103 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 0040050104 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 0040050105 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 0040050106 | 0.4 | 0.05 | 1 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 0040050202 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 0040050203 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 0040050204 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 0040050205 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 0040050206 | 0.4 | 0.05 | 2 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 004010102 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010103 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 004010104 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 004010105 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 004010106 | 0.4 | 0.1 | 1 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 004010202 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 2 | 50 | 4 |
| UR542 004010203 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 3 | 50 | 4 |
| UR542 004010204 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 4 | 50 | 4 |
| UR542 004010205 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 5 | 50 | 4 |
| UR542 004010206 | 0.4 | 0.1 | 2 | 0.6 | 0.8 | 6 | 50 | 4 |
| UR542 0050050104 | 0.5 | 0.05 | 1 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 0050050106 | 0.5 | 0.05 | 1 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 0050050108 | 0.5 | 0.05 | 1 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 0050050110 | 0.5 | 0.05 | 1 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 0050050204 | 0.5 | 0.05 | 2 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 0050050206 | 0.5 | 0.05 | 2 | 0.7 | 1 | 6 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 0050050208 | 0.5 | 0.05 | 2 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 0050050210 | 0.5 | 0.05 | 2 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 005010104 | 0.5 | 0.1 | 1 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 005010106 | 0.5 | 0.1 | 1 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 005010108 | 0.5 | 0.1 | 1 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 005010110 | 0.5 | 0.1 | 1 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 005010204 | 0.5 | 0.1 | 2 | 0.7 | 1 | 4 | 50 | 4 |
| UR542 005010206 | 0.5 | 0.1 | 2 | 0.7 | 1 | 6 | 50 | 4 |
| UR542 005010208 | 0.5 | 0.1 | 2 | 0.7 | 1 | 8 | 50 | 4 |
| UR542 005010210 | 0.5 | 0.1 | 2 | 0.7 | 1 | 10 | 50 | 4 |
| UR542 006010104 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 4 | 50 | 4 |
| UR542 006010106 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 006010108 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 8 | 50 | 4 |
| UR542 006010110 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 10 | 50 | 4 |
| UR542 006010112 | 0.6 | 0.1 | 1 | 0.9 | 1.2 | 12 | 50 | 4 |
| UR542 006010204 | 0.6 | 0.1 | 2 | 0.9 | 1.2 | 4 | 50 | 4 |
| UR542 006010206 | 0.6 | 0.1 | 2 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 006010208 | 0.6 | 0.1 | 2 | 0.9 | 1.2 | 8 | 50 | 4 |
| UR542 006010210 | 0.6 | 0.1 | 2 | 0.9 | 1.2 | 10 | 50 | 4 |
| UR542 006010212 | 0.6 | 0.1 | 2 | 0.9 | 1.2 | 12 | 50 | 4 |
| UR542 006020104 | 0.6 | 0.2 | 1 | 0.9 | 1.2 | 4 | 50 | 4 |
| UR542 006020106 | 0.6 | 0.2 | 1 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 006020108 | 0.6 | 0.2 | 1 | 0.9 | 1.2 | 8 | 50 | 4 |
| UR542 006020110 | 0.6 | 0.2 | 1 | 0.9 | 1.2 | 10 | 50 | 4 |
| UR542 006020112 | 0.6 | 0.2 | 1 | 0.9 | 1.2 | 12 | 50 | 4 |
| UR542 006020204 | 0.6 | 0.2 | 2 | 0.9 | 1.2 | 4 | 50 | 4 |
| UR542 006020206 | 0.6 | 0.2 | 2 | 0.9 | 1.2 | 6 | 50 | 4 |
| UR542 006020208 | 0.6 | 0.2 | 2 | 0.9 | 1.2 | 8 | 50 | 4 |
| UR542 006020210 | 0.6 | 0.2 | 2 | 0.9 | 1.2 | 10 | 50 | 4 |
| UR542 006020212 | 0.6 | 0.2 | 2 | 0.9 | 1.2 | 12 | 50 | 4 |
| UR542 008010104 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 4 | 50 | 4 |
| UR542 008010106 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 6 | 50 | 4 |
| UR542 008010108 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 8 | 50 | 4 |
| UR542 008010110 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 10 | 50 | 4 |
| UR542 008010112 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 12 | 50 | 4 |
| UR542 008010116 | 0.8 | 0.1 | 1 | 1.2 | 1.6 | 16 | 50 | 4 |
| UR542 008010204 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 4 | 50 | 4 |
| UR542 008010206 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 6 | 50 | 4 |
| UR542 008010208 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 8 | 50 | 4 |
| UR542 008010210 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 10 | 50 | 4 |
| UR542 008010212 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 12 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 008010216 | 0.8 | 0.1 | 2 | 1.2 | 1.6 | 16 | 50 | 4 |
| UR542 008020104 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 4 | 50 | 4 |
| UR542 008020106 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 6 | 50 | 4 |
| UR542 008020108 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 8 | 50 | 4 |
| UR542 008020110 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 10 | 50 | 4 |
| UR542 008020112 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 12 | 50 | 4 |
| UR542 008020116 | 0.8 | 0.2 | 1 | 1.2 | 1.6 | 16 | 50 | 4 |
| UR542 008020204 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 4 | 50 | 4 |
| UR542 008020206 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 6 | 50 | 4 |
| UR542 008020208 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 8 | 50 | 4 |
| UR542 008020210 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 10 | 50 | 4 |
| UR542 008020212 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 12 | 50 | 4 |
| UR542 008020216 | 0.8 | 0.2 | 2 | 1.2 | 1.6 | 16 | 50 | 4 |
| UR542 010010106 | 1 | 0.1 | 1 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR542 010010108 | 1 | 0.1 | 1 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR542 010010110 | 1 | 0.1 | 1 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR542 010010112 | 1 | 0.1 | 1 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR542 010010116 | 1 | 0.1 | 1 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR542 010010120 | 1 | 0.1 | 1 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR542 010010125 | 1 | 0.1 | 1 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR542 010010130 | 1 | 0.1 | 1 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR542 010010140 | 1 | 0.1 | 1 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR542 010010150 | 1 | 0.1 | 1 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR542 010010206 | 1 | 0.1 | 2 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR542 010010208 | 1 | 0.1 | 2 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR542 010010210 | 1 | 0.1 | 2 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR542 010010212 | 1 | 0.1 | 2 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR542 010010216 | 1 | 0.1 | 2 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR542 010010220 | 1 | 0.1 | 2 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR542 010010225 | 1 | 0.1 | 2 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR542 010010230 | 1 | 0.1 | 2 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR542 010010240 | 1 | 0.1 | 2 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR542 010010250 | 1 | 0.1 | 2 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR542 010020106 | 1 | 0.2 | 1 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR542 010020108 | 1 | 0.2 | 1 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR542 010020110 | 1 | 0.2 | 1 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR542 010020112 | 1 | 0.2 | 1 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR542 010020116 | 1 | 0.2 | 1 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR542 010020120 | 1 | 0.2 | 1 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR542 010020125 | 1 | 0.2 | 1 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR542 010020130 | 1 | 0.2 | 1 | 1.5 | 2.5 | 30 | 70 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 010020140 | 1 | 0.2 | 1 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR542 010020150 | 1 | 0.2 | 1 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR542 010020206 | 1 | 0.2 | 2 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR542 010020208 | 1 | 0.2 | 2 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR542 010020210 | 1 | 0.2 | 2 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR542 010020212 | 1 | 0.2 | 2 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR542 010020216 | 1 | 0.2 | 2 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR542 010020220 | 1 | 0.2 | 2 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR542 010020225 | 1 | 0.2 | 2 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR542 010020230 | 1 | 0.2 | 2 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR542 010020240 | 1 | 0.2 | 2 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR542 010020250 | 1 | 0.2 | 2 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR542 012010108 | 1.2 | 0.1 | 1 | 1.8 | 3 | 8 | 50 | 4 |
| UR542 012010112 | 1.2 | 0.1 | 1 | 1.8 | 3 | 12 | 50 | 4 |
| UR542 012010116 | 1.2 | 0.1 | 1 | 1.8 | 3 | 16 | 50 | 4 |
| UR542 012010120 | 1.2 | 0.1 | 1 | 1.8 | 3 | 20 | 50 | 4 |
| UR542 012010125 | 1.2 | 0.1 | 1 | 1.8 | 3 | 25 | 60 | 4 |
| UR542 012010130 | 1.2 | 0.1 | 1 | 1.8 | 3 | 30 | 70 | 4 |
| UR542 012010208 | 1.2 | 0.1 | 2 | 1.8 | 3 | 8 | 50 | 4 |
| UR542 012010212 | 1.2 | 0.1 | 2 | 1.8 | 3 | 12 | 50 | 4 |
| UR542 012010216 | 1.2 | 0.1 | 2 | 1.8 | 3 | 16 | 50 | 4 |
| UR542 012010220 | 1.2 | 0.1 | 2 | 1.8 | 3 | 20 | 50 | 4 |
| UR542 012010225 | 1.2 | 0.1 | 2 | 1.8 | 3 | 25 | 60 | 4 |
| UR542 012010230 | 1.2 | 0.1 | 2 | 1.8 | 3 | 30 | 70 | 4 |
| UR542 012020108 | 1.2 | 0.2 | 1 | 1.8 | 3 | 8 | 50 | 4 |
| UR542 012020112 | 1.2 | 0.2 | 1 | 1.8 | 3 | 12 | 50 | 4 |
| UR542 012020116 | 1.2 | 0.2 | 1 | 1.8 | 3 | 16 | 50 | 4 |
| UR542 012020120 | 1.2 | 0.2 | 1 | 1.8 | 3 | 20 | 50 | 4 |
| UR542 012020125 | 1.2 | 0.2 | 1 | 1.8 | 3 | 25 | 60 | 4 |
| UR542 012020130 | 1.2 | 0.2 | 1 | 1.8 | 3 | 30 | 70 | 4 |
| UR542 012020208 | 1.2 | 0.2 | 2 | 1.8 | 3 | 8 | 50 | 4 |
| UR542 012020212 | 1.2 | 0.2 | 2 | 1.8 | 3 | 12 | 50 | 4 |
| UR542 012020216 | 1.2 | 0.2 | 2 | 1.8 | 3 | 16 | 50 | 4 |
| UR542 012020220 | 1.2 | 0.2 | 2 | 1.8 | 3 | 20 | 50 | 4 |
| UR542 012020225 | 1.2 | 0.2 | 2 | 1.8 | 3 | 25 | 60 | 4 |
| UR542 012020230 | 1.2 | 0.2 | 2 | 1.8 | 3 | 30 | 70 | 4 |
| UR542 015010108 | 1.5 | 0.1 | 1 | 2.3 | 3 | 8 | 50 | 4 |
| UR542 015010110 | 1.5 | 0.1 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015010112 | 1.5 | 0.1 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015010116 | 1.5 | 0.1 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015010120 | 1.5 | 0.1 | 1 | 2.3 | 3 | 20 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 015010125 | 1.5 | 0.1 | 1 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015010130 | 1.5 | 0.1 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015010140 | 1.5 | 0.1 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR542 015010150 | 1.5 | 0.1 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR542 015010208 | 1.5 | 0.1 | 2 | 2.3 | 3 | 8 | 50 | 4 |
| UR542 015010210 | 1.5 | 0.1 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015010212 | 1.5 | 0.1 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015010216 | 1.5 | 0.1 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015010220 | 1.5 | 0.1 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR542 015010225 | 1.5 | 0.1 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015010230 | 1.5 | 0.1 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015010240 | 1.5 | 0.1 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR542 015010250 | 1.5 | 0.1 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR542 015020108 | 1.5 | 0.2 | 1 | 2.3 | 3 | 8 | 50 | 4 |
| UR542 015020110 | 1.5 | 0.2 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015020112 | 1.5 | 0.2 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015020116 | 1.5 | 0.2 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015020120 | 1.5 | 0.2 | 1 | 2.3 | 3 | 20 | 50 | 4 |
| UR542 015020125 | 1.5 | 0.2 | 1 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015020130 | 1.5 | 0.2 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015020140 | 1.5 | 0.2 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR542 015020150 | 1.5 | 0.2 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR542 015020208 | 1.5 | 0.2 | 2 | 2.3 | 3 | 8 | 50 | 4 |
| UR542 015020210 | 1.5 | 0.2 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015020212 | 1.5 | 0.2 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015020216 | 1.5 | 0.2 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015020220 | 1.5 | 0.2 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR542 015020225 | 1.5 | 0.2 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015020230 | 1.5 | 0.2 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015020240 | 1.5 | 0.2 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR542 015020250 | 1.5 | 0.2 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR542 015030108 | 1.5 | 0.3 | 1 | 2.3 | 3 | 8 | 50 | 4 |
| UR542 015030110 | 1.5 | 0.3 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015030112 | 1.5 | 0.3 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015030116 | 1.5 | 0.3 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015030120 | 1.5 | 0.3 | 1 | 2.3 | 3 | 20 | 50 | 4 |
| UR542 015030125 | 1.5 | 0.3 | 1 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015030130 | 1.5 | 0.3 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015030140 | 1.5 | 0.3 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR542 015030150 | 1.5 | 0.3 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR542 015030208 | 1.5 | 0.3 | 2 | 2.3 | 3 | 8 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 015030210 | 1.5 | 0.3 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR542 015030212 | 1.5 | 0.3 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR542 015030216 | 1.5 | 0.3 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR542 015030220 | 1.5 | 0.3 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR542 015030225 | 1.5 | 0.3 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR542 015030230 | 1.5 | 0.3 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR542 015030240 | 1.5 | 0.3 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR542 015030250 | 1.5 | 0.3 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR542 020010110 | 2 | 0.1 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR542 020010112 | 2 | 0.1 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR542 020010116 | 2 | 0.1 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR542 020010120 | 2 | 0.1 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR542 020010125 | 2 | 0.1 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR542 020010130 | 2 | 0.1 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR542 020010140 | 2 | 0.1 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR542 020010150 | 2 | 0.1 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR542 020010160 | 2 | 0.1 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR542 020010180 | 2 | 0.1 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR542 020010210 | 2 | 0.1 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR542 020010212 | 2 | 0.1 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR542 020010216 | 2 | 0.1 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR542 020010220 | 2 | 0.1 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR542 020010225 | 2 | 0.1 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR542 020010230 | 2 | 0.1 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR542 020010240 | 2 | 0.1 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR542 020010250 | 2 | 0.1 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR542 020010260 | 2 | 0.1 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR542 020010280 | 2 | 0.1 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR542 020020110 | 2 | 0.2 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR542 020020112 | 2 | 0.2 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR542 020020116 | 2 | 0.2 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR542 020020120 | 2 | 0.2 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR542 020020125 | 2 | 0.2 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR542 020020130 | 2 | 0.2 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR542 020020140 | 2 | 0.2 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR542 020020150 | 2 | 0.2 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR542 020020160 | 2 | 0.2 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR542 020020180 | 2 | 0.2 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR542 020020210 | 2 | 0.2 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR542 020020212 | 2 | 0.2 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR542 020020216 | 2 | 0.2 | 2 | 2 | 5 | 16 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 020020220 | 2 | 0.2 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR542 020020225 | 2 | 0.2 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR542 020020230 | 2 | 0.2 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR542 020020240 | 2 | 0.2 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR542 020020250 | 2 | 0.2 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR542 020020260 | 2 | 0.2 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR542 020020280 | 2 | 0.2 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR542 020030110 | 2 | 0.3 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR542 020030112 | 2 | 0.3 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR542 020030116 | 2 | 0.3 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR542 020030120 | 2 | 0.3 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR542 020030125 | 2 | 0.3 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR542 020030130 | 2 | 0.3 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR542 020030140 | 2 | 0.3 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR542 020030150 | 2 | 0.3 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR542 020030160 | 2 | 0.3 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR542 020030180 | 2 | 0.3 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR542 020030210 | 2 | 0.3 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR542 020030212 | 2 | 0.3 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR542 020030216 | 2 | 0.3 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR542 020030220 | 2 | 0.3 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR542 020030225 | 2 | 0.3 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR542 020030230 | 2 | 0.3 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR542 020030240 | 2 | 0.3 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR542 020030250 | 2 | 0.3 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR542 020030260 | 2 | 0.3 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR542 020030280 | 2 | 0.3 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR542 020050110 | 2 | 0.5 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR542 020050112 | 2 | 0.5 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR542 020050116 | 2 | 0.5 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR542 020050120 | 2 | 0.5 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR542 020050125 | 2 | 0.5 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR542 020050130 | 2 | 0.5 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR542 020050140 | 2 | 0.5 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR542 020050150 | 2 | 0.5 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR542 020050160 | 2 | 0.5 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR542 020050180 | 2 | 0.5 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR542 020050210 | 2 | 0.5 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR542 020050212 | 2 | 0.5 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR542 020050216 | 2 | 0.5 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR542 020050220 | 2 | 0.5 | 2 | 2 | 5 | 20 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 020050225 | 2 | 0.5 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR542 020050230 | 2 | 0.5 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR542 020050240 | 2 | 0.5 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR542 020050250 | 2 | 0.5 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR542 020050260 | 2 | 0.5 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR542 020050280 | 2 | 0.5 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR542 030020116 | 3 | 0.2 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030020120 | 3 | 0.2 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030020130 | 3 | 0.2 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR542 030020140 | 3 | 0.2 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030020150 | 3 | 0.2 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UR542 030020160 | 3 | 0.2 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR542 030020216 | 3 | 0.2 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030020220 | 3 | 0.2 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030020230 | 3 | 0.2 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UR542 030020240 | 3 | 0.2 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030020250 | 3 | 0.2 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR542 030020260 | 3 | 0.2 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR542 030020270 | 3 | 0.2 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR542 030030116 | 3 | 0.3 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030030120 | 3 | 0.3 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030030130 | 3 | 0.3 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR542 030030140 | 3 | 0.3 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030030150 | 3 | 0.3 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UR542 030030160 | 3 | 0.3 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR542 030030216 | 3 | 0.3 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030030220 | 3 | 0.3 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030030230 | 3 | 0.3 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UR542 030030240 | 3 | 0.3 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030030250 | 3 | 0.3 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR542 030030260 | 3 | 0.3 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR542 030030270 | 3 | 0.3 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR542 030050116 | 3 | 0.5 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030050120 | 3 | 0.5 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030050130 | 3 | 0.5 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR542 030050140 | 3 | 0.5 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030050150 | 3 | 0.5 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UR542 030050160 | 3 | 0.5 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR542 030050216 | 3 | 0.5 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR542 030050220 | 3 | 0.5 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR542 030050230 | 3 | 0.5 | 2 | 4.5 | 6 | 30 | 70 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR542 | 2 FLUTES TAPERED NECK RADIUS ENDMILL



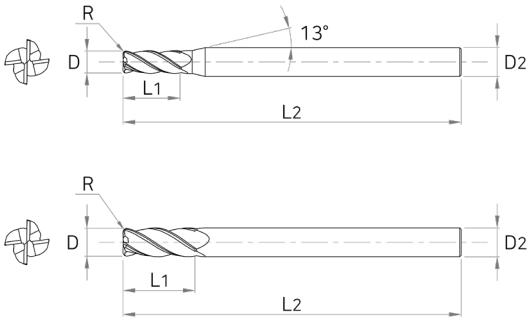
| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR542 030050240 | 3 | 0.5 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030050250 | 3 | 0.5 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR542 030050260 | 3 | 0.5 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR542 030050270 | 3 | 0.5 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR542 040020140 | 4 | 0.2 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR542 040020150 | 4 | 0.2 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR542 040020160 | 4 | 0.2 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR542 040020170 | 4 | 0.2 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR542 030050240 | 3 | 0.5 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR542 030050250 | 3 | 0.5 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR542 030050260 | 3 | 0.5 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR542 030050270 | 3 | 0.5 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR542 040020140 | 4 | 0.2 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR542 040020150 | 4 | 0.2 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR542 040020160 | 4 | 0.2 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR542 040020170 | 4 | 0.2 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR542 040020240 | 4 | 0.2 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR542 040020250 | 4 | 0.2 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR542 040020260 | 4 | 0.2 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR542 040020270 | 4 | 0.2 | 2 | 6 | 8 | 70 | 120 | 10 |
| UR542 040030140 | 4 | 0.3 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR542 040030150 | 4 | 0.3 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR542 040030160 | 4 | 0.3 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR542 040030170 | 4 | 0.3 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR542 040030240 | 4 | 0.3 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR542 040030250 | 4 | 0.3 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR542 040030260 | 4 | 0.3 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR542 040030270 | 4 | 0.3 | 2 | 6 | 8 | 70 | 120 | 10 |
| UR542 040050140 | 4 | 0.5 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR542 040050150 | 4 | 0.5 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR542 040050160 | 4 | 0.5 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR542 040050170 | 4 | 0.5 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR542 040050240 | 4 | 0.5 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR542 040050250 | 4 | 0.5 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR542 040050260 | 4 | 0.5 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR542 040050270 | 4 | 0.5 | 2 | 6 | 8 | 70 | 120 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR504 | 4 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 40° HELIX | R ±0.01 | DATA P.651

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR504 03002 | 3 | 0.2 | 8 | 60 | 6 |
| UR504 03002S4 | 3 | 0.2 | 8 | 60 | 4 |
| UR504 03003 | 3 | 0.3 | 8 | 60 | 6 |
| UR504 03005 | 3 | 0.5 | 8 | 60 | 6 |
| UR504 03005S4 | 3 | 0.5 | 8 | 60 | 4 |
| UR504 04002 | 4 | 0.2 | 10 | 70 | 6 |
| UR504 04002S4 | 4 | 0.2 | 10 | 70 | 4 |
| UR504 04003 | 4 | 0.3 | 10 | 70 | 6 |
| UR504 04005 | 4 | 0.5 | 10 | 70 | 6 |
| UR504 04005S4 | 4 | 0.5 | 10 | 70 | 4 |
| UR504 04010 | 4 | 1 | 10 | 70 | 6 |
| UR504 04010S4 | 4 | 1 | 10 | 70 | 4 |
| UR504 05002 | 5 | 0.2 | 13 | 90 | 6 |
| UR504 05003 | 5 | 0.3 | 13 | 90 | 6 |
| UR504 05003060 | 5 | 0.3 | 13 | 60 | 6 |
| UR504 05005 | 5 | 0.5 | 13 | 90 | 6 |
| UR504 05005060 | 5 | 0.5 | 13 | 60 | 6 |
| UR504 05010 | 5 | 1 | 13 | 90 | 6 |
| UR504 06002 | 6 | 0.2 | 13 | 90 | 6 |
| UR504 06003 | 6 | 0.3 | 15 | 90 | 6 |
| UR504 06003060 | 6 | 0.3 | 15 | 60 | 6 |
| UR504 06005 | 6 | 0.5 | 15 | 90 | 6 |
| UR504 06005060 | 6 | 0.5 | 15 | 60 | 6 |
| UR504 06010 | 6 | 1 | 15 | 90 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR504 06010060 | 6 | 1 | 15 | 60 | 6 |
| UR504 08003 | 8 | 0.3 | 20 | 100 | 8 |
| UR504 08003070 | 8 | 0.3 | 20 | 70 | 8 |
| UR504 08005 | 8 | 0.5 | 20 | 100 | 8 |
| UR504 08005070 | 8 | 0.5 | 20 | 70 | 8 |
| UR504 08010 | 8 | 1 | 20 | 100 | 8 |
| UR504 08010070 | 8 | 1 | 20 | 70 | 8 |
| UR504 08015 | 8 | 1.5 | 20 | 100 | 8 |
| UR504 08020 | 8 | 2 | 20 | 100 | 8 |
| UR504 10003 | 10 | 0.3 | 25 | 100 | 10 |
| UR504 10003075 | 10 | 0.3 | 25 | 75 | 10 |
| UR504 10005 | 10 | 0.5 | 25 | 100 | 10 |
| UR504 10005075 | 10 | 0.5 | 25 | 75 | 10 |
| UR504 10010 | 10 | 1 | 25 | 100 | 10 |
| UR504 10010075 | 10 | 1 | 25 | 75 | 10 |
| UR504 10015 | 10 | 1.5 | 25 | 100 | 10 |
| UR504 10020 | 10 | 2 | 25 | 100 | 10 |
| UR504 10025 | 10 | 2.5 | 25 | 100 | 10 |
| UR504 12003 | 12 | 0.3 | 30 | 110 | 12 |
| UR504 12003080 | 12 | 0.3 | 30 | 80 | 12 |
| UR504 12005 | 12 | 0.5 | 30 | 110 | 12 |
| UR504 12005080 | 12 | 0.5 | 30 | 80 | 12 |
| UR504 12010 | 12 | 1 | 30 | 110 | 12 |
| UR504 12010080 | 12 | 1 | 30 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR504 | 4 FLUTES RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR504 12015 | 12 | 1.5 | 30 | 110 | 12 |
| UR504 12020 | 12 | 2 | 30 | 110 | 12 |
| UR504 12025 | 12 | 2.5 | 30 | 110 | 12 |
| UR504 12030 | 12 | 3 | 30 | 110 | 12 |
| UR504 16005 | 16 | 0.5 | 32 | 150 | 16 |
| UR504 16005100 | 16 | 0.5 | 32 | 100 | 16 |
| UR504 16010 | 16 | 1 | 32 | 150 | 16 |
| UR504 16010100 | 16 | 1 | 32 | 100 | 16 |
| UR504 16015 | 16 | 1.5 | 32 | 150 | 16 |
| UR504 16015100 | 16 | 1.5 | 32 | 100 | 16 |
| UR504 16020 | 16 | 2 | 32 | 150 | 16 |

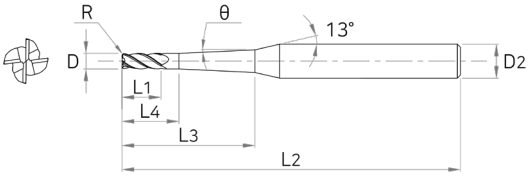
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR504 16020 | 16 | 2 | 32 | 150 | 16 |
| UR504 16020100 | 16 | 2 | 32 | 100 | 16 |
| UR504 20005 | 20 | 0.5 | 38 | 150 | 20 |
| UR504 20005100 | 20 | 0.5 | 38 | 100 | 20 |
| UR504 20010 | 20 | 1 | 38 | 150 | 20 |
| UR504 20010100 | 20 | 1 | 38 | 100 | 20 |
| UR504 20015 | 20 | 1.5 | 38 | 150 | 20 |
| UR504 20015100 | 20 | 1.5 | 38 | 100 | 20 |
| UR504 20020 | 20 | 2 | 38 | 150 | 20 |
| UR504 20020100 | 20 | 2 | 38 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 4 | 0 ~ -0.012 | h5 |

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.01 | DATA P.653

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 010010106 | 1 | 0.1 | 1 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR544 010010108 | 1 | 0.1 | 1 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR544 010010110 | 1 | 0.1 | 1 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR544 010010112 | 1 | 0.1 | 1 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR544 010010116 | 1 | 0.1 | 1 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR544 010010120 | 1 | 0.1 | 1 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR544 010010125 | 1 | 0.1 | 1 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR544 010010130 | 1 | 0.1 | 1 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR544 010010140 | 1 | 0.1 | 1 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR544 010010150 | 1 | 0.1 | 1 | 1.5 | 2.5 | 50 | 90 | 4 |
| UR544 010010206 | 1 | 0.1 | 2 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR544 010010208 | 1 | 0.1 | 2 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR544 010010210 | 1 | 0.1 | 2 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR544 010010212 | 1 | 0.1 | 2 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR544 010010216 | 1 | 0.1 | 2 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR544 010010220 | 1 | 0.1 | 2 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR544 010010225 | 1 | 0.1 | 2 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR544 010010230 | 1 | 0.1 | 2 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR544 010010240 | 1 | 0.1 | 2 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR544 010010250 | 1 | 0.1 | 2 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR544 010020106 | 1 | 0.2 | 1 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR544 010020108 | 1 | 0.2 | 1 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR544 010020110 | 1 | 0.2 | 1 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR544 010020112 | 1 | 0.2 | 1 | 1.5 | 2.5 | 12 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 010020116 | 1 | 0.2 | 1 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR544 010020120 | 1 | 0.2 | 1 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR544 010020125 | 1 | 0.2 | 1 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR544 010020130 | 1 | 0.2 | 1 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR544 010020140 | 1 | 0.2 | 1 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR544 010020150 | 1 | 0.2 | 1 | 1.5 | 2.5 | 50 | 90 | 4 |
| UR544 010020206 | 1 | 0.2 | 2 | 1.5 | 2.5 | 6 | 50 | 4 |
| UR544 010020208 | 1 | 0.2 | 2 | 1.5 | 2.5 | 8 | 50 | 4 |
| UR544 010020210 | 1 | 0.2 | 2 | 1.5 | 2.5 | 10 | 50 | 4 |
| UR544 010020212 | 1 | 0.2 | 2 | 1.5 | 2.5 | 12 | 50 | 4 |
| UR544 010020216 | 1 | 0.2 | 2 | 1.5 | 2.5 | 16 | 50 | 4 |
| UR544 010020220 | 1 | 0.2 | 2 | 1.5 | 2.5 | 20 | 50 | 4 |
| UR544 010020225 | 1 | 0.2 | 2 | 1.5 | 2.5 | 25 | 60 | 4 |
| UR544 010020230 | 1 | 0.2 | 2 | 1.5 | 2.5 | 30 | 70 | 4 |
| UR544 010020240 | 1 | 0.2 | 2 | 1.5 | 2.5 | 40 | 80 | 4 |
| UR544 010020250 | 1 | 0.2 | 2 | 1.5 | 2.5 | 50 | 90 | 6 |
| UR544 012010108 | 1.2 | 0.1 | 1 | 1.8 | 3 | 8 | 50 | 4 |
| UR544 012010112 | 1.2 | 0.1 | 1 | 1.8 | 3 | 12 | 50 | 4 |
| UR544 012010116 | 1.2 | 0.1 | 1 | 1.8 | 3 | 16 | 50 | 4 |
| UR544 012010120 | 1.2 | 0.1 | 1 | 1.8 | 3 | 20 | 50 | 4 |
| UR544 012010125 | 1.2 | 0.1 | 1 | 1.8 | 3 | 25 | 60 | 4 |
| UR544 012010130 | 1.2 | 0.1 | 1 | 1.8 | 3 | 30 | 70 | 4 |
| UR544 012010208 | 1.2 | 0.1 | 2 | 1.8 | 3 | 8 | 50 | 4 |
| UR544 012010212 | 1.2 | 0.1 | 2 | 1.8 | 3 | 12 | 50 | 4 |
| UR544 012010216 | 1.2 | 0.1 | 2 | 1.8 | 3 | 16 | 50 | 4 |
| UR544 012010220 | 1.2 | 0.1 | 2 | 1.8 | 3 | 20 | 50 | 4 |
| UR544 012010225 | 1.2 | 0.1 | 2 | 1.8 | 3 | 25 | 60 | 4 |
| UR544 012010230 | 1.2 | 0.1 | 2 | 1.8 | 3 | 30 | 70 | 4 |
| UR544 012020108 | 1.2 | 0.2 | 1 | 1.8 | 3 | 8 | 50 | 4 |
| UR544 012020112 | 1.2 | 0.2 | 1 | 1.8 | 3 | 12 | 50 | 4 |
| UR544 012020116 | 1.2 | 0.2 | 1 | 1.8 | 3 | 16 | 50 | 4 |
| UR544 012020120 | 1.2 | 0.2 | 1 | 1.8 | 3 | 20 | 50 | 4 |
| UR544 012020125 | 1.2 | 0.2 | 1 | 1.8 | 3 | 25 | 60 | 4 |
| UR544 012020130 | 1.2 | 0.2 | 1 | 1.8 | 3 | 30 | 70 | 4 |
| UR544 012020208 | 1.2 | 0.2 | 2 | 1.8 | 3 | 8 | 50 | 4 |
| UR544 012020212 | 1.2 | 0.2 | 2 | 1.8 | 3 | 12 | 50 | 4 |
| UR544 012020216 | 1.2 | 0.2 | 2 | 1.8 | 3 | 16 | 50 | 4 |
| UR544 012020220 | 1.2 | 0.2 | 2 | 1.8 | 3 | 20 | 50 | 4 |
| UR544 012020225 | 1.2 | 0.2 | 2 | 1.8 | 3 | 25 | 60 | 4 |
| UR544 012020230 | 1.2 | 0.2 | 2 | 1.8 | 3 | 30 | 70 | 4 |
| UR544 015010108 | 1.5 | 0.1 | 1 | 2.3 | 3 | 8 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 015010110 | 1.5 | 0.1 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015010112 | 1.5 | 0.1 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015010116 | 1.5 | 0.1 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015010120 | 1.5 | 0.1 | 1 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015010125 | 1.5 | 0.1 | 1 | 2.3 | 3 | 25 | 60 | 4 |
| UR544 015010130 | 1.5 | 0.1 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015010140 | 1.5 | 0.1 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR544 015010150 | 1.5 | 0.1 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR544 015010208 | 1.5 | 0.1 | 2 | 2.3 | 3 | 8 | 50 | 4 |
| UR544 015010210 | 1.5 | 0.1 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015010212 | 1.5 | 0.1 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015010216 | 1.5 | 0.1 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015010220 | 1.5 | 0.1 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015010225 | 1.5 | 0.1 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR544 015010230 | 1.5 | 0.1 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015010240 | 1.5 | 0.1 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR544 015010250 | 1.5 | 0.1 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR544 015020108 | 1.5 | 0.2 | 1 | 2.3 | 3 | 8 | 50 | 4 |
| UR544 015020110 | 1.5 | 0.2 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015020112 | 1.5 | 0.2 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015020116 | 1.5 | 0.2 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015020120 | 1.5 | 0.2 | 1 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015020125 | 1.5 | 0.2 | 1 | 2.3 | 3 | 25 | 60 | 4 |
| UR544 015020130 | 1.5 | 0.2 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015020140 | 1.5 | 0.2 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR544 015020150 | 1.5 | 0.2 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR544 015020208 | 1.5 | 0.2 | 2 | 2.3 | 3 | 8 | 50 | 4 |
| UR544 015020210 | 1.5 | 0.2 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015020212 | 1.5 | 0.2 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015020216 | 1.5 | 0.2 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015020220 | 1.5 | 0.2 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015020225 | 1.5 | 0.2 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR544 015020230 | 1.5 | 0.2 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015020240 | 1.5 | 0.2 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR544 015020250 | 1.5 | 0.2 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR544 015030108 | 1.5 | 0.3 | 1 | 2.3 | 3 | 8 | 50 | 4 |
| UR544 015030110 | 1.5 | 0.3 | 1 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015030112 | 1.5 | 0.3 | 1 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015030116 | 1.5 | 0.3 | 1 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015030120 | 1.5 | 0.3 | 1 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015030125 | 1.5 | 0.3 | 1 | 2.3 | 3 | 25 | 60 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 015030130 | 1.5 | 0.3 | 1 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015030140 | 1.5 | 0.3 | 1 | 2.3 | 3 | 40 | 80 | 4 |
| UR544 015030150 | 1.5 | 0.3 | 1 | 2.3 | 3 | 50 | 90 | 4 |
| UR544 015030208 | 1.5 | 0.3 | 2 | 2.3 | 3 | 8 | 50 | 4 |
| UR544 015030210 | 1.5 | 0.3 | 2 | 2.3 | 3 | 10 | 50 | 4 |
| UR544 015030212 | 1.5 | 0.3 | 2 | 2.3 | 3 | 12 | 50 | 4 |
| UR544 015030216 | 1.5 | 0.3 | 2 | 2.3 | 3 | 16 | 50 | 4 |
| UR544 015030220 | 1.5 | 0.3 | 2 | 2.3 | 3 | 20 | 50 | 4 |
| UR544 015030225 | 1.5 | 0.3 | 2 | 2.3 | 3 | 25 | 60 | 4 |
| UR544 015030230 | 1.5 | 0.3 | 2 | 2.3 | 3 | 30 | 70 | 4 |
| UR544 015030240 | 1.5 | 0.3 | 2 | 2.3 | 3 | 40 | 80 | 6 |
| UR544 015030250 | 1.5 | 0.3 | 2 | 2.3 | 3 | 50 | 90 | 6 |
| UR544 020010110 | 2 | 0.1 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR544 020010112 | 2 | 0.1 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR544 020010116 | 2 | 0.1 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR544 020010120 | 2 | 0.1 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR544 020010125 | 2 | 0.1 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR544 020010130 | 2 | 0.1 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR544 020010140 | 2 | 0.1 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR544 020010150 | 2 | 0.1 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR544 020010160 | 2 | 0.1 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR544 020010180 | 2 | 0.1 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR544 020010210 | 2 | 0.1 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR544 020010212 | 2 | 0.1 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR544 020010216 | 2 | 0.1 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR544 020010220 | 2 | 0.1 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR544 020010225 | 2 | 0.1 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR544 020010230 | 2 | 0.1 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR544 020010240 | 2 | 0.1 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR544 020010250 | 2 | 0.1 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR544 020010260 | 2 | 0.1 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR544 020010280 | 2 | 0.1 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR544 020020110 | 2 | 0.2 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR544 020020112 | 2 | 0.2 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR544 020020116 | 2 | 0.2 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR544 020020120 | 2 | 0.2 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR544 020020125 | 2 | 0.2 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR544 020020130 | 2 | 0.2 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR544 020020140 | 2 | 0.2 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR544 020020150 | 2 | 0.2 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR544 020020160 | 2 | 0.2 | 1 | 2 | 5 | 60 | 100 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 020020180 | 2 | 0.2 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR544 020020210 | 2 | 0.2 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR544 020020212 | 2 | 0.2 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR544 020020216 | 2 | 0.2 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR544 020020220 | 2 | 0.2 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR544 020020225 | 2 | 0.2 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR544 020020230 | 2 | 0.2 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR544 020020240 | 2 | 0.2 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR544 020020250 | 2 | 0.2 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR544 020020260 | 2 | 0.2 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR544 020020280 | 2 | 0.2 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR544 020030110 | 2 | 0.3 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR544 020030112 | 2 | 0.3 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR544 020030116 | 2 | 0.3 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR544 020030120 | 2 | 0.3 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR544 020030125 | 2 | 0.3 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR544 020030130 | 2 | 0.3 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR544 020030140 | 2 | 0.3 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR544 020030150 | 2 | 0.3 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR544 020030160 | 2 | 0.3 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR544 020030180 | 2 | 0.3 | 1 | 2 | 5 | 80 | 140 | 6 |
| UR544 020030210 | 2 | 0.3 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR544 020030212 | 2 | 0.3 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR544 020030216 | 2 | 0.3 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR544 020030220 | 2 | 0.3 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR544 020030225 | 2 | 0.3 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR544 020030230 | 2 | 0.3 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR544 020030240 | 2 | 0.3 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR544 020030250 | 2 | 0.3 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR544 020030260 | 2 | 0.3 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR544 020030280 | 2 | 0.3 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR544 020050110 | 2 | 0.5 | 1 | 2 | 5 | 10 | 50 | 4 |
| UR544 020050112 | 2 | 0.5 | 1 | 2 | 5 | 12 | 50 | 4 |
| UR544 020050116 | 2 | 0.5 | 1 | 2 | 5 | 16 | 50 | 4 |
| UR544 020050120 | 2 | 0.5 | 1 | 2 | 5 | 20 | 50 | 4 |
| UR544 020050125 | 2 | 0.5 | 1 | 2 | 5 | 25 | 60 | 4 |
| UR544 020050130 | 2 | 0.5 | 1 | 2 | 5 | 30 | 70 | 4 |
| UR544 020050140 | 2 | 0.5 | 1 | 2 | 5 | 40 | 80 | 6 |
| UR544 020050150 | 2 | 0.5 | 1 | 2 | 5 | 50 | 100 | 6 |
| UR544 020050160 | 2 | 0.5 | 1 | 2 | 5 | 60 | 100 | 6 |
| UR544 020050180 | 2 | 0.5 | 1 | 2 | 5 | 80 | 140 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 020050210 | 2 | 0.5 | 2 | 2 | 5 | 10 | 50 | 4 |
| UR544 020050212 | 2 | 0.5 | 2 | 2 | 5 | 12 | 50 | 4 |
| UR544 020050216 | 2 | 0.5 | 2 | 2 | 5 | 16 | 50 | 4 |
| UR544 020050220 | 2 | 0.5 | 2 | 2 | 5 | 20 | 50 | 4 |
| UR544 020050225 | 2 | 0.5 | 2 | 2 | 5 | 25 | 60 | 4 |
| UR544 020050230 | 2 | 0.5 | 2 | 2 | 5 | 30 | 70 | 4 |
| UR544 020050240 | 2 | 0.5 | 2 | 2 | 5 | 40 | 80 | 6 |
| UR544 020050250 | 2 | 0.5 | 2 | 2 | 5 | 50 | 100 | 6 |
| UR544 020050260 | 2 | 0.5 | 2 | 2 | 5 | 60 | 100 | 6 |
| UR544 020050280 | 2 | 0.5 | 2 | 2 | 5 | 80 | 140 | 8 |
| UR544 030020116 | 3 | 0.2 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030020120 | 3 | 0.2 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030020130 | 3 | 0.2 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030020140 | 3 | 0.2 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030020150 | 3 | 0.2 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UR544 030020160 | 3 | 0.2 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR544 030020216 | 3 | 0.2 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030020220 | 3 | 0.2 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030020230 | 3 | 0.2 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030020240 | 3 | 0.2 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030020250 | 3 | 0.2 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR544 030020260 | 3 | 0.2 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR544 030020270 | 3 | 0.2 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR544 030030116 | 3 | 0.3 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030030120 | 3 | 0.3 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030030130 | 3 | 0.3 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030030140 | 3 | 0.3 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030030150 | 3 | 0.3 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UR544 030030160 | 3 | 0.3 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR544 030030216 | 3 | 0.3 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030030220 | 3 | 0.3 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030030230 | 3 | 0.3 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030030240 | 3 | 0.3 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030030250 | 3 | 0.3 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR544 030030260 | 3 | 0.3 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR544 030030270 | 3 | 0.3 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR544 030050116 | 3 | 0.5 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030050120 | 3 | 0.5 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030050130 | 3 | 0.5 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030050140 | 3 | 0.5 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030050150 | 3 | 0.5 | 1 | 4.5 | 6 | 50 | 90 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR544 | 4 FLUTES TAPERED NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L4 | L3 | L2 | D2 |
| UR544 030050160 | 3 | 0.5 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UR544 030050216 | 3 | 0.5 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UR544 030050220 | 3 | 0.5 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UR544 030050230 | 3 | 0.5 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UR544 030050240 | 3 | 0.5 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UR544 030050250 | 3 | 0.5 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UR544 030050260 | 3 | 0.5 | 2 | 4.5 | 6 | 60 | 100 | 8 |
| UR544 030050270 | 3 | 0.5 | 2 | 4.5 | 6 | 70 | 120 | 8 |
| UR544 040020140 | 4 | 0.2 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR544 040020150 | 4 | 0.2 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR544 040020160 | 4 | 0.2 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR544 040020170 | 4 | 0.2 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR544 040020240 | 4 | 0.2 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR544 040020250 | 4 | 0.2 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR544 040020260 | 4 | 0.2 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR544 040020270 | 4 | 0.2 | 2 | 6 | 8 | 70 | 120 | 10 |
| UR544 040030140 | 4 | 0.3 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR544 040030150 | 4 | 0.3 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR544 040030160 | 4 | 0.3 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR544 040030170 | 4 | 0.3 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR544 040030240 | 4 | 0.3 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR544 040030250 | 4 | 0.3 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR544 040030260 | 4 | 0.3 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR544 040030270 | 4 | 0.3 | 2 | 6 | 8 | 70 | 120 | 10 |
| UR544 040050140 | 4 | 0.5 | 1 | 6 | 8 | 40 | 90 | 6 |
| UR544 040050150 | 4 | 0.5 | 1 | 6 | 8 | 50 | 100 | 6 |
| UR544 040050160 | 4 | 0.5 | 1 | 6 | 8 | 60 | 110 | 6 |
| UR544 040050170 | 4 | 0.5 | 1 | 6 | 8 | 70 | 120 | 8 |
| UR544 040050240 | 4 | 0.5 | 2 | 6 | 8 | 40 | 90 | 8 |
| UR544 040050250 | 4 | 0.5 | 2 | 6 | 8 | 50 | 100 | 8 |
| UR544 040050260 | 4 | 0.5 | 2 | 6 | 8 | 60 | 110 | 8 |
| UR544 040050270 | 4 | 0.5 | 2 | 6 | 8 | 70 | 120 | 10 |

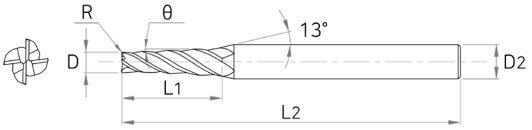


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | R ±0.02 | DATA P.654

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 010005 | 1 | 0.05 | 2.5 | 50 | 6 |
| UXR504 01001 | 1 | 0.1 | 2.5 | 50 | 6 |
| UXR504 01002 | 1 | 0.2 | 2.5 | 50 | 6 |
| UXR504 01003 | 1 | 0.3 | 2.5 | 50 | 6 |
| UXR504 012005 | 1.2 | 0.05 | 3 | 50 | 6 |
| UXR504 01201 | 1.2 | 0.1 | 3 | 50 | 6 |
| UXR504 01202 | 1.2 | 0.2 | 3 | 50 | 6 |
| UXR504 01203 | 1.2 | 0.3 | 3 | 50 | 6 |
| UXR504 015005 | 1.5 | 0.05 | 4 | 50 | 6 |
| UXR504 01501 | 1.5 | 0.1 | 4 | 50 | 6 |
| UXR504 01502 | 1.5 | 0.2 | 4 | 50 | 6 |
| UXR504 01503 | 1.5 | 0.3 | 4 | 50 | 6 |
| UXR504 01505 | 1.5 | 0.5 | 4 | 50 | 6 |
| UXR504 02001 | 2 | 0.1 | 6 | 50 | 6 |
| UXR504 02002 | 2 | 0.2 | 6 | 50 | 6 |
| UXR504 02003 | 2 | 0.3 | 6 | 50 | 6 |
| UXR504 02005 | 2 | 0.5 | 6 | 50 | 6 |
| UXR504 02501 | 2.5 | 0.1 | 7 | 60 | 6 |
| UXR504 02502 | 2.5 | 0.2 | 7 | 60 | 6 |
| UXR504 02503 | 2.5 | 0.3 | 7 | 60 | 6 |
| UXR504 02505 | 2.5 | 0.5 | 7 | 60 | 6 |
| UXR504 03001 | 3 | 0.1 | 8 | 60 | 6 |
| UXR504 03002 | 3 | 0.2 | 8 | 60 | 6 |
| UXR504 03003 | 3 | 0.3 | 8 | 60 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 03005 | 3 | 0.5 | 8 | 60 | 6 |
| UXR504 03010 | 3 | 1 | 8 | 60 | 6 |
| UXR504 03501 | 3.5 | 0.1 | 10 | 70 | 6 |
| UXR504 03502 | 3.5 | 0.2 | 10 | 70 | 6 |
| UXR504 03503 | 3.5 | 0.3 | 10 | 70 | 6 |
| UXR504 03505 | 3.5 | 0.5 | 10 | 70 | 6 |
| UXR504 04001 | 4 | 0.1 | 10 | 70 | 6 |
| UXR504 04001100S4 | 4 | 0.1 | 10 | 100 | 4 |
| UXR504 04001S4 | 4 | 0.1 | 10 | 70 | 4 |
| UXR504 04002 | 4 | 0.2 | 10 | 70 | 6 |
| UXR504 04002100S4 | 4 | 0.2 | 10 | 100 | 4 |
| UXR504 04002S4 | 4 | 0.2 | 10 | 70 | 4 |
| UXR504 04003 | 4 | 0.3 | 10 | 70 | 6 |
| UXR504 04003100S4 | 4 | 0.3 | 10 | 100 | 4 |
| UXR504 04003S4 | 4 | 0.3 | 10 | 70 | 4 |
| UXR504 04005 | 4 | 0.5 | 10 | 70 | 6 |
| UXR504 04005100S4 | 4 | 0.5 | 10 | 100 | 4 |
| UXR504 04005S4 | 4 | 0.5 | 10 | 70 | 4 |
| UXR504 04010 | 4 | 1 | 10 | 70 | 6 |
| UXR504 04010100S4 | 4 | 1 | 10 | 100 | 4 |
| UXR504 04010S4 | 4 | 1 | 10 | 70 | 4 |
| UXR504 04501 | 4.5 | 0.1 | 11 | 80 | 6 |
| UXR504 04502 | 4.5 | 0.2 | 11 | 80 | 6 |
| UXR504 04503 | 4.5 | 0.3 | 11 | 80 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 04505 | 4.5 | 0.5 | 11 | 80 | 6 |
| UXR504 05001 | 5 | 0.1 | 13 | 90 | 6 |
| UXR504 05002 | 5 | 0.2 | 13 | 90 | 6 |
| UXR504 05003 | 5 | 0.3 | 13 | 90 | 6 |
| UXR504 05005 | 5 | 0.5 | 13 | 90 | 6 |
| UXR504 05010 | 5 | 1 | 13 | 90 | 6 |
| UXR504 05501 | 5.5 | 0.1 | 13 | 90 | 6 |
| UXR504 05502 | 5.5 | 0.2 | 13 | 90 | 6 |
| UXR504 05503 | 5.5 | 0.3 | 13 | 90 | 6 |
| UXR504 05505 | 5.5 | 0.5 | 13 | 90 | 6 |
| UXR504 05510 | 5.5 | 1 | 13 | 90 | 6 |
| UXR504 06001 | 6 | 0.1 | 15 | 90 | 6 |
| UXR504 06001060 | 6 | 0.1 | 15 | 60 | 6 |
| UXR504 06002 | 6 | 0.2 | 15 | 90 | 6 |
| UXR504 06002060 | 6 | 0.2 | 15 | 60 | 6 |
| UXR504 06003 | 6 | 0.3 | 15 | 90 | 6 |
| UXR504 06005 | 6 | 0.5 | 15 | 90 | 6 |
| UXR504 06005060 | 6 | 0.5 | 15 | 60 | 6 |
| UXR504 06005110 | 6 | 0.5 | 15 | 110 | 6 |
| UXR504 06005130 | 6 | 0.5 | 15 | 130 | 6 |
| UXR504 06010 | 6 | 1 | 15 | 90 | 6 |
| UXR504 06010060 | 6 | 1 | 15 | 60 | 6 |
| UXR504 06010110 | 6 | 1 | 15 | 110 | 6 |
| UXR504 06010130 | 6 | 1 | 15 | 130 | 6 |
| UXR504 06015 | 6 | 1.5 | 15 | 90 | 6 |
| UXR504 06020 | 6 | 2 | 15 | 90 | 6 |
| UXR504 07001 | 7 | 0.1 | 16 | 90 | 8 |
| UXR504 07002 | 7 | 0.2 | 16 | 90 | 8 |
| UXR504 07003 | 7 | 0.3 | 16 | 90 | 8 |
| UXR504 07005 | 7 | 0.5 | 16 | 90 | 8 |
| UXR504 07010 | 7 | 1 | 16 | 90 | 8 |
| UXR504 07020 | 7 | 2 | 16 | 90 | 8 |
| UXR504 08001 | 8 | 0.1 | 20 | 100 | 8 |
| UXR504 08002 | 8 | 0.2 | 20 | 100 | 8 |
| UXR504 08003 | 8 | 0.3 | 20 | 100 | 8 |
| UXR504 08003070 | 8 | 0.3 | 20 | 70 | 8 |
| UXR504 08005 | 8 | 0.5 | 20 | 100 | 8 |
| UXR504 08005070 | 8 | 0.5 | 20 | 70 | 8 |
| UXR504 08005120 | 8 | 0.5 | 20 | 120 | 8 |
| UXR504 08005150 | 8 | 0.5 | 20 | 150 | 8 |
| UXR504 08010 | 8 | 1 | 20 | 100 | 8 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 08010070 | 8 | 1 | 20 | 70 | 8 |
| UXR504 08010120 | 8 | 1 | 20 | 120 | 8 |
| UXR504 08010150 | 8 | 1 | 20 | 150 | 8 |
| UXR504 08015 | 8 | 1.5 | 20 | 100 | 8 |
| UXR504 08015070 | 8 | 1.5 | 20 | 70 | 8 |
| UXR504 08020 | 8 | 2 | 20 | 100 | 8 |
| UXR504 08020070 | 8 | 2 | 20 | 70 | 8 |
| UXR504 08025 | 8 | 2.5 | 20 | 100 | 8 |
| UXR504 08030 | 8 | 3 | 20 | 100 | 8 |
| UXR504 10001 | 10 | 0.1 | 25 | 100 | 10 |
| UXR504 10002 | 10 | 0.2 | 25 | 100 | 10 |
| UXR504 10003 | 10 | 0.3 | 25 | 100 | 10 |
| UXR504 10003075 | 10 | 0.3 | 25 | 75 | 10 |
| UXR504 10005 | 10 | 0.5 | 25 | 100 | 10 |
| UXR504 10005075 | 10 | 0.5 | 25 | 75 | 10 |
| UXR504 10005130 | 10 | 0.5 | 22 | 130 | 10 |
| UXR504 10005150 | 10 | 0.5 | 22 | 150 | 10 |
| UXR504 10010 | 10 | 1 | 25 | 100 | 10 |
| UXR504 10010075 | 10 | 1 | 25 | 75 | 10 |
| UXR504 10010130 | 10 | 1 | 22 | 130 | 10 |
| UXR504 10010150 | 10 | 1 | 22 | 150 | 10 |
| UXR504 10015 | 10 | 1.5 | 25 | 100 | 10 |
| UXR504 10020 | 10 | 2 | 25 | 100 | 10 |
| UXR504 10025 | 10 | 2.5 | 25 | 100 | 10 |
| UXR504 10030 | 10 | 3 | 25 | 100 | 10 |
| UXR504 10040 | 10 | 4 | 25 | 100 | 10 |
| UXR504 11002 | 11 | 0.2 | 25 | 110 | 12 |
| UXR504 11003 | 11 | 0.3 | 25 | 110 | 12 |
| UXR504 11005 | 11 | 0.5 | 25 | 110 | 12 |
| UXR504 11010 | 11 | 1 | 25 | 110 | 12 |
| UXR504 11020 | 11 | 2 | 25 | 110 | 12 |
| UXR504 12001 | 12 | 0.1 | 30 | 110 | 12 |
| UXR504 12002 | 12 | 0.2 | 30 | 110 | 12 |
| UXR504 12003 | 12 | 0.3 | 30 | 110 | 12 |
| UXR504 12003080 | 12 | 0.3 | 30 | 80 | 12 |
| UXR504 12005 | 12 | 0.5 | 30 | 110 | 12 |
| UXR504 12005080 | 12 | 0.5 | 30 | 80 | 12 |
| UXR504 12005130 | 12 | 0.5 | 30 | 130 | 12 |
| UXR504 12005150 | 12 | 0.5 | 30 | 150 | 12 |
| UXR504 12010 | 12 | 1 | 30 | 110 | 12 |
| UXR504 12010080 | 12 | 1 | 30 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR504 | 4 FLUTES MULTI HELIX RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 12010130 | 12 | 1 | 30 | 130 | 12 |
| UXR504 12010150 | 12 | 1 | 30 | 150 | 12 |
| UXR504 12015 | 12 | 1.5 | 30 | 110 | 12 |
| UXR504 12015080 | 12 | 1.5 | 30 | 80 | 12 |
| UXR504 12020 | 12 | 2 | 30 | 110 | 12 |
| UXR504 12020080 | 12 | 2 | 30 | 80 | 12 |
| UXR504 12025 | 12 | 2.5 | 30 | 110 | 12 |
| UXR504 12025080 | 12 | 2.5 | 30 | 80 | 12 |
| UXR504 12030 | 12 | 3 | 30 | 110 | 12 |
| UXR504 12030080 | 12 | 3 | 30 | 80 | 12 |
| UXR504 12040 | 12 | 4 | 30 | 110 | 12 |
| UXR504 12050 | 12 | 5 | 30 | 110 | 12 |
| UXR504 14005 | 14 | 0.5 | 35 | 150 | 16 |
| UXR504 14010 | 14 | 1 | 35 | 150 | 16 |
| UXR504 14020 | 14 | 2 | 35 | 150 | 16 |
| UXR504 16005 | 16 | 0.5 | 40 | 100 | 16 |
| UXR504 16005150 | 16 | 0.5 | 40 | 150 | 16 |

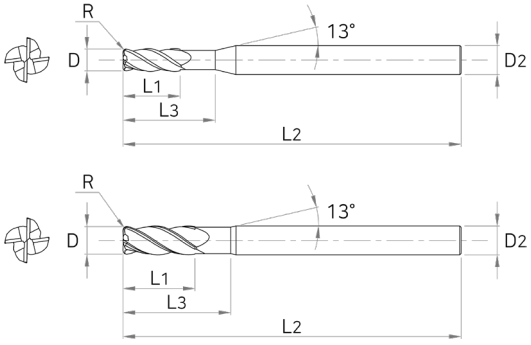
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UXR504 16010 | 16 | 1 | 40 | 100 | 16 |
| UXR504 16010150 | 16 | 1 | 40 | 150 | 16 |
| UXR504 16015 | 16 | 1.5 | 40 | 100 | 16 |
| UXR504 16015150 | 16 | 1.5 | 40 | 150 | 16 |
| UXR504 16020 | 16 | 2 | 40 | 100 | 16 |
| UXR504 16020150 | 16 | 2 | 40 | 150 | 16 |
| UXR504 16030 | 16 | 3 | 40 | 100 | 16 |
| UXR504 20005 | 20 | 0.5 | 45 | 110 | 20 |
| UXR504 20005150 | 20 | 0.5 | 45 | 150 | 20 |
| UXR504 20010 | 20 | 1 | 45 | 110 | 20 |
| UXR504 20010150 | 20 | 1 | 45 | 150 | 20 |
| UXR504 20015 | 20 | 1.5 | 45 | 110 | 20 |
| UXR504 20015150 | 20 | 1.5 | 45 | 150 | 20 |
| UXR504 20020 | 20 | 2 | 45 | 110 | 20 |
| UXR504 20020150 | 20 | 2 | 45 | 150 | 20 |
| UXR504 20030 | 20 | 3 | 45 | 110 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 34° HELIX | 36° HELIX | R ±0.02 | DATA P.653

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 01000503 | 1 | 0.05 | 1.5 | 3 | 50 | 4 |
| UXR514 01000504 | 1 | 0.05 | 1.5 | 4 | 50 | 4 |
| UXR514 01000506 | 1 | 0.05 | 1.5 | 6 | 50 | 4 |
| UXR514 01000508 | 1 | 0.05 | 1.5 | 8 | 50 | 4 |
| UXR514 01000510 | 1 | 0.05 | 1.5 | 10 | 50 | 4 |
| UXR514 01000512 | 1 | 0.05 | 1.5 | 12 | 50 | 4 |
| UXR514 01000514 | 1 | 0.05 | 1.5 | 14 | 50 | 4 |
| UXR514 01000516 | 1 | 0.05 | 1.5 | 16 | 50 | 4 |
| UXR514 01000520 | 1 | 0.05 | 1.5 | 20 | 50 | 4 |
| UXR514 0100103 | 1 | 0.1 | 1.5 | 3 | 50 | 4 |
| UXR514 0100104 | 1 | 0.1 | 1.5 | 4 | 50 | 4 |
| UXR514 0100106 | 1 | 0.1 | 1.5 | 6 | 50 | 4 |
| UXR514 0100108 | 1 | 0.1 | 1.5 | 8 | 50 | 4 |
| UXR514 0100110 | 1 | 0.1 | 1.5 | 10 | 50 | 4 |
| UXR514 0100112 | 1 | 0.1 | 1.5 | 12 | 50 | 4 |
| UXR514 0100114 | 1 | 0.1 | 1.5 | 14 | 50 | 4 |
| UXR514 0100116 | 1 | 0.1 | 1.5 | 16 | 50 | 4 |
| UXR514 0100120 | 1 | 0.1 | 1.5 | 20 | 50 | 4 |
| UXR514 0100203 | 1 | 0.2 | 1.5 | 3 | 50 | 4 |
| UXR514 0100204 | 1 | 0.2 | 1.5 | 4 | 50 | 4 |
| UXR514 0100206 | 1 | 0.2 | 1.5 | 6 | 50 | 4 |
| UXR514 0100208 | 1 | 0.2 | 1.5 | 8 | 50 | 4 |
| UXR514 0100210 | 1 | 0.2 | 1.5 | 10 | 50 | 4 |
| UXR514 0100212 | 1 | 0.2 | 1.5 | 12 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0100214 | 1 | 0.2 | 1.5 | 14 | 50 | 4 |
| UXR514 0100216 | 1 | 0.2 | 1.5 | 16 | 50 | 4 |
| UXR514 0100220 | 1 | 0.2 | 1.5 | 20 | 50 | 4 |
| UXR514 0100303 | 1 | 0.3 | 1.5 | 3 | 50 | 4 |
| UXR514 0100304 | 1 | 0.3 | 1.5 | 4 | 50 | 4 |
| UXR514 0100306 | 1 | 0.3 | 1.5 | 6 | 50 | 4 |
| UXR514 0100308 | 1 | 0.3 | 1.5 | 8 | 50 | 4 |
| UXR514 0100310 | 1 | 0.3 | 1.5 | 10 | 50 | 4 |
| UXR514 0100312 | 1 | 0.3 | 1.5 | 12 | 50 | 4 |
| UXR514 0100314 | 1 | 0.3 | 1.5 | 14 | 50 | 4 |
| UXR514 0100316 | 1 | 0.3 | 1.5 | 16 | 50 | 4 |
| UXR514 0100320 | 1 | 0.3 | 1.5 | 20 | 50 | 4 |
| UXR514 01200503 | 1.2 | 0.05 | 1.8 | 3 | 50 | 4 |
| UXR514 01200504 | 1.2 | 0.05 | 1.8 | 4 | 50 | 4 |
| UXR514 01200506 | 1.2 | 0.05 | 1.8 | 6 | 50 | 4 |
| UXR514 01200508 | 1.2 | 0.05 | 1.8 | 8 | 50 | 4 |
| UXR514 01200510 | 1.2 | 0.05 | 1.8 | 10 | 50 | 4 |
| UXR514 01200512 | 1.2 | 0.05 | 1.8 | 12 | 50 | 4 |
| UXR514 01200516 | 1.2 | 0.05 | 1.8 | 16 | 50 | 4 |
| UXR514 01200520 | 1.2 | 0.05 | 1.8 | 20 | 50 | 4 |
| UXR514 0120103 | 1.2 | 0.1 | 1.8 | 3 | 50 | 4 |
| UXR514 0120104 | 1.2 | 0.1 | 1.8 | 4 | 50 | 4 |
| UXR514 0120106 | 1.2 | 0.1 | 1.8 | 6 | 50 | 4 |
| UXR514 0120108 | 1.2 | 0.1 | 1.8 | 8 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0120110 | 1.2 | 0.1 | 1.8 | 10 | 50 | 4 |
| UXR514 0120112 | 1.2 | 0.1 | 1.8 | 12 | 50 | 4 |
| UXR514 0120116 | 1.2 | 0.1 | 1.8 | 16 | 50 | 4 |
| UXR514 0120120 | 1.2 | 0.1 | 1.8 | 20 | 50 | 4 |
| UXR514 0120203 | 1.2 | 0.2 | 1.8 | 3 | 50 | 4 |
| UXR514 0120204 | 1.2 | 0.2 | 1.8 | 4 | 50 | 4 |
| UXR514 0120206 | 1.2 | 0.2 | 1.8 | 6 | 50 | 4 |
| UXR514 0120208 | 1.2 | 0.2 | 1.8 | 8 | 50 | 4 |
| UXR514 0120210 | 1.2 | 0.2 | 1.8 | 10 | 50 | 4 |
| UXR514 0120212 | 1.2 | 0.2 | 1.8 | 12 | 50 | 4 |
| UXR514 0120216 | 1.2 | 0.2 | 1.8 | 16 | 50 | 4 |
| UXR514 0120220 | 1.2 | 0.2 | 1.8 | 20 | 50 | 4 |
| UXR514 0120303 | 1.2 | 0.3 | 1.8 | 3 | 50 | 4 |
| UXR514 0120304 | 1.2 | 0.3 | 1.8 | 4 | 50 | 4 |
| UXR514 0120306 | 1.2 | 0.3 | 1.8 | 6 | 50 | 4 |
| UXR514 0120308 | 1.2 | 0.3 | 1.8 | 8 | 50 | 4 |
| UXR514 0120310 | 1.2 | 0.3 | 1.8 | 10 | 50 | 4 |
| UXR514 0120312 | 1.2 | 0.3 | 1.8 | 12 | 50 | 4 |
| UXR514 0120316 | 1.2 | 0.3 | 1.8 | 16 | 50 | 4 |
| UXR514 0120320 | 1.2 | 0.3 | 1.8 | 20 | 50 | 4 |
| UXR514 01500504 | 1.5 | 0.05 | 2.3 | 4 | 50 | 4 |
| UXR514 01500506 | 1.5 | 0.05 | 2.3 | 6 | 50 | 4 |
| UXR514 01500508 | 1.5 | 0.05 | 2.3 | 8 | 50 | 4 |
| UXR514 01500510 | 1.5 | 0.05 | 2.3 | 10 | 50 | 4 |
| UXR514 01500512 | 1.5 | 0.05 | 2.3 | 12 | 50 | 4 |
| UXR514 01500514 | 1.5 | 0.05 | 2.3 | 14 | 50 | 4 |
| UXR514 01500516 | 1.5 | 0.05 | 2.3 | 16 | 50 | 4 |
| UXR514 01500520 | 1.5 | 0.05 | 2.3 | 20 | 50 | 4 |
| UXR514 01500522 | 1.5 | 0.05 | 2.3 | 22 | 60 | 4 |
| UXR514 01500526 | 1.5 | 0.05 | 2.3 | 26 | 60 | 4 |
| UXR514 0150104 | 1.5 | 0.1 | 2.3 | 4 | 50 | 4 |
| UXR514 0150106 | 1.5 | 0.1 | 2.3 | 6 | 50 | 4 |
| UXR514 0150108 | 1.5 | 0.1 | 2.3 | 8 | 50 | 4 |
| UXR514 0150110 | 1.5 | 0.1 | 2.3 | 10 | 50 | 4 |
| UXR514 0150112 | 1.5 | 0.1 | 2.3 | 12 | 50 | 4 |
| UXR514 0150114 | 1.5 | 0.1 | 2.3 | 14 | 50 | 4 |
| UXR514 0150116 | 1.5 | 0.1 | 2.3 | 16 | 50 | 4 |
| UXR514 0150120 | 1.5 | 0.1 | 2.3 | 20 | 50 | 4 |
| UXR514 0150122 | 1.5 | 0.1 | 2.3 | 22 | 60 | 4 |
| UXR514 0150126 | 1.5 | 0.1 | 2.3 | 26 | 60 | 4 |
| UXR514 0150204 | 1.5 | 0.2 | 2.3 | 4 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0150206 | 1.5 | 0.2 | 2.3 | 6 | 50 | 4 |
| UXR514 0150208 | 1.5 | 0.2 | 2.3 | 8 | 50 | 4 |
| UXR514 0150210 | 1.5 | 0.2 | 2.3 | 10 | 50 | 4 |
| UXR514 0150212 | 1.5 | 0.2 | 2.3 | 12 | 50 | 4 |
| UXR514 0150214 | 1.5 | 0.2 | 2.3 | 14 | 50 | 4 |
| UXR514 0150216 | 1.5 | 0.2 | 2.3 | 16 | 50 | 4 |
| UXR514 0150220 | 1.5 | 0.2 | 2.3 | 20 | 50 | 4 |
| UXR514 0150222 | 1.5 | 0.2 | 2.3 | 22 | 60 | 4 |
| UXR514 0150226 | 1.5 | 0.2 | 2.3 | 26 | 60 | 4 |
| UXR514 0150304 | 1.5 | 0.3 | 2.3 | 4 | 50 | 4 |
| UXR514 0150306 | 1.5 | 0.3 | 2.3 | 6 | 50 | 4 |
| UXR514 0150308 | 1.5 | 0.3 | 2.3 | 8 | 50 | 4 |
| UXR514 0150310 | 1.5 | 0.3 | 2.3 | 10 | 50 | 4 |
| UXR514 0150312 | 1.5 | 0.3 | 2.3 | 12 | 50 | 4 |
| UXR514 0150314 | 1.5 | 0.3 | 2.3 | 14 | 50 | 4 |
| UXR514 0150316 | 1.5 | 0.3 | 2.3 | 16 | 50 | 4 |
| UXR514 0150320 | 1.5 | 0.3 | 2.3 | 20 | 50 | 4 |
| UXR514 0150322 | 1.5 | 0.3 | 2.3 | 22 | 60 | 4 |
| UXR514 0150326 | 1.5 | 0.3 | 2.3 | 26 | 60 | 4 |
| UXR514 0150504 | 1.5 | 0.5 | 2.3 | 4 | 50 | 4 |
| UXR514 0150506 | 1.5 | 0.5 | 2.3 | 6 | 50 | 4 |
| UXR514 0150508 | 1.5 | 0.5 | 2.3 | 8 | 50 | 4 |
| UXR514 0150510 | 1.5 | 0.5 | 2.3 | 10 | 50 | 4 |
| UXR514 0150512 | 1.5 | 0.5 | 2.3 | 12 | 50 | 4 |
| UXR514 0150514 | 1.5 | 0.5 | 2.3 | 14 | 50 | 4 |
| UXR514 0150516 | 1.5 | 0.5 | 2.3 | 16 | 50 | 4 |
| UXR514 0150520 | 1.5 | 0.5 | 2.3 | 20 | 50 | 4 |
| UXR514 0150522 | 1.5 | 0.5 | 2.3 | 22 | 60 | 4 |
| UXR514 0150526 | 1.5 | 0.5 | 2.3 | 26 | 60 | 4 |
| UXR514 0200106 | 2 | 0.1 | 3 | 6 | 50 | 4 |
| UXR514 0200108 | 2 | 0.1 | 3 | 8 | 50 | 4 |
| UXR514 0200110 | 2 | 0.1 | 3 | 10 | 50 | 4 |
| UXR514 0200112 | 2 | 0.1 | 3 | 12 | 50 | 4 |
| UXR514 0200114 | 2 | 0.1 | 3 | 14 | 50 | 4 |
| UXR514 0200116 | 2 | 0.1 | 3 | 16 | 50 | 4 |
| UXR514 0200120 | 2 | 0.1 | 3 | 20 | 50 | 4 |
| UXR514 0200122 | 2 | 0.1 | 3 | 22 | 60 | 4 |
| UXR514 0200126 | 2 | 0.1 | 3 | 26 | 60 | 4 |
| UXR514 0200130 | 2 | 0.1 | 3 | 30 | 70 | 4 |
| UXR514 0200206 | 2 | 0.2 | 3 | 6 | 50 | 4 |
| UXR514 0200208 | 2 | 0.2 | 3 | 8 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0200210 | 2 | 0.2 | 3 | 10 | 50 | 4 |
| UXR514 0200212 | 2 | 0.2 | 3 | 12 | 50 | 4 |
| UXR514 0200214 | 2 | 0.2 | 3 | 14 | 50 | 4 |
| UXR514 0200216 | 2 | 0.2 | 3 | 16 | 50 | 4 |
| UXR514 0200220 | 2 | 0.2 | 3 | 20 | 50 | 4 |
| UXR514 0200222 | 2 | 0.2 | 3 | 22 | 60 | 4 |
| UXR514 0200226 | 2 | 0.2 | 3 | 26 | 60 | 4 |
| UXR514 0200230 | 2 | 0.2 | 3 | 30 | 70 | 4 |
| UXR514 0200306 | 2 | 0.3 | 3 | 6 | 50 | 4 |
| UXR514 0200308 | 2 | 0.3 | 3 | 8 | 50 | 4 |
| UXR514 0200310 | 2 | 0.3 | 3 | 10 | 50 | 4 |
| UXR514 0200312 | 2 | 0.3 | 3 | 12 | 50 | 4 |
| UXR514 0200314 | 2 | 0.3 | 3 | 14 | 50 | 4 |
| UXR514 0200316 | 2 | 0.3 | 3 | 16 | 50 | 4 |
| UXR514 0200320 | 2 | 0.3 | 3 | 20 | 50 | 4 |
| UXR514 0200322 | 2 | 0.3 | 3 | 22 | 60 | 4 |
| UXR514 0200326 | 2 | 0.3 | 3 | 26 | 60 | 4 |
| UXR514 0200330 | 2 | 0.3 | 3 | 30 | 70 | 4 |
| UXR514 0200506 | 2 | 0.5 | 3 | 6 | 50 | 4 |
| UXR514 0200508 | 2 | 0.5 | 3 | 8 | 50 | 4 |
| UXR514 0200510 | 2 | 0.5 | 3 | 10 | 50 | 4 |
| UXR514 0200512 | 2 | 0.5 | 3 | 12 | 50 | 4 |
| UXR514 0200514 | 2 | 0.5 | 3 | 14 | 50 | 4 |
| UXR514 0200516 | 2 | 0.5 | 3 | 16 | 50 | 4 |
| UXR514 0200520 | 2 | 0.5 | 3 | 20 | 50 | 4 |
| UXR514 0200522 | 2 | 0.5 | 3 | 22 | 60 | 4 |
| UXR514 0200526 | 2 | 0.5 | 3 | 26 | 60 | 4 |
| UXR514 0200530 | 2 | 0.5 | 3 | 30 | 70 | 4 |
| UXR514 0250108 | 2.5 | 0.1 | 4 | 8 | 50 | 4 |
| UXR514 0250110 | 2.5 | 0.1 | 4 | 10 | 50 | 4 |
| UXR514 0250112 | 2.5 | 0.1 | 4 | 12 | 50 | 4 |
| UXR514 0250114 | 2.5 | 0.1 | 4 | 14 | 50 | 4 |
| UXR514 0250116 | 2.5 | 0.1 | 4 | 16 | 50 | 4 |
| UXR514 0250120 | 2.5 | 0.1 | 4 | 20 | 50 | 4 |
| UXR514 0250126 | 2.5 | 0.1 | 4 | 26 | 60 | 4 |
| UXR514 0250130 | 2.5 | 0.1 | 4 | 30 | 70 | 4 |
| UXR514 0250208 | 2.5 | 0.2 | 4 | 8 | 50 | 4 |
| UXR514 0250210 | 2.5 | 0.2 | 4 | 10 | 50 | 4 |
| UXR514 0250212 | 2.5 | 0.2 | 4 | 12 | 50 | 4 |
| UXR514 0250214 | 2.5 | 0.2 | 4 | 14 | 50 | 4 |
| UXR514 0250216 | 2.5 | 0.2 | 4 | 16 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0250220 | 2.5 | 0.2 | 4 | 20 | 50 | 4 |
| UXR514 0250226 | 2.5 | 0.2 | 4 | 26 | 60 | 4 |
| UXR514 0250230 | 2.5 | 0.2 | 4 | 30 | 70 | 4 |
| UXR514 0250308 | 2.5 | 0.3 | 4 | 8 | 50 | 4 |
| UXR514 0250310 | 2.5 | 0.3 | 4 | 10 | 50 | 4 |
| UXR514 0250312 | 2.5 | 0.3 | 4 | 12 | 50 | 4 |
| UXR514 0250314 | 2.5 | 0.3 | 4 | 14 | 50 | 4 |
| UXR514 0250316 | 2.5 | 0.3 | 4 | 16 | 50 | 4 |
| UXR514 0250320 | 2.5 | 0.3 | 4 | 20 | 50 | 4 |
| UXR514 0250326 | 2.5 | 0.3 | 4 | 26 | 60 | 4 |
| UXR514 0250330 | 2.5 | 0.3 | 4 | 30 | 70 | 4 |
| UXR514 0250508 | 2.5 | 0.5 | 4 | 8 | 50 | 4 |
| UXR514 0250510 | 2.5 | 0.5 | 4 | 10 | 50 | 4 |
| UXR514 0250512 | 2.5 | 0.5 | 4 | 12 | 50 | 4 |
| UXR514 0250514 | 2.5 | 0.5 | 4 | 14 | 50 | 4 |
| UXR514 0250516 | 2.5 | 0.5 | 4 | 16 | 50 | 4 |
| UXR514 0250520 | 2.5 | 0.5 | 4 | 20 | 50 | 4 |
| UXR514 0250526 | 2.5 | 0.5 | 4 | 26 | 60 | 4 |
| UXR514 0250530 | 2.5 | 0.5 | 4 | 30 | 70 | 4 |
| UXR514 0300108 | 3 | 0.1 | 4.5 | 8 | 50 | 6 |
| UXR514 0300110 | 3 | 0.1 | 4.5 | 10 | 50 | 6 |
| UXR514 0300112 | 3 | 0.1 | 4.5 | 12 | 50 | 6 |
| UXR514 0300114 | 3 | 0.1 | 4.5 | 14 | 60 | 6 |
| UXR514 0300116 | 3 | 0.1 | 4.5 | 16 | 60 | 6 |
| UXR514 0300120 | 3 | 0.1 | 4.5 | 20 | 60 | 6 |
| UXR514 0300126 | 3 | 0.1 | 4.5 | 26 | 65 | 6 |
| UXR514 0300130 | 3 | 0.1 | 4.5 | 30 | 70 | 6 |
| UXR514 0300135 | 3 | 0.1 | 4.5 | 35 | 70 | 6 |
| UXR514 0300140 | 3 | 0.1 | 4.5 | 40 | 80 | 6 |
| UXR514 0300208 | 3 | 0.2 | 4.5 | 8 | 50 | 6 |
| UXR514 0300210 | 3 | 0.2 | 4.5 | 10 | 50 | 6 |
| UXR514 0300212 | 3 | 0.2 | 4.5 | 12 | 50 | 6 |
| UXR514 0300214 | 3 | 0.2 | 4.5 | 14 | 60 | 6 |
| UXR514 0300216 | 3 | 0.2 | 4.5 | 16 | 60 | 6 |
| UXR514 0300220 | 3 | 0.2 | 4.5 | 20 | 60 | 6 |
| UXR514 0300226 | 3 | 0.2 | 4.5 | 26 | 65 | 6 |
| UXR514 0300230 | 3 | 0.2 | 4.5 | 30 | 70 | 6 |
| UXR514 0300235 | 3 | 0.2 | 4.5 | 35 | 70 | 6 |
| UXR514 0300240 | 3 | 0.2 | 4.5 | 40 | 80 | 6 |
| UXR514 0300308 | 3 | 0.3 | 4.5 | 8 | 50 | 6 |
| UXR514 0300310 | 3 | 0.3 | 4.5 | 10 | 50 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0300312 | 3 | 0.3 | 4.5 | 12 | 50 | 6 |
| UXR514 0300314 | 3 | 0.3 | 4.5 | 14 | 60 | 6 |
| UXR514 0300316 | 3 | 0.3 | 4.5 | 16 | 60 | 6 |
| UXR514 0300320 | 3 | 0.3 | 4.5 | 20 | 60 | 6 |
| UXR514 0300326 | 3 | 0.3 | 4.5 | 26 | 65 | 6 |
| UXR514 0300330 | 3 | 0.3 | 4.5 | 30 | 70 | 6 |
| UXR514 0300335 | 3 | 0.3 | 4.5 | 35 | 70 | 6 |
| UXR514 0300340 | 3 | 0.3 | 4.5 | 40 | 80 | 6 |
| UXR514 0300508 | 3 | 0.5 | 4.5 | 8 | 50 | 6 |
| UXR514 0300510 | 3 | 0.5 | 4.5 | 10 | 50 | 6 |
| UXR514 0300512 | 3 | 0.5 | 4.5 | 12 | 50 | 6 |
| UXR514 0300514 | 3 | 0.5 | 4.5 | 14 | 60 | 6 |
| UXR514 0300516 | 3 | 0.5 | 4.5 | 16 | 60 | 6 |
| UXR514 0300520 | 3 | 0.5 | 4.5 | 20 | 60 | 6 |
| UXR514 0300526 | 3 | 0.5 | 4.5 | 26 | 65 | 6 |
| UXR514 0300530 | 3 | 0.5 | 4.5 | 30 | 70 | 6 |
| UXR514 0300535 | 3 | 0.5 | 4.5 | 35 | 70 | 6 |
| UXR514 0300540 | 3 | 0.5 | 4.5 | 40 | 80 | 6 |
| UXR514 0301008 | 3 | 1 | 4.5 | 8 | 50 | 6 |
| UXR514 0301010 | 3 | 1 | 4.5 | 10 | 50 | 6 |
| UXR514 0301012 | 3 | 1 | 4.5 | 12 | 50 | 6 |
| UXR514 0301014 | 3 | 1 | 4.5 | 14 | 60 | 6 |
| UXR514 0301016 | 3 | 1 | 4.5 | 16 | 60 | 6 |
| UXR514 0301020 | 3 | 1 | 4.5 | 20 | 60 | 6 |
| UXR514 0301026 | 3 | 1 | 4.5 | 26 | 65 | 6 |
| UXR514 0301030 | 3 | 1 | 4.5 | 30 | 70 | 6 |
| UXR514 0301035 | 3 | 1 | 4.5 | 35 | 70 | 6 |
| UXR514 0301040 | 3 | 1 | 4.5 | 40 | 80 | 6 |
| UXR514 0400110 | 4 | 0.1 | 6 | 10 | 50 | 6 |
| UXR514 0400112 | 4 | 0.1 | 6 | 12 | 50 | 6 |
| UXR514 0400114 | 4 | 0.1 | 6 | 14 | 60 | 6 |
| UXR514 0400116 | 4 | 0.1 | 6 | 16 | 60 | 6 |
| UXR514 0400120 | 4 | 0.1 | 6 | 20 | 60 | 6 |
| UXR514 0400126 | 4 | 0.1 | 6 | 26 | 65 | 6 |
| UXR514 0400130 | 4 | 0.1 | 6 | 30 | 70 | 6 |
| UXR514 0400135 | 4 | 0.1 | 6 | 35 | 70 | 6 |
| UXR514 0400140 | 4 | 0.1 | 6 | 40 | 80 | 6 |
| UXR514 0400145 | 4 | 0.1 | 6 | 45 | 90 | 6 |
| UXR514 0400150 | 4 | 0.1 | 6 | 50 | 100 | 6 |
| UXR514 0400210 | 4 | 0.2 | 6 | 10 | 50 | 6 |
| UXR514 0400212 | 4 | 0.2 | 6 | 12 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0400214 | 4 | 0.2 | 6 | 14 | 60 | 6 |
| UXR514 0400216 | 4 | 0.2 | 6 | 16 | 60 | 6 |
| UXR514 0400220 | 4 | 0.2 | 6 | 20 | 60 | 6 |
| UXR514 0400226 | 4 | 0.2 | 6 | 26 | 65 | 6 |
| UXR514 0400230 | 4 | 0.2 | 6 | 30 | 70 | 6 |
| UXR514 0400235 | 4 | 0.2 | 6 | 35 | 70 | 6 |
| UXR514 0400240 | 4 | 0.2 | 6 | 40 | 80 | 6 |
| UXR514 0400245 | 4 | 0.2 | 6 | 45 | 90 | 6 |
| UXR514 0400250 | 4 | 0.2 | 6 | 50 | 100 | 6 |
| UXR514 0400310 | 4 | 0.3 | 6 | 10 | 50 | 6 |
| UXR514 0400312 | 4 | 0.3 | 6 | 12 | 50 | 6 |
| UXR514 0400314 | 4 | 0.3 | 6 | 14 | 60 | 6 |
| UXR514 0400316 | 4 | 0.3 | 6 | 16 | 60 | 6 |
| UXR514 0400320 | 4 | 0.3 | 6 | 20 | 60 | 6 |
| UXR514 0400326 | 4 | 0.3 | 6 | 26 | 65 | 6 |
| UXR514 0400330 | 4 | 0.3 | 6 | 30 | 70 | 6 |
| UXR514 0400335 | 4 | 0.3 | 6 | 35 | 70 | 6 |
| UXR514 0400340 | 4 | 0.3 | 6 | 40 | 80 | 6 |
| UXR514 0400345 | 4 | 0.3 | 6 | 45 | 90 | 6 |
| UXR514 0400350 | 4 | 0.3 | 6 | 50 | 100 | 6 |
| UXR514 0400510 | 4 | 0.5 | 6 | 10 | 50 | 6 |
| UXR514 0400512 | 4 | 0.5 | 6 | 12 | 50 | 6 |
| UXR514 0400514 | 4 | 0.5 | 6 | 14 | 60 | 6 |
| UXR514 0400516 | 4 | 0.5 | 6 | 16 | 60 | 6 |
| UXR514 0400520 | 4 | 0.5 | 6 | 20 | 60 | 6 |
| UXR514 0400526 | 4 | 0.5 | 6 | 26 | 65 | 6 |
| UXR514 0400530 | 4 | 0.5 | 6 | 30 | 70 | 6 |
| UXR514 0400535 | 4 | 0.5 | 6 | 35 | 70 | 6 |
| UXR514 0400540 | 4 | 0.5 | 6 | 40 | 80 | 6 |
| UXR514 0400545 | 4 | 0.5 | 6 | 45 | 90 | 6 |
| UXR514 0400550 | 4 | 0.5 | 6 | 50 | 100 | 6 |
| UXR514 0401010 | 4 | 1 | 6 | 10 | 50 | 6 |
| UXR514 0401012 | 4 | 1 | 6 | 12 | 50 | 6 |
| UXR514 0401014 | 4 | 1 | 6 | 14 | 60 | 6 |
| UXR514 0401016 | 4 | 1 | 6 | 16 | 60 | 6 |
| UXR514 0401020 | 4 | 1 | 6 | 20 | 60 | 6 |
| UXR514 0401026 | 4 | 1 | 6 | 26 | 65 | 6 |
| UXR514 0401030 | 4 | 1 | 6 | 30 | 70 | 6 |
| UXR514 0401035 | 4 | 1 | 6 | 35 | 70 | 6 |
| UXR514 0401040 | 4 | 1 | 6 | 40 | 80 | 6 |
| UXR514 0401045 | 4 | 1 | 6 | 45 | 90 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UXR514 | 4 FLUTES MULTI HELIX NECK RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 0401050 | 4 | 1 | 6 | 50 | 100 | 6 |
| UXR514 05001 | 5 | 0.1 | 8 | 15 | 60 | 6 |
| UXR514 05002 | 5 | 0.2 | 8 | 15 | 60 | 6 |
| UXR514 05003 | 5 | 0.3 | 8 | 15 | 60 | 6 |
| UXR514 05005 | 5 | 0.5 | 8 | 15 | 60 | 6 |
| UXR514 05010 | 5 | 1 | 8 | 15 | 60 | 6 |
| UXR514 05015 | 5 | 1.5 | 8 | 15 | 60 | 6 |
| UXR514 05020 | 5 | 2 | 8 | 15 | 60 | 6 |
| UXR514 06001 | 6 | 0.1 | 9 | 20 | 60 | 6 |
| UXR514 06002 | 6 | 0.2 | 9 | 20 | 60 | 6 |
| UXR514 06003 | 6 | 0.3 | 9 | 20 | 60 | 6 |
| UXR514 06003090 | 6 | 0.3 | 15 | 30 | 90 | 6 |
| UXR514 06005 | 6 | 0.5 | 9 | 20 | 60 | 6 |
| UXR514 06005090 | 6 | 0.5 | 15 | 30 | 90 | 6 |
| UXR514 06010 | 6 | 1 | 9 | 20 | 60 | 6 |
| UXR514 06010090 | 6 | 1 | 15 | 30 | 90 | 6 |
| UXR514 06015 | 6 | 1.5 | 9 | 20 | 60 | 6 |
| UXR514 06020 | 6 | 2 | 9 | 20 | 60 | 6 |
| UXR514 08001 | 8 | 0.1 | 12 | 25 | 70 | 8 |
| UXR514 08002 | 8 | 0.2 | 12 | 25 | 70 | 8 |
| UXR514 08003 | 8 | 0.3 | 12 | 25 | 70 | 8 |
| UXR514 08003100 | 8 | 0.3 | 20 | 35 | 100 | 8 |
| UXR514 08005 | 8 | 0.5 | 12 | 25 | 70 | 8 |
| UXR514 08005100 | 8 | 0.5 | 20 | 35 | 100 | 8 |
| UXR514 08010 | 8 | 1 | 12 | 25 | 70 | 8 |
| UXR514 08010100 | 8 | 1 | 20 | 35 | 100 | 8 |
| UXR514 08015 | 8 | 1.5 | 12 | 25 | 70 | 8 |
| UXR514 08020 | 8 | 2 | 12 | 25 | 70 | 8 |

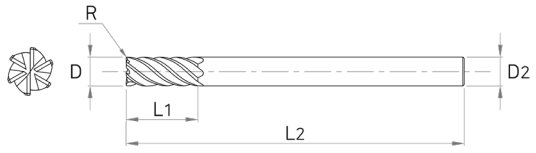
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UXR514 10001 | 10 | 0.1 | 15 | 30 | 75 | 10 |
| UXR514 10002 | 10 | 0.2 | 15 | 30 | 75 | 10 |
| UXR514 10003 | 10 | 0.3 | 15 | 30 | 75 | 10 |
| UXR514 10003100 | 10 | 0.3 | 25 | 40 | 100 | 10 |
| UXR514 10005 | 10 | 0.5 | 15 | 30 | 75 | 10 |
| UXR514 10005100 | 10 | 0.5 | 25 | 40 | 100 | 10 |
| UXR514 10010 | 10 | 1 | 15 | 30 | 75 | 10 |
| UXR514 10010100 | 10 | 1 | 25 | 40 | 100 | 10 |
| UXR514 10015 | 10 | 1.5 | 15 | 30 | 75 | 10 |
| UXR514 10020 | 10 | 2 | 15 | 30 | 75 | 10 |
| UXR514 12002 | 12 | 0.2 | 18 | 32 | 80 | 12 |
| UXR514 12003 | 12 | 0.3 | 18 | 32 | 80 | 12 |
| UXR514 12003110 | 12 | 0.3 | 30 | 45 | 110 | 12 |
| UXR514 12005 | 12 | 0.5 | 18 | 32 | 80 | 12 |
| UXR514 12005110 | 12 | 0.5 | 30 | 45 | 110 | 12 |
| UXR514 12010 | 12 | 1 | 18 | 32 | 80 | 12 |
| UXR514 12010110 | 12 | 1 | 30 | 45 | 110 | 12 |
| UXR514 12015 | 12 | 1.5 | 18 | 32 | 80 | 12 |
| UXR514 12020 | 12 | 2 | 18 | 32 | 80 | 12 |
| UXR514 16005 | 16 | 0.5 | 20 | 35 | 100 | 16 |
| UXR514 16005150 | 16 | 0.5 | 35 | 50 | 150 | 16 |
| UXR514 16010 | 16 | 1 | 20 | 35 | 100 | 16 |
| UXR514 16010150 | 16 | 1 | 35 | 50 | 150 | 16 |
| UXR514 20005 | 20 | 0.5 | 25 | 40 | 100 | 20 |
| UXR514 20005150 | 20 | 0.5 | 40 | 55 | 150 | 20 |
| UXR514 20010 | 20 | 1 | 25 | 40 | 100 | 20 |
| UXR514 20010150 | 20 | 1 | 40 | 55 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UR506 | 6 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 6 | 45° HELIX | R ±0.015 | DATA P.654

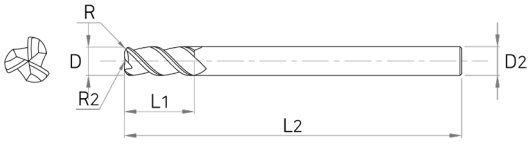
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UR506 06003 | 6 | 0.3 | 15 | 90 | 6 |
| UR506 06005 | 6 | 0.5 | 15 | 90 | 6 |
| UR506 06010 | 6 | 1 | 15 | 90 | 6 |
| UR506 08003 | 8 | 0.3 | 20 | 100 | 8 |
| UR506 08005 | 8 | 0.5 | 20 | 100 | 8 |
| UR506 08010 | 8 | 1 | 20 | 100 | 8 |
| UR506 10003 | 10 | 0.3 | 25 | 100 | 10 |
| UR506 10005 | 10 | 0.5 | 25 | 100 | 10 |
| UR506 10010 | 10 | 1 | 25 | 100 | 10 |
| UR506 12003 | 12 | 0.3 | 30 | 110 | 12 |
| UR506 12005 | 12 | 0.5 | 30 | 110 | 12 |
| UR506 12010 | 12 | 1 | 30 | 110 | 12 |
| UR506 16005 | 16 | 0.5 | 32 | 150 | 16 |
| UR506 16010 | 16 | 1 | 32 | 150 | 16 |
| UR506 16015 | 16 | 1.5 | 32 | 150 | 16 |
| UR506 16020 | 16 | 2 | 32 | 150 | 16 |
| UR506 20005 | 20 | 0.5 | 38 | 150 | 20 |
| UR506 20010 | 20 | 1 | 38 | 150 | 20 |
| UR506 20015 | 20 | 1.5 | 38 | 150 | 20 |
| UR506 20020 | 20 | 2 | 38 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UDR503 | 3 FLUTES DOUBLE RADIUS ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 ~ 20 | 0 ~ -0.02 | h5 |

CARBIDE | AlCrN | 3 | 45° HELIX | R ±0.02 | DATA P.655

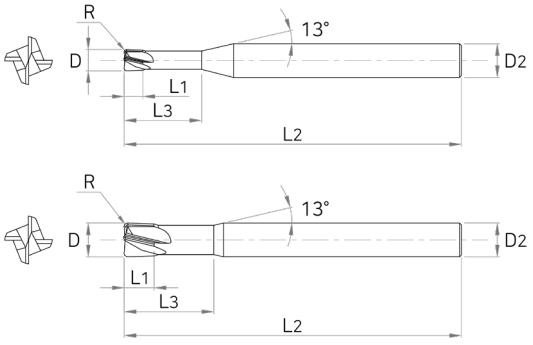
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | R2 | L1 | L2 | D2 |
| UDR503 06005 | 6 | 0.5 | 6 | 10 | 90 | 6 |
| UDR503 06010 | 6 | 1 | 6 | 10 | 90 | 6 |
| UDR503 06020 | 6 | 2 | 6 | 10 | 90 | 6 |
| UDR503 08005 | 8 | 0.5 | 8 | 16 | 100 | 8 |
| UDR503 08010 | 8 | 1 | 8 | 16 | 100 | 8 |
| UDR503 08020 | 8 | 2 | 8 | 16 | 100 | 8 |
| UDR503 10005 | 10 | 0.5 | 10 | 20 | 100 | 10 |
| UDR503 10010 | 10 | 1 | 10 | 20 | 100 | 10 |
| UDR503 10020 | 10 | 2 | 10 | 20 | 100 | 10 |
| UDR503 12005 | 12 | 0.5 | 12 | 24 | 110 | 12 |
| UDR503 12010 | 12 | 1 | 12 | 24 | 110 | 12 |
| UDR503 12020 | 12 | 2 | 12 | 24 | 110 | 12 |
| UDR503 16005 | 16 | 0.5 | 16 | 32 | 150 | 16 |
| UDR503 16010 | 16 | 1 | 16 | 32 | 150 | 16 |
| UDR503 20005 | 20 | 0.5 | 20 | 40 | 150 | 20 |
| UDR503 20010 | 20 | 1 | 20 | 40 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# USPM4 | 4 FLUTES RADIUS ENDMILL FOR HIGH SPEED




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 20 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 10° HELIX | R ±0.02 | DATA P.656

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| USPM4 010-01 | 1 | 0.1 | 1 | 2.5 | 50 | 6 |
| USPM4 010-02 | 1 | 0.2 | 1 | 2.5 | 50 | 6 |
| USPM4 010-03 | 1 | 0.3 | 1 | 2.5 | 50 | 6 |
| USPM4 015-02 | 1.5 | 0.2 | 1.5 | 4 | 50 | 6 |
| USPM4 015-03 | 1.5 | 0.3 | 1.5 | 4 | 50 | 6 |
| USPM4 015-05 | 1.5 | 0.5 | 1.5 | 4 | 50 | 6 |
| USPM4 020-02 | 2 | 0.2 | 2 | 6 | 50 | 6 |
| USPM4 020-03 | 2 | 0.3 | 2 | 6 | 50 | 6 |
| USPM4 020-05 | 2 | 0.5 | 2 | 6 | 50 | 6 |
| USPM4 030-02 | 3 | 0.2 | 3 | 8 | 50 | 6 |
| USPM4 030-03 | 3 | 0.3 | 3 | 8 | 50 | 6 |
| USPM4 030-05 | 3 | 0.5 | 3 | 8 | 50 | 6 |
| USPM4 040-02 | 4 | 0.2 | 4 | 10 | 50 | 6 |
| USPM4 040-03 | 4 | 0.3 | 4 | 10 | 50 | 6 |
| USPM4 040-05 | 4 | 0.5 | 4 | 10 | 50 | 6 |
| USPM4 040-10 | 4 | 1 | 4 | 10 | 50 | 6 |
| USPM4 060-02 | 6 | 0.2 | 6 | 15 | 60 | 6 |
| USPM4 060-02L | 6 | 0.2 | 6 | 15 | 90 | 6 |
| USPM4 060-03 | 6 | 0.3 | 6 | 15 | 60 | 6 |
| USPM4 060-03L | 6 | 0.3 | 6 | 15 | 90 | 6 |
| USPM4 060-05 | 6 | 0.5 | 6 | 15 | 60 | 6 |
| USPM4 060-05L | 6 | 0.5 | 6 | 15 | 90 | 6 |
| USPM4 060-10 | 6 | 1 | 6 | 15 | 60 | 6 |
| USPM4 060-10L | 6 | 1 | 6 | 15 | 90 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| USPM4 060-20 | 6 | 2 | 6 | 15 | 60 | 6 |
| USPM4 060-20L | 6 | 2 | 6 | 15 | 90 | 6 |
| USPM4 080-02 | 8 | 0.2 | 8 | 20 | 70 | 8 |
| USPM4 080-02L | 8 | 0.2 | 8 | 20 | 100 | 8 |
| USPM4 080-03 | 8 | 0.3 | 8 | 20 | 70 | 8 |
| USPM4 080-03L | 8 | 0.3 | 8 | 20 | 100 | 8 |
| USPM4 080-05 | 8 | 0.5 | 8 | 20 | 70 | 8 |
| USPM4 080-05L | 8 | 0.5 | 8 | 20 | 100 | 8 |
| USPM4 080-10 | 8 | 1 | 8 | 20 | 70 | 8 |
| USPM4 080-10L | 8 | 1 | 8 | 20 | 100 | 8 |
| USPM4 080-20 | 8 | 2 | 8 | 20 | 70 | 8 |
| USPM4 080-20L | 8 | 2 | 8 | 20 | 100 | 8 |
| USPM4 100-02 | 10 | 0.2 | 10 | 25 | 75 | 10 |
| USPM4 100-02L | 10 | 0.2 | 10 | 25 | 100 | 10 |
| USPM4 100-03 | 10 | 0.3 | 10 | 25 | 75 | 10 |
| USPM4 100-03L | 10 | 0.3 | 10 | 25 | 100 | 10 |
| USPM4 100-05 | 10 | 0.5 | 10 | 25 | 75 | 10 |
| USPM4 100-05L | 10 | 0.5 | 10 | 25 | 100 | 10 |
| USPM4 100-10 | 10 | 1 | 10 | 25 | 75 | 10 |
| USPM4 100-10L | 10 | 1 | 10 | 25 | 100 | 10 |
| USPM4 100-15 | 10 | 1.5 | 10 | 25 | 75 | 10 |
| USPM4 100-15L | 10 | 1.5 | 10 | 25 | 100 | 10 |
| USPM4 100-20 | 10 | 2 | 10 | 25 | 75 | 10 |
| USPM4 100-20L | 10 | 2 | 10 | 25 | 100 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# USPM4 | 4 FLUTES RADIUS ENDMILL FOR HIGH SPEED

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| USPM4 120-03 | 12 | 0.3 | 12 | 30 | 80 | 12 |
| USPM4 120-03L | 12 | 0.3 | 12 | 30 | 110 | 12 |
| USPM4 120-05 | 12 | 0.5 | 12 | 30 | 80 | 12 |
| USPM4 120-05L | 12 | 0.5 | 12 | 30 | 110 | 12 |
| USPM4 120-10 | 12 | 1 | 12 | 30 | 80 | 12 |
| USPM4 120-10L | 12 | 1 | 12 | 30 | 110 | 12 |
| USPM4 120-15 | 12 | 1.5 | 12 | 30 | 80 | 12 |
| USPM4 120-15L | 12 | 1.5 | 12 | 30 | 110 | 12 |
| USPM4 120-20 | 12 | 2 | 12 | 30 | 80 | 12 |
| USPM4 120-20L | 12 | 2 | 12 | 30 | 110 | 12 |
| USPM4 120-30 | 12 | 3 | 12 | 30 | 80 | 12 |
| USPM4 120-30L | 12 | 3 | 12 | 30 | 110 | 12 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| USPM4 160-05 | 16 | 0.5 | 16 | 35 | 100 | 16 |
| USPM4 160-05L | 16 | 0.5 | 16 | 35 | 150 | 16 |
| USPM4 160-10 | 16 | 1 | 16 | 35 | 100 | 16 |
| USPM4 160-10L | 16 | 1 | 16 | 35 | 150 | 16 |
| USPM4 160-20 | 16 | 2 | 16 | 35 | 100 | 16 |
| USPM4 160-20L | 16 | 2 | 16 | 35 | 150 | 16 |
| USPM4 200-05 | 20 | 0.5 | 20 | 40 | 100 | 20 |
| USPM4 200-05L | 20 | 0.5 | 20 | 40 | 150 | 20 |
| USPM4 200-10 | 20 | 1 | 20 | 40 | 100 | 20 |
| USPM4 200-10L | 20 | 1 | 20 | 40 | 150 | 20 |
| USPM4 200-20 | 20 | 2 | 20 | 40 | 100 | 20 |
| USPM4 200-20L | 20 | 2 | 20 | 40 | 150 | 20 |

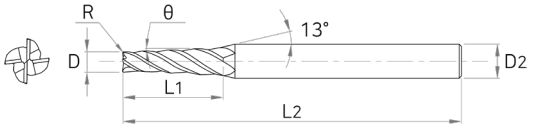


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.8 ~ 2.5 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.01 | DATA P.656

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 008010104 | 0.8 | 0.1 | 4 | 1 | 45 | 4 |
| UTR504 008010106 | 0.8 | 0.1 | 6 | 1 | 45 | 4 |
| UTR504 008010108 | 0.8 | 0.1 | 8 | 1 | 45 | 4 |
| UTR504 0080101504 | 0.8 | 0.1 | 4 | 1.5 | 45 | 4 |
| UTR504 0080101506 | 0.8 | 0.1 | 6 | 1.5 | 45 | 4 |
| UTR504 0080101508 | 0.8 | 0.1 | 8 | 1.5 | 45 | 4 |
| UTR504 008020104 | 0.8 | 0.2 | 4 | 1 | 45 | 4 |
| UTR504 008020106 | 0.8 | 0.2 | 6 | 1 | 45 | 4 |
| UTR504 008020108 | 0.8 | 0.2 | 8 | 1 | 45 | 4 |
| UTR504 0080201504 | 0.8 | 0.2 | 4 | 1.5 | 45 | 4 |
| UTR504 0080201506 | 0.8 | 0.2 | 6 | 1.5 | 45 | 4 |
| UTR504 0080201508 | 0.8 | 0.2 | 8 | 1.5 | 45 | 4 |
| UTR504 010010104 | 1 | 0.1 | 4 | 1 | 50 | 4 |
| UTR504 010010106 | 1 | 0.1 | 6 | 1 | 50 | 4 |
| UTR504 010010108 | 1 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 010010110 | 1 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 010010112 | 1 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 0100101504 | 1 | 0.1 | 4 | 1.5 | 50 | 4 |
| UTR504 0100101506 | 1 | 0.1 | 6 | 1.5 | 50 | 4 |
| UTR504 0100101508 | 1 | 0.1 | 8 | 1.5 | 50 | 4 |
| UTR504 0100101510 | 1 | 0.1 | 10 | 1.5 | 50 | 4 |
| UTR504 0100101512 | 1 | 0.1 | 12 | 1.5 | 50 | 4 |
| UTR504 010010204 | 1 | 0.1 | 4 | 2 | 50 | 4 |
| UTR504 010010206 | 1 | 0.1 | 6 | 2 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 010010208 | 1 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 010010210 | 1 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 010010212 | 1 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 010010304 | 1 | 0.1 | 4 | 3 | 50 | 4 |
| UTR504 010010306 | 1 | 0.1 | 6 | 3 | 50 | 4 |
| UTR504 010010308 | 1 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 010010310 | 1 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 010010312 | 1 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 010020104 | 1 | 0.2 | 4 | 1 | 50 | 4 |
| UTR504 010020106 | 1 | 0.2 | 6 | 1 | 50 | 4 |
| UTR504 010020108 | 1 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 010020110 | 1 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 010020112 | 1 | 0.2 | 12 | 1 | 50 | 4 |
| UTR504 0100201504 | 1 | 0.2 | 4 | 1.5 | 50 | 4 |
| UTR504 0100201506 | 1 | 0.2 | 6 | 1.5 | 50 | 4 |
| UTR504 0100201508 | 1 | 0.2 | 8 | 1.5 | 50 | 4 |
| UTR504 0100201510 | 1 | 0.2 | 10 | 1.5 | 50 | 4 |
| UTR504 0100201512 | 1 | 0.2 | 12 | 1.5 | 50 | 4 |
| UTR504 010020204 | 1 | 0.2 | 4 | 2 | 50 | 4 |
| UTR504 010020206 | 1 | 0.2 | 6 | 2 | 50 | 4 |
| UTR504 010020208 | 1 | 0.2 | 8 | 2 | 50 | 4 |
| UTR504 010020210 | 1 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 010020212 | 1 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 010020304 | 1 | 0.2 | 4 | 3 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 010020306 | 1 | 0.2 | 6 | 3 | 50 | 4 |
| UTR504 010020308 | 1 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 010020310 | 1 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 010020312 | 1 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 010030104 | 1 | 0.3 | 4 | 1 | 50 | 4 |
| UTR504 010030106 | 1 | 0.3 | 6 | 1 | 50 | 4 |
| UTR504 010030108 | 1 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 010030110 | 1 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 010030112 | 1 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 0100301504 | 1 | 0.3 | 4 | 1.5 | 50 | 4 |
| UTR504 0100301506 | 1 | 0.3 | 6 | 1.5 | 50 | 4 |
| UTR504 0100301508 | 1 | 0.3 | 8 | 1.5 | 50 | 4 |
| UTR504 0100301510 | 1 | 0.3 | 10 | 1.5 | 50 | 4 |
| UTR504 0100301512 | 1 | 0.3 | 12 | 1.5 | 50 | 4 |
| UTR504 010030204 | 1 | 0.3 | 4 | 2 | 50 | 4 |
| UTR504 010030206 | 1 | 0.3 | 6 | 2 | 50 | 4 |
| UTR504 010030208 | 1 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 010030210 | 1 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 010030212 | 1 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 010030304 | 1 | 0.3 | 4 | 3 | 50 | 4 |
| UTR504 010030306 | 1 | 0.3 | 6 | 3 | 50 | 4 |
| UTR504 010030308 | 1 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 010030310 | 1 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 010030312 | 1 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 012010106 | 1.2 | 0.1 | 6 | 1 | 50 | 4 |
| UTR504 012010108 | 1.2 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 012010110 | 1.2 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 012010112 | 1.2 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 012010206 | 1.2 | 0.1 | 6 | 2 | 50 | 4 |
| UTR504 012010208 | 1.2 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 012010210 | 1.2 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 012010212 | 1.2 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 012010306 | 1.2 | 0.1 | 6 | 3 | 50 | 4 |
| UTR504 012010308 | 1.2 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 012010310 | 1.2 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 012010312 | 1.2 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 012020106 | 1.2 | 0.2 | 6 | 1 | 50 | 4 |
| UTR504 012020108 | 1.2 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 012020110 | 1.2 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 012020112 | 1.2 | 0.2 | 12 | 1 | 50 | 4 |
| UTR504 012020206 | 1.2 | 0.2 | 6 | 2 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 012020208 | 1.2 | 0.2 | 8 | 2 | 50 | 4 |
| UTR504 012020210 | 1.2 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 012020212 | 1.2 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 012020306 | 1.2 | 0.2 | 6 | 3 | 50 | 4 |
| UTR504 012020308 | 1.2 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 012020310 | 1.2 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 012020312 | 1.2 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 012030106 | 1.2 | 0.3 | 6 | 1 | 50 | 4 |
| UTR504 012030108 | 1.2 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 012030110 | 1.2 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 012030112 | 1.2 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 012030206 | 1.2 | 0.3 | 6 | 2 | 50 | 4 |
| UTR504 012030208 | 1.2 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 012030210 | 1.2 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 012030212 | 1.2 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 012030306 | 1.2 | 0.3 | 6 | 3 | 50 | 4 |
| UTR504 012030308 | 1.2 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 012030310 | 1.2 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 012030312 | 1.2 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 015010106 | 1.5 | 0.1 | 6 | 1 | 50 | 4 |
| UTR504 015010108 | 1.5 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 015010110 | 1.5 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 015010112 | 1.5 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 015010116 | 1.5 | 0.1 | 16 | 1 | 50 | 4 |
| UTR504 015010120 | 1.5 | 0.1 | 20 | 1 | 60 | 4 |
| UTR504 015010206 | 1.5 | 0.1 | 6 | 2 | 50 | 4 |
| UTR504 015010208 | 1.5 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 015010210 | 1.5 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 015010212 | 1.5 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 015010216 | 1.5 | 0.1 | 16 | 2 | 50 | 4 |
| UTR504 015010220 | 1.5 | 0.1 | 20 | 2 | 60 | 4 |
| UTR504 015010306 | 1.5 | 0.1 | 6 | 3 | 50 | 4 |
| UTR504 015010308 | 1.5 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 015010310 | 1.5 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 015010312 | 1.5 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 015010316 | 1.5 | 0.1 | 16 | 3 | 50 | 4 |
| UTR504 015010320 | 1.5 | 0.1 | 20 | 3 | 60 | 4 |
| UTR504 015020106 | 1.5 | 0.2 | 6 | 1 | 50 | 4 |
| UTR504 015020108 | 1.5 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 015020110 | 1.5 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 015020112 | 1.5 | 0.2 | 12 | 1 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 015020116 | 1.5 | 0.2 | 16 | 1 | 50 | 4 |
| UTR504 015020120 | 1.5 | 0.2 | 20 | 1 | 60 | 4 |
| UTR504 015020206 | 1.5 | 0.2 | 6 | 2 | 50 | 4 |
| UTR504 015020208 | 1.5 | 0.2 | 8 | 2 | 50 | 4 |
| UTR504 015020210 | 1.5 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 015020212 | 1.5 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 015020216 | 1.5 | 0.2 | 16 | 2 | 50 | 4 |
| UTR504 015020220 | 1.5 | 0.2 | 20 | 2 | 60 | 4 |
| UTR504 015020306 | 1.5 | 0.2 | 6 | 3 | 50 | 4 |
| UTR504 015020308 | 1.5 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 015020310 | 1.5 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 015020312 | 1.5 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 015020316 | 1.5 | 0.2 | 16 | 3 | 50 | 4 |
| UTR504 015020320 | 1.5 | 0.2 | 20 | 3 | 60 | 4 |
| UTR504 015030106 | 1.5 | 0.3 | 6 | 1 | 50 | 4 |
| UTR504 015030108 | 1.5 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 015030110 | 1.5 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 015030112 | 1.5 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 015030116 | 1.5 | 0.3 | 16 | 1 | 50 | 4 |
| UTR504 015030120 | 1.5 | 0.3 | 20 | 1 | 60 | 4 |
| UTR504 015030206 | 1.5 | 0.3 | 6 | 2 | 50 | 4 |
| UTR504 015030208 | 1.5 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 015030210 | 1.5 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 015030212 | 1.5 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 015030216 | 1.5 | 0.3 | 16 | 2 | 50 | 4 |
| UTR504 015030220 | 1.5 | 0.3 | 20 | 2 | 60 | 4 |
| UTR504 015030306 | 1.5 | 0.3 | 6 | 3 | 50 | 4 |
| UTR504 015030308 | 1.5 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 015030310 | 1.5 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 015030312 | 1.5 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 015030316 | 1.5 | 0.3 | 16 | 3 | 50 | 4 |
| UTR504 015030320 | 1.5 | 0.3 | 20 | 3 | 60 | 4 |
| UTR504 020010108 | 2 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 020010110 | 2 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 020010112 | 2 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 020010116 | 2 | 0.1 | 16 | 1 | 50 | 4 |
| UTR504 020010120 | 2 | 0.1 | 20 | 1 | 60 | 4 |
| UTR504 020010125 | 2 | 0.1 | 25 | 1 | 60 | 4 |
| UTR504 020010208 | 2 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 020010210 | 2 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 020010212 | 2 | 0.1 | 12 | 2 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 020010216 | 2 | 0.1 | 16 | 2 | 50 | 4 |
| UTR504 020010220 | 2 | 0.1 | 20 | 2 | 60 | 4 |
| UTR504 020010225 | 2 | 0.1 | 25 | 2 | 60 | 4 |
| UTR504 020010308 | 2 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 020010310 | 2 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 020010312 | 2 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 020010316 | 2 | 0.1 | 16 | 3 | 50 | 4 |
| UTR504 020010320 | 2 | 0.1 | 20 | 3 | 60 | 6 |
| UTR504 020010325 | 2 | 0.1 | 25 | 3 | 60 | 6 |
| UTR504 020020108 | 2 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 020020110 | 2 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 020020112 | 2 | 0.2 | 12 | 1 | 50 | 4 |
| UTR504 020020116 | 2 | 0.2 | 16 | 1 | 50 | 4 |
| UTR504 020020120 | 2 | 0.2 | 20 | 1 | 60 | 4 |
| UTR504 020020125 | 2 | 0.2 | 25 | 1 | 60 | 4 |
| UTR504 020020208 | 2 | 0.2 | 8 | 2 | 50 | 4 |
| UTR504 020020210 | 2 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 020020212 | 2 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 020020216 | 2 | 0.2 | 16 | 2 | 50 | 4 |
| UTR504 020020220 | 2 | 0.2 | 20 | 2 | 60 | 4 |
| UTR504 020020225 | 2 | 0.2 | 25 | 2 | 60 | 4 |
| UTR504 020020308 | 2 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 020020310 | 2 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 020020312 | 2 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 020020316 | 2 | 0.2 | 16 | 3 | 50 | 4 |
| UTR504 020020320 | 2 | 0.2 | 20 | 3 | 60 | 6 |
| UTR504 020020325 | 2 | 0.2 | 25 | 3 | 60 | 6 |
| UTR504 020030108 | 2 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 020030110 | 2 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 020030112 | 2 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 020030116 | 2 | 0.3 | 16 | 1 | 50 | 4 |
| UTR504 020030120 | 2 | 0.3 | 20 | 1 | 60 | 4 |
| UTR504 020030125 | 2 | 0.3 | 25 | 1 | 60 | 4 |
| UTR504 020030208 | 2 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 020030210 | 2 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 020030212 | 2 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 020030216 | 2 | 0.3 | 16 | 2 | 50 | 4 |
| UTR504 020030220 | 2 | 0.3 | 20 | 2 | 60 | 4 |
| UTR504 020030225 | 2 | 0.3 | 25 | 2 | 60 | 4 |
| UTR504 020030308 | 2 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 020030310 | 2 | 0.3 | 10 | 3 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 010020306 | 1 | 0.2 | 6 | 3 | 50 | 4 |
| UTR504 010020308 | 1 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 010020310 | 1 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 010020312 | 1 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 010030104 | 1 | 0.3 | 4 | 1 | 50 | 4 |
| UTR504 010030106 | 1 | 0.3 | 6 | 1 | 50 | 4 |
| UTR504 010030108 | 1 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 010030110 | 1 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 010030112 | 1 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 0100301504 | 1 | 0.3 | 4 | 1.5 | 50 | 4 |
| UTR504 0100301506 | 1 | 0.3 | 6 | 1.5 | 50 | 4 |
| UTR504 0100301508 | 1 | 0.3 | 8 | 1.5 | 50 | 4 |
| UTR504 0100301510 | 1 | 0.3 | 10 | 1.5 | 50 | 4 |
| UTR504 0100301512 | 1 | 0.3 | 12 | 1.5 | 50 | 4 |
| UTR504 010030204 | 1 | 0.3 | 4 | 2 | 50 | 4 |
| UTR504 010030206 | 1 | 0.3 | 6 | 2 | 50 | 4 |
| UTR504 010030208 | 1 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 010030210 | 1 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 010030212 | 1 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 010030304 | 1 | 0.3 | 4 | 3 | 50 | 4 |
| UTR504 010030306 | 1 | 0.3 | 6 | 3 | 50 | 4 |
| UTR504 010030308 | 1 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 010030310 | 1 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 010030312 | 1 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 012010106 | 1.2 | 0.1 | 6 | 1 | 50 | 4 |
| UTR504 012010108 | 1.2 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 012010110 | 1.2 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 012010112 | 1.2 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 012010206 | 1.2 | 0.1 | 6 | 2 | 50 | 4 |
| UTR504 012010208 | 1.2 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 012010210 | 1.2 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 012010212 | 1.2 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 012010306 | 1.2 | 0.1 | 6 | 3 | 50 | 4 |
| UTR504 012010308 | 1.2 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 012010310 | 1.2 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 012010312 | 1.2 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 012020106 | 1.2 | 0.2 | 6 | 1 | 50 | 4 |
| UTR504 012020108 | 1.2 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 012020110 | 1.2 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 012020112 | 1.2 | 0.2 | 12 | 1 | 50 | 4 |
| UTR504 012020206 | 1.2 | 0.2 | 6 | 2 | 50 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 012020208 | 1.2 | 0.2 | 8 | 2 | 50 | 4 |
| UTR504 012020210 | 1.2 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 012020212 | 1.2 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 012020306 | 1.2 | 0.2 | 6 | 3 | 50 | 4 |
| UTR504 012020308 | 1.2 | 0.2 | 8 | 3 | 50 | 4 |
| UTR504 012020310 | 1.2 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 012020312 | 1.2 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 012030106 | 1.2 | 0.3 | 6 | 1 | 50 | 4 |
| UTR504 012030108 | 1.2 | 0.3 | 8 | 1 | 50 | 4 |
| UTR504 012030110 | 1.2 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 012030112 | 1.2 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 012030206 | 1.2 | 0.3 | 6 | 2 | 50 | 4 |
| UTR504 012030208 | 1.2 | 0.3 | 8 | 2 | 50 | 4 |
| UTR504 012030210 | 1.2 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 012030212 | 1.2 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 012030306 | 1.2 | 0.3 | 6 | 3 | 50 | 4 |
| UTR504 012030308 | 1.2 | 0.3 | 8 | 3 | 50 | 4 |
| UTR504 012030310 | 1.2 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 012030312 | 1.2 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 015010106 | 1.5 | 0.1 | 6 | 1 | 50 | 4 |
| UTR504 015010108 | 1.5 | 0.1 | 8 | 1 | 50 | 4 |
| UTR504 015010110 | 1.5 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 015010112 | 1.5 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 015010116 | 1.5 | 0.1 | 16 | 1 | 50 | 4 |
| UTR504 015010120 | 1.5 | 0.1 | 20 | 1 | 60 | 4 |
| UTR504 015010206 | 1.5 | 0.1 | 6 | 2 | 50 | 4 |
| UTR504 015010208 | 1.5 | 0.1 | 8 | 2 | 50 | 4 |
| UTR504 015010210 | 1.5 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 015010212 | 1.5 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 015010216 | 1.5 | 0.1 | 16 | 2 | 50 | 4 |
| UTR504 015010220 | 1.5 | 0.1 | 20 | 2 | 60 | 4 |
| UTR504 015010306 | 1.5 | 0.1 | 6 | 3 | 50 | 4 |
| UTR504 015010308 | 1.5 | 0.1 | 8 | 3 | 50 | 4 |
| UTR504 015010310 | 1.5 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 015010312 | 1.5 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 015010316 | 1.5 | 0.1 | 16 | 3 | 50 | 4 |
| UTR504 015010320 | 1.5 | 0.1 | 20 | 3 | 60 | 4 |
| UTR504 015020106 | 1.5 | 0.2 | 6 | 1 | 50 | 4 |
| UTR504 015020108 | 1.5 | 0.2 | 8 | 1 | 50 | 4 |
| UTR504 015020110 | 1.5 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 015020112 | 1.5 | 0.2 | 12 | 1 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTR504 | 4 FLUTES TAPERED RADIUS ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 020030312 | 2 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 020030316 | 2 | 0.3 | 16 | 3 | 50 | 4 |
| UTR504 020030320 | 2 | 0.3 | 20 | 3 | 60 | 6 |
| UTR504 020030325 | 2 | 0.3 | 25 | 3 | 60 | 6 |
| UTR504 025010110 | 2.5 | 0.1 | 10 | 1 | 50 | 4 |
| UTR504 025010112 | 2.5 | 0.1 | 12 | 1 | 50 | 4 |
| UTR504 025010116 | 2.5 | 0.1 | 16 | 1 | 50 | 4 |
| UTR504 025010120 | 2.5 | 0.1 | 20 | 1 | 60 | 4 |
| UTR504 025010125 | 2.5 | 0.1 | 25 | 1 | 60 | 4 |
| UTR504 025010130 | 2.5 | 0.1 | 30 | 1 | 60 | 4 |
| UTR504 025010210 | 2.5 | 0.1 | 10 | 2 | 50 | 4 |
| UTR504 025010212 | 2.5 | 0.1 | 12 | 2 | 50 | 4 |
| UTR504 025010216 | 2.5 | 0.1 | 16 | 2 | 50 | 4 |
| UTR504 025010220 | 2.5 | 0.1 | 20 | 2 | 60 | 4 |
| UTR504 025010225 | 2.5 | 0.1 | 25 | 2 | 60 | 6 |
| UTR504 025010230 | 2.5 | 0.1 | 30 | 2 | 60 | 6 |
| UTR504 025010310 | 2.5 | 0.1 | 10 | 3 | 50 | 4 |
| UTR504 025010312 | 2.5 | 0.1 | 12 | 3 | 50 | 4 |
| UTR504 025010316 | 2.5 | 0.1 | 16 | 3 | 50 | 6 |
| UTR504 025010320 | 2.5 | 0.1 | 20 | 3 | 60 | 6 |
| UTR504 025010325 | 2.5 | 0.1 | 25 | 3 | 60 | 6 |
| UTR504 025010330 | 2.5 | 0.1 | 30 | 3 | 60 | 6 |
| UTR504 025020110 | 2.5 | 0.2 | 10 | 1 | 50 | 4 |
| UTR504 025020112 | 2.5 | 0.2 | 12 | 1 | 50 | 4 |
| UTR504 025020116 | 2.5 | 0.2 | 16 | 1 | 50 | 4 |
| UTR504 025020120 | 2.5 | 0.2 | 20 | 1 | 60 | 4 |
| UTR504 025020125 | 2.5 | 0.2 | 25 | 1 | 60 | 4 |
| UTR504 025020130 | 2.5 | 0.2 | 30 | 1 | 60 | 4 |
| UTR504 025020210 | 2.5 | 0.2 | 10 | 2 | 50 | 4 |
| UTR504 025020212 | 2.5 | 0.2 | 12 | 2 | 50 | 4 |

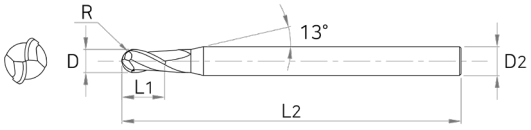
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | θ | L2 | D2 |
| UTR504 025020212 | 2.5 | 0.2 | 12 | 2 | 50 | 4 |
| UTR504 025020216 | 2.5 | 0.2 | 16 | 2 | 50 | 4 |
| UTR504 025020220 | 2.5 | 0.2 | 20 | 2 | 60 | 4 |
| UTR504 025020225 | 2.5 | 0.2 | 25 | 2 | 60 | 6 |
| UTR504 025020230 | 2.5 | 0.2 | 30 | 2 | 60 | 6 |
| UTR504 025020310 | 2.5 | 0.2 | 10 | 3 | 50 | 4 |
| UTR504 025020312 | 2.5 | 0.2 | 12 | 3 | 50 | 4 |
| UTR504 025020316 | 2.5 | 0.2 | 16 | 3 | 50 | 6 |
| UTR504 025020320 | 2.5 | 0.2 | 20 | 3 | 60 | 6 |
| UTR504 025020325 | 2.5 | 0.2 | 25 | 3 | 60 | 6 |
| UTR504 025020330 | 2.5 | 0.2 | 30 | 3 | 60 | 6 |
| UTR504 025030110 | 2.5 | 0.3 | 10 | 1 | 50 | 4 |
| UTR504 025030112 | 2.5 | 0.3 | 12 | 1 | 50 | 4 |
| UTR504 025030116 | 2.5 | 0.3 | 16 | 1 | 50 | 4 |
| UTR504 025030120 | 2.5 | 0.3 | 20 | 1 | 60 | 4 |
| UTR504 025030125 | 2.5 | 0.3 | 25 | 1 | 60 | 4 |
| UTR504 025030130 | 2.5 | 0.3 | 30 | 1 | 60 | 4 |
| UTR504 025030210 | 2.5 | 0.3 | 10 | 2 | 50 | 4 |
| UTR504 025030212 | 2.5 | 0.3 | 12 | 2 | 50 | 4 |
| UTR504 025030216 | 2.5 | 0.3 | 16 | 2 | 50 | 4 |
| UTR504 025030220 | 2.5 | 0.3 | 20 | 2 | 60 | 4 |
| UTR504 025030225 | 2.5 | 0.3 | 25 | 2 | 60 | 6 |
| UTR504 025030230 | 2.5 | 0.3 | 30 | 2 | 60 | 6 |
| UTR504 025030310 | 2.5 | 0.3 | 10 | 3 | 50 | 4 |
| UTR504 025030312 | 2.5 | 0.3 | 12 | 3 | 50 | 4 |
| UTR504 025030316 | 2.5 | 0.3 | 16 | 3 | 50 | 6 |
| UTR504 025030320 | 2.5 | 0.3 | 20 | 3 | 60 | 6 |
| UTR504 025030325 | 2.5 | 0.3 | 25 | 3 | 60 | 6 |
| UTR504 025030330 | 2.5 | 0.3 | 30 | 3 | 60 | 6 |

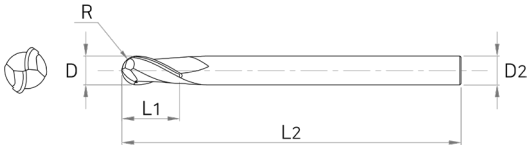
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

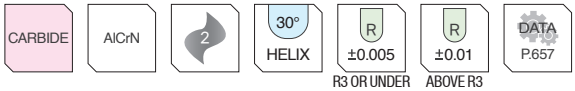
# UB502 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D6.5 ~ 25 | 0 ~ -0.015 | |




| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 001S | 0.1 | 0.05 | 0.1 | 40 | 4 |
| UB502 001 | 0.1 | 0.05 | 0.2 | 40 | 4 |
| UB502 001S3 | 0.1 | 0.05 | 0.2 | 40 | 3 |
| UB502 0015S | 0.15 | 0.075 | 0.15 | 40 | 4 |
| UB502 0015 | 0.15 | 0.075 | 0.3 | 40 | 4 |
| UB502 0015S3 | 0.15 | 0.075 | 0.3 | 40 | 3 |
| UB502 002S | 0.2 | 0.1 | 0.2 | 40 | 4 |
| UB502 002 | 0.2 | 0.1 | 0.4 | 40 | 4 |
| UB502 002S3 | 0.2 | 0.1 | 0.4 | 40 | 3 |
| UB502 003S | 0.3 | 0.15 | 0.3 | 40 | 4 |
| UB502 003 | 0.3 | 0.15 | 0.6 | 40 | 4 |
| UB502 003S3 | 0.3 | 0.15 | 0.6 | 40 | 3 |
| UB502 004S | 0.4 | 0.2 | 0.4 | 40 | 4 |
| UB502 004 | 0.4 | 0.2 | 0.8 | 40 | 4 |
| UB502 004S3 | 0.4 | 0.2 | 0.8 | 40 | 3 |
| UB502 005S | 0.5 | 0.25 | 0.5 | 40 | 4 |
| UB502 005 | 0.5 | 0.25 | 1 | 40 | 4 |
| UB502 005S3 | 0.5 | 0.25 | 1 | 40 | 3 |
| UB502 006S | 0.6 | 0.3 | 0.6 | 40 | 4 |
| UB502 006 | 0.6 | 0.3 | 1.2 | 40 | 4 |
| UB502 006S3 | 0.6 | 0.3 | 1.2 | 40 | 3 |
| UB502 007S | 0.7 | 0.35 | 0.7 | 40 | 4 |
| UB502 007 | 0.7 | 0.35 | 1.4 | 40 | 4 |
| UB502 007S3 | 0.7 | 0.35 | 1.4 | 40 | 3 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 008S | 0.8 | 0.4 | 0.8 | 40 | 4 |
| UB502 008 | 0.8 | 0.4 | 1.6 | 40 | 4 |
| UB502 008S3 | 0.8 | 0.4 | 1.6 | 40 | 3 |
| UB502 009S | 0.9 | 0.45 | 0.9 | 40 | 4 |
| UB502 009 | 0.9 | 0.45 | 1.8 | 40 | 4 |
| UB502 009S3 | 0.9 | 0.45 | 1.8 | 40 | 3 |
| UB502 010S | 1 | 0.5 | 1.5 | 40 | 6 |
| UB502 010S3 | 1 | 0.5 | 2.5 | 50 | 3 |
| UB502 010S4 | 1 | 0.5 | 2.5 | 50 | 4 |
| UB502 010 | 1 | 0.5 | 2.5 | 50 | 6 |
| UB502 010070 | 1 | 0.5 | 2.5 | 70 | 6 |
| UB502 010100 | 1 | 0.5 | 2.5 | 100 | 6 |
| UB502 012S | 1.2 | 0.6 | 2 | 40 | 6 |
| UB502 012S3 | 1.2 | 0.6 | 3 | 50 | 3 |
| UB502 012S4 | 1.2 | 0.6 | 3 | 50 | 4 |
| UB502 012 | 1.2 | 0.6 | 3 | 50 | 6 |
| UB502 012070 | 1.2 | 0.6 | 3 | 70 | 6 |
| UB502 012100 | 1.2 | 0.6 | 3 | 100 | 6 |
| UB502 015S | 1.5 | 0.75 | 2.5 | 40 | 6 |
| UB502 015S3 | 1.5 | 0.75 | 4 | 50 | 3 |
| UB502 015S4 | 1.5 | 0.75 | 4 | 50 | 4 |
| UB502 015 | 1.5 | 0.75 | 4 | 50 | 6 |
| UB502 015070 | 1.5 | 0.75 | 4 | 70 | 6 |
| UB502 015100 | 1.5 | 0.75 | 4 | 100 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB502 | 2 FLUTES BALL ENDMILL



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 020S | 2 | 1 | 3 | 40 | 6 |
| UB502 020S3 | 2 | 1 | 5 | 50 | 3 |
| UB502 020S4 | 2 | 1 | 5 | 50 | 4 |
| UB502 020 | 2 | 1 | 5 | 50 | 6 |
| UB502 020080 | 2 | 1 | 5 | 80 | 6 |
| UB502 020100 | 2 | 1 | 5 | 100 | 6 |
| UB502 025S | 2.5 | 1.25 | 4 | 40 | 6 |
| UB502 025S3 | 2.5 | 1.25 | 6 | 60 | 3 |
| UB502 025S4 | 2.5 | 1.25 | 6 | 60 | 4 |
| UB502 025 | 2.5 | 1.25 | 6 | 60 | 6 |
| UB502 025080 | 2.5 | 1.25 | 6 | 80 | 6 |
| UB502 025100 | 2.5 | 1.25 | 6 | 100 | 6 |
| UB502 030S | 3 | 1.5 | 4.5 | 40 | 6 |
| UB502 030S3 | 3 | 1.5 | 6 | 60 | 3 |
| UB502 030S4 | 3 | 1.5 | 6 | 60 | 4 |
| UB502 030 | 3 | 1.5 | 6 | 60 | 6 |
| UB502 030080 | 3 | 1.5 | 6 | 80 | 6 |
| UB502 030100 | 3 | 1.5 | 6 | 100 | 6 |
| UB502 035 | 3.5 | 1.75 | 8 | 70 | 6 |
| UB502 040S | 4 | 2 | 6 | 50 | 6 |
| UB502 040S4 | 4 | 2 | 8 | 70 | 4 |
| UB502 040 | 4 | 2 | 8 | 70 | 6 |
| UB502 040100S4 | 4 | 2 | 8 | 100 | 4 |
| UB502 040120S4 | 4 | 2 | 8 | 120 | 4 |
| UB502 040100 | 4 | 2 | 8 | 100 | 6 |
| UB502 040120 | 4 | 2 | 8 | 120 | 6 |
| UB502 045 | 4.5 | 2.25 | 9 | 80 | 6 |
| UB502 050S | 5 | 2.5 | 7.5 | 60 | 6 |
| UB502 050 | 5 | 2.5 | 10 | 80 | 6 |
| UB502 050S5 | 5 | 2.5 | 10 | 80 | 5 |
| UB502 055 | 5.5 | 2.75 | 11 | 90 | 6 |
| UB502 060S | 6 | 3 | 9 | 50 | 6 |
| UB502 060060 | 6 | 3 | 9 | 60 | 6 |
| UB502 060080 | 6 | 3 | 9 | 80 | 6 |
| UB502 060 | 6 | 3 | 12 | 90 | 6 |
| UB502 060110 | 6 | 3 | 12 | 110 | 6 |
| UB502 060130 | 6 | 3 | 12 | 130 | 6 |
| UB502 060150 | 6 | 3 | 12 | 150 | 6 |
| UB502 065 | 6.5 | 3.25 | 13 | 90 | 8 |
| UB502 070 | 7 | 3.5 | 14 | 90 | 8 |
| UB502 080S | 8 | 4 | 12 | 50 | 8 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 080060 | 8 | 4 | 12 | 60 | 8 |
| UB502 080080 | 8 | 4 | 12 | 80 | 8 |
| UB502 080090 | 8 | 4 | 12 | 90 | 8 |
| UB502 080 | 8 | 4 | 14 | 100 | 8 |
| UB502 080130 | 8 | 4 | 14 | 130 | 8 |
| UB502 080150 | 8 | 4 | 14 | 150 | 8 |
| UB502 085 | 8.5 | 4.25 | 16 | 100 | 10 |
| UB502 090 | 9 | 4.5 | 18 | 100 | 10 |
| UB502 100S | 10 | 5 | 15 | 50 | 10 |
| UB502 100060 | 10 | 5 | 15 | 60 | 10 |
| UB502 100080 | 10 | 5 | 15 | 80 | 10 |
| UB502 100090 | 10 | 5 | 15 | 90 | 10 |
| UB502 100 | 10 | 5 | 18 | 100 | 10 |
| UB502 100130 | 10 | 5 | 18 | 130 | 10 |
| UB502 100150 | 10 | 5 | 18 | 150 | 10 |
| UB502 100180 | 10 | 5 | 18 | 180 | 10 |
| UB502 100200 | 10 | 5 | 18 | 200 | 10 |
| UB502 110 | 11 | 5.5 | 20 | 100 | 12 |
| UB502 120S | 12 | 6 | 18 | 60 | 12 |
| UB502 120080 | 12 | 6 | 18 | 80 | 12 |
| UB502 120090 | 12 | 6 | 18 | 90 | 12 |
| UB502 120100 | 12 | 6 | 18 | 100 | 12 |
| UB502 120 | 12 | 6 | 24 | 110 | 12 |
| UB502 120130 | 12 | 6 | 24 | 130 | 12 |
| UB502 120150 | 12 | 6 | 24 | 150 | 12 |
| UB502 120180 | 12 | 6 | 24 | 180 | 12 |
| UB502 120200 | 12 | 6 | 24 | 200 | 12 |
| UB502 130 | 13 | 6.5 | 24 | 100 | 12 |
| UB502 140S12 | 14 | 7 | 26 | 100 | 12 |
| UB502 140 | 14 | 7 | 26 | 100 | 14 |
| UB502 140S16 | 14 | 7 | 26 | 100 | 16 |
| UB502 150 | 15 | 7.5 | 28 | 140 | 16 |
| UB502 160100 | 16 | 8 | 24 | 100 | 16 |
| UB502 160130 | 16 | 8 | 24 | 130 | 16 |
| UB502 160 | 16 | 8 | 30 | 150 | 16 |
| UB502 160180 | 16 | 8 | 30 | 180 | 16 |
| UB502 160200 | 16 | 8 | 30 | 200 | 16 |
| UB502 180S16 | 18 | 9 | 34 | 150 | 16 |
| UB502 180 | 18 | 9 | 34 | 150 | 18 |
| UB502 200100 | 20 | 10 | 30 | 100 | 20 |
| UB502 200130 | 20 | 10 | 30 | 130 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB502 | 2 FLUTES BALL ENDMILL

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 200 | 20 | 10 | 38 | 150 | 20 |
| UB502 200200 | 20 | 10 | 38 | 200 | 20 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 250120 | 25 | 12.5 | 50 | 120 | 25 |
| UB502 250180 | 25 | 12.5 | 50 | 180 | 25 |

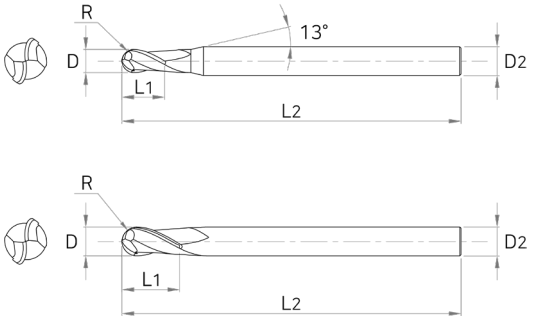


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB502-P | 2 FLUTES HIGH PRECISION BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.002 R3 OR UNDER | R ±0.003 ABOVE R3 | DATA P.657

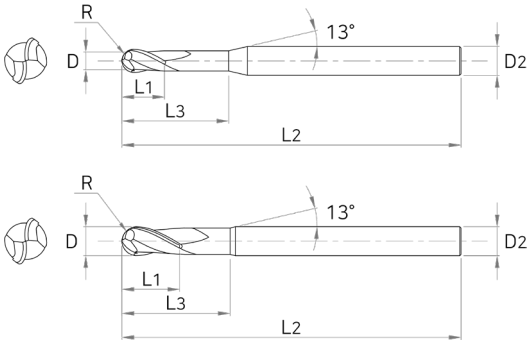
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB502 001P | 0.1 | 0.05 | 0.2 | 40 | 4 |
| UB502 0015P | 0.15 | 0.075 | 0.3 | 40 | 4 |
| UB502 002P | 0.2 | 0.1 | 0.4 | 40 | 4 |
| UB502 003P | 0.3 | 0.15 | 0.6 | 40 | 4 |
| UB502 004P | 0.4 | 0.2 | 0.8 | 40 | 4 |
| UB502 005P | 0.5 | 0.25 | 1 | 40 | 4 |
| UB502 006P | 0.6 | 0.3 | 1.2 | 40 | 4 |
| UB502 007P | 0.7 | 0.35 | 1.4 | 40 | 4 |
| UB502 008P | 0.8 | 0.4 | 1.6 | 40 | 4 |
| UB502 009P | 0.9 | 0.45 | 1.8 | 40 | 4 |
| UB502 010P | 1 | 0.5 | 2.5 | 50 | 6 |
| UB502 012P | 1.2 | 0.6 | 3 | 50 | 6 |
| UB502 015P | 1.5 | 0.75 | 4 | 50 | 6 |
| UB502 020P | 2 | 1 | 5 | 50 | 6 |
| UB502 025P | 2.5 | 1.25 | 6 | 60 | 6 |
| UB502 030P | 3 | 1.5 | 6 | 60 | 6 |
| UB502 040P | 4 | 2 | 8 | 70 | 6 |
| UB502 050P | 5 | 2.5 | 10 | 80 | 6 |
| UB502 060P | 6 | 3 | 12 | 90 | 6 |
| UB502 080P | 8 | 4 | 14 | 100 | 8 |
| UB502 100P | 10 | 5 | 18 | 100 | 10 |
| UB502 120P | 12 | 6 | 24 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512 | 2 FLUTES LONG NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.658

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 001002 | 0.1 | 0.05 | 0.1 | 0.2 | 40 | 4 |
| UB512 001003 | 0.1 | 0.05 | 0.1 | 0.3 | 40 | 4 |
| UB512 001005 | 0.1 | 0.05 | 0.1 | 0.5 | 40 | 4 |
| UB512 00101 | 0.1 | 0.05 | 0.1 | 1 | 40 | 4 |
| UB512 002005 | 0.2 | 0.1 | 0.2 | 0.5 | 40 | 4 |
| UB512 00201 | 0.2 | 0.1 | 0.2 | 1 | 40 | 4 |
| UB512 002015 | 0.2 | 0.1 | 0.2 | 1.5 | 40 | 4 |
| UB512 00202 | 0.2 | 0.1 | 0.2 | 2 | 40 | 4 |
| UB512 00203 | 0.2 | 0.1 | 0.2 | 3 | 40 | 4 |
| UB512 00301 | 0.3 | 0.15 | 0.3 | 1 | 40 | 4 |
| UB512 003015 | 0.3 | 0.15 | 0.3 | 1.5 | 40 | 4 |
| UB512 00302 | 0.3 | 0.15 | 0.3 | 2 | 40 | 4 |
| UB512 003025 | 0.3 | 0.15 | 0.3 | 2.5 | 40 | 4 |
| UB512 00303 | 0.3 | 0.15 | 0.3 | 3 | 40 | 4 |
| UB512 00304 | 0.3 | 0.15 | 0.3 | 4 | 40 | 4 |
| UB512 00305 | 0.3 | 0.15 | 0.3 | 5 | 40 | 4 |
| UB512 00401 | 0.4 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB512 004015 | 0.4 | 0.2 | 0.4 | 1.5 | 40 | 4 |
| UB512 00402 | 0.4 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB512 004025 | 0.4 | 0.2 | 0.4 | 2.5 | 40 | 4 |
| UB512 00403 | 0.4 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB512 00404 | 0.4 | 0.2 | 0.4 | 4 | 40 | 4 |
| UB512 00405 | 0.4 | 0.2 | 0.4 | 5 | 40 | 4 |
| UB512 00406 | 0.4 | 0.2 | 0.4 | 6 | 40 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 00408 | 0.4 | 0.2 | 0.4 | 8 | 40 | 4 |
| UB512 00410 | 0.4 | 0.2 | 0.4 | 10 | 40 | 4 |
| UB512 00501 | 0.5 | 0.25 | 0.5 | 1 | 45 | 4 |
| UB512 005015 | 0.5 | 0.25 | 0.5 | 1.5 | 45 | 4 |
| UB512 00502 | 0.5 | 0.25 | 0.5 | 2 | 45 | 4 |
| UB512 005025 | 0.5 | 0.25 | 0.5 | 2.5 | 45 | 4 |
| UB512 00503 | 0.5 | 0.25 | 0.5 | 3 | 45 | 4 |
| UB512 00504 | 0.5 | 0.25 | 0.5 | 4 | 45 | 4 |
| UB512 00505 | 0.5 | 0.25 | 0.5 | 5 | 45 | 4 |
| UB512 00506 | 0.5 | 0.25 | 0.5 | 6 | 45 | 4 |
| UB512 00508 | 0.5 | 0.25 | 0.5 | 8 | 45 | 4 |
| UB512 00510 | 0.5 | 0.25 | 0.5 | 10 | 45 | 4 |
| UB512 00512 | 0.5 | 0.25 | 0.5 | 12 | 45 | 4 |
| UB512 00514 | 0.5 | 0.25 | 0.5 | 14 | 45 | 4 |
| UB512 00516 | 0.5 | 0.25 | 0.5 | 16 | 45 | 4 |
| UB512 00601 | 0.6 | 0.3 | 0.6 | 1 | 45 | 4 |
| UB512 00602 | 0.6 | 0.3 | 0.6 | 2 | 45 | 4 |
| UB512 00603 | 0.6 | 0.3 | 0.6 | 3 | 45 | 4 |
| UB512 00604 | 0.6 | 0.3 | 0.6 | 4 | 45 | 4 |
| UB512 00605 | 0.6 | 0.3 | 0.6 | 5 | 45 | 4 |
| UB512 00606 | 0.6 | 0.3 | 0.6 | 6 | 45 | 4 |
| UB512 00608 | 0.6 | 0.3 | 0.6 | 8 | 45 | 4 |
| UB512 00610 | 0.6 | 0.3 | 0.6 | 10 | 45 | 4 |
| UB512 00612 | 0.6 | 0.3 | 0.6 | 12 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512 | 2 FLUTES LONG NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 00614 | 0.6 | 0.3 | 0.6 | 14 | 45 | 4 |
| UB512 00616 | 0.6 | 0.3 | 0.6 | 16 | 45 | 4 |
| UB512 00702 | 0.7 | 0.35 | 0.7 | 2 | 45 | 4 |
| UB512 00704 | 0.7 | 0.35 | 0.7 | 4 | 45 | 4 |
| UB512 00706 | 0.7 | 0.35 | 0.7 | 6 | 45 | 4 |
| UB512 00708 | 0.7 | 0.35 | 0.7 | 8 | 45 | 4 |
| UB512 00710 | 0.7 | 0.35 | 0.7 | 10 | 45 | 4 |
| UB512 00712 | 0.7 | 0.35 | 0.7 | 12 | 45 | 4 |
| UB512 00801 | 0.8 | 0.4 | 0.8 | 1 | 45 | 4 |
| UB512 00802 | 0.8 | 0.4 | 0.8 | 2 | 45 | 4 |
| UB512 00803 | 0.8 | 0.4 | 0.8 | 3 | 45 | 4 |
| UB512 00804 | 0.8 | 0.4 | 0.8 | 4 | 45 | 4 |
| UB512 00805 | 0.8 | 0.4 | 0.8 | 5 | 45 | 4 |
| UB512 00806 | 0.8 | 0.4 | 0.8 | 6 | 45 | 4 |
| UB512 00807 | 0.8 | 0.4 | 0.8 | 7 | 45 | 4 |
| UB512 00808 | 0.8 | 0.4 | 0.8 | 8 | 45 | 4 |
| UB512 00810 | 0.8 | 0.4 | 0.8 | 10 | 45 | 4 |
| UB512 00812 | 0.8 | 0.4 | 0.8 | 12 | 45 | 4 |
| UB512 00814 | 0.8 | 0.4 | 0.8 | 14 | 45 | 4 |
| UB512 00816 | 0.8 | 0.4 | 0.8 | 16 | 45 | 4 |
| UB512 00820 | 0.8 | 0.4 | 0.8 | 20 | 45 | 4 |
| UB512 00904 | 0.9 | 0.45 | 0.9 | 4 | 45 | 4 |
| UB512 00906 | 0.9 | 0.45 | 0.9 | 6 | 45 | 4 |
| UB512 00908 | 0.9 | 0.45 | 0.9 | 8 | 45 | 4 |
| UB512 00910 | 0.9 | 0.45 | 0.9 | 10 | 45 | 4 |
| UB512 01002 | 1 | 0.5 | 1 | 2 | 50 | 4 |
| UB512 010025 | 1 | 0.5 | 1 | 2.5 | 50 | 4 |
| UB512 01003 | 1 | 0.5 | 1 | 3 | 50 | 4 |
| UB512 01004 | 1 | 0.5 | 1 | 4 | 50 | 4 |
| UB512 01005 | 1 | 0.5 | 1 | 5 | 50 | 4 |
| UB512 01006 | 1 | 0.5 | 1 | 6 | 50 | 4 |
| UB512 01007 | 1 | 0.5 | 1 | 7 | 50 | 4 |
| UB512 01008 | 1 | 0.5 | 1 | 8 | 50 | 4 |
| UB512 01009 | 1 | 0.5 | 1 | 9 | 50 | 4 |
| UB512 01010 | 1 | 0.5 | 1 | 10 | 50 | 4 |
| UB512 01012 | 1 | 0.5 | 1 | 12 | 50 | 4 |
| UB512 01014 | 1 | 0.5 | 1 | 14 | 50 | 4 |
| UB512 01016 | 1 | 0.5 | 1 | 16 | 50 | 4 |
| UB512 01018 | 1 | 0.5 | 1 | 18 | 50 | 4 |
| UB512 01020 | 1 | 0.5 | 1 | 20 | 55 | 4 |
| UB512 01022 | 1 | 0.5 | 1 | 22 | 60 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 01026 | 1 | 0.5 | 1 | 26 | 60 | 4 |
| UB512 01030 | 1 | 0.5 | 1 | 30 | 70 | 4 |
| UB512 01040 | 1 | 0.5 | 1 | 40 | 80 | 4 |
| UB512 01050 | 1 | 0.5 | 1 | 50 | 100 | 4 |
| UB512 01204 | 1.2 | 0.6 | 1.2 | 4 | 50 | 4 |
| UB512 01206 | 1.2 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB512 01208 | 1.2 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB512 01210 | 1.2 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB512 01212 | 1.2 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB512 01214 | 1.2 | 0.6 | 1.2 | 14 | 50 | 4 |
| UB512 01216 | 1.2 | 0.6 | 1.2 | 16 | 50 | 4 |
| UB512 01220 | 1.2 | 0.6 | 1.2 | 20 | 55 | 4 |
| UB512 01226 | 1.2 | 0.6 | 1.2 | 26 | 60 | 4 |
| UB512 01406 | 1.4 | 0.7 | 1.4 | 6 | 50 | 4 |
| UB512 01408 | 1.4 | 0.7 | 1.4 | 8 | 50 | 4 |
| UB512 01410 | 1.4 | 0.7 | 1.4 | 10 | 50 | 4 |
| UB512 01412 | 1.4 | 0.7 | 1.4 | 12 | 50 | 4 |
| UB512 01416 | 1.4 | 0.7 | 1.4 | 16 | 50 | 4 |
| UB512 01503 | 1.5 | 0.75 | 1.5 | 3 | 50 | 4 |
| UB512 01504 | 1.5 | 0.75 | 1.5 | 4 | 50 | 4 |
| UB512 01505 | 1.5 | 0.75 | 1.5 | 5 | 50 | 4 |
| UB512 01506 | 1.5 | 0.75 | 1.5 | 6 | 50 | 4 |
| UB512 01507 | 1.5 | 0.75 | 1.5 | 7 | 50 | 4 |
| UB512 01508 | 1.5 | 0.75 | 1.5 | 8 | 50 | 4 |
| UB512 01510 | 1.5 | 0.75 | 1.5 | 10 | 50 | 4 |
| UB512 01512 | 1.5 | 0.75 | 1.5 | 12 | 50 | 4 |
| UB512 01514 | 1.5 | 0.75 | 1.5 | 14 | 50 | 4 |
| UB512 01516 | 1.5 | 0.75 | 1.5 | 16 | 50 | 4 |
| UB512 01518 | 1.5 | 0.75 | 1.5 | 18 | 50 | 4 |
| UB512 01520 | 1.5 | 0.75 | 1.5 | 20 | 55 | 4 |
| UB512 01522 | 1.5 | 0.75 | 1.5 | 22 | 60 | 4 |
| UB512 01526 | 1.5 | 0.75 | 1.5 | 26 | 60 | 4 |
| UB512 01530 | 1.5 | 0.75 | 1.5 | 30 | 70 | 4 |
| UB512 01535 | 1.5 | 0.75 | 1.5 | 35 | 70 | 4 |
| UB512 01540 | 1.5 | 0.75 | 1.5 | 40 | 80 | 4 |
| UB512 01604 | 1.6 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB512 01606 | 1.6 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB512 01608 | 1.6 | 0.8 | 1.6 | 8 | 50 | 4 |
| UB512 01610 | 1.6 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB512 01612 | 1.6 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB512 01616 | 1.6 | 0.8 | 1.6 | 16 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512 | 2 FLUTES LONG NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 01620 | 1.6 | 0.8 | 1.6 | 20 | 50 | 4 |
| UB512 01804 | 1.8 | 0.9 | 1.8 | 4 | 50 | 4 |
| UB512 01806 | 1.8 | 0.9 | 1.8 | 6 | 50 | 4 |
| UB512 01808 | 1.8 | 0.9 | 1.8 | 8 | 50 | 4 |
| UB512 01810 | 1.8 | 0.9 | 1.8 | 10 | 50 | 4 |
| UB512 01812 | 1.8 | 0.9 | 1.8 | 12 | 50 | 4 |
| UB512 01816 | 1.8 | 0.9 | 1.8 | 16 | 50 | 4 |
| UB512 01820 | 1.8 | 0.9 | 1.8 | 20 | 50 | 4 |
| UB512 02004 | 2 | 1 | 2 | 4 | 50 | 4 |
| UB512 02005 | 2 | 1 | 2 | 5 | 50 | 4 |
| UB512 02006 | 2 | 1 | 2 | 6 | 50 | 4 |
| UB512 02008 | 2 | 1 | 2 | 8 | 50 | 4 |
| UB512 02010 | 2 | 1 | 2 | 10 | 50 | 4 |
| UB512 02012 | 2 | 1 | 2 | 12 | 50 | 4 |
| UB512 02014 | 2 | 1 | 2 | 14 | 50 | 4 |
| UB512 02016 | 2 | 1 | 2 | 16 | 50 | 4 |
| UB512 02018 | 2 | 1 | 2 | 18 | 55 | 4 |
| UB512 02020 | 2 | 1 | 2 | 20 | 55 | 4 |
| UB512 02022 | 2 | 1 | 2 | 22 | 60 | 4 |
| UB512 02026 | 2 | 1 | 2 | 26 | 60 | 4 |
| UB512 02030 | 2 | 1 | 2 | 30 | 70 | 4 |
| UB512 02035 | 2 | 1 | 2 | 35 | 70 | 4 |
| UB512 02040 | 2 | 1 | 2 | 40 | 80 | 4 |
| UB512 02045 | 2 | 1 | 2 | 45 | 90 | 4 |
| UB512 02050 | 2 | 1 | 2 | 50 | 100 | 4 |
| UB512 02060 | 2 | 1 | 2 | 60 | 110 | 4 |
| UB512 02508 | 2.5 | 1.25 | 2.5 | 8 | 50 | 4 |
| UB512 02510 | 2.5 | 1.25 | 2.5 | 10 | 50 | 4 |
| UB512 02512 | 2.5 | 1.25 | 2.5 | 12 | 50 | 4 |
| UB512 02516 | 2.5 | 1.25 | 2.5 | 16 | 50 | 4 |
| UB512 02520 | 2.5 | 1.25 | 2.5 | 20 | 50 | 4 |
| UB512 02522 | 2.5 | 1.25 | 2.5 | 22 | 60 | 4 |
| UB512 02526 | 2.5 | 1.25 | 2.5 | 26 | 60 | 4 |
| UB512 02530 | 2.5 | 1.25 | 2.5 | 30 | 70 | 4 |
| UB512 02535 | 2.5 | 1.25 | 2.5 | 35 | 70 | 4 |
| UB512 02540 | 2.5 | 1.25 | 2.5 | 40 | 80 | 4 |
| UB512 02545 | 2.5 | 1.25 | 2.5 | 45 | 90 | 4 |
| UB512 02550 | 2.5 | 1.25 | 2.5 | 50 | 100 | 4 |
| UB512 03006 | 3 | 1.5 | 3 | 6 | 50 | 6 |
| UB512 03008 | 3 | 1.5 | 3 | 8 | 50 | 6 |
| UB512 03010 | 3 | 1.5 | 3 | 10 | 50 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 03012 | 3 | 1.5 | 3 | 12 | 50 | 6 |
| UB512 03014 | 3 | 1.5 | 3 | 14 | 60 | 6 |
| UB512 03016 | 3 | 1.5 | 3 | 16 | 60 | 6 |
| UB512 03018 | 3 | 1.5 | 3 | 18 | 60 | 6 |
| UB512 03020 | 3 | 1.5 | 3 | 20 | 60 | 6 |
| UB512 03022 | 3 | 1.5 | 3 | 22 | 65 | 6 |
| UB512 03026 | 3 | 1.5 | 3 | 26 | 65 | 6 |
| UB512 03030 | 3 | 1.5 | 3 | 30 | 70 | 6 |
| UB512 03035 | 3 | 1.5 | 3 | 35 | 70 | 6 |
| UB512 03040 | 3 | 1.5 | 3 | 40 | 80 | 6 |
| UB512 03045 | 3 | 1.5 | 3 | 45 | 90 | 6 |
| UB512 03050 | 3 | 1.5 | 3 | 50 | 100 | 6 |
| UB512 03060 | 3 | 1.5 | 3 | 60 | 100 | 6 |
| UB512 04008 | 4 | 2 | 4 | 8 | 50 | 6 |
| UB512 04010 | 4 | 2 | 4 | 10 | 50 | 6 |
| UB512 04012 | 4 | 2 | 4 | 12 | 50 | 6 |
| UB512 04014 | 4 | 2 | 4 | 14 | 60 | 6 |
| UB512 04016 | 4 | 2 | 4 | 16 | 60 | 6 |
| UB512 04018 | 4 | 2 | 4 | 18 | 60 | 6 |
| UB512 04020 | 4 | 2 | 4 | 20 | 60 | 6 |
| UB512 04022 | 4 | 2 | 4 | 22 | 65 | 6 |
| UB512 04026 | 4 | 2 | 4 | 26 | 65 | 6 |
| UB512 04030 | 4 | 2 | 4 | 30 | 70 | 6 |
| UB512 04035 | 4 | 2 | 4 | 35 | 70 | 6 |
| UB512 04040 | 4 | 2 | 4 | 40 | 80 | 6 |
| UB512 04045 | 4 | 2 | 4 | 45 | 90 | 6 |
| UB512 04050 | 4 | 2 | 4 | 50 | 100 | 6 |
| UB512 04055 | 4 | 2 | 4 | 55 | 100 | 6 |
| UB512 04060 | 4 | 2 | 4 | 60 | 100 | 6 |
| UB512 05015 | 5 | 2.5 | 6 | 15 | 60 | 6 |
| UB512 05020 | 5 | 2.5 | 6 | 20 | 60 | 6 |
| UB512 05026 | 5 | 2.5 | 6 | 26 | 65 | 6 |
| UB512 05030 | 5 | 2.5 | 6 | 30 | 70 | 6 |
| UB512 05035 | 5 | 2.5 | 6 | 35 | 70 | 6 |
| UB512 05040 | 5 | 2.5 | 6 | 40 | 80 | 6 |
| UB512 05045 | 5 | 2.5 | 6 | 45 | 90 | 6 |
| UB512 05050 | 5 | 2.5 | 6 | 50 | 100 | 6 |
| UB512 05055 | 5 | 2.5 | 6 | 55 | 100 | 6 |
| UB512 05060 | 5 | 2.5 | 6 | 60 | 100 | 6 |
| UB512 06020 | 6 | 3 | 8 | 20 | 60 | 6 |
| UB512 0602090 | 6 | 3 | 12 | 20 | 90 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512 | 2 FLUTES LONG NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 06030 | 6 | 3 | 8 | 30 | 60 | 6 |
| UB512 0603090 | 6 | 3 | 12 | 30 | 90 | 6 |
| UB512 08025 | 8 | 4 | 10 | 25 | 70 | 8 |
| UB512 08025100 | 8 | 4 | 14 | 25 | 100 | 8 |
| UB512 08035 | 8 | 4 | 10 | 35 | 70 | 8 |
| UB512 08035100 | 8 | 4 | 14 | 35 | 100 | 8 |
| UB512 10030 | 10 | 5 | 12 | 30 | 75 | 10 |

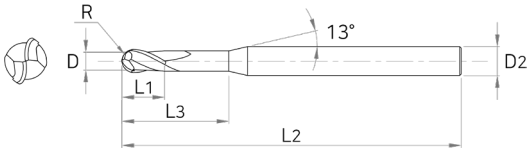
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 10030100 | 10 | 5 | 18 | 30 | 100 | 10 |
| UB512 10040 | 10 | 5 | 12 | 40 | 75 | 10 |
| UB512 10040100 | 10 | 5 | 18 | 40 | 100 | 10 |
| UB512 12032 | 12 | 6 | 14 | 32 | 80 | 12 |
| UB512 12032110 | 12 | 6 | 22 | 32 | 110 | 12 |
| UB512 12045 | 12 | 6 | 14 | 45 | 80 | 12 |
| UB512 12045110 | 12 | 6 | 22 | 45 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512S6 | 2 FLUTES LONG NECK BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.5 ~ 2 | 0 ~ -0.012 | h5 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 00501S6 | 0.5 | 0.25 | 0.5 | 1 | 45 | 6 |
| UB512 00502S6 | 0.5 | 0.25 | 0.5 | 2 | 45 | 6 |
| UB512 00504S6 | 0.5 | 0.25 | 0.5 | 4 | 45 | 6 |
| UB512 00601S6 | 0.6 | 0.3 | 0.6 | 1 | 45 | 6 |
| UB512 00602S6 | 0.6 | 0.3 | 0.6 | 2 | 45 | 6 |
| UB512 00603S6 | 0.6 | 0.3 | 0.6 | 3 | 45 | 6 |
| UB512 00604S6 | 0.6 | 0.3 | 0.6 | 4 | 45 | 6 |
| UB512 00605S6 | 0.6 | 0.3 | 0.6 | 5 | 45 | 6 |
| UB512 00606S6 | 0.6 | 0.3 | 0.6 | 6 | 45 | 6 |
| UB512 00608S6 | 0.6 | 0.3 | 0.6 | 8 | 45 | 6 |
| UB512 00610S6 | 0.6 | 0.3 | 0.6 | 10 | 45 | 6 |
| UB512 00612S6 | 0.6 | 0.3 | 0.6 | 12 | 45 | 6 |
| UB512 00614S6 | 0.6 | 0.3 | 0.6 | 14 | 45 | 6 |
| UB512 00616S6 | 0.6 | 0.3 | 0.6 | 16 | 45 | 6 |
| UB512 00801S6 | 0.8 | 0.4 | 0.8 | 1 | 45 | 6 |
| UB512 00802S6 | 0.8 | 0.4 | 0.8 | 2 | 45 | 6 |
| UB512 00803S6 | 0.8 | 0.4 | 0.8 | 3 | 45 | 6 |
| UB512 00804S6 | 0.8 | 0.4 | 0.8 | 4 | 45 | 6 |
| UB512 00805S6 | 0.8 | 0.4 | 0.8 | 5 | 45 | 6 |
| UB512 00806S6 | 0.8 | 0.4 | 0.8 | 6 | 45 | 6 |
| UB512 00808S6 | 0.8 | 0.4 | 0.8 | 8 | 45 | 6 |
| UB512 00810S6 | 0.8 | 0.4 | 0.8 | 10 | 45 | 6 |
| UB512 00812S6 | 0.8 | 0.4 | 0.8 | 12 | 45 | 6 |
| UB512 00814S6 | 0.8 | 0.4 | 0.8 | 14 | 45 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 00816S6 | 0.8 | 0.4 | 0.8 | 16 | 45 | 6 |
| UB512 00820S6 | 0.8 | 0.4 | 0.8 | 20 | 55 | 6 |
| UB512 01002S6 | 1 | 0.5 | 1 | 2 | 50 | 6 |
| UB512 01003S6 | 1 | 0.5 | 1 | 3 | 50 | 6 |
| UB512 01004S6 | 1 | 0.5 | 1 | 4 | 50 | 6 |
| UB512 01005S6 | 1 | 0.5 | 1 | 5 | 50 | 6 |
| UB512 01006S6 | 1 | 0.5 | 1 | 6 | 50 | 6 |
| UB512 01007S6 | 1 | 0.5 | 1 | 7 | 50 | 6 |
| UB512 01008S6 | 1 | 0.5 | 1 | 8 | 50 | 6 |
| UB512 01009S6 | 1 | 0.5 | 1 | 9 | 50 | 6 |
| UB512 01010S6 | 1 | 0.5 | 1 | 10 | 50 | 6 |
| UB512 01012S6 | 1 | 0.5 | 1 | 12 | 50 | 6 |
| UB512 01014S6 | 1 | 0.5 | 1 | 14 | 50 | 6 |
| UB512 01016S6 | 1 | 0.5 | 1 | 16 | 50 | 6 |
| UB512 01018S6 | 1 | 0.5 | 1 | 18 | 50 | 6 |
| UB512 01020S6 | 1 | 0.5 | 1 | 20 | 55 | 6 |
| UB512 01022S6 | 1 | 0.5 | 1 | 22 | 60 | 6 |
| UB512 01026S6 | 1 | 0.5 | 1 | 26 | 60 | 6 |
| UB512 01030S6 | 1 | 0.5 | 1 | 30 | 70 | 6 |
| UB512 01503S6 | 1.5 | 0.75 | 1.5 | 3 | 50 | 6 |
| UB512 01504S6 | 1.5 | 0.75 | 1.5 | 4 | 50 | 6 |
| UB512 01506S6 | 1.5 | 0.75 | 1.5 | 6 | 50 | 6 |
| UB512 01508S6 | 1.5 | 0.75 | 1.5 | 8 | 50 | 6 |
| UB512 01510S6 | 1.5 | 0.75 | 1.5 | 10 | 50 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB512S6 | 2 FLUTES LONG NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 01512S6 | 1.5 | 0.75 | 1.5 | 12 | 50 | 6 |
| UB512 01514S6 | 1.5 | 0.75 | 1.5 | 14 | 50 | 6 |
| UB512 01516S6 | 1.5 | 0.75 | 1.5 | 16 | 50 | 6 |
| UB512 01518S6 | 1.5 | 0.75 | 1.5 | 18 | 50 | 6 |
| UB512 01520S6 | 1.5 | 0.75 | 1.5 | 20 | 55 | 6 |
| UB512 01522S6 | 1.5 | 0.75 | 1.5 | 22 | 60 | 6 |
| UB512 01526S6 | 1.5 | 0.75 | 1.5 | 26 | 60 | 6 |
| UB512 01530S6 | 1.5 | 0.75 | 1.5 | 30 | 70 | 6 |
| UB512 01535S6 | 1.5 | 0.75 | 1.5 | 35 | 70 | 6 |
| UB512 01540S6 | 1.5 | 0.75 | 1.5 | 40 | 80 | 6 |
| UB512 02004S6 | 2 | 1 | 2 | 4 | 50 | 6 |
| UB512 02006S6 | 2 | 1 | 2 | 6 | 50 | 6 |
| UB512 02008S6 | 2 | 1 | 2 | 8 | 50 | 6 |
| UB512 02010S6 | 2 | 1 | 2 | 10 | 50 | 6 |

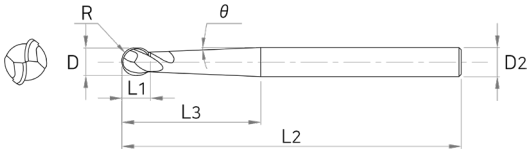
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| UB512 02010S6 | 2 | 1 | 2 | 10 | 50 | 6 |
| UB512 02012S6 | 2 | 1 | 2 | 12 | 50 | 6 |
| UB512 02014S6 | 2 | 1 | 2 | 14 | 50 | 6 |
| UB512 02016S6 | 2 | 1 | 2 | 16 | 50 | 6 |
| UB512 02018S6 | 2 | 1 | 2 | 18 | 50 | 6 |
| UB512 02020S6 | 2 | 1 | 2 | 20 | 50 | 6 |
| UB512 02022S6 | 2 | 1 | 2 | 22 | 60 | 6 |
| UB512 02026S6 | 2 | 1 | 2 | 26 | 60 | 6 |
| UB512 02030S6 | 2 | 1 | 2 | 30 | 70 | 6 |
| UB512 02035S6 | 2 | 1 | 2 | 35 | 70 | 6 |
| UB512 02040S6 | 2 | 1 | 2 | 40 | 80 | 6 |
| UB512 02045S6 | 2 | 1 | 2 | 45 | 90 | 6 |
| UB512 02050S6 | 2 | 1 | 2 | 50 | 100 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB532 | 2 FLUTES LOLLIPOP STYLE BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 12 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.663

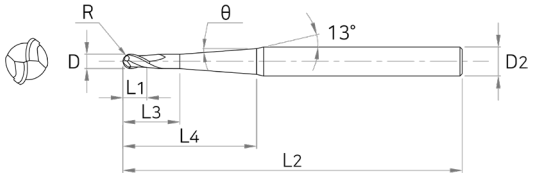
| EDP No | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L2 | D2 |
| UB532 030 | 3 | 1.5 | 1.5 | 2.3 | 16 | 80 | 6 |
| UB532 040 | 4 | 2 | 1.5 | 3.1 | 20 | 80 | 6 |
| UB532 050 | 5 | 2.5 | 1.5 | 3.9 | 25 | 80 | 6 |
| UB532 060 | 6 | 3 | 1.5 | 4.9 | 30 | 100 | 6 |
| UB532 080 | 8 | 4 | 1.5 | 6.3 | 35 | 100 | 8 |
| UB532 100 | 10 | 5 | 1.5 | 7.9 | 40 | 100 | 10 |
| UB532 120 | 12 | 6 | 1.5 | 9.5 | 50 | 100 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.1 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.664

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 00105005 | 0.1 | 0.05 | 0.5 | 0.1 | - | 0.5 | 40 | 4 |
| UB542 0010501 | 0.1 | 0.05 | 0.5 | 0.1 | - | 1 | 40 | 4 |
| UB542 00110005 | 0.1 | 0.05 | 1 | 0.1 | - | 0.5 | 40 | 4 |
| UB542 0011001 | 0.1 | 0.05 | 1 | 0.1 | - | 1 | 40 | 4 |
| UB542 00115005 | 0.1 | 0.05 | 1.5 | 0.1 | - | 0.5 | 40 | 4 |
| UB542 0011501 | 0.1 | 0.05 | 1.5 | 0.1 | - | 1 | 40 | 4 |
| UB542 00120005 | 0.1 | 0.05 | 2 | 0.1 | - | 0.5 | 40 | 4 |
| UB542 0012001 | 0.1 | 0.05 | 2 | 0.1 | - | 1 | 40 | 4 |
| UB542 00130005 | 0.1 | 0.05 | 3 | 0.1 | - | 0.5 | 40 | 4 |
| UB542 0013001 | 0.1 | 0.05 | 3 | 0.1 | - | 1 | 40 | 4 |
| UB542 0020501 | 0.2 | 0.1 | 0.5 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB542 0020502 | 0.2 | 0.1 | 0.5 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB542 0020503 | 0.2 | 0.1 | 0.5 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0021001 | 0.2 | 0.1 | 1 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB542 0021002 | 0.2 | 0.1 | 1 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB542 0021003 | 0.2 | 0.1 | 1 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0021501 | 0.2 | 0.1 | 1.5 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB542 0021502 | 0.2 | 0.1 | 1.5 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB542 0021503 | 0.2 | 0.1 | 1.5 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0022001 | 0.2 | 0.1 | 2 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB542 0022002 | 0.2 | 0.1 | 2 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB542 0022003 | 0.2 | 0.1 | 2 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0023001 | 0.2 | 0.1 | 3 | 0.2 | 0.4 | 1 | 40 | 4 |
| UB542 0023002 | 0.2 | 0.1 | 3 | 0.2 | 0.4 | 2 | 40 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0023003 | 0.2 | 0.1 | 3 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0025002 | 0.2 | 0.1 | 5 | 0.2 | 0.4 | 2 | 40 | 4 |
| UB542 0025003 | 0.2 | 0.1 | 5 | 0.2 | 0.4 | 3 | 40 | 4 |
| UB542 0030502 | 0.3 | 0.15 | 0.5 | 0.3 | 0.6 | 2 | 40 | 4 |
| UB542 0030503 | 0.3 | 0.15 | 0.5 | 0.3 | 0.6 | 3 | 40 | 4 |
| UB542 0030504 | 0.3 | 0.15 | 0.5 | 0.3 | 0.6 | 4 | 40 | 4 |
| UB542 0030505 | 0.3 | 0.15 | 0.5 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0031002 | 0.3 | 0.15 | 1 | 0.3 | 0.6 | 2 | 40 | 4 |
| UB542 0031003 | 0.3 | 0.15 | 1 | 0.3 | 0.6 | 3 | 40 | 4 |
| UB542 0031004 | 0.3 | 0.15 | 1 | 0.3 | 0.6 | 4 | 40 | 4 |
| UB542 0031005 | 0.3 | 0.15 | 1 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0031502 | 0.3 | 0.15 | 1.5 | 0.3 | 0.6 | 2 | 40 | 4 |
| UB542 0031503 | 0.3 | 0.15 | 1.5 | 0.3 | 0.6 | 3 | 40 | 4 |
| UB542 0031504 | 0.3 | 0.15 | 1.5 | 0.3 | 0.6 | 4 | 40 | 4 |
| UB542 0031505 | 0.3 | 0.15 | 1.5 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0032002 | 0.3 | 0.15 | 2 | 0.3 | 0.6 | 2 | 40 | 4 |
| UB542 0032003 | 0.3 | 0.15 | 2 | 0.3 | 0.6 | 3 | 40 | 4 |
| UB542 0032004 | 0.3 | 0.15 | 2 | 0.3 | 0.6 | 4 | 40 | 4 |
| UB542 0032005 | 0.3 | 0.15 | 2 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0033002 | 0.3 | 0.15 | 3 | 0.3 | 0.6 | 2 | 40 | 4 |
| UB542 0033003 | 0.3 | 0.15 | 3 | 0.3 | 0.6 | 3 | 40 | 4 |
| UB542 0033004 | 0.3 | 0.15 | 3 | 0.3 | 0.6 | 4 | 40 | 4 |
| UB542 0033005 | 0.3 | 0.15 | 3 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0035005 | 0.3 | 0.15 | 5 | 0.3 | 0.6 | 5 | 40 | 4 |
| UB542 0040502 | 0.4 | 0.2 | 0.5 | 0.4 | 0.8 | 2 | 50 | 4 |
| UB542 0040503 | 0.4 | 0.2 | 0.5 | 0.4 | 0.8 | 3 | 50 | 4 |
| UB542 0040504 | 0.4 | 0.2 | 0.5 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0040505 | 0.4 | 0.2 | 0.5 | 0.4 | 0.8 | 5 | 50 | 4 |
| UB542 0040506 | 0.4 | 0.2 | 0.5 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0041002 | 0.4 | 0.2 | 1 | 0.4 | 0.8 | 2 | 50 | 4 |
| UB542 0041003 | 0.4 | 0.2 | 1 | 0.4 | 0.8 | 3 | 50 | 4 |
| UB542 0041004 | 0.4 | 0.2 | 1 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0041005 | 0.4 | 0.2 | 1 | 0.4 | 0.8 | 5 | 50 | 4 |
| UB542 0041006 | 0.4 | 0.2 | 1 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0041502 | 0.4 | 0.2 | 1.5 | 0.4 | 0.8 | 2 | 50 | 4 |
| UB542 0041503 | 0.4 | 0.2 | 1.5 | 0.4 | 0.8 | 3 | 50 | 4 |
| UB542 0041504 | 0.4 | 0.2 | 1.5 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0041505 | 0.4 | 0.2 | 1.5 | 0.4 | 0.8 | 5 | 50 | 4 |
| UB542 0041506 | 0.4 | 0.2 | 1.5 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0042002 | 0.4 | 0.2 | 2 | 0.4 | 0.8 | 2 | 50 | 4 |
| UB542 0042003 | 0.4 | 0.2 | 2 | 0.4 | 0.8 | 3 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0042004 | 0.4 | 0.2 | 2 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0042005 | 0.4 | 0.2 | 2 | 0.4 | 0.8 | 5 | 50 | 4 |
| UB542 0042006 | 0.4 | 0.2 | 2 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0043002 | 0.4 | 0.2 | 3 | 0.4 | 0.8 | 2 | 50 | 4 |
| UB542 0043003 | 0.4 | 0.2 | 3 | 0.4 | 0.8 | 3 | 50 | 4 |
| UB542 0043004 | 0.4 | 0.2 | 3 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0043005 | 0.4 | 0.2 | 3 | 0.4 | 0.8 | 5 | 50 | 4 |
| UB542 0043006 | 0.4 | 0.2 | 3 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0045004 | 0.4 | 0.2 | 5 | 0.4 | 0.8 | 4 | 50 | 4 |
| UB542 0045006 | 0.4 | 0.2 | 5 | 0.4 | 0.8 | 6 | 50 | 4 |
| UB542 0050504 | 0.5 | 0.25 | 0.5 | 0.5 | 1 | 4 | 50 | 4 |
| UB542 0050506 | 0.5 | 0.25 | 0.5 | 0.5 | 1 | 6 | 50 | 4 |
| UB542 0050508 | 0.5 | 0.25 | 0.5 | 0.5 | 1 | 8 | 50 | 4 |
| UB542 0050510 | 0.5 | 0.25 | 0.5 | 0.5 | 1 | 10 | 50 | 4 |
| UB542 0051004 | 0.5 | 0.25 | 1 | 0.5 | 1 | 4 | 50 | 4 |
| UB542 0051006 | 0.5 | 0.25 | 1 | 0.5 | 1 | 6 | 50 | 4 |
| UB542 0051008 | 0.5 | 0.25 | 1 | 0.5 | 1 | 8 | 50 | 4 |
| UB542 0051010 | 0.5 | 0.25 | 1 | 0.5 | 1 | 10 | 50 | 4 |
| UB542 0051504 | 0.5 | 0.25 | 1.5 | 0.5 | 1 | 4 | 50 | 4 |
| UB542 0051506 | 0.5 | 0.25 | 1.5 | 0.5 | 1 | 6 | 50 | 4 |
| UB542 0051508 | 0.5 | 0.25 | 1.5 | 0.5 | 1 | 8 | 50 | 4 |
| UB542 0051510 | 0.5 | 0.25 | 1.5 | 0.5 | 1 | 10 | 50 | 4 |
| UB542 0052004 | 0.5 | 0.25 | 2 | 0.5 | 1 | 4 | 50 | 4 |
| UB542 0052006 | 0.5 | 0.25 | 2 | 0.5 | 1 | 6 | 50 | 4 |
| UB542 0052008 | 0.5 | 0.25 | 2 | 0.5 | 1 | 8 | 50 | 4 |
| UB542 0052010 | 0.5 | 0.25 | 2 | 0.5 | 1 | 10 | 50 | 4 |
| UB542 0053004 | 0.5 | 0.25 | 3 | 0.5 | 1 | 4 | 50 | 4 |
| UB542 0053006 | 0.5 | 0.25 | 3 | 0.5 | 1 | 6 | 50 | 4 |
| UB542 0053008 | 0.5 | 0.25 | 3 | 0.5 | 1 | 8 | 50 | 4 |
| UB542 0053010 | 0.5 | 0.25 | 3 | 0.5 | 1 | 10 | 50 | 4 |
| UB542 0060504 | 0.6 | 0.3 | 0.5 | 0.6 | 1.2 | 4 | 50 | 4 |
| UB542 0060506 | 0.6 | 0.3 | 0.5 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB542 0060508 | 0.6 | 0.3 | 0.5 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB542 0060510 | 0.6 | 0.3 | 0.5 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB542 0060512 | 0.6 | 0.3 | 0.5 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB542 0061004 | 0.6 | 0.3 | 1 | 0.6 | 1.2 | 4 | 50 | 4 |
| UB542 0061006 | 0.6 | 0.3 | 1 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB542 0061008 | 0.6 | 0.3 | 1 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB542 0061010 | 0.6 | 0.3 | 1 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB542 0061012 | 0.6 | 0.3 | 1 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB542 0061504 | 0.6 | 0.3 | 1.5 | 0.6 | 1.2 | 4 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0061506 | 0.6 | 0.3 | 1.5 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB542 0061508 | 0.6 | 0.3 | 1.5 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB542 0061510 | 0.6 | 0.3 | 1.5 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB542 0061512 | 0.6 | 0.3 | 1.5 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB542 0062004 | 0.6 | 0.3 | 2 | 0.6 | 1.2 | 4 | 50 | 4 |
| UB542 0062006 | 0.6 | 0.3 | 2 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB542 0062008 | 0.6 | 0.3 | 2 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB542 0062010 | 0.6 | 0.3 | 2 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB542 0062012 | 0.6 | 0.3 | 2 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB542 0063004 | 0.6 | 0.3 | 3 | 0.6 | 1.2 | 4 | 50 | 4 |
| UB542 0063006 | 0.6 | 0.3 | 3 | 0.6 | 1.2 | 6 | 50 | 4 |
| UB542 0063008 | 0.6 | 0.3 | 3 | 0.6 | 1.2 | 8 | 50 | 4 |
| UB542 0063010 | 0.6 | 0.3 | 3 | 0.6 | 1.2 | 10 | 50 | 4 |
| UB542 0063012 | 0.6 | 0.3 | 3 | 0.6 | 1.2 | 12 | 50 | 4 |
| UB542 0080504 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB542 0080506 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB542 0080508 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 8 | 50 | 4 |
| UB542 0080510 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB542 0080512 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB542 0080516 | 0.8 | 0.4 | 0.5 | 0.8 | 1.6 | 16 | 50 | 4 |
| UB542 0081004 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB542 0081006 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB542 0081008 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 8 | 50 | 4 |
| UB542 0081010 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB542 0081012 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB542 0081016 | 0.8 | 0.4 | 1 | 0.8 | 1.6 | 16 | 50 | 4 |
| UB542 0081504 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB542 0081506 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB542 0081508 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 8 | 50 | 4 |
| UB542 0081510 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB542 0081512 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB542 0081516 | 0.8 | 0.4 | 1.5 | 0.8 | 1.6 | 16 | 50 | 4 |
| UB542 0082004 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB542 0082006 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB542 0082008 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 8 | 50 | 4 |
| UB542 0082010 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB542 0082012 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB542 0082016 | 0.8 | 0.4 | 2 | 0.8 | 1.6 | 16 | 50 | 4 |
| UB542 0083004 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 4 | 50 | 4 |
| UB542 0083006 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 6 | 50 | 4 |
| UB542 0083008 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 8 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0083010 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 10 | 50 | 4 |
| UB542 0083012 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 12 | 50 | 4 |
| UB542 0083016 | 0.8 | 0.4 | 3 | 0.8 | 1.6 | 16 | 50 | 4 |
| UB542 0100506 | 1 | 0.5 | 0.5 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0100508 | 1 | 0.5 | 0.5 | 1 | 2.5 | 8 | 50 | 4 |
| UB542 0100510 | 1 | 0.5 | 0.5 | 1 | 2.5 | 10 | 50 | 4 |
| UB542 0100512 | 1 | 0.5 | 0.5 | 1 | 2.5 | 12 | 50 | 4 |
| UB542 0100516 | 1 | 0.5 | 0.5 | 1 | 2.5 | 16 | 50 | 4 |
| UB542 0100520 | 1 | 0.5 | 0.5 | 1 | 2.5 | 20 | 50 | 4 |
| UB542 0100525 | 1 | 0.5 | 0.5 | 1 | 2.5 | 25 | 60 | 4 |
| UB542 0100530 | 1 | 0.5 | 0.5 | 1 | 2.5 | 30 | 70 | 4 |
| UB542 0100540 | 1 | 0.5 | 0.5 | 1 | 2.5 | 40 | 80 | 4 |
| UB542 0100550 | 1 | 0.5 | 0.5 | 1 | 2.5 | 50 | 90 | 4 |
| UB542 0101006 | 1 | 0.5 | 1 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0101008 | 1 | 0.5 | 1 | 1 | 2.5 | 8 | 50 | 4 |
| UB542 0101010 | 1 | 0.5 | 1 | 1 | 2.5 | 10 | 50 | 4 |
| UB542 0101012 | 1 | 0.5 | 1 | 1 | 2.5 | 12 | 50 | 4 |
| UB542 0101016 | 1 | 0.5 | 1 | 1 | 2.5 | 16 | 50 | 4 |
| UB542 0101020 | 1 | 0.5 | 1 | 1 | 2.5 | 20 | 50 | 4 |
| UB542 0101025 | 1 | 0.5 | 1 | 1 | 2.5 | 25 | 60 | 4 |
| UB542 0101030 | 1 | 0.5 | 1 | 1 | 2.5 | 30 | 70 | 4 |
| UB542 0101040 | 1 | 0.5 | 1 | 1 | 2.5 | 40 | 80 | 4 |
| UB542 0101050 | 1 | 0.5 | 1 | 1 | 2.5 | 50 | 90 | 4 |
| UB542 0101506 | 1 | 0.5 | 1.5 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0101508 | 1 | 0.5 | 1.5 | 1 | 2.5 | 8 | 50 | 4 |
| UB542 0101510 | 1 | 0.5 | 1.5 | 1 | 2.5 | 10 | 50 | 4 |
| UB542 0101512 | 1 | 0.5 | 1.5 | 1 | 2.5 | 12 | 50 | 4 |
| UB542 0101516 | 1 | 0.5 | 1.5 | 1 | 2.5 | 16 | 50 | 4 |
| UB542 0101520 | 1 | 0.5 | 1.5 | 1 | 2.5 | 20 | 50 | 4 |
| UB542 0101525 | 1 | 0.5 | 1.5 | 1 | 2.5 | 25 | 60 | 4 |
| UB542 0101530 | 1 | 0.5 | 1.5 | 1 | 2.5 | 30 | 70 | 4 |
| UB542 0101540 | 1 | 0.5 | 1.5 | 1 | 2.5 | 40 | 80 | 4 |
| UB542 0101550 | 1 | 0.5 | 1.5 | 1 | 2.5 | 50 | 90 | 4 |
| UB542 0102006 | 1 | 0.5 | 2 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0102008 | 1 | 0.5 | 2 | 1 | 2.5 | 8 | 50 | 4 |
| UB542 0102010 | 1 | 0.5 | 2 | 1 | 2.5 | 10 | 50 | 4 |
| UB542 0102030 | 1 | 0.5 | 2 | 1 | 2.5 | 30 | 70 | 4 |
| UB542 0102040 | 1 | 0.5 | 2 | 1 | 2.5 | 40 | 80 | 4 |
| UB542 0102050 | 1 | 0.5 | 2 | 1 | 2.5 | 50 | 90 | 6 |
| UB542 0103006 | 1 | 0.5 | 3 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0102030 | 1 | 0.5 | 2 | 1 | 2.5 | 30 | 70 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0102040 | 1 | 0.5 | 2 | 1 | 2.5 | 40 | 80 | 4 |
| UB542 0102050 | 1 | 0.5 | 2 | 1 | 2.5 | 50 | 90 | 6 |
| UB542 0103006 | 1 | 0.5 | 3 | 1 | 2.5 | 6 | 50 | 4 |
| UB542 0103008 | 1 | 0.5 | 3 | 1 | 2.5 | 8 | 50 | 4 |
| UB542 0103010 | 1 | 0.5 | 3 | 1 | 2.5 | 10 | 50 | 4 |
| UB542 0103012 | 1 | 0.5 | 3 | 1 | 2.5 | 12 | 50 | 4 |
| UB542 0103016 | 1 | 0.5 | 3 | 1 | 2.5 | 16 | 50 | 4 |
| UB542 0103020 | 1 | 0.5 | 3 | 1 | 2.5 | 20 | 50 | 4 |
| UB542 0103025 | 1 | 0.5 | 3 | 1 | 2.5 | 25 | 60 | 4 |
| UB542 0103030 | 1 | 0.5 | 3 | 1 | 2.5 | 30 | 70 | 6 |
| UB542 0103040 | 1 | 0.5 | 3 | 1 | 2.5 | 40 | 80 | 6 |
| UB542 0103050 | 1 | 0.5 | 3 | 1 | 2.5 | 50 | 90 | 6 |
| UB542 0105030 | 1 | 0.5 | 5 | 1 | 2.5 | 30 | 70 | 6 |
| UB542 0120508 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0120512 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0120516 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0120520 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0120525 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0120530 | 1.2 | 0.6 | 0.5 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0121008 | 1.2 | 0.6 | 1 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0121012 | 1.2 | 0.6 | 1 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0121016 | 1.2 | 0.6 | 1 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0121020 | 1.2 | 0.6 | 1 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0121025 | 1.2 | 0.6 | 1 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0121030 | 1.2 | 0.6 | 1 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0121508 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0121512 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0121516 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0121520 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0121525 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0121530 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0122008 | 1.2 | 0.6 | 2 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0122012 | 1.2 | 0.6 | 2 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0122016 | 1.2 | 0.6 | 2 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0122020 | 1.2 | 0.6 | 2 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0122025 | 1.2 | 0.6 | 2 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0122030 | 1.2 | 0.6 | 2 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0123008 | 1.2 | 0.6 | 3 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0123012 | 1.2 | 0.6 | 3 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0123016 | 1.2 | 0.6 | 3 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0123020 | 1.2 | 0.6 | 3 | 1.2 | 3 | 20 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0123025 | 1.2 | 0.6 | 3 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0123030 | 1.2 | 0.6 | 5 | 1.2 | 3 | 30 | 70 | 6 |
| UB542 0150508 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0150510 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0150512 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0150516 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0150520 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0150525 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0150530 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0150540 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0150550 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0151008 | 1.5 | 0.75 | 1 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0151010 | 1.5 | 0.75 | 1 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0151012 | 1.5 | 0.75 | 1 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0151016 | 1.5 | 0.75 | 1 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0151020 | 1.5 | 0.75 | 1 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0151025 | 1.5 | 0.75 | 1 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0151030 | 1.5 | 0.75 | 1 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0151040 | 1.5 | 0.75 | 1 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0151050 | 1.5 | 0.75 | 1 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0151508 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0151510 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0151512 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0151516 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0151520 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0151525 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0151530 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0151540 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0151550 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0121016 | 1.2 | 0.6 | 1 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0121020 | 1.2 | 0.6 | 1 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0121025 | 1.2 | 0.6 | 1 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0121030 | 1.2 | 0.6 | 1 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0121508 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0121512 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0121516 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0121520 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0121525 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0121530 | 1.2 | 0.6 | 1.5 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0122008 | 1.2 | 0.6 | 2 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0122012 | 1.2 | 0.6 | 2 | 1.2 | 3 | 12 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0122016 | 1.2 | 0.6 | 2 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0122020 | 1.2 | 0.6 | 2 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0122025 | 1.2 | 0.6 | 2 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0122030 | 1.2 | 0.6 | 2 | 1.2 | 3 | 30 | 70 | 4 |
| UB542 0123008 | 1.2 | 0.6 | 3 | 1.2 | 3 | 8 | 50 | 4 |
| UB542 0123012 | 1.2 | 0.6 | 3 | 1.2 | 3 | 12 | 50 | 4 |
| UB542 0123016 | 1.2 | 0.6 | 3 | 1.2 | 3 | 16 | 50 | 4 |
| UB542 0123020 | 1.2 | 0.6 | 3 | 1.2 | 3 | 20 | 50 | 4 |
| UB542 0123025 | 1.2 | 0.6 | 3 | 1.2 | 3 | 25 | 60 | 4 |
| UB542 0123030 | 1.2 | 0.6 | 5 | 1.2 | 3 | 30 | 70 | 6 |
| UB542 0150508 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0150510 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0150512 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0150516 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0150520 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0150525 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0150530 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0150540 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0150550 | 1.5 | 0.75 | 0.5 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0151008 | 1.5 | 0.75 | 1 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0151010 | 1.5 | 0.75 | 1 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0151012 | 1.5 | 0.75 | 1 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0151016 | 1.5 | 0.75 | 1 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0151020 | 1.5 | 0.75 | 1 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0151025 | 1.5 | 0.75 | 1 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0151030 | 1.5 | 0.75 | 1 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0151040 | 1.5 | 0.75 | 1 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0151050 | 1.5 | 0.75 | 1 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0151508 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0151510 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0151512 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0151516 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 16 | 50 | 4 |
| UB542 0151520 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0151525 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0151530 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0151540 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 40 | 80 | 4 |
| UB542 0151550 | 1.5 | 0.75 | 1.5 | 1.5 | 4 | 50 | 90 | 4 |
| UB542 0152008 | 1.5 | 0.75 | 2 | 1.5 | 4 | 8 | 50 | 4 |
| UB542 0152010 | 1.5 | 0.75 | 2 | 1.5 | 4 | 10 | 50 | 4 |
| UB542 0152012 | 1.5 | 0.75 | 2 | 1.5 | 4 | 12 | 50 | 4 |
| UB542 0152016 | 1.5 | 0.75 | 2 | 1.5 | 4 | 16 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0152020 | 1.5 | 0.75 | 2 | 1.5 | 4 | 20 | 50 | 4 |
| UB542 0152025 | 1.5 | 0.75 | 2 | 1.5 | 4 | 25 | 60 | 4 |
| UB542 0152030 | 1.5 | 0.75 | 2 | 1.5 | 4 | 30 | 70 | 4 |
| UB542 0152040 | 1.5 | 0.75 | 2 | 1.5 | 4 | 40 | 80 | 6 |
| UB542 0152050 | 1.5 | 0.75 | 2 | 1.5 | 4 | 50 | 90 | 6 |
| UB542 0153020 | 1.5 | 0.75 | 3 | 1.5 | 4 | 20 | 50 | 6 |
| UB542 0153030 | 1.5 | 0.75 | 3 | 1.5 | 4 | 30 | 70 | 6 |
| UB542 0153040 | 1.5 | 0.75 | 3 | 1.5 | 4 | 40 | 80 | 6 |
| UB542 0153050 | 1.5 | 0.75 | 3 | 1.5 | 4 | 50 | 90 | 8 |
| UB542 0155030 | 1.5 | 0.75 | 5 | 1.5 | 4 | 30 | 70 | 8 |
| UB542 0200510 | 2 | 1 | 0.5 | 2 | 5 | 10 | 50 | 4 |
| UB542 0200512 | 2 | 1 | 0.5 | 2 | 5 | 12 | 50 | 4 |
| UB542 0200516 | 2 | 1 | 0.5 | 2 | 5 | 16 | 50 | 4 |
| UB542 0200520 | 2 | 1 | 0.5 | 2 | 5 | 20 | 50 | 4 |
| UB542 0200525 | 2 | 1 | 0.5 | 2 | 5 | 25 | 60 | 4 |
| UB542 0200530 | 2 | 1 | 0.5 | 2 | 5 | 30 | 70 | 4 |
| UB542 0200540 | 2 | 1 | 0.5 | 2 | 5 | 40 | 80 | 4 |
| UB542 0200550 | 2 | 1 | 0.5 | 2 | 5 | 50 | 100 | 6 |
| UB542 0200560 | 2 | 1 | 0.5 | 2 | 5 | 60 | 100 | 6 |
| UB542 0200580 | 2 | 1 | 0.5 | 2 | 5 | 80 | 140 | 6 |
| UB542 0201010 | 2 | 1 | 1 | 2 | 5 | 10 | 50 | 4 |
| UB542 0201012 | 2 | 1 | 1 | 2 | 5 | 12 | 50 | 4 |
| UB542 0201016 | 2 | 1 | 1 | 2 | 5 | 16 | 50 | 4 |
| UB542 0201020 | 2 | 1 | 1 | 2 | 5 | 20 | 50 | 4 |
| UB542 0201025 | 2 | 1 | 1 | 2 | 5 | 25 | 60 | 4 |
| UB542 0201030 | 2 | 1 | 1 | 2 | 5 | 30 | 70 | 4 |
| UB542 0201040 | 2 | 1 | 1 | 2 | 5 | 40 | 80 | 6 |
| UB542 0201050 | 2 | 1 | 1 | 2 | 5 | 50 | 100 | 6 |
| UB542 0201060 | 2 | 1 | 1 | 2 | 5 | 60 | 100 | 6 |
| UB542 0201080 | 2 | 1 | 1 | 2 | 5 | 80 | 140 | 6 |
| UB542 0201510 | 2 | 1 | 1.5 | 2 | 5 | 10 | 50 | 4 |
| UB542 0201512 | 2 | 1 | 1.5 | 2 | 5 | 12 | 50 | 4 |
| UB542 0201516 | 2 | 1 | 1.5 | 2 | 5 | 16 | 50 | 4 |
| UB542 0201520 | 2 | 1 | 1.5 | 2 | 5 | 20 | 50 | 4 |
| UB542 0201525 | 2 | 1 | 1.5 | 2 | 5 | 25 | 60 | 4 |
| UB542 0201530 | 2 | 1 | 1.5 | 2 | 5 | 30 | 70 | 6 |
| UB542 0201540 | 2 | 1 | 1.5 | 2 | 5 | 40 | 80 | 6 |
| UB542 0201550 | 2 | 1 | 1.5 | 2 | 5 | 50 | 100 | 6 |
| UB542 0201560 | 2 | 1 | 1.5 | 2 | 5 | 60 | 100 | 6 |
| UB542 0201580 | 2 | 1 | 1.5 | 2 | 5 | 80 | 140 | 6 |
| UB542 0202010 | 2 | 1 | 2 | 2 | 5 | 10 | 50 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0202012 | 2 | 1 | 2 | 2 | 5 | 12 | 50 | 4 |
| UB542 0202016 | 2 | 1 | 2 | 2 | 5 | 16 | 50 | 4 |
| UB542 0202020 | 2 | 1 | 2 | 2 | 5 | 20 | 55 | 4 |
| UB542 0202025 | 2 | 1 | 2 | 2 | 5 | 25 | 60 | 4 |
| UB542 0202030 | 2 | 1 | 2 | 2 | 5 | 30 | 70 | 4 |
| UB542 0202040 | 2 | 1 | 2 | 2 | 5 | 40 | 80 | 6 |
| UB542 0202050 | 2 | 1 | 2 | 2 | 5 | 50 | 90 | 6 |
| UB542 0202060 | 2 | 1 | 2 | 2 | 5 | 60 | 100 | 6 |
| UB542 0202080 | 2 | 1 | 2 | 2 | 5 | 80 | 140 | 8 |
| UB542 0203030 | 2 | 1 | 3 | 2 | 5 | 30 | 70 | 6 |
| UB542 0203040 | 2 | 1 | 3 | 2 | 5 | 40 | 80 | 6 |
| UB542 0203050 | 2 | 1 | 3 | 2 | 5 | 50 | 90 | 8 |
| UB542 0203060 | 2 | 1 | 3 | 2 | 5 | 60 | 100 | 8 |
| UB542 0203080 | 2 | 1 | 3 | 2 | 5 | 80 | 140 | 10 |
| UB542 0205030 | 2 | 1 | 5 | 2 | 5 | 30 | 70 | 8 |
| UB542 0205040 | 2 | 1 | 5 | 2 | 5 | 40 | 90 | 10 |
| UB542 0300516 | 3 | 1.5 | 0.5 | 4.5 | 6 | 16 | 60 | 6 |
| UB542 0300520 | 3 | 1.5 | 0.5 | 4.5 | 6 | 20 | 65 | 6 |
| UB542 0300530 | 3 | 1.5 | 0.5 | 4.5 | 6 | 30 | 70 | 6 |
| UB542 0300540 | 3 | 1.5 | 0.5 | 4.5 | 6 | 40 | 80 | 6 |
| UB542 0300550 | 3 | 1.5 | 0.5 | 4.5 | 6 | 50 | 90 | 6 |
| UB542 0300560 | 3 | 1.5 | 0.5 | 4.5 | 6 | 60 | 100 | 6 |
| UB542 0301016 | 3 | 1.5 | 1 | 4.5 | 6 | 16 | 60 | 6 |
| UB542 0301020 | 3 | 1.5 | 1 | 4.5 | 6 | 20 | 65 | 6 |
| UB542 0301030 | 3 | 1.5 | 1 | 4.5 | 6 | 30 | 70 | 6 |
| UB542 0301040 | 3 | 1.5 | 1 | 4.5 | 6 | 40 | 80 | 6 |
| UB542 0301050 | 3 | 1.5 | 1 | 4.5 | 6 | 50 | 90 | 6 |
| UB542 0301060 | 3 | 1.5 | 1 | 4.5 | 6 | 60 | 100 | 6 |
| UB542 0301070 | 3 | 1.5 | 1 | 4.5 | 6 | 70 | 120 | 6 |
| UB542 0301516 | 3 | 1.5 | 1.5 | 4.5 | 6 | 16 | 60 | 6 |
| UB542 0301520 | 3 | 1.5 | 1.5 | 4.5 | 6 | 20 | 65 | 6 |
| UB542 0301530 | 3 | 1.5 | 1.5 | 4.5 | 6 | 30 | 70 | 6 |
| UB542 0301540 | 3 | 1.5 | 1.5 | 4.5 | 6 | 40 | 80 | 6 |
| UB542 0301550 | 3 | 1.5 | 1.5 | 4.5 | 6 | 50 | 90 | 6 |
| UB542 0301560 | 3 | 1.5 | 1.5 | 4.5 | 6 | 60 | 100 | 6 |
| UB542 0302016 | 3 | 1.5 | 2 | 4.5 | 6 | 16 | 60 | 6 |
| UB542 0302020 | 3 | 1.5 | 2 | 4.5 | 6 | 20 | 65 | 6 |
| UB542 0302030 | 3 | 1.5 | 2 | 4.5 | 6 | 30 | 70 | 6 |
| UB542 0302040 | 3 | 1.5 | 2 | 4.5 | 6 | 40 | 80 | 6 |
| UB542 0302050 | 3 | 1.5 | 2 | 4.5 | 6 | 50 | 90 | 8 |
| UB542 0303030 | 3 | 1.5 | 3 | 4.5 | 6 | 30 | 70 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL



| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 0303040 | 3 | 1.5 | 3 | 4.5 | 6 | 40 | 90 | 8 |
| UB542 0305030 | 3 | 1.5 | 5 | 4.5 | 6 | 30 | 70 | 8 |
| UB542 0305040 | 3 | 1.5 | 5 | 4.5 | 6 | 40 | 90 | 10 |
| UB542 0400540 | 4 | 2 | 0.5 | 6 | 8 | 40 | 90 | 6 |
| UB542 0400550 | 4 | 2 | 0.5 | 6 | 8 | 50 | 100 | 6 |
| UB542 0400560 | 4 | 2 | 0.5 | 6 | 8 | 60 | 110 | 6 |
| UB542 0400570 | 4 | 2 | 0.5 | 6 | 8 | 70 | 120 | 6 |
| UB542 0401040 | 4 | 2 | 1 | 6 | 8 | 40 | 90 | 6 |
| UB542 0401050 | 4 | 2 | 1 | 6 | 8 | 50 | 100 | 6 |
| UB542 0401060 | 4 | 2 | 1 | 6 | 8 | 60 | 110 | 8 |
| UB542 0401070 | 4 | 2 | 1 | 6 | 8 | 70 | 120 | 8 |
| UB542 0401540 | 4 | 2 | 1.5 | 6 | 8 | 40 | 90 | 6 |
| UB542 0401550 | 4 | 2 | 1.5 | 6 | 8 | 50 | 100 | 8 |
| UB542 0401560 | 4 | 2 | 1.5 | 6 | 8 | 60 | 110 | 8 |
| UB542 0401570 | 4 | 2 | 1.5 | 6 | 8 | 70 | 120 | 8 |
| UB542 0403050 | 4 | 2 | 3 | 6 | 8 | 50 | 100 | 10 |
| UB542 0405050 | 4 | 2 | 5 | 6 | 8 | 50 | 100 | 12 |
| UB542 0501060 | 5 | 2.5 | 1 | 10 | 13 | 60 | 120 | 8 |
| UB542 0501560 | 5 | 2.5 | 1.5 | 10 | 13 | 60 | 120 | 8 |
| UB542 0503040 | 5 | 2.5 | 3 | 10 | 13 | 40 | 120 | 8 |
| UB542 0601060 | 6 | 3 | 1 | 12 | 15 | 60 | 120 | 8 |
| UB542 0601090 | 6 | 3 | 1 | 12 | 15 | 90 | 150 | 10 |
| UB542 0601560 | 6 | 3 | 1.5 | 12 | 15 | 60 | 120 | 10 |
| UB542 0601590 | 6 | 3 | 1.5 | 12 | 15 | 90 | 150 | 10 |
| UB542 0602060 | 6 | 3 | 2 | 12 | 15 | 60 | 120 | 10 |
| UB542 0602090 | 6 | 3 | 2 | 12 | 15 | 90 | 150 | 12 |
| UB542 0603060 | 6 | 3 | 3 | 12 | 15 | 60 | 120 | 12 |
| UB542 0603090 | 6 | 3 | 3 | 12 | 15 | 90 | 150 | 14 |
| UB542 08010100 | 8 | 4 | 1 | 14 | 18 | 100 | 150 | 12 |
| UB542 0801070 | 8 | 4 | 1 | 14 | 18 | 70 | 130 | 10 |
| UB542 08015100 | 8 | 4 | 1.5 | 14 | 18 | 100 | 150 | 14 |
| UB542 0801570 | 8 | 4 | 1.5 | 14 | 18 | 70 | 130 | 12 |
| UB542 08020100 | 8 | 4 | 2 | 14 | 18 | 100 | 150 | 14 |
| UB542 0802070 | 8 | 4 | 2 | 14 | 18 | 70 | 130 | 12 |
| UB542 08030100 | 8 | 4 | 3 | 14 | 18 | 100 | 150 | 18 |
| UB542 0803070 | 8 | 4 | 3 | 14 | 18 | 70 | 130 | 14 |
| UB542 10010100 | 10 | 5 | 1 | 18 | 22 | 100 | 200 | 14 |
| UB542 1001070 | 10 | 5 | 1 | 18 | 22 | 70 | 130 | 12 |
| UB542 1001080 | 10 | 5 | 1 | 18 | 22 | 80 | 150 | 14 |
| UB542 10015100 | 10 | 5 | 1.5 | 18 | 22 | 100 | 200 | 16 |
| UB542 1001570 | 10 | 5 | 1.5 | 18 | 22 | 70 | 130 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB542 | 2 FLUTES TAPERED NECK BALL ENDMILL

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L3 | L4 | L2 | D2 |
| UB542 1001580 | 10 | 5 | 1.5 | 18 | 22 | 80 | 150 | 14 |
| UB542 10020100 | 10 | 5 | 2 | 18 | 22 | 100 | 200 | 16 |
| UB542 1002070 | 10 | 5 | 2 | 18 | 22 | 70 | 130 | 14 |
| UB542 1002080 | 10 | 5 | 2 | 18 | 22 | 80 | 150 | 16 |
| UB542 10030100 | 10 | 5 | 3 | 18 | 22 | 100 | 200 | 20 |
| UB542 1003070 | 10 | 5 | 3 | 18 | 22 | 70 | 130 | 16 |
| UB542 1003080 | 10 | 5 | 3 | 18 | 22 | 80 | 150 | 18 |
| UB542 12010100 | 12 | 6 | 1 | 22 | 25 | 100 | 200 | 16 |
| UB542 1201060 | 12 | 6 | 1 | 22 | 25 | 60 | 130 | 14 |
| UB542 1201080 | 12 | 6 | 1 | 22 | 25 | 80 | 150 | 14 |
| UB542 1201090 | 12 | 6 | 1 | 22 | 25 | 90 | 180 | 16 |
| UB542 12015100 | 12 | 6 | 1.5 | 22 | 25 | 100 | 200 | 16 |
| UB542 1201560 | 12 | 6 | 1.5 | 22 | 25 | 60 | 130 | 14 |
| UB542 1201580 | 12 | 6 | 1.5 | 22 | 25 | 80 | 150 | 16 |
| UB542 1201590 | 12 | 6 | 1.5 | 22 | 25 | 90 | 180 | 16 |
| UB542 12020100 | 12 | 6 | 2 | 22 | 25 | 100 | 200 | 18 |
| UB542 1202060 | 12 | 6 | 2 | 22 | 25 | 60 | 130 | 16 |
| UB542 1202080 | 12 | 6 | 2 | 22 | 25 | 80 | 150 | 16 |
| UB542 1202090 | 12 | 6 | 2 | 22 | 25 | 90 | 180 | 18 |
| UB542 12030100 | 12 | 6 | 3 | 22 | 25 | 100 | 200 | 20 |
| UB542 1203060 | 12 | 6 | 3 | 22 | 25 | 60 | 130 | 16 |
| UB542 1203080 | 12 | 6 | 3 | 22 | 25 | 80 | 150 | 18 |
| UB542 1203090 | 12 | 6 | 3 | 22 | 25 | 90 | 180 | 20 |

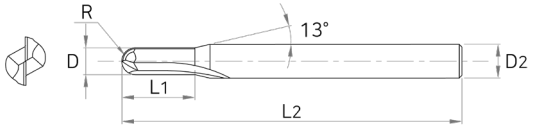


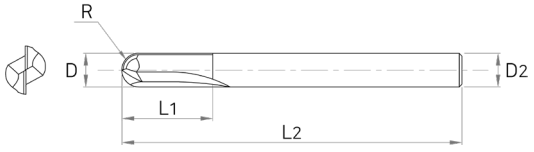
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# USB502 | 2 FLUTES STRAIGHT BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 20 | 0 ~ -0.015 | |

CARBIDE | AlCrN | 2 | 0° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.665

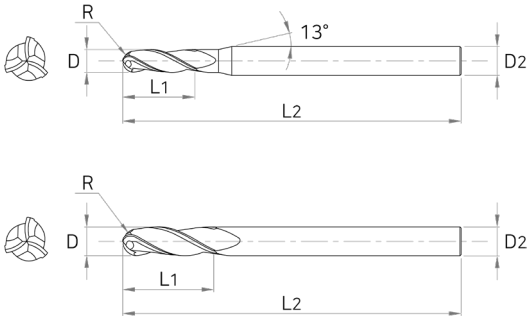
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| USB502 030 | 3 | 1.5 | 10 | 70 | 6 |
| USB502 040 | 4 | 2 | 12 | 70 | 6 |
| USB502 050 | 5 | 2.5 | 18 | 90 | 6 |
| USB502 060 | 6 | 3 | 20 | 90 | 6 |
| USB502 080 | 8 | 4 | 25 | 100 | 8 |
| USB502 100 | 10 | 5 | 30 | 100 | 10 |
| USB502 120 | 12 | 6 | 32 | 110 | 12 |
| USB502 160 | 16 | 8 | 35 | 150 | 16 |
| USB502 200 | 20 | 10 | 40 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB503 | 3 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.02 | h5 |

CARBIDE | AlCrN | 3 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.665

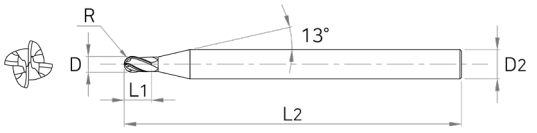
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB503 010 | 1 | 0.5 | 1 | 50 | 6 |
| UB503 015 | 1.5 | 0.75 | 1.5 | 50 | 6 |
| UB503 020 | 2 | 1 | 2 | 50 | 6 |
| UB503 030 | 3 | 1.5 | 3 | 60 | 6 |
| UB503 040 | 4 | 2 | 4 | 70 | 6 |
| UB503 050 | 5 | 2.5 | 5 | 80 | 6 |
| UB503 060 | 6 | 3 | 6 | 90 | 6 |
| UB503 080 | 8 | 4 | 8 | 100 | 8 |
| UB503 100 | 10 | 5 | 10 | 100 | 10 |
| UB503 120 | 12 | 6 | 12 | 110 | 12 |

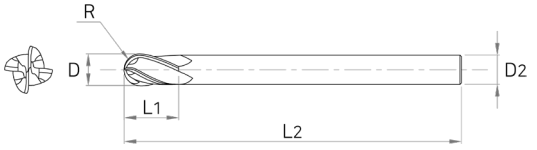
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UB504 | 4 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.02 | h5 |

CARBIDE | AlCrN | 4 | 30° HELIX | R ±0.005 R3 OR UNDER | R ±0.01 ABOVE R3 | DATA P.666

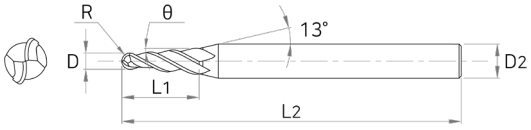
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| UB504 010 | 1 | 0.5 | 1 | 50 | 6 |
| UB504 015 | 1.5 | 0.75 | 1.5 | 50 | 6 |
| UB504 020 | 2 | 1 | 2 | 50 | 6 |
| UB504 030 | 3 | 1.5 | 3 | 60 | 6 |
| UB504 040 | 4 | 2 | 4 | 70 | 6 |
| UB504 050 | 5 | 2.5 | 5 | 80 | 6 |
| UB504 060 | 6 | 3 | 6 | 90 | 6 |
| UB504 080 | 8 | 4 | 8 | 100 | 8 |
| UB504 100 | 10 | 5 | 10 | 100 | 10 |
| UB504 120 | 12 | 6 | 12 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTB502 | 2 FLUTES TAPERED BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.3 ~ 2 | 0 ~ -0.03 | h5 |

CARBIDE | AlCrN | 2 | 30° HELIX | R ±0.01 | DATA P.666

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L2 | D2 |
| UTB502 00305 | 0.3 | 0.15 | 5 | 1.2 | 40 | 4 |
| UTB502 00303 | 0.3 | 0.15 | 3 | 1.2 | 40 | 4 |
| UTB502 00302 | 0.3 | 0.15 | 2 | 1.2 | 40 | 4 |
| UTB502 003015 | 0.3 | 0.15 | 1.5 | 1.2 | 40 | 4 |
| UTB502 00301 | 0.3 | 0.15 | 1 | 1.2 | 40 | 4 |
| UTB502 003005 | 0.3 | 0.15 | 0.5 | 1.2 | 40 | 4 |
| UTB502 00310 | 0.3 | 0.15 | 10 | 1.5 | 40 | 4 |
| UTB502 00307 | 0.3 | 0.15 | 7 | 1.5 | 40 | 4 |
| UTB502 00405 | 0.4 | 0.2 | 5 | 1.6 | 40 | 4 |
| UTB502 00403 | 0.4 | 0.2 | 3 | 1.6 | 40 | 4 |
| UTB502 00402 | 0.4 | 0.2 | 2 | 1.6 | 40 | 4 |
| UTB502 004015 | 0.4 | 0.2 | 1.5 | 1.6 | 40 | 4 |
| UTB502 00401 | 0.4 | 0.2 | 1 | 1.6 | 40 | 4 |
| UTB502 004005 | 0.4 | 0.2 | 0.5 | 1.6 | 40 | 4 |
| UTB502 00410 | 0.4 | 0.2 | 10 | 2 | 40 | 4 |
| UTB502 00407 | 0.4 | 0.2 | 7 | 2 | 40 | 4 |
| UTB502 00505 | 0.5 | 0.25 | 5 | 2 | 45 | 4 |
| UTB502 00503 | 0.5 | 0.25 | 3 | 2 | 45 | 4 |
| UTB502 00502 | 0.5 | 0.25 | 2 | 2 | 45 | 4 |
| UTB502 005015 | 0.5 | 0.25 | 1.5 | 2 | 45 | 4 |
| UTB502 00501 | 0.5 | 0.25 | 1 | 2 | 45 | 4 |
| UTB502 005005 | 0.5 | 0.25 | 0.5 | 2 | 45 | 4 |
| UTB502 00510 | 0.5 | 0.25 | 10 | 2.5 | 45 | 4 |
| UTB502 00507 | 0.5 | 0.25 | 7 | 2.5 | 45 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L2 | D2 |
| UTB502 00605 | 0.6 | 0.3 | 5 | 2 | 45 | 4 |
| UTB502 00603 | 0.6 | 0.3 | 3 | 2 | 45 | 4 |
| UTB502 00602 | 0.6 | 0.3 | 2 | 2 | 45 | 4 |
| UTB502 006015 | 0.6 | 0.3 | 1.5 | 2 | 45 | 4 |
| UTB502 00601 | 0.6 | 0.3 | 1 | 2 | 45 | 4 |
| UTB502 006005 | 0.6 | 0.3 | 0.5 | 2 | 45 | 4 |
| UTB502 00610 | 0.6 | 0.3 | 10 | 2.5 | 45 | 4 |
| UTB502 00607 | 0.6 | 0.3 | 7 | 2.5 | 45 | 4 |
| UTB502 00705 | 0.7 | 0.35 | 5 | 2.5 | 45 | 4 |
| UTB502 00703 | 0.7 | 0.35 | 3 | 2.5 | 45 | 4 |
| UTB502 00702 | 0.7 | 0.35 | 2 | 2.5 | 45 | 4 |
| UTB502 007015 | 0.7 | 0.35 | 1.5 | 2.5 | 45 | 4 |
| UTB502 00701 | 0.7 | 0.35 | 1 | 2.5 | 45 | 4 |
| UTB502 007005 | 0.7 | 0.35 | 0.5 | 2.5 | 45 | 4 |
| UTB502 00710 | 0.7 | 0.35 | 10 | 3 | 45 | 4 |
| UTB502 00707 | 0.7 | 0.35 | 7 | 3 | 45 | 4 |
| UTB502 00810 | 0.8 | 0.4 | 10 | 3.2 | 45 | 4 |
| UTB502 00807 | 0.8 | 0.4 | 7 | 3.2 | 45 | 4 |
| UTB502 00805 | 0.8 | 0.4 | 5 | 3.2 | 45 | 4 |
| UTB502 00803 | 0.8 | 0.4 | 3 | 3.2 | 45 | 4 |
| UTB502 00802 | 0.8 | 0.4 | 2 | 3.2 | 45 | 4 |
| UTB502 008015 | 0.8 | 0.4 | 1.5 | 3.2 | 45 | 4 |
| UTB502 00801 | 0.8 | 0.4 | 1 | 3.2 | 45 | 4 |
| UTB502 008005 | 0.8 | 0.4 | 0.5 | 3.2 | 45 | 4 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UTB502 | 2 FLUTES TAPERED BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L2 | D2 |
| UTB502 01010 | 1 | 0.5 | 10 | 4 | 50 | 4 |
| UTB502 01007 | 1 | 0.5 | 7 | 4 | 50 | 4 |
| UTB502 01005 | 1 | 0.5 | 5 | 4 | 50 | 4 |
| UTB502 01003 | 1 | 0.5 | 3 | 4 | 50 | 4 |
| UTB502 01002 | 1 | 0.5 | 2 | 4 | 50 | 4 |
| UTB502 010015 | 1 | 0.5 | 1.5 | 4 | 50 | 4 |
| UTB502 01001 | 1 | 0.5 | 1 | 4 | 50 | 4 |
| UTB502 010005 | 1 | 0.5 | 0.5 | 4 | 50 | 4 |
| UTB502 015015 | 1.5 | 0.75 | 1.5 | 6 | 50 | 4 |
| UTB502 01501 | 1.5 | 0.75 | 1 | 6 | 50 | 4 |
| UTB502 015005 | 1.5 | 0.75 | 0.5 | 6 | 50 | 4 |
| UTB502 01502 | 1.5 | 0.75 | 2 | 7 | 50 | 4 |

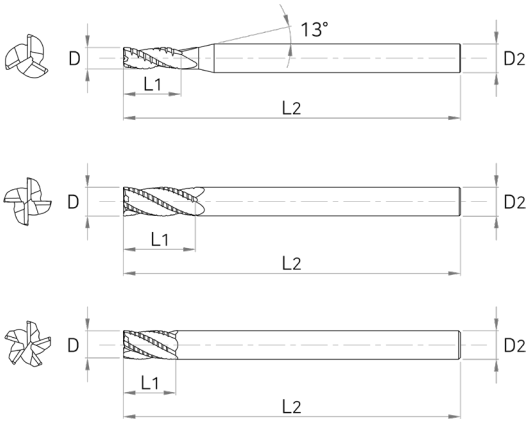
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | θ | L1 | L2 | D2 |
| UTB502 01503 | 1.5 | 0.75 | 3 | 8 | 50 | 4 |
| UTB502 01510 | 1.5 | 0.75 | 10 | 10 | 50 | 6 |
| UTB502 01507 | 1.5 | 0.75 | 7 | 10 | 50 | 4 |
| UTB502 01505 | 1.5 | 0.75 | 5 | 10 | 50 | 4 |
| UTB502 020015 | 2 | 1 | 1.5 | 6 | 50 | 4 |
| UTB502 02001 | 2 | 1 | 1 | 6 | 50 | 4 |
| UTB502 020005 | 2 | 1 | 0.5 | 6 | 50 | 4 |
| UTB502 02007 | 2 | 1 | 7 | 10 | 50 | 6 |
| UTB502 02005 | 2 | 1 | 5 | 10 | 50 | 4 |
| UTB502 02003 | 2 | 1 | 3 | 10 | 50 | 4 |
| UTB502 02002 | 2 | 1 | 2 | 10 | 50 | 4 |
| UTB502 02010 | 2 | 1 | 10 | 11 | 50 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

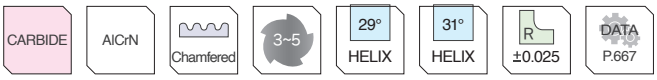
○ : GOOD ◎ : EXCELLENT

# UF50 | 3~5 FLUTES CHIP BRAKER ROUGHING ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 25 | 0 ~ -0.05 | h5 |



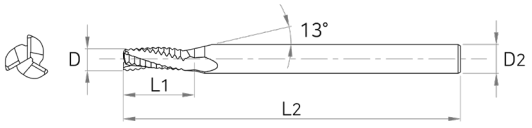

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 | Z |
| UF50 3030 | 3 | 0.2 | 8 | 50 | 6 | 3 |
| UF50 3040 | 4 | 0.2 | 10 | 50 | 6 | 3 |
| UF50 4050 | 5 | 0.2 | 13 | 50 | 6 | 4 |
| UF50 4060 | 6 | 0.2 | 10 | 50 | 6 | 4 |
| UF50 406015 | 6 | 0.2 | 15 | 60 | 6 | 4 |
| UF50 4070 | 7 | 0.2 | 18 | 70 | 8 | 4 |
| UF50 4080 | 8 | 0.2 | 12 | 60 | 8 | 4 |
| UF50 408020 | 8 | 0.2 | 20 | 70 | 8 | 4 |
| UF50 4090 | 9 | 0.3 | 22 | 75 | 10 | 4 |
| UF50 4100 | 10 | 0.3 | 15 | 65 | 10 | 4 |
| UF50 410025 | 10 | 0.3 | 25 | 75 | 10 | 4 |
| UF50 4110 | 11 | 0.3 | 27 | 80 | 12 | 4 |
| UF50 4120 | 12 | 0.3 | 20 | 70 | 12 | 4 |
| UF50 412030 | 12 | 0.3 | 30 | 80 | 12 | 4 |
| UF50 5130 | 13 | 0.5 | 35 | 100 | 12 | 5 |
| UF50 5140S16 | 14 | 0.5 | 35 | 100 | 16 | 5 |
| UF50 5140 | 14 | 0.5 | 35 | 100 | 14 | 5 |
| UF50 5150 | 15 | 0.5 | 35 | 100 | 16 | 5 |
| UF50 5160 | 16 | 1 | 25 | 80 | 16 | 5 |
| UF50 516040 | 16 | 1 | 40 | 100 | 16 | 5 |
| UF50 5180S20 | 18 | 1 | 40 | 100 | 20 | 5 |
| UF50 5180 | 18 | 1 | 40 | 100 | 18 | 5 |
| UF50 5200 | 20 | 1 | 25 | 80 | 20 | 5 |
| UF50 520045 | 20 | 1 | 45 | 100 | 20 | 5 |
| UF50 5250 | 25 | 1 | 45 | 100 | 25 | 5 |

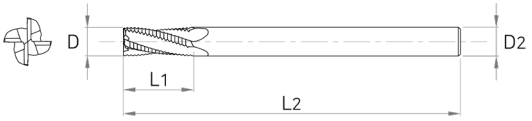
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

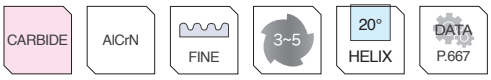
# UF51 | 3~5 FLUTES PITCH ROUGHING ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | 0 ~ -0.04 | h5 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D11 ~ 18 | 0 ~ -0.07 | |
| D20 ~ 25 | 0 ~ -0.084 | |



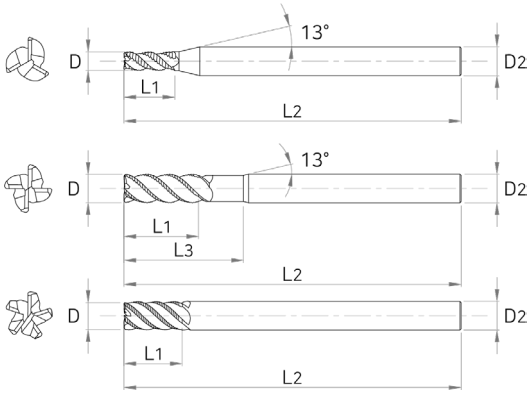

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Z |
| UF51 3030 | 3 | 8 | 50 | 6 | 3 |
| UF51 3040 | 4 | 10 | 50 | 6 | 3 |
| UF51 3050 | 5 | 13 | 50 | 6 | 3 |
| UF51 3060 | 6 | 15 | 60 | 6 | 3 |
| UF51 306020 | 6 | 20 | 60 | 6 | 3 |
| UF51 3070 | 7 | 18 | 70 | 8 | 3 |
| UF51 3080 | 8 | 20 | 70 | 8 | 3 |
| UF51 308025 | 8 | 25 | 70 | 8 | 3 |
| UF51 4090 | 9 | 22 | 75 | 10 | 4 |
| UF51 4100 | 10 | 25 | 75 | 10 | 4 |
| UF51 410030 | 10 | 30 | 75 | 10 | 4 |
| UF51 4110 | 11 | 27 | 80 | 12 | 4 |
| UF51 4120 | 12 | 30 | 80 | 12 | 4 |
| UF51 412035 | 12 | 35 | 80 | 12 | 4 |
| UF51 4130 | 13 | 35 | 100 | 12 | 4 |
| UF51 4140 | 14 | 35 | 100 | 16 | 4 |
| UF51 4160 | 16 | 40 | 100 | 16 | 4 |
| UF51 4180 | 18 | 40 | 100 | 18 | 4 |
| UF51 4200 | 20 | 50 | 100 | 20 | 4 |
| UF51 5250 | 25 | 50 | 100 | 25 | 5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# UF51-H | 3~5 FLUTES 45° HELIX PINE PITCH ROUGHING ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 25 | 0 ~ -0.05 | h5 |

CARBIDE | AlCrN | FINE | 3~5 | 45° HELIX | DATA P.668

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Z |
| UF51 3030H | 3 | 8 | 50 | 6 | 3 |
| UF51 3040H | 4 | 10 | 50 | 6 | 3 |
| UF51 4050H | 5 | 13 | 50 | 6 | 4 |
| UF51 4060H | 6 | 10 | 50 | 6 | 4 |
| UF51 406015H | 6 | 15 | 60 | 6 | 4 |
| UF51 4070H | 7 | 18 | 70 | 8 | 4 |
| UF51 4080H | 8 | 12 | 60 | 8 | 4 |
| UF51 408020H | 8 | 20 | 70 | 8 | 4 |
| UF51 4090H | 9 | 22 | 75 | 10 | 4 |
| UF51 4100H | 10 | 15 | 65 | 10 | 4 |
| UF51 410025H | 10 | 25 | 75 | 10 | 4 |
| UF51 4110H | 11 | 27 | 80 | 12 | 4 |
| UF51 4120H | 12 | 20 | 70 | 12 | 4 |
| UF51 412030H | 12 | 30 | 80 | 12 | 4 |
| UF51 5130H | 13 | 35 | 100 | 12 | 5 |
| UF51 5140S16H | 14 | 35 | 100 | 16 | 5 |
| UF51 5140H | 14 | 35 | 100 | 14 | 5 |
| UF51 5160H | 16 | 25 | 80 | 16 | 5 |
| UF51 516040H | 16 | 40 | 100 | 16 | 5 |
| UF51 5180S20H | 18 | 40 | 100 | 20 | 5 |
| UF51 5180H | 18 | 40 | 100 | 18 | 5 |
| UF51 5200H | 20 | 25 | 80 | 20 | 5 |
| UF51 520045H | 20 | 45 | 100 | 20 | 5 |
| UF51 5250H | 25 | 45 | 100 | 25 | 5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | | ○ | | | | |

○ : GOOD ◎ : EXCELLENT

# ZAMUS THUNDER SERIES

Low Hardness HRc 10 ~ 30

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
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| | 4F | TX204 | | 4 FLUTES SHORT SHANK SQUARE ENDMILL | D1 | D20 | 268 |
| | 2F | TX222 | | 2 FLUTES LONG SQUARE ENDMILL | D3 | D20 | 269 |
| | 4F | TX224 | | 4 FLUTES LONG SQUARE ENDMILL | D3 | D20 | 270 |
| | 2F | TX302 | | 2 FLUTES SQUARE ENDMILL | D1 | D20 | 271 |
| | 4F | TX304 | | 4 FLUTES SQUARE ENDMILL | D1 | D20 | 272 |
| | 4F | TX304H | | 4 FLUTES 45° HELIX SQUARE ENDMILL | D3 | D20 | 273 |
| | 2F | ZE302P | | 2 FLUTES SQUARE ENDMILL | D1 | D20 | 274 |
| | 4F | ZE304P | | 4 FLUTES SQUARE ENDMILL | D1 | D20 | 275 |
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| | 2F | DB342 | | 2 FLUTES TAPERED NECK BALL NOSE ENDMILL | R0.5 | R6 | 283 |
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| | 4F | TXB204 | | 4 FLUTES SHORT SHANK BALL NOSE ENDMILL | R1 | R10 | 285 |
| | 2F | TXB222 | | 2 FLUTES LONG BALL NOSE ENDMILL | R1.5 | R10 | 286 |
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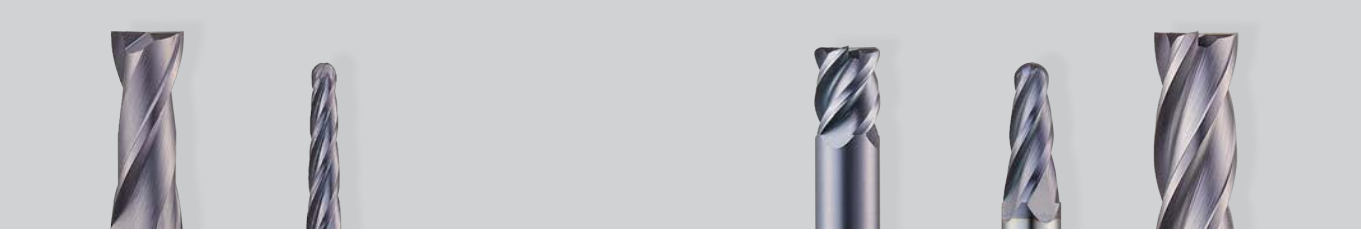
| | 2F | TXB302 | | 2 FLUTES BALL NOSE ENDMILL | R0.5 | R10 | 288 |
| | 4F | TXB304 | | 4 FLUTES BALL NOSE ENDMILL | R0.5 | R10 | 289 |



## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| Z | R | 3 | 2 | 4H | 08 | 10 |
|---|---|---|---|---|---|---|

| Type | Appearance | Grade | Length, Shank Type | Flute | Cutting Dia | Corner R | Shank Dia |
|---|---|---|---|---|---|---|---|
| D : Dynamic | E : Square | 2 : Grade | 0 : Straight | 2 : 2 Flutes | 1 | 0.2 | 4 |
| Z : Zamus Endmill | R : Radius | 3 : Grade | 1 : Long Cutting Length | 4 : 4 Flutes | ~ | ~ | ~ |
| T : Thunder | B : Ball | | 2 : Long Cutting Length | 4H : 4 Flutes (Helix 45°) | 20 | 3 | 20 |
| | X : Square | | 3 : Long Shank | | | | |
| | S : Square | | 4 : Tapered Neck | | | | |
| | XB : Ball | | | | | | |

Ex) 4 Flutes 45° Helix / Cutting Dia Ø8 / Corner R 1.0 / 30 Grade / Corner Radius Long Cutting Length Type Zamus Endmill

# ZAMUS THUNDER SERIES

Low Hardness HRc 10 ~ 30

## General Features

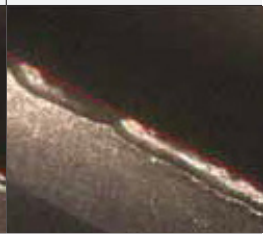
· Suitable for low hardness steel(HRc 10 ~ 30) ; alloy steel, carbon steel, pre-harden, hardened steel etc.
· General purpose suitable for rough machining, finishing and curved and sloped surfaces

## Characteristics

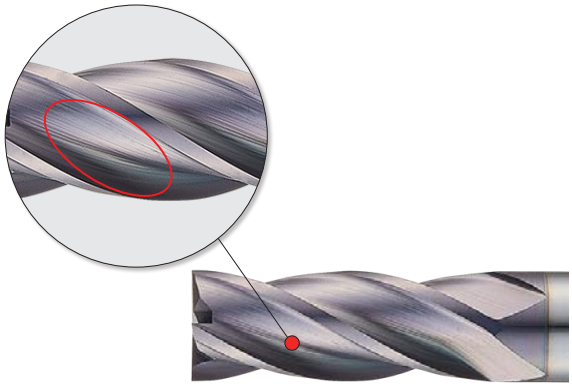
· Excellent Rake angle and Cutting edge considered the characteristics of workpiece.
· Improved chipping resistance and enhanced machinability by using high toughness materials
· TiAlN coating for enhanced oxidation resistance and chipping resistance

## Case Study

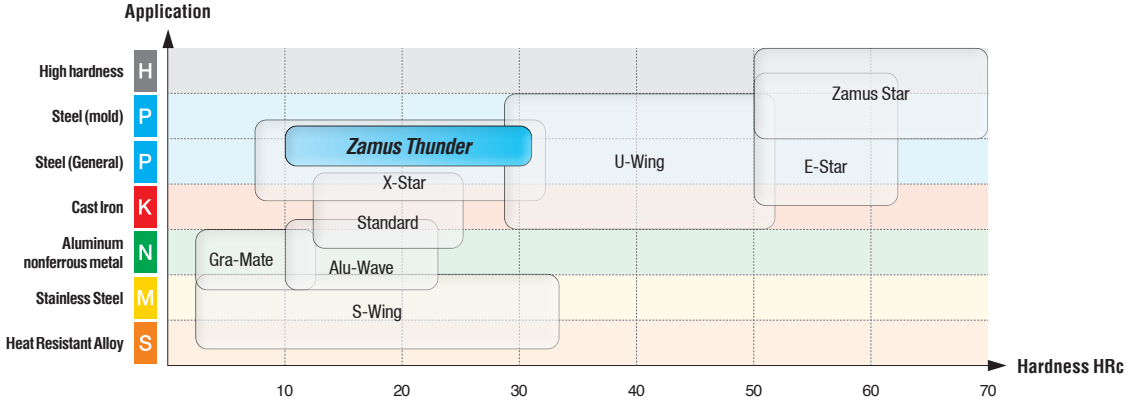
### 4F D3.0 SQUARE ENDMILL

| *Zamus Thunder* | Competitor |
|---|---|
| |  |

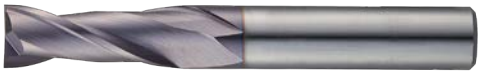
· TEST TOOL : ZE304100P
· Workpiece : STC3, rpm : 4,515, feed : 845, ap : 10, ae : 0.4

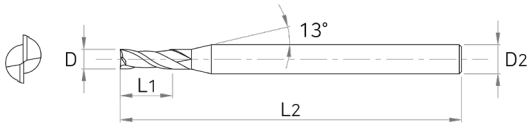


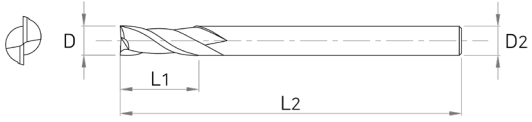
## Applications



# TX202 | 2 FLUTES SHORT SHANK SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

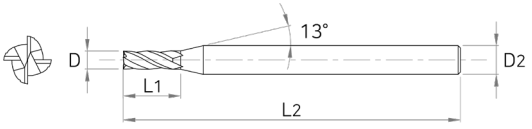
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX202 010 | 1 | 3 | 39 | 3 |
| TX202 015 | 1.5 | 5 | 39 | 3 |
| TX202 020 | 2 | 7 | 39 | 3 |
| TX202 025 | 2.5 | 8 | 39 | 3 |
| TX202 030 | 3 | 10 | 39 | 3 |
| TX202 040 | 4 | 14 | 51 | 4 |
| TX202 050 | 5 | 16 | 51 | 5 |
| TX202 060 | 6 | 19 | 64 | 6 |
| TX202 080 | 8 | 21 | 64 | 8 |
| TX202 100 | 10 | 25 | 70 | 10 |
| TX202 120 | 12 | 25 | 76 | 12 |
| TX202 160 | 16 | 32 | 89 | 16 |
| TX202 200 | 20 | 38 | 102 | 20 |

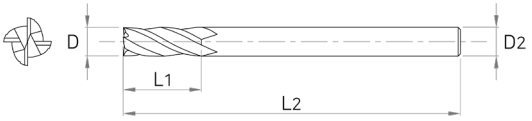
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX204 | 4 FLUTES SHORT SHANK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

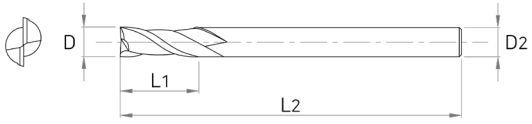
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX204 010 | 1 | 3 | 39 | 3 |
| TX204 015 | 1.5 | 5 | 39 | 3 |
| TX204 020 | 2 | 7 | 39 | 3 |
| TX204 025 | 2.5 | 8 | 39 | 3 |
| TX204 030 | 3 | 10 | 39 | 3 |
| TX204 040 | 4 | 14 | 51 | 4 |
| TX204 050 | 5 | 16 | 51 | 5 |
| TX204 060 | 6 | 19 | 64 | 6 |
| TX204 080 | 8 | 21 | 64 | 8 |
| TX204 100 | 10 | 25 | 70 | 10 |
| TX204 120 | 12 | 25 | 76 | 12 |
| TX204 160 | 16 | 32 | 89 | 16 |
| TX204 200 | 20 | 38 | 102 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX222 | 2 FLUTES LONG SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

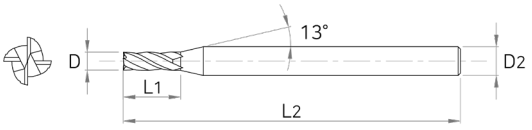
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX222 030 | 3 | 20 | 60 | 3 |
| TX222 040 | 4 | 20 | 60 | 4 |
| TX222 050 | 5 | 25 | 75 | 5 |
| TX222 060 | 6 | 30 | 75 | 6 |
| TX222 080 | 8 | 30 | 75 | 8 |
| TX222 100 | 10 | 40 | 100 | 10 |
| TX222 120 | 12 | 45 | 100 | 12 |
| TX222 140 | 14 | 45 | 100 | 14 |
| TX222 160 | 16 | 45 | 100 | 16 |
| TX222 180 | 18 | 45 | 100 | 18 |
| TX222 200 | 20 | 45 | 100 | 20 |

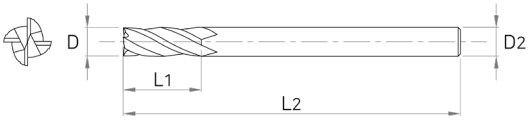
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX224 | 4 FLUTES LONG SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

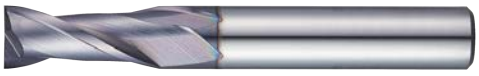
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX224 030 | 3 | 20 | 60 | 3 |
| TX224 040 | 4 | 20 | 60 | 4 |
| TX224 050 | 5 | 25 | 75 | 5 |
| TX224 060 | 6 | 30 | 75 | 6 |
| TX224 080 | 8 | 30 | 75 | 8 |
| TX224 081 | 8 | 30 | 100 | 8 |
| TX224 100 | 10 | 40 | 100 | 10 |
| TX224 120 | 12 | 45 | 100 | 12 |
| TX224 140 | 14 | 45 | 100 | 14 |
| TX224 160 | 16 | 45 | 100 | 16 |
| TX224 180 | 18 | 45 | 100 | 18 |
| TX224 200 | 20 | 45 | 100 | 20 |
| TX202 200 | 20 | 38 | 102 | 20 |

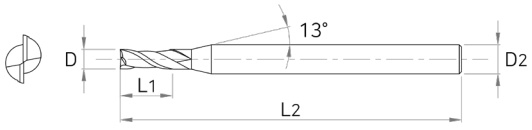
## ■ Applicable Working Material

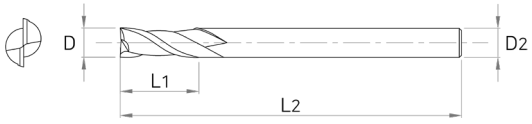
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX302 | 2 FLUTES SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.669

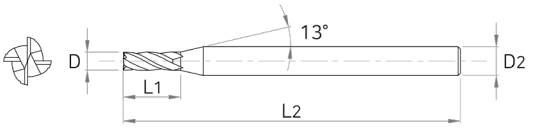
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX302 010 | 1 | 3 | 50 | 4 |
| TX302 015 | 1.5 | 4 | 50 | 4 |
| TX302 020 | 2 | 6 | 50 | 4 |
| TX302 025 | 2.5 | 8 | 50 | 4 |
| TX302 030 | 3 | 9 | 50 | 4 |
| TX302 040 | 4 | 11 | 50 | 4 |
| TX302 050 | 5 | 13 | 50 | 6 |
| TX302 060 | 6 | 16 | 50 | 6 |
| TX302 070 | 7 | 16 | 60 | 8 |
| TX302 080 | 8 | 19 | 60 | 8 |
| TX302 090 | 9 | 19 | 60 | 10 |
| TX302 100 | 10 | 25 | 75 | 10 |
| TX302 120 | 12 | 30 | 75 | 12 |
| TX302 140 | 14 | 32 | 75 | 14 |
| TX302 160 | 16 | 32 | 100 | 16 |
| TX302 180 | 18 | 32 | 100 | 18 |
| TX302 200 | 20 | 38 | 100 | 20 |

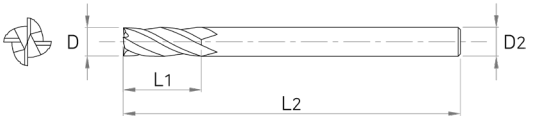
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX304 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.670

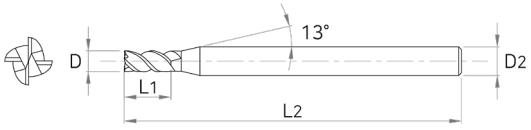
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX304 010 | 1 | 3 | 50 | 4 |
| TX304 015 | 1.5 | 4 | 50 | 4 |
| TX304 020 | 2 | 6 | 50 | 4 |
| TX304 025 | 2.5 | 8 | 50 | 4 |
| TX304 030 | 3 | 9 | 50 | 4 |
| TX304 040 | 4 | 11 | 50 | 4 |
| TX304 050 | 5 | 13 | 50 | 6 |
| TX304 060 | 6 | 16 | 50 | 6 |
| TX304 070 | 7 | 16 | 60 | 8 |
| TX304 080 | 8 | 19 | 60 | 8 |
| TX304 090 | 9 | 19 | 60 | 10 |
| TX304 100 | 10 | 25 | 75 | 10 |
| TX304 120 | 12 | 30 | 75 | 12 |
| TX304 140 | 14 | 32 | 75 | 14 |
| TX304 160 | 16 | 32 | 100 | 16 |
| TX304 180 | 18 | 32 | 100 | 18 |
| TX304 200 | 20 | 38 | 100 | 20 |

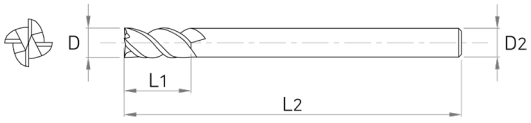
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TX304H | 4 FLUTES 45° HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | -0.014 ~ -0.028 | h6 |
| D4 ~ 6 | -0.02 ~ -0.038 | |
| D7 ~ 10 | -0.025 ~ -0.047 | |
| D12 ~ 18 | -0.032 ~ -0.059 | |
| D20 ~ | -0.04 ~ -0.073 | |

CARBIDE | TiAlN | 4 | 45° HELIX | DATA P.671

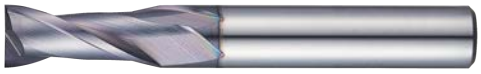
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| TX304H 030 | 3 | 8 | 50 | 6 |
| TX304H 030 S3 | 3 | 8 | 50 | 3 |
| TX304H 030 S4 | 3 | 8 | 50 | 4 |
| TX304H 040 | 4 | 11 | 50 | 6 |
| TX304H 040 S4 | 4 | 11 | 50 | 4 |
| TX304H 050 | 5 | 13 | 50 | 6 |
| TX304H 060 | 6 | 13 | 50 | 6 |
| TX304H 080 | 8 | 19 | 60 | 8 |
| TX304H 100 | 10 | 22 | 70 | 10 |
| TX304H 120 | 12 | 26 | 75 | 12 |
| TX304H 130 | 13 | 26 | 80 | 12 |
| TX304H 140 | 14 | 26 | 80 | 14 |
| TX304H 160 | 16 | 32 | 90 | 16 |
| TX304H 180 | 18 | 32 | 100 | 18 |
| TX304H 200 | 20 | 38 | 100 | 20 |

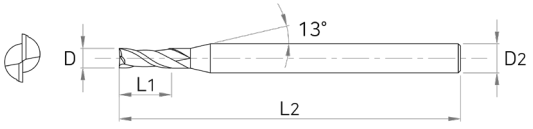
## ■ Applicable Working Material

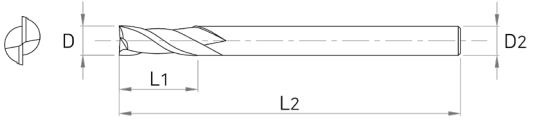
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE302P | 2 FLUTES SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.672

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE302 010P | 1 | 2.5 | 50 | 6 |
| ZE302 015P | 1.5 | 4 | 50 | 6 |
| ZE302 020P | 2 | 6 | 50 | 6 |
| ZE302 025P | 2.5 | 8 | 50 | 6 |
| ZE302 030P | 3 | 10 | 50 | 6 |
| ZE302 035P | 3.5 | 10 | 50 | 6 |
| ZE302 040P | 4 | 12 | 50 | 6 |
| ZE302 045P | 4.5 | 14 | 50 | 6 |
| ZE302 050P | 5 | 15 | 60 | 6 |
| ZE302 055P | 5.5 | 15 | 60 | 6 |
| ZE302 060P | 6 | 15 | 60 | 6 |
| ZE302 065P | 6.5 | 18 | 60 | 8 |
| ZE302 070P | 7 | 20 | 65 | 8 |
| ZE302 075P | 7.5 | 20 | 65 | 8 |
| ZE302 080P | 8 | 20 | 65 | 8 |

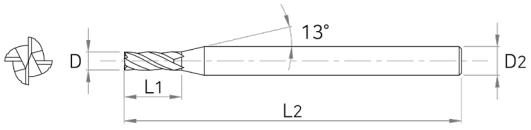
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE302 085P | 8.5 | 22 | 70 | 10 |
| ZE302 090P | 9 | 22 | 70 | 10 |
| ZE302 095P | 9.5 | 24 | 70 | 10 |
| ZE302 100P | 10 | 25 | 70 | 10 |
| ZE302 105P | 10.5 | 26 | 80 | 12 |
| ZE302 110P | 11 | 30 | 80 | 12 |
| ZE302 115P | 11.5 | 30 | 80 | 12 |
| ZE302 120P | 12 | 30 | 80 | 12 |
| ZE302 130P | 13 | 35 | 90 | 12 |
| ZE302 140P | 14 | 35 | 100 | 14 |
| ZE302 150P | 15 | 40 | 100 | 16 |
| ZE302 160P | 16 | 40 | 100 | 16 |
| ZE302 180P | 18 | 45 | 100 | 18 |
| ZE302 200P | 20 | 45 | 100 | 20 |

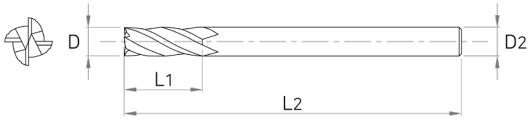
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE304P | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.674

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE304 010P | 1 | 2.5 | 50 | 6 |
| ZE304 015P | 1.5 | 4 | 50 | 6 |
| ZE304 020P | 2 | 6 | 50 | 6 |
| ZE304 025P | 2.5 | 8 | 50 | 6 |
| ZE304 030P | 3 | 10 | 50 | 6 |
| ZE304 035P | 3.5 | 10 | 50 | 6 |
| ZE304 040P | 4 | 12 | 50 | 6 |
| ZE304 045P | 4.5 | 14 | 50 | 6 |
| ZE304 050P | 5 | 15 | 60 | 6 |
| ZE304 055P | 5.5 | 15 | 60 | 6 |
| ZE304 060P | 6 | 15 | 60 | 6 |
| ZE304 065P | 6.5 | 18 | 60 | 8 |
| ZE304 070P | 7 | 20 | 65 | 8 |
| ZE304 075P | 7.5 | 20 | 65 | 8 |
| ZE304 080P | 8 | 20 | 65 | 8 |

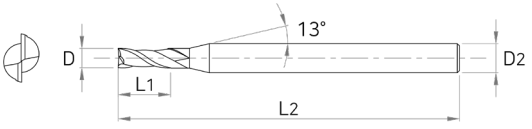
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE304 085P | 8.5 | 22 | 70 | 10 |
| ZE304 090P | 9 | 22 | 70 | 10 |
| ZE304 095P | 9.5 | 24 | 70 | 10 |
| ZE304 100P | 10 | 25 | 70 | 10 |
| ZE304 105P | 10.5 | 26 | 80 | 12 |
| ZE304 110P | 11 | 30 | 80 | 12 |
| ZE304 115P | 11.5 | 30 | 80 | 12 |
| ZE304 120P | 12 | 30 | 80 | 12 |
| ZE304 130P | 13 | 35 | 90 | 12 |
| ZE304 140P | 14 | 35 | 100 | 14 |
| ZE304 150P | 15 | 40 | 100 | 16 |
| ZE304 160P | 16 | 40 | 100 | 16 |
| ZE304 180P | 18 | 45 | 100 | 18 |
| ZE304 200P | 20 | 45 | 100 | 20 |

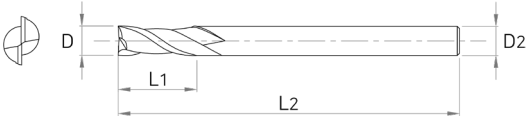
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE322 | 2 FLUTES EXTRA LONG SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ALL SIZE | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | DATA P.672

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE322 030 | 3 | 15 | 60 | 6 |
| ZE322 031 | 3 | 20 | 70 | 6 |
| ZE322 030S | 3 | 20 | 100 | 3 |
| ZE322 040 | 4 | 15 | 60 | 6 |
| ZE322 041 | 4 | 20 | 70 | 6 |
| ZE322 040S | 4 | 20 | 100 | 4 |
| ZE322 050 | 5 | 20 | 60 | 6 |
| ZE322 051 | 5 | 20 | 80 | 6 |
| ZE322 052 | 5 | 25 | 100 | 6 |
| ZE322 060 | 6 | 20 | 80 | 6 |
| ZE322 061 | 6 | 30 | 100 | 6 |
| ZE322 062 | 6 | 40 | 150 | 6 |
| ZE322 080 | 8 | 30 | 90 | 8 |
| ZE322 081 | 8 | 35 | 100 | 8 |
| ZE322 082 | 8 | 40 | 150 | 8 |
| ZE322 100 | 10 | 30 | 90 | 10 |

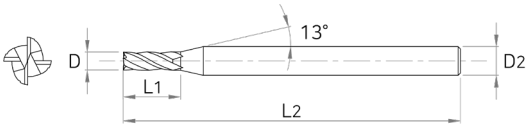
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE322 101 | 10 | 35 | 100 | 10 |
| ZE322 102 | 10 | 45 | 150 | 10 |
| ZE322 103 | 10 | 55 | 180 | 10 |
| ZE322 120 | 12 | 30 | 90 | 12 |
| ZE322 121 | 12 | 40 | 110 | 12 |
| ZE322 122 | 12 | 50 | 150 | 12 |
| ZE322 123 | 12 | 60 | 200 | 12 |
| ZE322 140 | 14 | 40 | 120 | 14 |
| ZE322 141 | 14 | 60 | 150 | 14 |
| ZE322 160 | 16 | 50 | 140 | 16 |
| ZE322 161 | 16 | 70 | 160 | 16 |
| ZE322 162 | 16 | 80 | 200 | 16 |
| ZE322 180 | 18 | 50 | 140 | 18 |
| ZE322 200 | 20 | 60 | 150 | 20 |
| ZE322 201 | 20 | 100 | 200 | 20 |
| ZE322 202 | 20 | 130 | 250 | 20 |

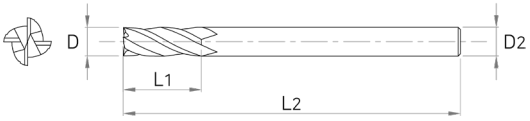
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZE324 | 4 FLUTES EXTRA LONG SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ALL SIZE | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 4 | 30° HELIX | DATA P.674

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE324 030 | 3 | 15 | 60 | 6 |
| ZE324 031 | 3 | 20 | 70 | 6 |
| ZE324 030S | 3 | 20 | 100 | 3 |
| ZE324 040 | 4 | 15 | 60 | 6 |
| ZE324 041 | 4 | 20 | 70 | 6 |
| ZE324 040S | 4 | 20 | 100 | 4 |
| ZE324 050 | 5 | 20 | 60 | 6 |
| ZE324 051 | 5 | 20 | 80 | 6 |
| ZE324 052 | 5 | 25 | 100 | 6 |
| ZE324 060 | 6 | 20 | 80 | 6 |
| ZE324 061 | 6 | 30 | 100 | 6 |
| ZE324 062 | 6 | 40 | 150 | 6 |
| ZE324 080 | 8 | 30 | 90 | 8 |
| ZE324 081 | 8 | 35 | 100 | 8 |
| ZE324 082 | 8 | 40 | 150 | 8 |
| ZE324 100 | 10 | 30 | 90 | 10 |

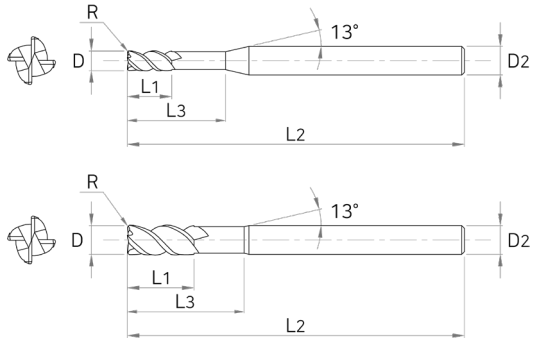
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| ZE324 101 | 10 | 35 | 100 | 10 |
| ZE324 102 | 10 | 45 | 150 | 10 |
| ZE324 103 | 10 | 55 | 180 | 10 |
| ZE324 120 | 12 | 30 | 90 | 12 |
| ZE324 121 | 12 | 40 | 110 | 12 |
| ZE324 122 | 12 | 50 | 150 | 12 |
| ZE324 123 | 12 | 60 | 200 | 12 |
| ZE324 140 | 14 | 40 | 120 | 14 |
| ZE324 141 | 14 | 60 | 150 | 14 |
| ZE324 160 | 16 | 50 | 140 | 16 |
| ZE324 161 | 16 | 70 | 160 | 16 |
| ZE324 162 | 16 | 80 | 200 | 16 |
| ZE324 180 | 18 | 50 | 140 | 18 |
| ZE324 200 | 20 | 60 | 150 | 20 |
| ZE324201 | 20 | 100 | 200 | 20 |
| ZE324202 | 20 | 130 | 250 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR304H | 4 FLUTES 45° HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 4 | 45° HELIX | R ±0.02 All Sizes | DATA P.676

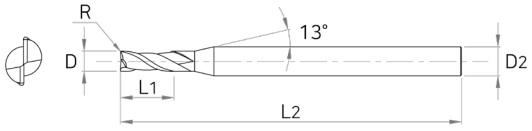
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR304H 0303 | 3 | 0.3 | 4 | 12 | 55 | 6 |
| ZR304H 0302S3 | 3 | 0.2 | 4 | 12 | 55 | 3 |
| ZR304H 0303S4 | 3 | 0.3 | 4 | 12 | 55 | 4 |
| ZR304H 0305 | 3 | 0.5 | 4 | 12 | 55 | 6 |
| ZR304H 0305S3 | 3 | 0.5 | 4 | 12 | 55 | 3 |
| ZR304H 0305S4 | 3 | 0.5 | 4 | 12 | 55 | 4 |
| ZR304H 0402S4 | 4 | 0.2 | 5 | 16 | 55 | 4 |
| ZR304H 0403 | 4 | 0.3 | 5 | 16 | 55 | 6 |
| ZR304H 0403S4 | 4 | 0.3 | 5 | 16 | 55 | 4 |
| ZR304H 0405 | 4 | 0.5 | 5 | 16 | 55 | 6 |
| ZR304H 0405S4 | 4 | 0.5 | 5 | 16 | 55 | 4 |
| ZR304H 0605 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| ZR304H 0610 | 6 | 1 | 7 | 20 | 60 | 6 |
| ZR304H 0805 | 8 | 0.5 | 10 | 25 | 65 | 8 |
| ZR304H 0810 | 8 | 1 | 10 | 25 | 65 | 8 |
| ZR304H 1005 | 10 | 0.5 | 12 | 30 | 70 | 10 |
| ZR304H 1010 | 10 | 1 | 12 | 30 | 70 | 10 |
| ZR304H 1015 | 10 | 1.5 | 12 | 30 | 70 | 10 |
| ZR304H 1020 | 10 | 2 | 12 | 30 | 70 | 10 |
| ZR304H 1205 | 12 | 0.5 | 15 | 30 | 80 | 12 |
| ZR304H 1210 | 12 | 1 | 15 | 30 | 80 | 12 |
| ZR304H 1215 | 12 | 1.5 | 15 | 30 | 80 | 12 |
| ZR304H 1220 | 12 | 2 | 15 | 30 | 80 | 12 |

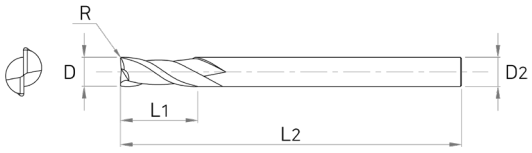
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR322 | 2 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.02 All Sizes | DATA P.676

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ZR322 0302S4 | 3 | 0.2 | 8 | 60 | 4 |
| ZR322 0302 | 3 | 0.2 | 8 | 60 | 6 |
| ZR322 0303 | 3 | 0.3 | 8 | 60 | 6 |
| ZR322 0305S4 | 3 | 0.5 | 8 | 60 | 4 |
| ZR322 0305 | 3 | 0.5 | 8 | 60 | 6 |
| ZR322 0402S4 | 4 | 0.2 | 11 | 70 | 4 |
| ZR322 0402 | 4 | 0.2 | 11 | 70 | 6 |
| ZR322 0403 | 4 | 0.3 | 11 | 70 | 6 |
| ZR322 0405S4 | 4 | 0.5 | 11 | 70 | 4 |
| ZR322 0405 | 4 | 0.5 | 11 | 70 | 6 |
| ZR322 0410S4 | 4 | 1 | 11 | 70 | 4 |
| ZR322 0410 | 4 | 1 | 11 | 70 | 6 |
| ZR322 0502 | 5 | 0.2 | 13 | 80 | 6 |
| ZR322 0503 | 5 | 0.3 | 13 | 80 | 6 |
| ZR322 0505 | 5 | 0.5 | 13 | 80 | 6 |
| ZR322 0510 | 5 | 1 | 13 | 80 | 6 |
| ZR322 0602 | 6 | 0.2 | 13 | 90 | 6 |
| ZR322 0603 | 6 | 0.3 | 13 | 90 | 6 |
| ZR322 0605 | 6 | 0.5 | 13 | 90 | 6 |

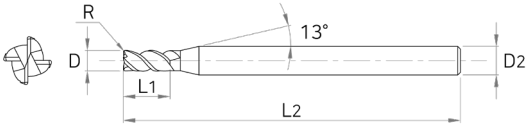
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ZR322 0610 | 6 | 1 | 13 | 90 | 6 |
| ZR322 0803 | 8 | 0.3 | 19 | 100 | 8 |
| ZR322 0805 | 8 | 0.5 | 19 | 100 | 8 |
| ZR322 0810 | 8 | 1 | 19 | 100 | 8 |
| ZR322 0815 | 8 | 1.5 | 19 | 100 | 8 |
| ZR322 0820 | 8 | 2 | 19 | 100 | 8 |
| ZR322 1003 | 10 | 0.3 | 22 | 100 | 10 |
| ZR322 1005 | 10 | 0.5 | 22 | 100 | 10 |
| ZR322 1010 | 10 | 1 | 22 | 100 | 10 |
| ZR322 1015 | 10 | 1.5 | 22 | 100 | 10 |
| ZR322 1020 | 10 | 2 | 22 | 100 | 10 |
| ZR322 1025 | 10 | 2.5 | 22 | 100 | 10 |
| ZR322 1205 | 12 | 0.5 | 26 | 110 | 12 |
| ZR322 1210 | 12 | 1 | 26 | 110 | 12 |
| ZR322 1215 | 12 | 1.5 | 26 | 110 | 12 |
| ZR322 1220 | 12 | 2 | 26 | 110 | 12 |
| ZR322 1225 | 12 | 2.5 | 26 | 110 | 12 |
| ZR322 1230 | 12 | 3 | 26 | 110 | 12 |

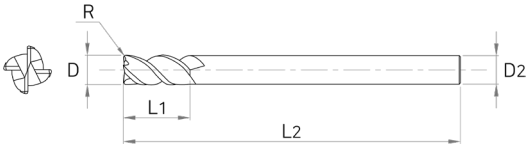
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR324 | 4 FLUTES LONG SHANK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.02 | DATA P.677

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ZR324 0302S4 | 3 | 0.2 | 8 | 60 | 4 |
| ZR324 0302 | 3 | 0.2 | 8 | 60 | 6 |
| ZR324 0303 | 3 | 0.3 | 8 | 60 | 6 |
| ZR324 0305S4 | 3 | 0.5 | 8 | 60 | 4 |
| ZR324 0305 | 3 | 0.5 | 8 | 60 | 6 |
| ZR324 0402S4 | 4 | 0.2 | 11 | 70 | 4 |
| ZR324 0402 | 4 | 0.2 | 11 | 70 | 6 |
| ZR324 0403 | 4 | 0.3 | 11 | 70 | 6 |
| ZR324 0405S4 | 4 | 0.5 | 11 | 70 | 4 |
| ZR324 0405 | 4 | 0.5 | 11 | 70 | 6 |
| ZR324 0410S4 | 4 | 1 | 11 | 70 | 4 |
| ZR324 0410 | 4 | 1 | 11 | 70 | 6 |
| ZR324 0502 | 5 | 0.2 | 13 | 80 | 6 |
| ZR324 0503 | 5 | 0.3 | 13 | 80 | 6 |
| ZR324 0505 | 5 | 0.5 | 13 | 80 | 6 |
| ZR324 0510 | 5 | 1 | 13 | 80 | 6 |
| ZR324 0602 | 6 | 0.2 | 13 | 90 | 6 |
| ZR324 0603 | 6 | 0.3 | 13 | 90 | 6 |
| ZR324 0605 | 6 | 0.5 | 13 | 90 | 6 |

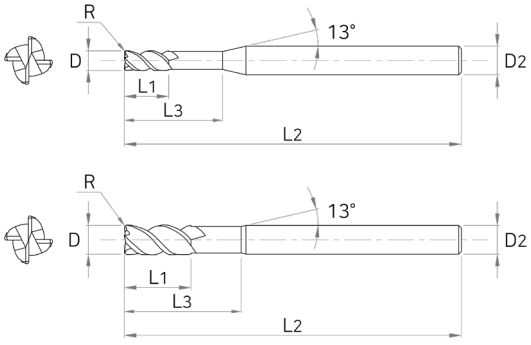
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| ZR324 0610 | 6 | 1 | 13 | 90 | 6 |
| ZR324 0803 | 8 | 0.3 | 19 | 100 | 8 |
| ZR324 0805 | 8 | 0.5 | 19 | 100 | 8 |
| ZR324 0810 | 8 | 1 | 19 | 100 | 8 |
| ZR324 0815 | 8 | 1.5 | 19 | 100 | 8 |
| ZR324 0820 | 8 | 2 | 19 | 100 | 8 |
| ZR324 1003 | 10 | 0.3 | 22 | 100 | 10 |
| ZR324 1005 | 10 | 0.5 | 22 | 100 | 10 |
| ZR324 1010 | 10 | 1 | 22 | 100 | 10 |
| ZR324 1015 | 10 | 1.5 | 22 | 100 | 10 |
| ZR324 1020 | 10 | 2 | 22 | 100 | 10 |
| ZR324 1025 | 10 | 2.5 | 22 | 100 | 10 |
| ZR324 1205 | 12 | 0.5 | 26 | 110 | 12 |
| ZR324 1210 | 12 | 1 | 26 | 110 | 12 |
| ZR324 1215 | 12 | 1.5 | 26 | 110 | 12 |
| ZR324 1220 | 12 | 2 | 26 | 110 | 12 |
| ZR324 1225 | 12 | 2.5 | 26 | 110 | 12 |
| ZR324 1230 | 12 | 3 | 26 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# ZR324H | 4 FLUTES 45° HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | TiAlN | 4 | 45° HELIX | R ±0.02 | DATA P.676

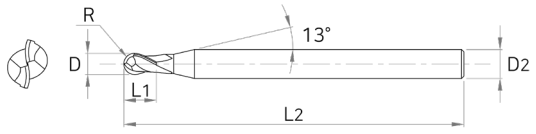
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| ZR324H 0605 | 6 | 0.5 | 9 | 20 | 90 | 6 |
| ZR324H 0610 | 6 | 1 | 9 | 20 | 90 | 6 |
| ZR324H 0805 | 8 | 0.5 | 12 | 25 | 100 | 8 |
| ZR324H 0810 | 8 | 1 | 12 | 25 | 100 | 8 |
| ZR324H 1005 | 10 | 0.5 | 15 | 32 | 100 | 10 |
| ZR324H 1010 | 10 | 1 | 15 | 32 | 100 | 10 |
| ZR324H 1015 | 10 | 1.5 | 15 | 32 | 100 | 10 |
| ZR324H 1020 | 10 | 2 | 15 | 32 | 100 | 10 |
| ZR324H 1205 | 12 | 0.5 | 18 | 38 | 110 | 12 |
| ZR324H 1210 | 12 | 1 | 18 | 38 | 110 | 12 |
| ZR324H 1215 | 12 | 1.5 | 18 | 38 | 110 | 12 |
| ZR324H 1220 | 12 | 2 | 18 | 38 | 110 | 12 |

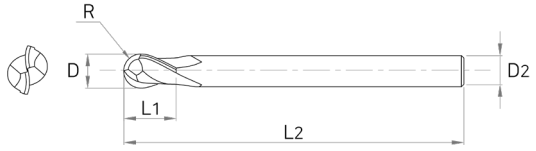
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# DB312 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.678

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| DB312 010 S4 | 1 | 0.5 | 2.5 | 50 | 4 |
| DB312 010 | 1 | 0.5 | 2.5 | 50 | 6 |
| DB312 012 | 1.2 | 0.6 | 3 | 50 | 6 |
| DB312 015 | 1.5 | 0.75 | 4 | 50 | 6 |
| DB312 020 S4 | 2 | 1 | 5 | 50 | 4 |
| DB312 020 | 2 | 1 | 5 | 50 | 6 |
| DB312 025 | 2.5 | 1.25 | 6 | 60 | 6 |
| DB312 030 S3 | 3 | 1.5 | 8 | 60 | 3 |
| DB312 030 S4 | 3 | 1.5 | 8 | 60 | 4 |
| DB312 030 | 3 | 1.5 | 8 | 60 | 6 |
| DB312 035 | 3.5 | 1.75 | 8 | 70 | 6 |
| DB312 040 S4 | 4 | 2 | 8 | 70 | 4 |
| DB312 040 | 4 | 2 | 8 | 70 | 6 |
| DB312 045 | 4.5 | 2.25 | 8 | 70 | 6 |
| DB312 050 | 5 | 2.5 | 10 | 80 | 6 |

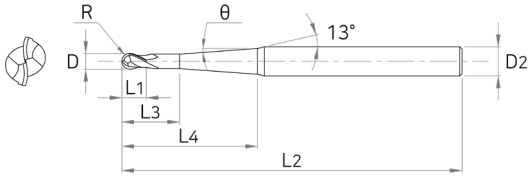
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| DB312 055 | 5.5 | 2.75 | 10 | 80 | 6 |
| DB312 060S | 6 | 3 | 12 | 60 | 6 |
| DB312 060 | 6 | 3 | 12 | 90 | 6 |
| DB312 065 | 6.5 | 3.25 | 12 | 90 | 8 |
| DB312 070 | 7 | 3.5 | 14 | 90 | 8 |
| DB312 080S | 8 | 4 | 14 | 60 | 8 |
| DB312 080 | 8 | 4 | 14 | 100 | 8 |
| DB312 090 | 9 | 4.5 | 18 | 100 | 10 |
| DB312 100S | 10 | 5 | 18 | 60 | 10 |
| DB312 100 | 10 | 5 | 18 | 100 | 10 |
| DB312 120 | 12 | 6 | 22 | 110 | 12 |
| DB312 140 | 14 | 7 | 26 | 110 | 14 |
| DB312 160 | 16 | 8 | 30 | 140 | 16 |
| DB312 180 | 18 | 9 | 34 | 140 | 18 |
| DB312 200 | 20 | 10 | 38 | 160 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# DB342 | 2 FLUTES TAPERED NECK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.678

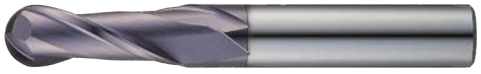
| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L4 | L2 | D2 | θ |
| DB342 01015 | 1 | 0.5 | 2 | 4 | 23 | 60 | 6 | 1°30′ |
| DB342 01050 | 1 | 0.5 | 2 | 4 | 23 | 60 | 6 | 5° |
| DB342 01030 | 1 | 0.5 | 2 | 4 | 42 | 80 | 6 | 3° |
| DB342 02015 | 2 | 1 | 4 | 6 | 23 | 60 | 6 | 1°30′ |
| DB342 02050 | 2 | 1 | 4 | 6 | 23 | 60 | 6 | 5° |
| DB342 02030 | 2 | 1 | 4 | 6 | 41 | 80 | 6 | 3° |
| DB342 03030 | 3 | 1.5 | 6 | 8 | 32 | 70 | 6 | 3° |
| DB342 03015 | 3 | 1.5 | 6 | 8 | 52 | 90 | 6 | 1°30′ |
| DB342 04030 | 4 | 2 | 8 | 10 | 28 | 70 | 6 | 3° |
| DB342 04015 | 4 | 2 | 8 | 10 | 49 | 90 | 6 | 1°30′ |
| DB342 05030 | 5 | 2.5 | 10 | 12 | 41 | 90 | 8 | 3° |
| DB342 05015 | 5 | 2.5 | 10 | 12 | 61 | 110 | 8 | 1°30′ |
| DB342 06030 | 6 | 3 | 12 | 15 | 34 | 90 | 8 | 3° |
| DB342 06015 | 6 | 3 | 12 | 15 | 53 | 110 | 8 | 1°30′ |
| DB342 08030 | 8 | 4 | 14 | 17 | 36 | 100 | 10 | 3° |
| DB342 08015 | 8 | 4 | 14 | 17 | 55 | 120 | 10 | 1°30′ |
| DB342 10030 | 10 | 5 | 18 | 21 | 40 | 110 | 12 | 3° |
| DB342 10015 | 10 | 5 | 18 | 21 | 59 | 130 | 12 | 1°30′ |
| DB342 12030 | 12 | 6 | 22 | 25 | 63 | 140 | 16 | 3° |
| DB342 12015 | 12 | 6 | 22 | 25 | 83 | 160 | 16 | 1°30′ |

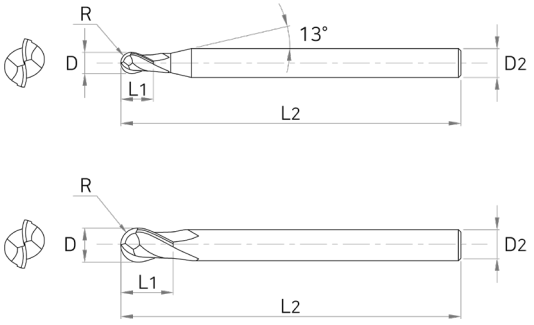
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TXB202 | 2 FLUTES SHORT SHANK BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

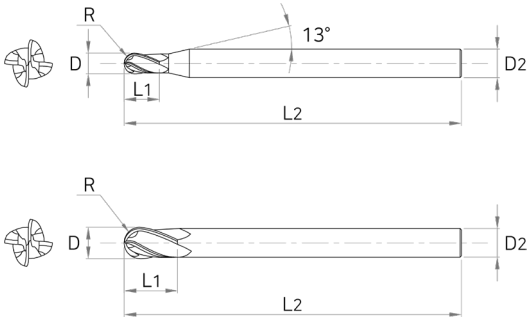
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB202 010 | 1 | 0.5 | 3 | 39 | 3 |
| TXB202 015 | 1.5 | 0.75 | 5 | 39 | 3 |
| TXB202 020 | 2 | 1 | 7 | 39 | 3 |
| TXB202 025 | 2.5 | 1.25 | 8 | 39 | 3 |
| TXB202 030 | 3 | 1.5 | 10 | 39 | 3 |
| TXB202 040 | 4 | 2 | 14 | 51 | 4 |
| TXB202 050 | 5 | 2.5 | 16 | 51 | 5 |
| TXB202 060 | 6 | 3 | 19 | 64 | 6 |
| TXB202 080 | 8 | 4 | 21 | 64 | 8 |
| TXB202 100 | 10 | 5 | 25 | 70 | 10 |
| TXB202 120 | 12 | 6 | 25 | 76 | 12 |
| TXB202 160 | 16 | 8 | 32 | 89 | 16 |
| TXB202 200 | 20 | 10 | 38 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

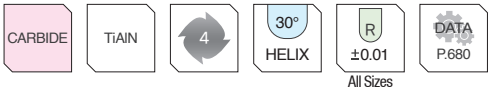
○ : GOOD ◎ : EXCELLENT

# TXB204 | 4 FLUTES SHORT SHANK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |



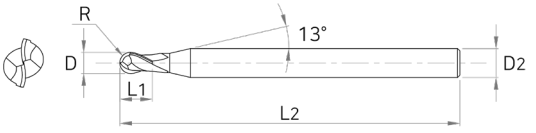

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB204 020 | 2 | 1 | 7 | 39 | 3 |
| TXB204 030 | 3 | 1.5 | 10 | 39 | 3 |
| TXB204 040 | 4 | 2 | 14 | 51 | 4 |
| TXB204 050 | 5 | 2.5 | 16 | 51 | 5 |
| TXB204 060 | 6 | 3 | 19 | 64 | 6 |
| TXB204 080 | 8 | 4 | 21 | 64 | 8 |
| TXB204 100 | 10 | 5 | 25 | 70 | 10 |
| TXB204 120 | 12 | 6 | 25 | 76 | 12 |
| TXB204 160 | 16 | 8 | 32 | 89 | 16 |
| TXB204 200 | 20 | 10 | 38 | 100 | 20 |

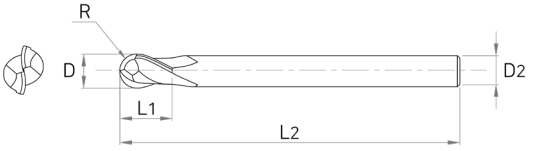
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TXB222 | 2 FLUTES LONG BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

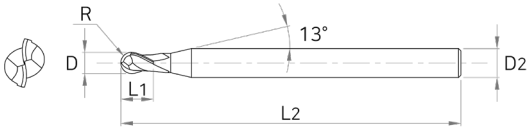
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB222 030 | 3 | 1.5 | 20 | 60 | 3 |
| TXB222 040 | 4 | 2 | 20 | 60 | 4 |
| TXB222 050 | 5 | 2.5 | 25 | 75 | 5 |
| TXB222 060 | 6 | 3 | 30 | 75 | 6 |
| TXB222 080 | 8 | 4 | 30 | 100 | 8 |
| TXB222 100 | 10 | 5 | 40 | 100 | 10 |
| TXB222 120 | 12 | 6 | 45 | 100 | 12 |
| TXB222 140 | 14 | 7 | 45 | 100 | 14 |
| TXB222 160 | 16 | 8 | 45 | 100 | 16 |
| TXB222 180 | 18 | 9 | 45 | 100 | 18 |
| TXB222 200 | 20 | 10 | 45 | 100 | 20 |

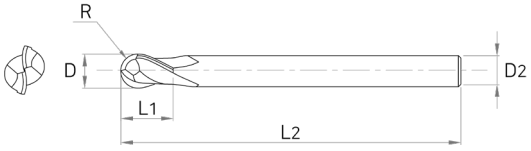
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TXB232 | 2 FLUTES LONG SHANK BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

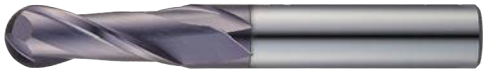
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB232 030 | 3 | 1.5 | 5 | 75 | 3 |
| TXB232 040 | 4 | 2 | 8 | 75 | 4 |
| TXB232 050 | 5 | 2.5 | 9 | 75 | 5 |
| TXB232 060 | 6 | 3 | 10 | 100 | 6 |
| TXB232 060-75 | 6 | 3 | 10 | 75 | 6 |
| TXB232 080 | 8 | 4 | 12 | 100 | 8 |
| TXB232 080-75 | 8 | 4 | 12 | 75 | 8 |
| TXB232 100 | 10 | 5 | 14 | 100 | 10 |
| TXB232 100L | 10 | 5 | 14 | 150 | 10 |
| TXB232 120 | 12 | 6 | 16 | 100 | 12 |
| TXB232 120L | 12 | 6 | 16 | 150 | 12 |
| TXB232 140 | 14 | 7 | 18 | 100 | 14 |
| TXB232 160 | 16 | 8 | 22 | 150 | 16 |
| TXB232 200 | 20 | 10 | 26 | 150 | 20 |

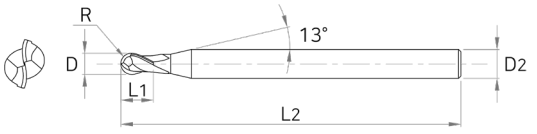
## ■ Applicable Working Material

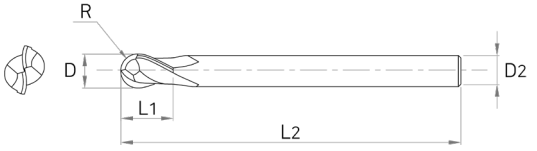
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TXB302 | 2 FLUTES BALL ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |

CARBIDE | TiAlN | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

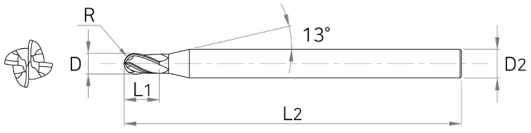
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB302 010 | 1 | 0.5 | 2 | 50 | 4 |
| TXB302 015 | 1.5 | 0.75 | 3 | 50 | 4 |
| TXB302 020 | 2 | 1 | 4 | 50 | 4 |
| TXB302 025 | 2.5 | 1.25 | 6 | 50 | 4 |
| TXB302 030 | 3 | 1.5 | 6 | 50 | 4 |
| TXB302 040 | 4 | 2 | 8 | 50 | 4 |
| TXB302 050 | 5 | 2.5 | 10 | 50 | 6 |
| TXB302 060 | 6 | 3 | 12 | 50 | 6 |
| TXB302 080 | 8 | 4 | 14 | 60 | 8 |
| TXB302 100 | 10 | 5 | 18 | 75 | 10 |
| TXB302 120 | 12 | 6 | 22 | 75 | 12 |
| TXB302 140 | 14 | 7 | 32 | 75 | 14 |
| TXB302 160 | 16 | 8 | 32 | 100 | 16 |
| TXB302 180 | 18 | 9 | 32 | 100 | 18 |
| TXB302 200 | 20 | 10 | 38 | 100 | 20 |

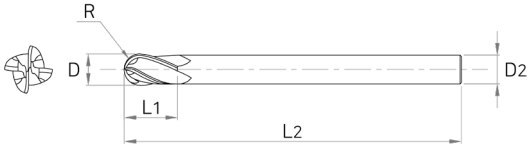
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# TXB304 | 4 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.04 | h6 |

CARBIDE | TiAlN | 4 | 30° HELIX | R ±0.02 All Sizes | DATA P.680

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| TXB304 010 | 1 | 0.5 | 2 | 50 | 4 |
| TXB304 015 | 1.5 | 0.75 | 3 | 50 | 4 |
| TXB304 020 | 2 | 1 | 4 | 50 | 4 |
| TXB304 030 | 3 | 1.5 | 6 | 50 | 4 |
| TXB304 040 | 4 | 2 | 8 | 50 | 4 |
| TXB304 050 | 5 | 2.5 | 10 | 50 | 6 |
| TXB304 060 | 6 | 3 | 12 | 50 | 6 |
| TXB304 080 | 8 | 4 | 14 | 60 | 8 |
| TXB304 100 | 10 | 5 | 18 | 75 | 10 |
| TXB304 120 | 12 | 6 | 22 | 75 | 12 |
| TXB304 140 | 14 | 7 | 32 | 75 | 14 |
| TXB304 160 | 16 | 8 | 32 | 100 | 16 |
| TXB304 180 | 18 | 9 | 32 | 100 | 18 |
| TXB304 200 | 20 | 10 | 38 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# X-STAR ENDMILL

Difficult To Cut Material and Low Hardness Material HRc ~ 35

## Contents


| Section | | EDP No. | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 3F | XCE503 | | 3 FLUTES DOUBLE CORE SQUARE ENDMILL | D2 | D25 | 292 |
| | 4F | XCE504 | | 4 FLUTES DOUBLE CORE SQUARE ENDMILL | D6 | D25 | 293 |
| | 4F | XE504 | | 4 FLUTES VARIABLE HELIX SQUARE ENDMILL | D1 | D25 | 294 |
| | 5F | XE505 | | 5 FLUTES VARIABLE HELIX SQUARE ENDMILL | D6 | D25 | 295 |
| | 4F | XE514 | | 4 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL | D1 | D20 | 296 |
| | 5F | XE515 | | 5 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL | D6 | D20 | 297 |
| | 4F | XE524 | | 4 FLUTES VARIABLE HELIX LONG SHANK SQUARE | D6 | D16 | 298 |
| RADIUS | 3F | XCR503 | | 3 FLUTES DOUBLE CORE RADIUS ENDMILL | D5 | D25 | 299 |
| | 4F | XCR504 | | 4 FLUTES DOUBLE CORE RADIUS ENDMILL | D6 | D25 | 300 |
| | 4F | XR504 | | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL | D2 | D25 | 301 |
| | 5F | XR505 | | 5 FLUTES VARIABLE HELIX RADIUS ENDMILL | D6 | D25 | 302 |
| | 4F | XR514 | | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL | D2 | D20 | 303 |
| BALL | 4F | XXB504 | | 4 FLUTES VARIABLE HELIX BALL ENDMILL | R2 | R6 | 304 |
| CHAMFER | 3F | XCC503 | | 3 FLUTES DOUBLE CORE CHAMFER ENDMILL | D2 | D25 | 305 |
| | 4F | XCC504 | | 4 FLUTES DOUBLE CORE CHAMFER ENDMILL | D6 | D25 | 306 |

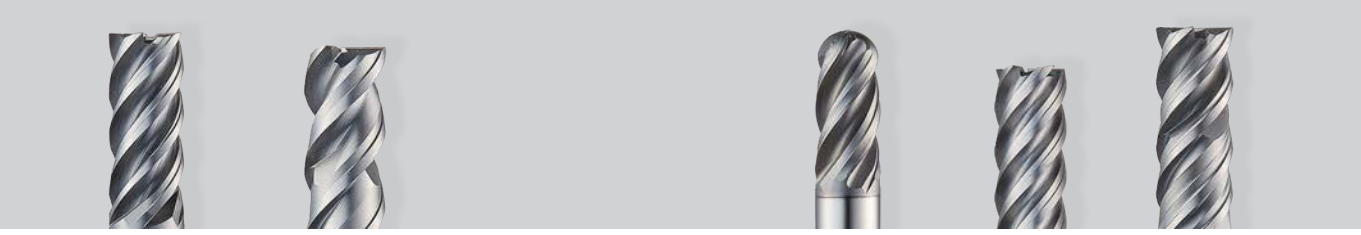

## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| X | CR | 5 | 0 | 3 | 12 | 05 |
|---|---|---|---|---|---|---|

| Section | Appearance | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R |
|---|---|---|---|---|---|---|
| X : X-STAR | E : Sqaure | 3 : Grade | 0 : Straight | 3 : 3 Flutes | 1 | 0.1 |
| | R : Radius | 5 : Grade | 1 : Neck | 4 : 4 Flutes | ~ | ~ |
| | XE : Square (Edge protection) | | 2 : Long neck | 5 : 5 Flutes | 25.4 | 5 |
| | XB : Ball | | | | | |
| | XR : Radius (Edge Protection) | | | | | |
| | CE : Square (Double Core) | | | | | |
| | CC : Chamfer (Double Core) | | | | | |
| | CR : Radius (Double Core) | | | | | |

Ex) 3 Flutes / Cutting Dia Ø12 / 50 Grade / Straight type Double Core Radius X-Star Endmill



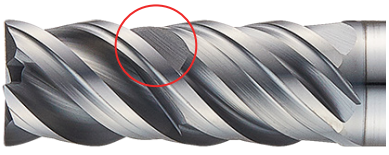
## Characteristics

· Suitable for the difficult to cut material and low hardness material (HRc ~ 35) Stainless and Inconel etc.
· Various product line considered machining methods for rough and finishing for the difficult to cut materials and flat, sloped surfaces.

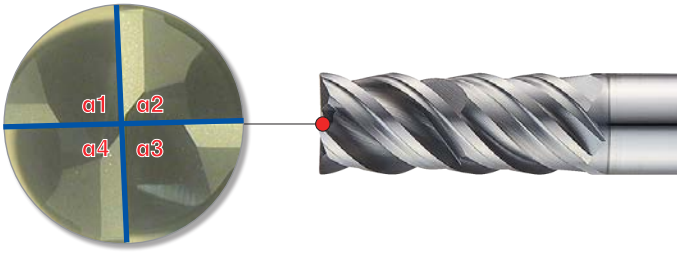
## Features

· High machining efficiency through unequal index cutting edge in all series
· Excellent chipping resistance and Minimized sudden breakage by using high toughness materials
· TiAlN, AlTiN coating for enhanced oxidation resistance and high hardness on surface
· Superb Groove design to improve chip emission according to workpiece's characteristics

β1° ≠ β2°

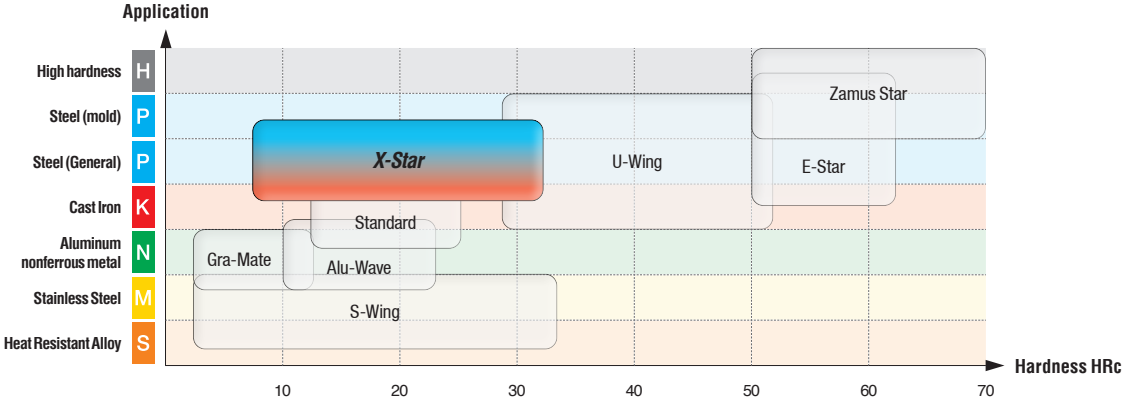


Cutting edge with High strength
by applying double core type

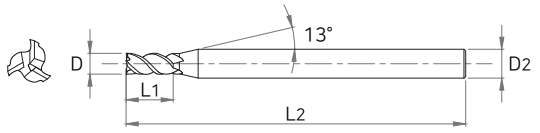


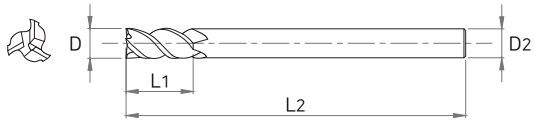

α1° ≠ α2° ≠ α3° ≠ α4°

## Applications



# XCE503 | 3 FLUTES DOUBLE CORE SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 3 | M HELIX | DATA P.681

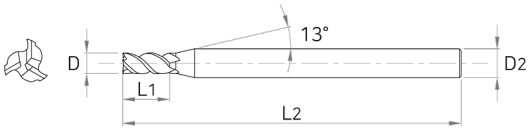
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| XCE503 020 | 2 | 6 | 50 | 6 |
| XCE503 025 | 2.5 | 8 | 50 | 6 |
| XCE503 030 | 3 | 10 | 50 | 6 |
| XCE503 035 | 3.5 | 10 | 50 | 6 |
| XCE503 040 | 4 | 12 | 50 | 6 |
| XCE503 045 | 4.5 | 14 | 50 | 6 |
| XCE503 050 | 5 | 15 | 50 | 6 |
| XCE503 055 | 5.5 | 15 | 50 | 6 |
| XCE503 060 | 6 | 15 | 50 | 6 |
| XCE503 080 | 8 | 20 | 60 | 8 |
| XCE503 100 | 10 | 25 | 70 | 10 |
| XCE503 120 | 12 | 30 | 75 | 12 |
| XCE503 160 | 16 | 40 | 90 | 16 |
| XCE503 200 | 20 | 45 | 100 | 20 |
| XCE503 250 | 25 | 50 | 120 | 25 |

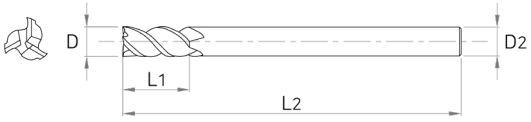
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XCE504 | 4 FLUTES DOUBLE CORE SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 4 | M HELIX | DATA P.681

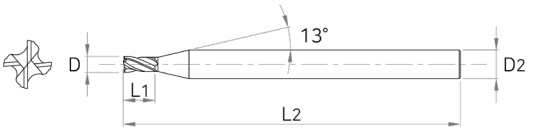
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| XCE504 060 | 6 | 15 | 50 | 6 |
| XCE504 080 | 8 | 20 | 60 | 8 |
| XCE504 100 | 10 | 25 | 70 | 10 |
| XCE504 120 | 12 | 30 | 75 | 12 |
| XCE504 160 | 16 | 40 | 90 | 16 |
| XCE504 200 | 20 | 45 | 100 | 20 |
| XCE504 250 | 25 | 50 | 120 | 25 |

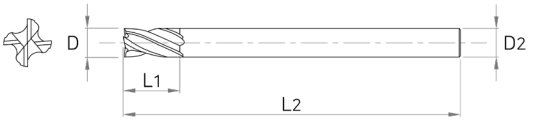
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XE504 | 4 FLUTES VARIABLE HELIX SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.02 | h6 |
| D13 ~ 25 | 0 ~ -0.03 | |

CARBIDE | AlTiN | 4 | M HELIX | DATA P.681

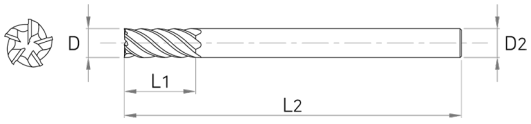
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| XE504 010 | 1 | 2.5 | 45 | 4 |
| XE504 020 | 2 | 5 | 45 | 4 |
| XE504 030 | 3 | 8 | 50 | 6 |
| XE504 040 | 4 | 11 | 50 | 6 |
| XE504 050 | 5 | 13 | 50 | 6 |
| XE504 060 | 6 | 13 | 50 | 6 |
| XE504 070 | 7 | 16 | 60 | 8 |
| XE504 080 | 8 | 19 | 60 | 8 |
| XE504 090 | 9 | 19 | 70 | 10 |
| XE504 100 | 10 | 22 | 70 | 10 |
| XE504 110 | 11 | 22 | 75 | 12 |
| XE504 120 | 12 | 26 | 75 | 12 |
| XE504 130 | 13 | 26 | 80 | 12 |
| XE504 140 | 14 | 26 | 80 | 14 |
| XE504 160 | 16 | 32 | 90 | 16 |
| XE504 180 | 18 | 32 | 100 | 18 |
| XE504 200 | 20 | 38 | 100 | 20 |
| XE504 250 | 25 | 45 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XE505 | 4 FLUTES VARIABLE HELIX SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 8 | 0 ~ -0.04 | h6 |
| D10 ~ 25 | 0 ~ -0.05 | |

CARBIDE | TiAlN | 5 | M HELIX | DATA P.681

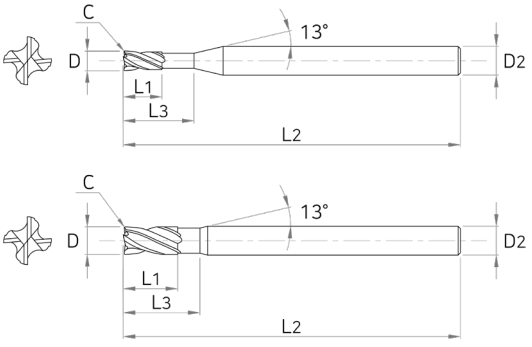
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| XE505 060 | 6 | 13 | 57 | 6 |
| XE505 080 | 8 | 19 | 63 | 8 |
| XE505 100 | 10 | 22 | 72 | 10 |
| XE505 120 | 12 | 26 | 83 | 12 |
| XE505 140 | 14 | 26 | 83 | 14 |
| XE505 160 | 16 | 32 | 92 | 16 |
| XE505 180 | 18 | 32 | 92 | 18 |
| XE505 200 | 20 | 38 | 104 | 20 |
| XE505 250 | 25 | 38 | 104 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XE514 | 4 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.02 | h6 |
| D13 ~ 20 | 0 ~ -0.03 | |

CARBIDE | AlTiN | 4 | M HELIX | C | DATA P.681

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| XE514 010 | 1 | 2 | 10 | 45 | 4 |
| XE514 020 | 2 | 3 | 12 | 45 | 4 |
| XE514 030 | 3 | 4 | 14 | 50 | 6 |
| XE514 040 | 4 | 5 | 16 | 50 | 6 |
| XE514 050 | 5 | 6 | 18 | 50 | 6 |
| XE514 060 | 6 | 7 | 20 | 50 | 6 |
| XE514 080 | 8 | 9 | 26 | 60 | 8 |
| XE514 100 | 10 | 11 | 31 | 70 | 10 |
| XE514 120 | 12 | 13 | 37 | 75 | 12 |
| XE514 160 | 16 | 17 | 43 | 90 | 16 |
| XE514 200 | 20 | 21 | 53 | 100 | 20 |

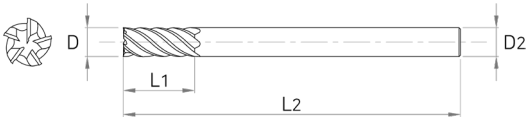
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XE515

## 5 FLUTES VARIABLE HELIX NECK SQUARE ENDMILL






### ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 8 | 0 ~ -0.04 | h6 |
| D10 ~ 25 | 0 ~ -0.05 | |

CARBIDE | TiAlN | 5 | M HELIX | DATA P.681

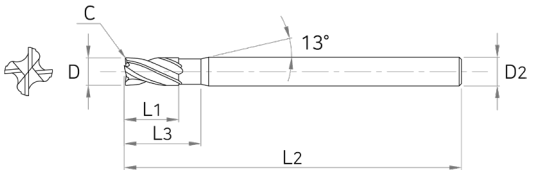
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| XE515 060 | 6 | 25 | 75 | 6 |
| XE515 080 | 8 | 30 | 75 | 8 |
| XE515 100 | 10 | 45 | 100 | 10 |
| XE515 120 | 12 | 75 | 150 | 12 |
| XE515 160 | 16 | 75 | 150 | 16 |
| XE515 200 | 20 | 75 | 150 | 20 |

### ■ Applicable Working Material

| Carbon Steel ~ HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XE524 | 4 FLUTES VARIABLE HELIX LONG SHANK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 ~ 12 | 0 ~ -0.02 | h6 |
| D16 | 0 ~ -0.03 | |

CARBIDE | AlTiN | 4 | M HELIX | C | DATA P.681

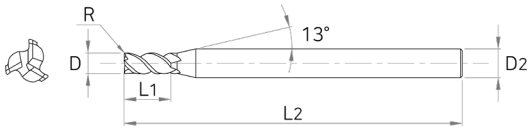
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| XE524 060 | 6 | 7 | 33 | 70 | 6 |
| XE524 080 | 8 | 9 | 43 | 80 | 8 |
| XE524 100 | 10 | 11 | 43 | 84 | 10 |
| XE524 120 | 12 | 13 | 51 | 97 | 12 |
| XE524 160 | 16 | 17 | 66 | 115 | 16 |

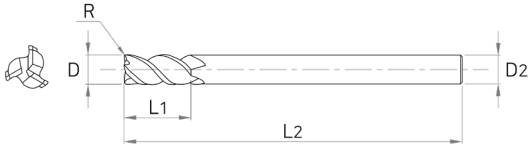
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XCR503 | 3 FLUTES DOUBLE CORE RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 3 | M HELIX | R ±0.02 All Sizes | DATA P.681

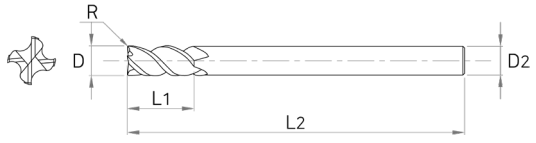
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XCR503 05 02 | 5 | 0.2 | 15 | 50 | 6 |
| XCR503 06 02 | 6 | 0.2 | 15 | 50 | 6 |
| XCR503 06 05 | 6 | 0.5 | 15 | 50 | 6 |
| XCR503 06 10 | 6 | 1 | 15 | 50 | 6 |
| XCR503 08 05 | 8 | 0.5 | 20 | 60 | 8 |
| XCR503 08 10 | 8 | 1 | 20 | 60 | 8 |
| XCR503 10 05 | 10 | 0.5 | 25 | 70 | 10 |
| XCR503 10 10 | 10 | 1 | 25 | 70 | 10 |
| XCR503 12 05 | 12 | 0.5 | 30 | 75 | 12 |
| XCR503 12 10 | 12 | 1 | 30 | 75 | 12 |
| XCR503 16 05 | 16 | 0.5 | 40 | 90 | 16 |
| XCR503 16 10 | 16 | 1 | 40 | 90 | 16 |
| XCR503 20 05 | 20 | 0.5 | 45 | 100 | 20 |
| XCR503 20 10 | 20 | 1 | 45 | 100 | 20 |
| XCR503 25 05 | 25 | 0.5 | 50 | 120 | 25 |
| XCR503 25 10 | 25 | 1 | 50 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XCR504 | 4 FLUTES DOUBLE CORE RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

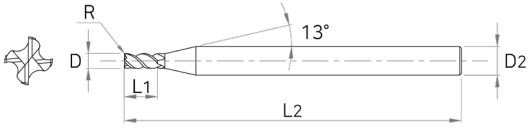
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XCR504 0602 | 6 | 0.2 | 15 | 50 | 6 |
| XCR504 0605 | 6 | 0.5 | 15 | 50 | 6 |
| XCR504 0610 | 6 | 1 | 15 | 50 | 6 |
| XCR504 0805 | 8 | 0.5 | 20 | 60 | 8 |
| XCR504 0810 | 8 | 1 | 20 | 60 | 8 |
| XCR504 1005 | 10 | 0.5 | 25 | 70 | 10 |
| XCR504 1010 | 10 | 1 | 25 | 70 | 10 |
| XCR504 1205 | 12 | 0.5 | 30 | 75 | 12 |
| XCR504 1210 | 12 | 1 | 30 | 75 | 12 |
| XCR504 1605 | 16 | 0.5 | 40 | 90 | 16 |
| XCR504 1610 | 16 | 1 | 40 | 90 | 16 |
| XCR504 2005 | 20 | 0.5 | 45 | 100 | 20 |
| XCR504 2010 | 20 | 1 | 45 | 100 | 20 |
| XCR504 2505 | 25 | 0.5 | 50 | 120 | 25 |
| XCR504 2510 | 25 | 1 | 50 | 120 | 25 |

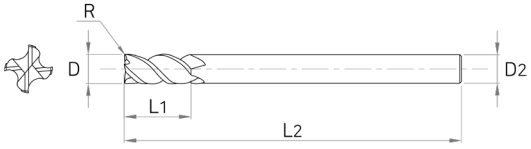
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XR504 | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 12 | 0 ~ -0.02 | h6 |
| D13 ~ 25 | 0 ~ -0.03 | |

CARBIDE | AlTiN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

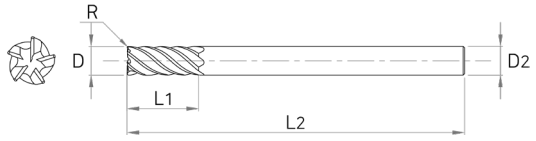
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XR504 020 | 2 | 0.1 | 5 | 45 | 4 |
| XR504 030 | 3 | 0.1 | 8 | 50 | 6 |
| XR504 040 | 4 | 0.2 | 11 | 50 | 6 |
| XR504 050 | 5 | 0.2 | 13 | 50 | 6 |
| XR504 060 | 6 | 0.2 | 13 | 50 | 6 |
| XR504 070 | 7 | 0.2 | 16 | 60 | 8 |
| XR504 080 | 8 | 0.2 | 19 | 60 | 8 |
| XR504 090 | 9 | 0.2 | 19 | 70 | 10 |
| XR504 100 | 10 | 0.3 | 22 | 70 | 10 |
| XR504 110 | 11 | 0.3 | 22 | 75 | 12 |
| XR504 120 | 12 | 0.3 | 26 | 75 | 12 |
| XR504 130 | 13 | 0.3 | 26 | 80 | 12 |
| XR504 140 | 14 | 0.3 | 26 | 80 | 14 |
| XR504 160 | 16 | 0.3 | 32 | 90 | 16 |
| XR504 180 | 18 | 0.3 | 32 | 100 | 18 |
| XR504 200 | 20 | 0.3 | 38 | 100 | 20 |
| XR504 250 | 25 | 0.3 | 45 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XR505 | 5 FLUTES VARIABLE HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 8 | 0 ~ -0.04 | h6 |
| D10 ~ 25 | 0 ~ -0.05 | |

CARBIDE | TiAlN | 5 | M HELIX | R ±0.02 All Sizes | DATA P.681

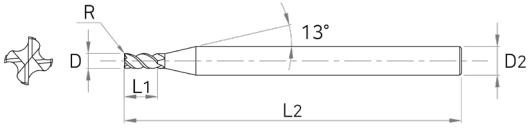
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XR505 06 050 | 6 | 0.5 | 13 | 57 | 6 |
| XR505 08 050 | 8 | 0.5 | 19 | 63 | 8 |
| XR505 10 050 | 10 | 0.5 | 22 | 72 | 10 |
| XR505 12 075 | 12 | 0.75 | 26 | 83 | 12 |
| XR505 14 075 | 14 | 0.75 | 26 | 83 | 14 |
| XR505 14 075 S16 | 14 | 0.75 | 26 | 92 | 16 |
| XR505 16 100 | 16 | 1 | 32 | 92 | 16 |
| XR505 18 100 | 18 | 1 | 32 | 92 | 18 |
| XR505 18 100 S20 | 18 | 1 | 32 | 104 | 20 |
| XR505 20 100 | 20 | 1 | 38 | 104 | 20 |
| XR505 25 100 | 25 | 1 | 38 | 104 | 25 |

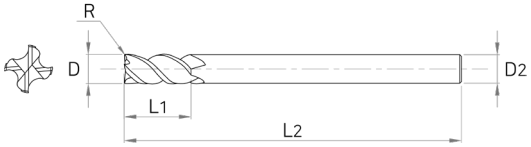
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XR514 | 4 FLUTES VARIABLE HELIX RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D2 ~ 12 | 0 ~ -0.02 | h6 |
| D13 ~ 25 | 0 ~ -0.03 | |

CARBIDE | AlTiN | 4 | M HELIX | R ±0.02 All Sizes | DATA P.681

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XR514 0201 | 2 | 0.1 | 5 | 45 | 4 |
| XR514 0202 | 2 | 0.2 | 5 | 45 | 4 |
| XR514 0302 | 3 | 0.2 | 8 | 50 | 6 |
| XR514 0303 | 3 | 0.3 | 8 | 50 | 6 |
| XR514 0305 | 3 | 0.5 | 8 | 50 | 6 |
| XR514 0403 | 4 | 0.3 | 10 | 50 | 6 |
| XR514 0405 | 4 | 0.5 | 10 | 50 | 6 |
| XR514 0410 | 4 | 1 | 10 | 50 | 6 |
| XR514 0505 | 5 | 0.5 | 13 | 50 | 6 |
| XR514 0510 | 5 | 1 | 13 | 50 | 6 |
| XR514 0605 | 6 | 0.5 | 13 | 50 | 6 |
| XR514 0610 | 6 | 1 | 13 | 50 | 6 |
| XR514 0615 | 6 | 1.5 | 13 | 50 | 6 |
| XR514 0805 | 8 | 0.5 | 19 | 60 | 8 |
| XR514 0810 | 8 | 1 | 19 | 60 | 8 |
| XR514 0815 | 8 | 1.5 | 19 | 60 | 8 |

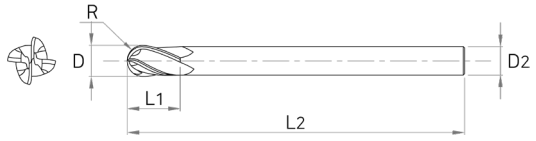
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XR514 0820 | 8 | 2 | 19 | 60 | 8 |
| XR514 1005 | 10 | 0.5 | 22 | 70 | 10 |
| XR514 1010 | 10 | 1 | 22 | 70 | 10 |
| XR514 1015 | 10 | 1.5 | 22 | 70 | 10 |
| XR514 1020 | 10 | 2 | 22 | 70 | 10 |
| XR514 1205 | 12 | 0.5 | 26 | 75 | 12 |
| XR514 1210 | 12 | 1 | 26 | 75 | 12 |
| XR514 1215 | 12 | 1.5 | 26 | 75 | 12 |
| XR514 1220 | 12 | 2 | 26 | 75 | 12 |
| XR514 1230 | 12 | 3 | 26 | 75 | 12 |
| XR514 1615 | 16 | 1.5 | 32 | 90 | 16 |
| XR514 1620 | 16 | 2 | 32 | 90 | 16 |
| XR514 1630 | 16 | 3 | 32 | 90 | 16 |
| XR514 2030 | 20 | 3 | 38 | 100 | 20 |
| XR514 2040 | 20 | 4 | 38 | 100 | 20 |
| XR514 2050 | 20 | 5 | 38 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XXB504 | 4 FLUTES VARIABLE HELIX BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 4 | M HELIX | R ±0.01 All Sizes | DATA P.681

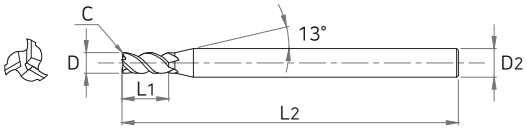
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| XXB504 040 | 4 | 2 | 8 | 70 | 4 |
| XXB504 060 | 6 | 3 | 12 | 90 | 6 |
| XXB504 080 | 8 | 4 | 15 | 100 | 8 |
| XXB504 100 | 10 | 5 | 20 | 100 | 10 |
| XXB504 120 | 12 | 6 | 25 | 110 | 12 |

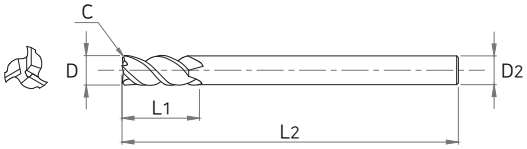
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XCC503 | 3 FLUTES DOUBLE CORE CHAMFER ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 3 | M HELIX | C | DATA P.681

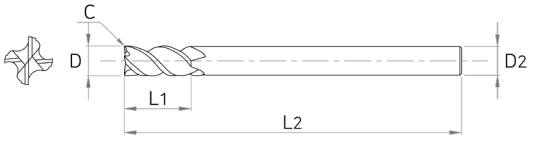
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | C | L1 | L2 | D2 |
| XCC503 020 | 2 | 0.025 | 6 | 50 | 6 |
| XCC503 025 | 2.5 | 0.025 | 8 | 50 | 6 |
| XCC503 030 | 3 | 0.035 | 10 | 50 | 6 |
| XCC503 035 | 3.5 | 0.035 | 10 | 50 | 6 |
| XCC503 040 | 4 | 0.045 | 12 | 50 | 6 |
| XCC503 045 | 4.5 | 0.045 | 14 | 50 | 6 |
| XCC503 050 | 5 | 0.055 | 15 | 50 | 6 |
| XCC503 055 | 5.5 | 0.055 | 15 | 50 | 6 |
| XCC503 060 | 6 | 0.075 | 15 | 50 | 6 |
| XCC503 080 | 8 | 0.1 | 20 | 60 | 8 |
| XCC503 100 | 10 | 0.125 | 25 | 70 | 10 |
| XCC503 120 | 12 | 0.15 | 30 | 75 | 12 |
| XCC503 160 | 16 | 0.2 | 40 | 90 | 16 |
| XCC503 200 | 20 | 0.25 | 45 | 100 | 20 |
| XCC503 250 | 25 | 0.3 | 50 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# XCC504 | 4 FLUTES DOUBLE CORE CHAMFER ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | TiAlN | 4 | M HELIX | C | DATA P.681

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | C | L1 | L2 | D2 |
| XCC504 060 | 6 | 0.075 | 15 | 50 | 6 |
| XCC504 080 | 8 | 0.1 | 20 | 60 | 8 |
| XCC504 100 | 10 | 0.125 | 25 | 70 | 10 |
| XCC504 120 | 12 | 0.15 | 30 | 75 | 12 |
| XCC504 160 | 16 | 0.2 | 40 | 90 | 16 |
| XCC504 200 | 20 | 0.3 | 45 | 100 | 20 |
| XCC504 250 | 25 | 0.3 | 50 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | | | ○ | | | | ◎ |

○ : GOOD ◎ : EXCELLENT

# S-WING ENDMILL

Difficult To Cut Material (STS, Ti, Ni and Inconel)

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | SE502 | | 2 FLUTES SQUARE ENDMILL | D1 | D20 | 311 |
| | 3F | SE503 | | 3 FLUTES SQUARE ENDMILL | D1 | D20 | 312 |
| | 4F | SE504 | | 4 FLUTES SQUARE ENDMILL | D1 | D20 | 313 |
| | 6F | SE506 | | 6 FLUTES SQUARE ENDMILL | D6 | D20 | 315 |
| RADIUS | 4F | SR504 | | 4 FLUTES RADIUS ENDMILL | D1 | D20 | 316 |
| | 5F | SR505 | | 5 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL | D6 | D20 | 318 |
| | 7F | SR507 | | 7 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL | D6 | D20 | 319 |
| BALL | 2F | SB502 | | 2 FLUTES BALL ENDMILL | R1 | R12 | 320 |
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| ROUGHING | 3~5F | SF51H | | 3~5 FLUTES ROUGHING ENDMILL | D3 | D20 | 322 |

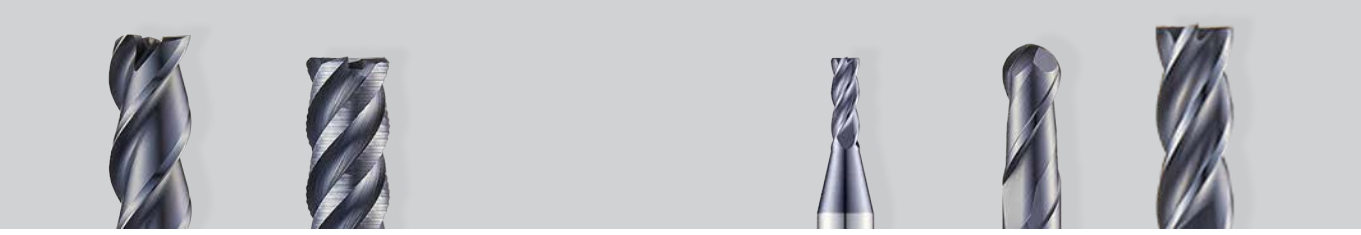

## EDP No. System

*If expressed as an integer, the decimal point is omitted.

S F 5 1 4 120 03 H

| Section | Appearance | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R | Note |
|---|---|---|---|---|---|---|---|
| S : SUS high performance | E : Square Type<br>R : Radius Type<br>B : Ball Type<br>F : Roughing | 5 : Grade | 0, 1 - Standard(Neck) | 2 : 2 Flute<br>3 : 3 Flute<br>4 : 4 Flute<br>5 : 5 Flute<br>6 : 6 Flute<br>7 : 7 Flute | 1<br>~<br>20 | 0.1<br>~<br>2 | H : High Helix<br>F : Weldon Shank (DIN 6535 HB) |

Ex) 4 Flute / Cutting Dia Ø2 / Corner R 0.3 / Shank Dia Ø4 / 50 Grade / Corner Radius Standard Type STS high Performance Endmill



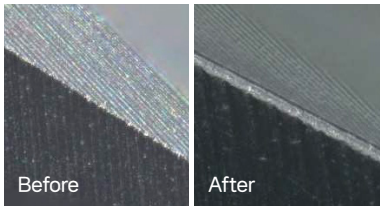
## Characteristics

· Suitable for difficult to cut material such as STS, Ti, Ni and Inconel
· New coatings with high oxidation resistance and surface hardness
· Advanced surface roughness with improved chip emission and deposition resistance

## Features

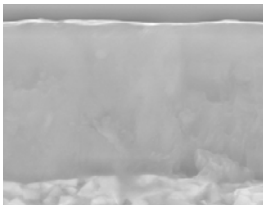
· Stable high speed processing with minimum vibration, unequal index and optimal rake angle
· High processability and low vibration by applying unequal index in cutting edge
· Minimum vibration through optimized helix angle and R gash, enhanced chip emission with stiffness supplementation
· Reduced friction resistance and improved chip emission by applying new coatings with high surface hardness oxidation resistance
· Enhanced chipping resistance and deposition resistance with new strengthened flute

### Cutting edge

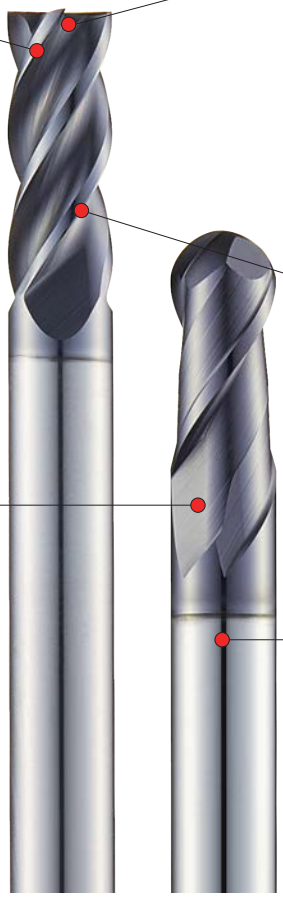



1) Settled initial chipping resistance in processing
2) Enhancing wear resistance and inducing stable processing
3) High quality by stabilizing cutting edge

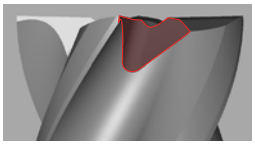
### AlCrN coating



1) Improved lubrication through containing Cr
2) improved heat resistance



### Unequal Index / R gash



1) High chip emission through R gash shape
2) Stability when shouldering machining

### Additional finishing edge

1) Improved surface roughness by enhancing the first O.D grinding roughness
2) High quality of cutting edge and improved deposition resistance

### Raw-material for high performance

1) Chipping resistance and working stability through high performance raw-material

# S-WING ENDMILL

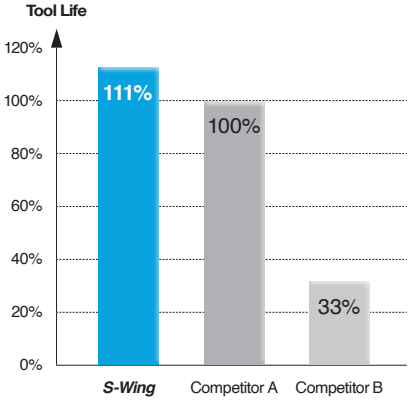
Difficult To Cut Material (STS, Ti, Ni and Inconel)

## Case Study

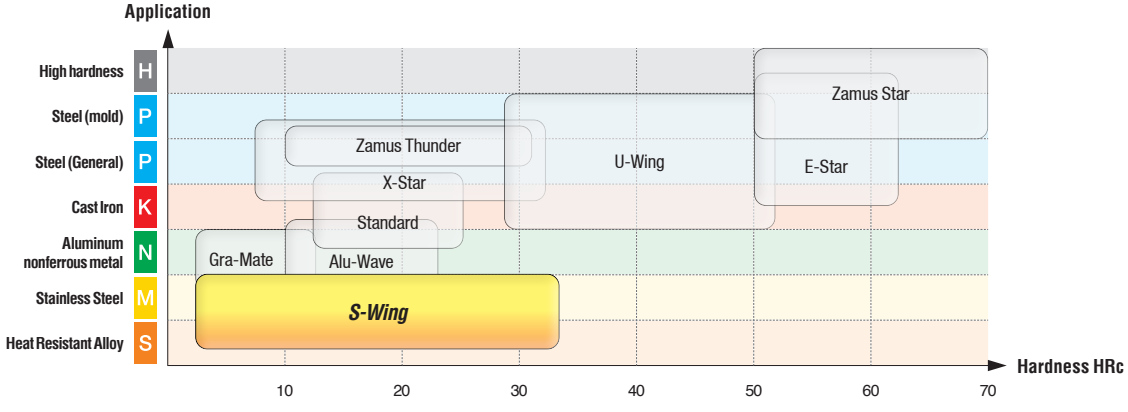
### 4F D6.0 SQUARE ENDMILL

| *S-Wing* | Competitor A | Competitor B |
|---|---|---|
| | | |

· TEST TOOL : STS304 SERIES
· Shouldering, rpm : 3,200, feed : 380, ap : 9, ae : 0.6, Note : Wet Machining

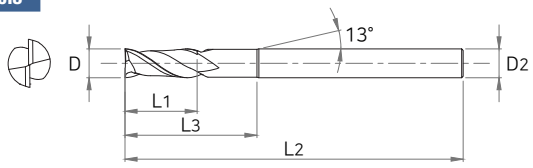



## Applications

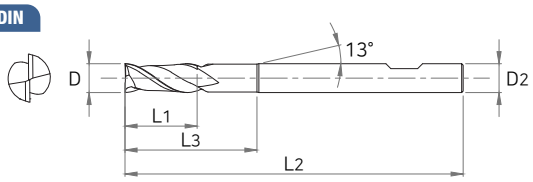


# SE502 | 2 FLUTES SQUARE ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |
| D6 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 2 | 36° HELIX | DATA P.684

| EDP No | | SIZES (mm) | | | | |
|---|---|---|---|---|---|---|
| JIS | DIN | D | L1 | L3 | L2 | D2 |
| SE502 010 | SE502 010F | 1 | 2.5 | 7.5 | 50 | 6 |
| SE502 012 | SE502 012F | 1.2 | 3 | 8 | 50 | 6 |
| SE502 015 | SE502 015F | 1.5 | 4 | 9 | 50 | 6 |
| SE502 020 | SE502 020F | 2 | 6 | 11 | 50 | 6 |
| SE502 025 | SE502 025F | 2.5 | 7 | 12 | 50 | 6 |
| SE502 030 | SE502 030F | 3 | 8 | 13 | 55 | 6 |
| SE502 040 | SE502 040F | 4 | 10 | 15 | 55 | 6 |
| SE502 050 | SE502 050F | 5 | 15 | 20 | 55 | 6 |
| SE502 060 | SE502 060F | 6 | 15 | 22 | 60 | 6 |
| SE502 080 | SE502 080F | 8 | 20 | 32 | 70 | 8 |
| SE502 100 | SE502 100F | 10 | 25 | 33 | 75 | 10 |
| SE502 120 | SE502 120F | 12 | 30 | 35 | 80 | 12 |
| SE502 140 | SE502 140F | 14 | 35 | 42 | 90 | 16 |
| SE502 160 | SE502 160F | 16 | 42 | 52 | 100 | 16 |
| SE502 180 | - | 18 | 45 | - | 100 | 16 |
| SE502 200 | SE502 200F | 20 | 48 | 50 | 100 | 20 |

※ The tools of DIN standard do not consider of holding inventory

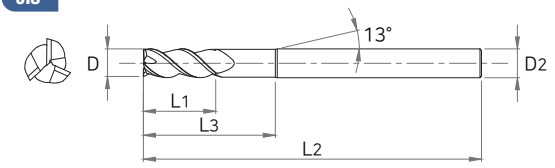
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

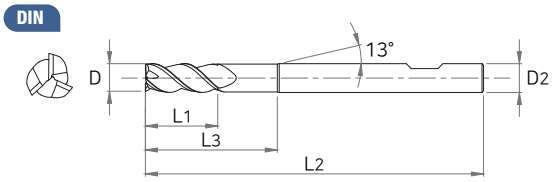
○ : GOOD ◎ : EXCELLENT

# SE503 | 3 FLUTES SQUARE ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |
| D6 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 3 | 42° HELIX | 43.5° HELIX | 45° HELIX | DATA P.685

| EDP No | | SIZES (mm) | | | | |
|---|---|---|---|---|---|---|
| JIS | DIN | D | L1 | L3 | L2 | D2 |
| SE503 010 | SE503 010F | 1 | 2.5 | 7.5 | 50 | 6 |
| SE503 012 | SE503 012F | 1.2 | 3 | 8 | 50 | 6 |
| SE503 015 | SE503 015F | 1.5 | 4 | 9 | 50 | 6 |
| SE503 020 | SE503 020F | 2 | 6 | 11 | 50 | 6 |
| SE503 025 | SE503 025F | 2.5 | 7 | 12 | 50 | 6 |
| SE503 030 | SE503 030F | 3 | 8 | 13 | 55 | 6 |
| SE503 03010 | SE503 03010F | 3 | 10 | 15 | 60 | 6 |
| SE503 040 | SE503 040F | 4 | 10 | 15 | 55 | 6 |
| SE503 04012 | SE503 04012F | 4 | 12 | 17 | 60 | 6 |
| SE503 050 | SE503 050F | 5 | 13 | 18 | 55 | 6 |
| SE503 060 | SE503 060F | 6 | 15 | 22 | 60 | 6 |
| SE503 06020 | SE503 06020F | 6 | 20 | 27 | 65 | 6 |
| SE503 080 | SE503 080F | 8 | 20 | 32 | 70 | 8 |
| SE503 08030 | SE503 08030F | 8 | 30 | 42 | 80 | 8 |
| SE503 100 | SE503 100F | 10 | 25 | 33 | 75 | 10 |
| SE503 10035 | SE503 10035F | 10 | 35 | 43 | 85 | 10 |
| SE503 120 | SE503 120F | 12 | 30 | 35 | 80 | 12 |
| SE503 12040 | SE503 12040F | 12 | 40 | 45 | 90 | 12 |
| SE503 140 | SE503 140F | 14 | 35 | 42 | 90 | 16 |
| SE503 160 | SE503 160F | 16 | 42 | 52 | 100 | 16 |
| SE503 180 | - | 18 | 45 | - | 100 | 16 |
| SE503 200 | SE503 200F | 20 | 48 | 50 | 100 | 20 |

※ The tools of DIN standard do not consider of holding inventory

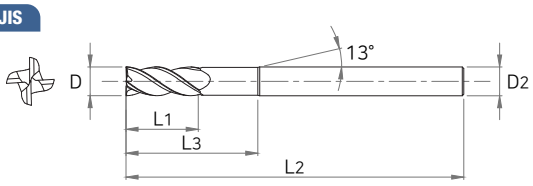
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

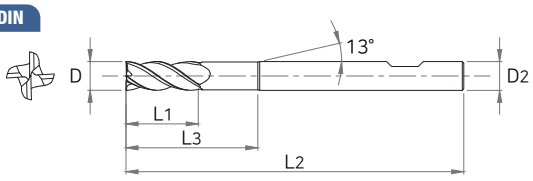
○ : GOOD ◎ : EXCELLENT

# SE504 | 4 FLUTES SQUARE ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5.5 | 0 ~ -0.015 | h5 |
| D6 ~ 7 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 4 | 35° HELIX | 37° HELIX | DATA P.687

| EDP No | | SIZES (mm) | | | | |
|---|---|---|---|---|---|---|
| JIS | DIN | D | L1 | L3 | L2 | D2 |
| SE504 010 | SE504 010F | 1 | 2.5 | 7.5 | 50 | 6 |
| SE504 012 | SE504 012F | 1.2 | 3 | 8 | 50 | 6 |
| SE504 015 | SE504 015F | 1.5 | 4 | 9 | 50 | 6 |
| SE504 020 | SE504 020F | 2 | 6 | 11 | 50 | 6 |
| SE504 025 | SE504 025F | 2.5 | 7 | 12 | 50 | 6 |
| SE504 030 | SE504 030F | 3 | 8 | 13 | 55 | 6 |
| SE504 03010 | SE504 03010F | 3 | 10 | 15 | 60 | 6 |
| SE504 035 | SE504 035F | 3.5 | 10 | 15 | 55 | 6 |
| SE504 040 | SE504 040F | 4 | 10 | 15 | 55 | 6 |
| SE504 04012 | SE504 04012F | 4 | 12 | 17 | 60 | 6 |
| SE504 045 | SE504 045F | 4.5 | 12 | 17 | 55 | 6 |
| SE504 050 | SE504 050F | 5 | 15 | 20 | 55 | 6 |
| SE504 055 | SE504 055F | 5.5 | 15 | 20 | 60 | 6 |
| SE504 060 | SE504 060F | 6 | 15 | 22 | 60 | 6 |
| SE504 06020 | SE504 06020F | 6 | 20 | 27 | 65 | 6 |
| SE504 065 | SE504 065F | 6.5 | 15 | 22 | 60 | 8 |
| SE504 070 | SE504 070F | 7 | 20 | 42 | 80 | 8 |
| SE504 080 | SE504 080F | 8 | 20 | 32 | 70 | 8 |
| SE504 08025 | SE504 08025F | 8 | 25 | 32 | 70 | 8 |
| SE504 08030 | SE504 08030F | 8 | 30 | 42 | 80 | 8 |
| SE504 085 | SE504 085F | 8.5 | 20 | 28 | 70 | 10 |
| SE504 090 | SE504 090F | 9 | 25 | 38 | 80 | 10 |
| SE504 100 | SE504 100F | 10 | 25 | 33 | 75 | 10 |
| SE504 10035 | SE504 10035F | 10 | 35 | 43 | 85 | 10 |

※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SE504 | 4 FLUTES SQUARE ENDMILL



| EDP No | | SIZES (mm) | | | | |
|---|---|---|---|---|---|---|
| JIS | DIN | D | L1 | L3 | L2 | D2 |
| SE504 120 | SE504 120F | 12 | 30 | 35 | 80 | 12 |
| SE504 12040 | SE504 12040F | 12 | 40 | 45 | 90 | 12 |
| SE504 140 | SE504 140F | 14 | 35 | 42 | 90 | 16 |
| SE504 160 | SE504 160F | 16 | 42 | 52 | 100 | 16 |
| SE504 180 | - | 18 | 45 | - | 100 | 16 |
| SE504 200 | SE504 200F | 20 | 48 | 50 | 100 | 20 |

※ The tools of DIN standard do not consider of holding inventory

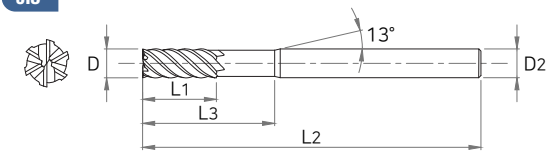
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

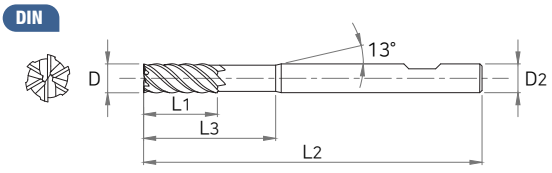
○ : GOOD ◎ : EXCELLENT

# SE506 | 6 FLUTES SQUARE ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 | 0 ~ -0.02 | h5 |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 6 | 45° HELIX | DATA P.688

| EDP No | | SIZES (mm) | | | | |
|---|---|---|---|---|---|---|
| JIS | DIN | D | L1 | L3 | L2 | D2 |
| SE506 060 | SE506 060F | 6 | 15 | 22 | 60 | 6 |
| SE506 080 | SE506 080F | 8 | 20 | 32 | 70 | 8 |
| SE506 100 | SE506 100F | 10 | 25 | 33 | 75 | 10 |
| SE506 120 | SE506 120F | 12 | 30 | 35 | 80 | 12 |
| SE506 160 | SE506 160F | 16 | 42 | 52 | 100 | 16 |
| SE506 200 | SE506 200F | 20 | 48 | 50 | 100 | 20 |

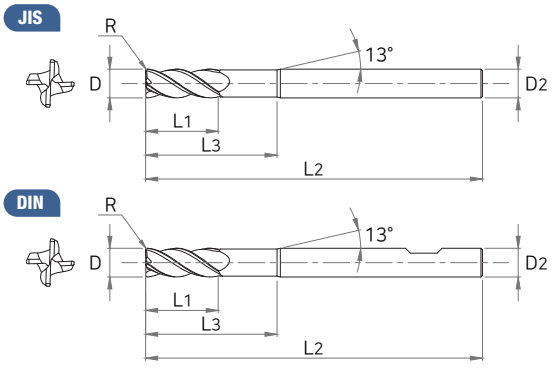
※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SR504 | 4 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |
| D6 ~ 7 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SR504 01001 | SR504 01001F | 1 | 0.1 | 2.5 | 7.5 | 50 | 6 |
| SR504 01002 | SR504 01002F | 1 | 0.2 | 2.5 | 7.5 | 50 | 6 |
| SR504 01201 | SR504 01201F | 1.2 | 0.1 | 3 | 8 | 50 | 6 |
| SR504 01501 | SR504 01501F | 1.5 | 0.1 | 4 | 9 | 50 | 6 |
| SR504 01502 | SR504 01502F | 1.5 | 0.2 | 4 | 9 | 50 | 6 |
| SR504 02001 | SR504 02001F | 2 | 0.1 | 6 | 11 | 50 | 6 |
| SR504 02002 | SR504 02002F | 2 | 0.2 | 6 | 11 | 50 | 6 |
| SR504 02502 | SR504 02502F | 2.5 | 0.2 | 7 | 12 | 50 | 6 |
| SR504 03002 | SR504 03002F | 3 | 0.2 | 8 | 13 | 55 | 6 |
| SR504 03003 | SR504 03003F | 3 | 0.3 | 8 | 13 | 55 | 6 |
| SR504 03005 | SR504 03005F | 3 | 0.5 | 8 | 13 | 55 | 6 |
| SR504 04002 | SR504 04002F | 4 | 0.2 | 10 | 15 | 55 | 6 |
| SR504 04003 | SR504 04003F | 4 | 0.3 | 10 | 15 | 55 | 6 |
| SR504 04005 | SR504 04005F | 4 | 0.5 | 10 | 15 | 55 | 6 |
| SR504 05002 | SR504 05002F | 5 | 0.2 | 15 | 20 | 55 | 6 |
| SR504 05003 | SR504 05003F | 5 | 0.3 | 15 | 20 | 55 | 6 |
| SR504 05005 | SR504 05005F | 5 | 0.5 | 15 | 20 | 55 | 6 |
| SR504 06003 | SR504 06003F | 6 | 0.3 | 15 | 22 | 60 | 6 |
| SR504 06005 | SR504 06005F | 6 | 0.5 | 15 | 22 | 60 | 6 |
| SR504 06010 | SR504 06010F | 6 | 1 | 15 | 22 | 60 | 6 |
| SR504 07003 | SR504 07003F | 7 | 0.3 | 15 | 22 | 60 | 8 |
| SR504 08002 | SR504 08002F | 8 | 0.2 | 20 | 32 | 70 | 8 |
| SR504 08003 | SR504 08003F | 8 | 0.3 | 20 | 32 | 70 | 8 |
| SR504 08005 | SR504 08005F | 8 | 0.5 | 20 | 32 | 70 | 8 |

※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SR504 | 4 FLUTES RADIUS ENDMILL

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SR504 08010 | SR504 08010F | 8 | 1 | 20 | 32 | 70 | 8 |
| SR504 10003 | SR504 10003F | 10 | 0.3 | 25 | 33 | 75 | 10 |
| SR504 10005 | SR504 10005F | 10 | 0.5 | 25 | 33 | 75 | 10 |
| SR504 10010 | SR504 10010F | 10 | 1 | 25 | 33 | 75 | 10 |
| SR504 10015 | SR504 10015F | 10 | 1.5 | 25 | 33 | 75 | 10 |
| SR504 10020 | SR504 10020F | 10 | 2 | 25 | 33 | 75 | 10 |
| SR504 10030 | SR504 10030F | 10 | 3 | 25 | 33 | 75 | 10 |
| SR504 12003 | SR504 12003F | 12 | 0.3 | 30 | 35 | 80 | 12 |
| SR504 12005 | SR504 12005F | 12 | 0.5 | 30 | 35 | 80 | 12 |
| SR504 12010 | SR504 12010F | 12 | 1 | 30 | 35 | 80 | 12 |
| SR504 12015 | SR504 12015F | 12 | 1.5 | 30 | 35 | 80 | 12 |
| SR504 12020 | SR504 12020F | 12 | 2 | 30 | 35 | 80 | 12 |
| SR504 12030 | SR504 12030F | 12 | 3 | 30 | 35 | 80 | 12 |
| SR504 12040 | SR504 12040F | 12 | 4 | 30 | 35 | 80 | 12 |
| SR504 14005 | SR504 14005F | 14 | 0.5 | 35 | 42 | 90 | 16 |
| SR504 14010 | SR504 14010F | 14 | 1 | 35 | 42 | 90 | 16 |
| SR504 14020 | SR504 14020F | 14 | 2 | 35 | 42 | 90 | 16 |
| SR504 14030 | SR504 14030F | 14 | 3 | 35 | 42 | 90 | 16 |
| SR504 14040 | SR504 14040F | 14 | 4 | 35 | 42 | 90 | 16 |
| SR504 16005 | SR504 16005F | 16 | 0.5 | 42 | 52 | 100 | 16 |
| SR504 16010 | SR504 16010F | 16 | 1 | 42 | 52 | 100 | 16 |
| SR504 16020 | SR504 16020F | 16 | 2 | 42 | 52 | 100 | 16 |
| SR504 16030 | SR504 16030F | 16 | 3 | 42 | 52 | 100 | 16 |
| SR504 16040 | SR504 16040F | 16 | 4 | 42 | 52 | 100 | 16 |
| SR504 16050 | SR504 16050F | 16 | 5 | 42 | 52 | 100 | 16 |
| SR504 18005 | - | 18 | 0.5 | 45 | - | 100 | 16 |
| SR504 20005 | SR504 20005F | 20 | 0.5 | 48 | 50 | 100 | 20 |
| SR504 20010 | SR504 20010F | 20 | 1 | 48 | 50 | 100 | 20 |
| SR504 20020 | SR504 20020F | 20 | 2 | 48 | 50 | 100 | 20 |
| SR504 20030 | SR504 20030F | 20 | 3 | 48 | 50 | 100 | 20 |
| SR504 20040 | SR504 20040F | 20 | 4 | 48 | 50 | 100 | 20 |
| SR504 20050 | SR504 20050F | 20 | 5 | 48 | 50 | 100 | 20 |

※ The tools of DIN standard do not consider of holding inventory



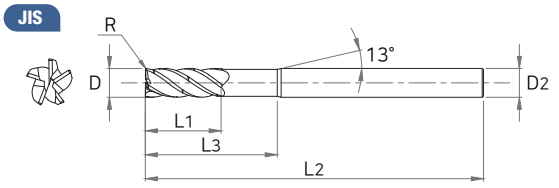
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

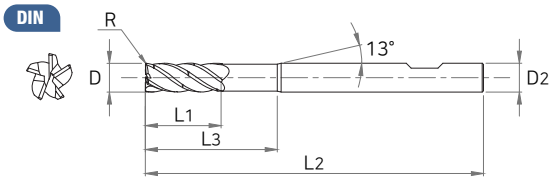
○ : GOOD ◎ : EXCELLENT

# SR505 | 5 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 | 0 ~ -0.02 | h5 |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 5 | 35° HELIX | 38° HELIX | R ±0.01 | DATA P.687

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SR505 06005 | SR505 06005F | 6 | 0.5 | 15 | 22 | 60 | 6 |
| SR505 0602405 | SR505 0602405F | 6 | 0.5 | 24 | 32 | 70 | 6 |
| SR505 08005 | SR505 08005F | 8 | 0.5 | 20 | 32 | 70 | 8 |
| SR505 0803205 | SR505 0803205F | 8 | 0.5 | 32 | 52 | 90 | 8 |
| SR505 10005 | SR505 10005F | 10 | 0.5 | 25 | 33 | 75 | 10 |
| SR505 1004005 | SR505 1004005F | 10 | 0.5 | 40 | 58 | 100 | 10 |
| SR505 12005 | SR505 12005F | 12 | 0.5 | 30 | 35 | 80 | 12 |
| SR505 12010 | SR505 12010F | 12 | 1 | 30 | 35 | 80 | 12 |
| SR505 12020 | SR505 12020F | 12 | 2 | 30 | 35 | 80 | 12 |
| SR505 12030 | SR505 12030F | 12 | 3 | 30 | 35 | 80 | 12 |
| SR505 1204805 | SR505 1204805F | 12 | 0.5 | 48 | 63 | 110 | 12 |
| SR505 16005 | SR505 16005F | 16 | 0.5 | 42 | 52 | 100 | 16 |
| SR505 16010 | SR505 16010F | 16 | 1 | 42 | 52 | 100 | 16 |
| SR505 16020 | SR505 16020F | 16 | 2 | 42 | 52 | 100 | 16 |
| SR505 16030 | SR505 16030F | 16 | 3 | 42 | 52 | 100 | 16 |
| SR505 16040 | SR505 16040F | 16 | 4 | 42 | 52 | 100 | 16 |
| SR505 1606505 | SR505 1606505F | 16 | 0.5 | 65 | 80 | 130 | 16 |
| SR505 20005 | SR505 20005F | 20 | 0.5 | 48 | 58 | 110 | 20 |
| SR505 2006505 | SR505 2006505F | 20 | 0.5 | 65 | 78 | 130 | 20 |

※ The tools of DIN standard do not consider of holding inventory

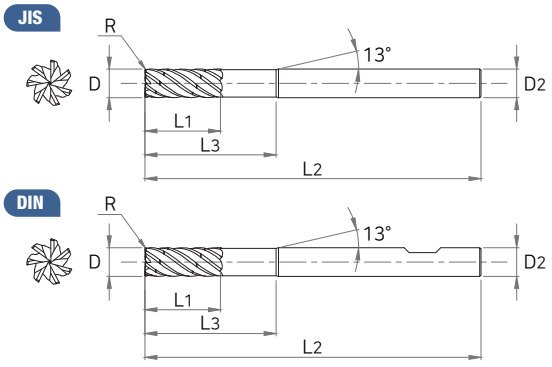
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

※ Trochoidal Milling Possible

○ : GOOD ◎ : EXCELLENT

# SR507 | 7 FLUTES CHIP BREAKER TYPE RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D6 | 0 ~ -0.02 | h5 |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 7 | 38° HELIX | R ±0.01 | DATA P.689

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SR507 06005 | SR507 06005F | 6 | 0.5 | 15 | 22 | 60 | 6 |
| SR507 0602405 | SR507 0602405F | 6 | 0.5 | 24 | 32 | 70 | 6 |
| SR507 08005 | SR507 08005F | 8 | 0.5 | 20 | 32 | 70 | 8 |
| SR507 0803205 | SR507 0803205F | 8 | 0.5 | 32 | 52 | 90 | 8 |
| SR507 10005 | SR507 10005F | 10 | 0.5 | 25 | 33 | 75 | 10 |
| SR507 1004005 | SR507 1004005F | 10 | 0.5 | 40 | 58 | 100 | 10 |
| SR507 12005 | SR507 12005F | 12 | 0.5 | 30 | 35 | 80 | 12 |
| SR507 12010 | SR507 12010F | 12 | 1 | 30 | 35 | 80 | 12 |
| SR507 12020 | SR507 12020F | 12 | 2 | 30 | 35 | 80 | 12 |
| SR507 12030 | SR507 12030F | 12 | 3 | 30 | 35 | 80 | 12 |
| SR507 12040 | SR507 12040F | 12 | 4 | 30 | 35 | 80 | 12 |
| SR507 1204805 | SR507 1204805F | 12 | 0.5 | 48 | 63 | 110 | 12 |
| SR507 16005 | SR507 16005F | 16 | 0.5 | 42 | 52 | 100 | 16 |
| SR507 16010 | SR507 16010F | 16 | 1 | 42 | 52 | 100 | 16 |
| SR507 16020 | SR507 16020F | 16 | 2 | 42 | 52 | 100 | 16 |
| SR507 16030 | SR507 16030F | 16 | 3 | 42 | 52 | 100 | 16 |
| SR507 16040 | SR507 16040F | 16 | 4 | 42 | 52 | 100 | 16 |
| SR507 16050 | SR507 16050F | 16 | 5 | 42 | 52 | 100 | 16 |
| SR507 1606505 | SR507 1606505F | 16 | 0.5 | 65 | 80 | 130 | 16 |
| SR507 20005 | SR507 20005F | 20 | 0.5 | 48 | 58 | 110 | 20 |
| SR507 2006505 | SR507 2006505F | 20 | 0.5 | 65 | 78 | 130 | 20 |

※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

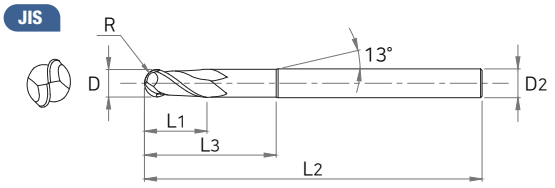
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

※ Trochoidal Milling Possible

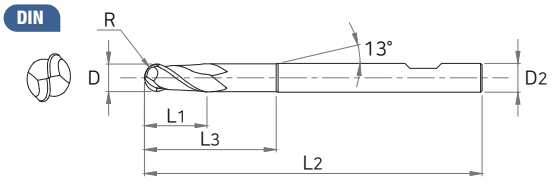
○ : GOOD ◎ : EXCELLENT

# SB502 | 2 FLUTES BALL ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |
| D6 ~ 7 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

DIN 6535HB | CARBIDE | AlCrN | 2 | 38° HELIX | R ±0.01 | DATA P.690

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SB502 010 | SB502 010F | 1 | 0.5 | 3 | 8 | 50 | 6 |
| SB502 020 | SB502 020F | 2 | 1 | 6 | 11 | 50 | 6 |
| SB502 030 | SB502 030F | 3 | 1.5 | 8 | 13 | 50 | 6 |
| SB502 030L | SB502 030LF | 3 | 1.5 | 8 | 13 | 70 | 6 |
| SB502 040 | SB502 040F | 4 | 2 | 10 | 15 | 50 | 6 |
| SB502 040L | SB502 040LF | 4 | 2 | 10 | 15 | 70 | 6 |
| SB502 050 | SB502 050F | 5 | 2.5 | 13 | 18 | 50 | 6 |
| SB502 050L | SB502 050LF | 5 | 2.5 | 13 | 18 | 80 | 6 |
| SB502 060 | SB502 060F | 6 | 3 | 13 | 20 | 50 | 6 |
| SB502 060L | SB502 060LF | 6 | 3 | 13 | 52 | 90 | 6 |
| SB502 080 | SB502 080F | 8 | 4 | 19 | 24 | 60 | 8 |
| SB502 080L | SB502 080LF | 8 | 4 | 19 | 62 | 100 | 8 |
| SB502 100 | SB502 100F | 10 | 5 | 22 | 30 | 70 | 10 |
| SB502 100L | SB502 100LF | 10 | 5 | 22 | 58 | 100 | 10 |
| SB502 120 | SB502 120F | 12 | 6 | 26 | 30 | 75 | 12 |
| SB502 120L | SB502 120LF | 12 | 6 | 26 | 63 | 110 | 12 |

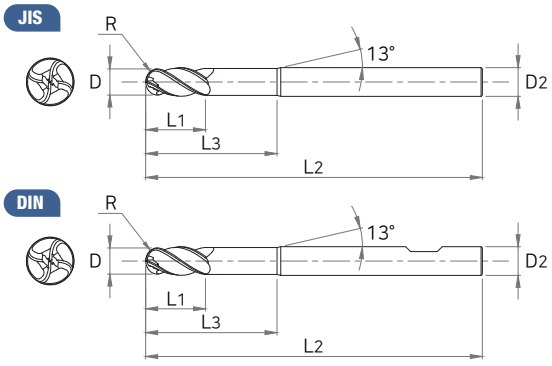
※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SB504 | 4 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 5 | 0 ~ -0.015 | h5 |
| D6 | 0 ~ -0.02 | |
| D8 ~ 20 | 0 ~ -0.03 | |

| EDP No | | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| JIS | DIN | D | R | L1 | L3 | L2 | D2 |
| SB504 030 | SB504 030F | 3 | 1.5 | 8 | 13 | 60 | 6 |
| SB504 040 | SB504 040F | 4 | 2 | 8 | 13 | 70 | 6 |
| SB504 050 | SB504 050F | 5 | 2.5 | 12 | 17 | 80 | 6 |
| SB504 060 | SB504 060F | 6 | 3 | 12 | 52 | 90 | 6 |
| SB504 080 | SB504 080F | 8 | 4 | 16 | 62 | 100 | 8 |
| SB504 100 | SB504 100F | 10 | 5 | 20 | 58 | 100 | 10 |
| SB504 120 | SB504 120F | 12 | 6 | 25 | 53 | 100 | 12 |
| SB504 160 | SB504 160F | 16 | 8 | 30 | 50 | 100 | 16 |
| SB504 200 | SB504 200F | 20 | 10 | 38 | 48 | 100 | 20 |

※ The tools of DIN standard do not consider of holding inventory

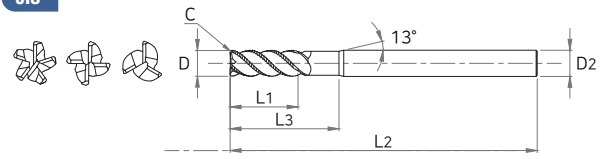
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

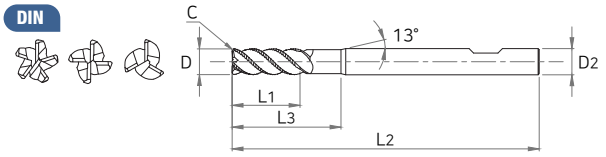
○ : GOOD ◎ : EXCELLENT

# SF51H | 3~5 FLUTES ROUGHING ENDMILL

JIS




DIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 20 | 0 ~ -0.05 | h5 |

DIN 6535HB | CARBIDE | AlCrN | 3~5 | 45° HELIX | DATA P.691

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| JIS | DIN | D | C | L1 | L3 | L2 | D2 | Z |
| SF51 303002H | SF51 303002HF | 3 | 0.2 | 8 | 13 | 50 | 6 | 3 |
| SF51 304002H | SF51 304002HF | 4 | 0.2 | 10 | 15 | 50 | 6 | 3 |
| SF51 405002H | SF51 405002HF | 5 | 0.3 | 13 | 18 | 50 | 6 | 4 |
| SF51 406002H | SF51 406002HF | 6 | 0.3 | 13 | 22 | 60 | 6 | 4 |
| SF51 406002NH | SF51 406002NHF | 6 | 0.3 | 10 | 22 | 60 | 6 | 4 |
| SF51 407002H | SF51 407002HF | 7 | 0.4 | 18 | 32 | 70 | 8 | 4 |
| SF51 408002H | SF51 408002HF | 8 | 0.4 | 19 | 32 | 70 | 8 | 4 |
| SF51 408002NH | SF51 408002NHF | 8 | 0.4 | 12 | 32 | 70 | 8 | 4 |
| SF51 409003H | SF51 409003HF | 9 | 0.4 | 20 | 28 | 70 | 10 | 4 |
| SF51 410003H | SF51 410003HF | 10 | 0.4 | 22 | 33 | 75 | 10 | 4 |
| SF51 410003NH | SF51 410003NHF | 10 | 0.4 | 15 | 33 | 75 | 10 | 4 |
| SF51 411003H | SF51 411003HF | 11 | 0.5 | 25 | 33 | 80 | 12 | 4 |
| SF51 412003H | SF51 412003HF | 12 | 0.5 | 26 | 35 | 80 | 12 | 4 |
| SF51 412003NH | SF51 412003NHF | 12 | 0.5 | 20 | 35 | 80 | 12 | 4 |
| SF51 506002H | SF51 506002HF | 6 | 0.5 | 13 | 22 | 60 | 6 | 5 |
| SF51 508002H | SF51 508002HF | 8 | 0.5 | 19 | 27 | 65 | 8 | 5 |
| SF51 510003H | SF51 510003HF | 10 | 0.5 | 22 | 30 | 70 | 10 | 5 |
| SF51 512003H | SF51 512003HF | 12 | 0.5 | 26 | 35 | 80 | 12 | 5 |
| SF51 514005H | SF51 514005HF | 14 | 0.5 | 28 | 40 | 90 | 16 | 5 |
| SF51 516005H | SF51 516005HF | 16 | 0.5 | 32 | 50 | 100 | 16 | 5 |
| SF51 51600542H | SF51 51600542HF | 16 | 0.5 | 42 | 52 | 100 | 16 | 5 |
| SF51 520005H | SF51 520005HF | 20 | 0.5 | 38 | 48 | 100 | 20 | 5 |
| SF51 52000545H | SF51 52000545HF | 20 | 0.5 | 45 | 50 | 100 | 20 | 5 |

※ The tools of DIN standard do not consider of holding inventory

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Cast Iron ~FCD500 | Aluminum | Stainless Steel | Ti-Alloy | Ni-Alloy |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | | | ◎ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# ALU-WAVE ENDMILL

Aluminum, Aluminum Alloy and Non-ferrous Materials

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 1F | WAE301 | | 1 FLUTE SQUARE ENDMILL | D0.2 | D12 | 326 |
| | 2F | WAE302 | | 2 FLUTES SQUARE ENDMILL | D1 | D25 | 327 |
| | 3F | WAE30(2)3 | | 3 FLUTES SQUARE ENDMILL | D1 | D25 | 328 |
| RADIUS | 2F | WAR302 | | 2 FLUTES RADIUS ENDMILL | D6 | D20 | 330 |
| | 3F | WAR303 | | 3 FLUTES RADIUS ENDMILL | D6 | D20 | 331 |
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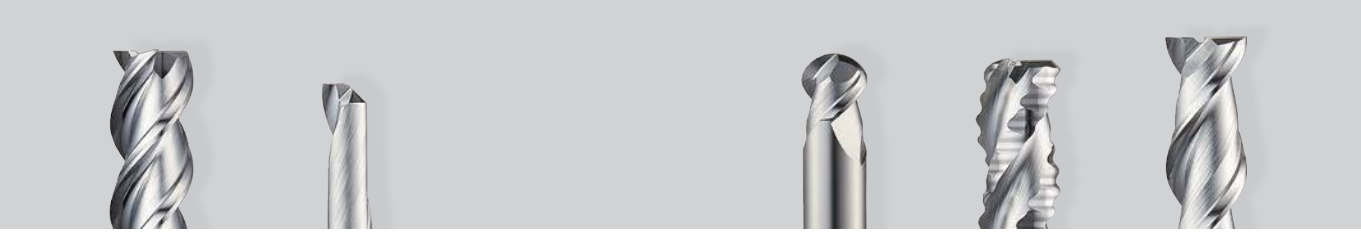
## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| WA | R | 3 | 0 | 3 | 14 | 10 |
|---|---|---|---|---|---|---|

| Section | Appearance | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R |
|---|---|---|---|---|---|---|
| WA : Winner Aluminium | E : Square | 3 : NON Coating | 0 : Stub Length | 1 : 1 Flute | 0.2 | 0.05 |
| | R : Radius | 5 : D.L.C Coating | 1 : Regula Length | 2 : 2 Flutes | ~ | ~ |
| | B : Ball | | 2 : Long Length | 3 : 3 Flutes | 25 | 5 |
| | F : Roughing | | | | | |

Ex) 3 Flute / Cutting Dia Ø14 / Corner R 1.0 / NON Coating Corner Radius Alu Wave Endmill



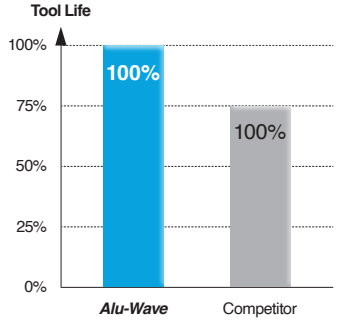
## General Features

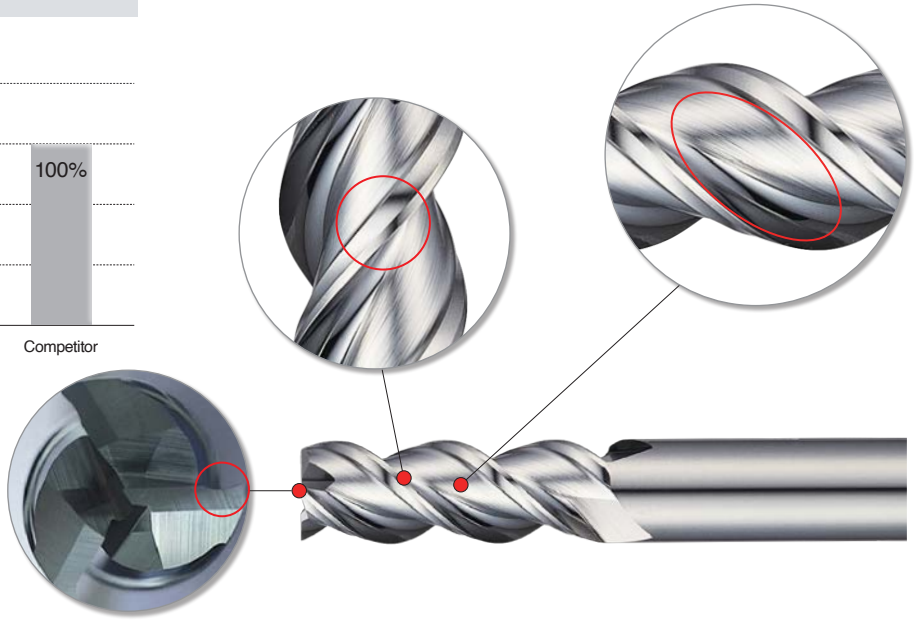
· Suitable for Aluminum, Aluminum alloy and Non-ferrous materials.
· Various specifications in the line such as Ball, single flute and  roughing etc. for wide range in machining.

## Characteristics

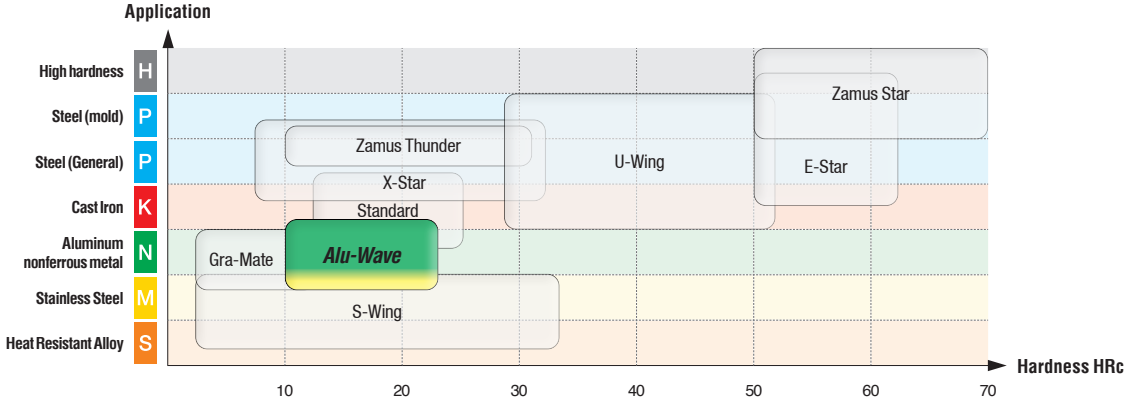
· Sharp cutting edge considered the characteristics of workpiece
· High deposition resistance and enhanced chip emission through the surface of a mirror in the groove.

## Case Study

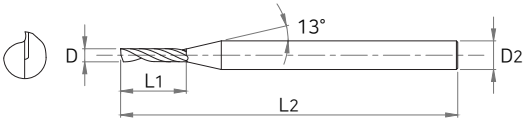


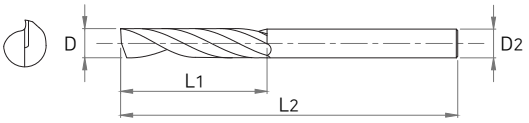



## Applications



# WAE301 | 1 FLUTE SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D0.2 ~ 5 | 0 ~ -0.02 | h6 |
| D6 ~ 12 | 0 ~ -0.03 | |

CARBIDE | Uncoated | 1 | 30° HELIX | DATA P.692

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE301 002 | 0.2 | 0.3 | 40 | 4 |
| WAE301 003 | 0.3 | 0.9 | 40 | 4 |
| WAE301 004 | 0.4 | 1.2 | 40 | 4 |
| WAE301 005 | 0.5 | 1.5 | 40 | 4 |
| WAE301 006 | 0.6 | 1.8 | 40 | 4 |
| WAE301 007 | 0.7 | 2.1 | 40 | 4 |
| WAE301 008 | 0.8 | 2.4 | 40 | 4 |
| WAE301 009 | 0.9 | 2.7 | 40 | 4 |
| WAE301 010 | 1 | 3 | 45 | 6 |
| WAE301 010-4.5 | 1 | 4.5 | 45 | 6 |
| WAE301 010-6 | 1 | 6 | 50 | 6 |
| WAE301 012 | 1.2 | 3 | 45 | 6 |
| WAE301 012-5 | 1.2 | 5 | 45 | 6 |
| WAE301 012-6 | 1.2 | 6 | 50 | 6 |
| WAE301 015 | 1.5 | 4 | 45 | 6 |
| WAE301 015-6 | 1.5 | 6 | 50 | 6 |
| WAE301 015-8 | 1.5 | 8 | 50 | 6 |
| WAE301 020 | 2 | 6 | 50 | 6 |
| WAE301 020-8 | 2 | 8 | 50 | 6 |
| WAE301 020-10 | 2 | 10 | 50 | 6 |
| WAE301 025 | 2.5 | 7 | 50 | 6 |

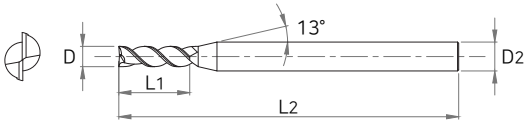
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE301 025-8 | 2.5 | 8 | 50 | 6 |
| WAE301 025-10 | 2.5 | 10 | 50 | 6 |
| WAE301 025-12 | 2.5 | 12 | 50 | 6 |
| WAE301 030 | 3 | 8 | 50 | 6 |
| WAE301 030-12 | 3 | 12 | 50 | 6 |
| WAE301 030-15 | 3 | 15 | 50 | 6 |
| WAE301 040 | 4 | 10 | 50 | 6 |
| WAE301 040-15 | 4 | 15 | 50 | 6 |
| WAE301 040-20 | 4 | 20 | 60 | 6 |
| WAE301 050 | 5 | 13 | 60 | 6 |
| WAE301 050-20 | 5 | 20 | 60 | 6 |
| WAE301 050-25 | 5 | 25 | 60 | 6 |
| WAE301 060 | 6 | 15 | 60 | 6 |
| WAE301 060-20 | 6 | 20 | 60 | 6 |
| WAE301 060-25 | 6 | 25 | 60 | 6 |
| WAE301 080 | 8 | 20 | 70 | 8 |
| WAE301 080-25 | 8 | 25 | 75 | 8 |
| WAE301 100 | 10 | 22 | 75 | 10 |
| WAE301 100-30 | 10 | 30 | 80 | 10 |
| WAE301 120 | 12 | 26 | 75 | 12 |
| WAE301 120-35 | 12 | 35 | 90 | 12 |

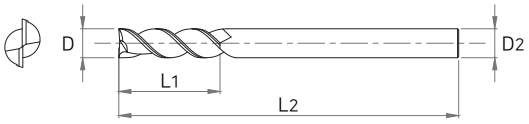
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAE302 | 2 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | Uncoated | 2 | 45° HELIX | SHARP EDGE | DATA P.693

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE302 010 | 1 | 3 | 50 | 4 |
| WAE302 010-6 | 1 | 6 | 60 | 6 |
| WAE302 012 | 1.2 | 4 | 50 | 6 |
| WAE302 015 | 1.5 | 6 | 50 | 6 |
| WAE302 015-8 | 1.5 | 8 | 60 | 6 |
| WAE302 020 S4 | 2 | 6 | 50 | 4 |
| WAE302 020 | 2 | 6 | 50 | 6 |
| WAE302 020-10 | 2 | 10 | 60 | 6 |
| WAE302 025 | 2.5 | 12 | 55 | 6 |
| WAE302 030 | 3 | 12 | 55 | 6 |
| WAE302 030-15 | 3 | 15 | 65 | 6 |
| WAE302 035 | 3.5 | 14 | 57 | 6 |
| WAE302 040 | 4 | 14 | 55 | 6 |
| WAE302 040-16 | 4 | 16 | 65 | 6 |
| WAE302 050 | 5 | 17 | 55 | 6 |
| WAE302 050-22 | 5 | 22 | 60 | 6 |
| WAE302 060 | 6 | 17 | 60 | 6 |
| WAE302 060-22 | 6 | 22 | 60 | 6 |
| WAE302 070 | 7 | 20 | 63 | 8 |

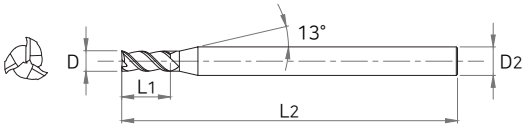
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE302 080 | 8 | 23 | 70 | 8 |
| WAE302 080-31 | 8 | 31 | 80 | 8 |
| WAE302 090 | 9 | 25 | 72 | 10 |
| WAE302 100 | 10 | 28 | 75 | 10 |
| WAE302 100-36 | 10 | 36 | 90 | 10 |
| WAE302 110 | 11 | 30 | 80 | 12 |
| WAE302 120 | 12 | 33 | 80 | 12 |
| WAE302 120-41 | 12 | 41 | 95 | 12 |
| WAE302 122 | 12 | 45 | 100 | 12 |
| WAE302 130 | 13 | 35 | 85 | 14 |
| WAE302 140 | 14 | 38 | 90 | 14 |
| WAE302 150 | 15 | 40 | 90 | 16 |
| WAE302 160 | 16 | 45 | 100 | 16 |
| WAE302 160-53 | 16 | 53 | 110 | 16 |
| WAE302 180 | 18 | 49 | 100 | 18 |
| WAE302 200 | 20 | 50 | 100 | 20 |
| WAE302 200-55 | 20 | 55 | 110 | 20 |
| WAE302 250 | 25 | 50 | 120 | 25 |

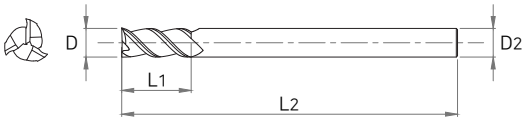
## ■ Applicable Working Material

| Carbon Steel ~ HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAE30(2)3 | 3 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | Uncoated | 3 | 45° HELIX | SHARP EDGE | DATA P.694

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE303 010-02 | 1 | 2 | 40 | 6 |
| WAE303 010-025 | 1 | 2.5 | 40 | 6 |
| WAE303 010 | 1 | 3 | 50 | 6 |
| WAE303 010-04 | 1 | 4 | 60 | 6 |
| WAE303 010-06 | 1 | 6 | 60 | 6 |
| WAE303 012 | 1.2 | 4 | 50 | 6 |
| WAE303 015-03 | 1.5 | 3 | 40 | 6 |
| WAE303 015 | 1.5 | 5 | 50 | 6 |
| WAE303 015-06 | 1.5 | 6 | 60 | 6 |
| WAE303 015-08 | 1.5 | 8 | 60 | 6 |
| WAE303 015-10 | 1.5 | 10 | 60 | 6 |
| WAE303 020-03 | 2 | 3 | 40 | 6 |
| WAE303 020 | 2 | 6 | 50 | 6 |
| WAE303 020-08 | 2 | 8 | 60 | 6 |
| WAE303 020-10 | 2 | 10 | 60 | 6 |
| WAE303 020-12 | 2 | 12 | 60 | 6 |
| WAE303 025 | 2.5 | 8 | 40 | 6 |
| WAE303 025-10 | 2.5 | 10 | 55 | 6 |
| WAE303 025-12 | 2.5 | 12 | 60 | 6 |
| WAE303 030-04 | 3 | 4 | 45 | 6 |
| WAE303 030-08 | 3 | 8 | 45 | 6 |
| WAE303 030 | 3 | 12 | 55 | 6 |
| WAE303 031 | 3 | 15 | 65 | 6 |
| WAE323 030 | 3 | 20 | 70 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE323 031 | 3 | 25 | 75 | 6 |
| WAE323 032 | 3 | 30 | 80 | 6 |
| WAE303 035 | 3.5 | 12 | 55 | 6 |
| WAE303 040-05 | 4 | 5 | 45 | 6 |
| WAE303 040-08 | 4 | 8 | 45 | 6 |
| WAE303 040-11 | 4 | 11 | 45 | 6 |
| WAE303 040 | 4 | 14 | 55 | 6 |
| WAE303 040-16 | 4 | 16 | 65 | 6 |
| WAE303 041 | 4 | 20 | 70 | 6 |
| WAE323 040 | 4 | 26 | 75 | 6 |
| WAE323 041 | 4 | 30 | 80 | 6 |
| WAE303 045 | 4.5 | 15 | 55 | 6 |
| WAE303 050-06 | 5 | 6 | 45 | 6 |
| WAE303 050 | 5 | 17 | 55 | 6 |
| WAE303 051 | 5 | 22 | 60 | 6 |
| WAE303 052 | 5 | 26 | 70 | 6 |
| WAE323 050 | 5 | 31 | 75 | 6 |
| WAE323 051 | 5 | 36 | 80 | 6 |
| WAE323 052 | 5 | 41 | 85 | 6 |
| WAE323 053 | 5 | 46 | 90 | 6 |
| WAE303 055 | 5.5 | 17 | 55 | 6 |
| WAE303 060-07 | 6 | 7 | 50 | 6 |
| WAE303 060-13 | 6 | 13 | 50 | 6 |
| WAE303 060 | 6 | 17 | 60 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAE30(2)3 | 3 FLUTES SQUARE ENDMILL

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE303 061 | 6 | 22 | 60 | 6 |
| WAE303 062 | 6 | 26 | 70 | 6 |
| WAE303 063 | 6 | 31 | 75 | 6 |
| WAE323 060 | 6 | 36 | 80 | 6 |
| WAE323 061 | 6 | 43 | 90 | 6 |
| WAE323 062 | 6 | 51 | 100 | 6 |
| WAE303 070 | 7 | 23 | 65 | 8 |
| WAE303 080-10 | 8 | 10 | 60 | 8 |
| WAE303 080-20 | 8 | 20 | 60 | 8 |
| WAE303 080 | 8 | 23 | 70 | 8 |
| WAE303 080-29 | 8 | 29 | 80 | 8 |
| WAE303 081 | 8 | 31 | 80 | 8 |
| WAE303 082 | 8 | 36 | 85 | 8 |
| WAE323 080 | 8 | 41 | 90 | 8 |
| WAE323 081 | 8 | 46 | 95 | 8 |
| WAE323 082 | 8 | 51 | 100 | 8 |
| WAE323 083 | 8 | 56 | 105 | 8 |
| WAE323 084 | 8 | 66 | 110 | 8 |
| WAE303 090 | 9 | 28 | 70 | 10 |
| WAE303 100-12 | 10 | 12 | 65 | 10 |
| WAE303 100-23 | 10 | 23 | 65 | 10 |
| WAE303 100 | 10 | 28 | 75 | 10 |
| WAE303 100-33 | 10 | 33 | 90 | 10 |
| WAE303 101 | 10 | 36 | 90 | 10 |
| WAE303 100-41 | 10 | 41 | 90 | 10 |
| WAE303 102 | 10 | 46 | 100 | 10 |
| WAE303 103 | 10 | 51 | 100 | 10 |
| WAE323 100 | 10 | 56 | 110 | 10 |
| WAE323 100-61 | 10 | 61 | 110 | 10 |
| WAE323 101 | 10 | 66 | 120 | 10 |
| WAE303 110 | 11 | 30 | 80 | 12 |
| WAE303 120-14 | 12 | 14 | 70 | 12 |
| WAE303 120-27 | 12 | 27 | 70 | 12 |
| WAE303 120 | 12 | 33 | 80 | 12 |
| WAE303 121 | 12 | 41 | 95 | 12 |

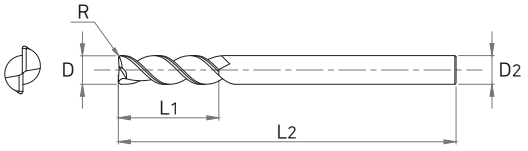
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAE303 122 | 12 | 46 | 100 | 12 |
| WAE303 122-51 | 12 | 51 | 100 | 12 |
| WAE303 123 | 12 | 56 | 110 | 12 |
| WAE303 124-61 | 12 | 61 | 110 | 12 |
| WAE323 120 | 12 | 66 | 120 | 12 |
| WAE323 120-71 | 12 | 71 | 120 | 12 |
| WAE323 121 | 12 | 76 | 135 | 12 |
| WAE303 130 | 13 | 35 | 85 | 14 |
| WAE303 140 | 14 | 38 | 90 | 14 |
| WAE303 150 | 15 | 40 | 90 | 16 |
| WAE303 160-19 | 16 | 19 | 90 | 16 |
| WAE303 160-33 | 16 | 33 | 90 | 16 |
| WAE303 160 | 16 | 45 | 100 | 16 |
| WAE303 160-53 | 16 | 53 | 105 | 16 |
| WAE303 161 | 16 | 56 | 110 | 16 |
| WAE303 162 | 16 | 66 | 130 | 16 |
| WAE303 163 | 16 | 76 | 150 | 16 |
| WAE323 160 | 16 | 86 | 160 | 16 |
| WAE323 161 | 16 | 96 | 180 | 16 |
| WAE323 162 | 16 | 106 | 190 | 16 |
| WAE323 163 | 16 | 116 | 200 | 16 |
| WAE303 180 | 18 | 49 | 100 | 18 |
| WAE303 200-23 | 20 | 23 | 90 | 20 |
| WAE303 200-39 | 20 | 39 | 90 | 20 |
| WAE303 200 | 20 | 50 | 100 | 20 |
| WAE303 201 | 20 | 60 | 110 | 20 |
| WAE303 202 | 20 | 70 | 130 | 20 |
| WAE303 203 | 20 | 76 | 150 | 20 |
| WAE323 200 | 20 | 86 | 160 | 20 |
| WAE323 201 | 20 | 96 | 180 | 20 |
| WAE323 202 | 20 | 106 | 190 | 20 |
| WAE323 203 | 20 | 116 | 200 | 20 |
| WAE323 204 | 20 | 126 | 220 | 20 |
| WAE303 250 | 25 | 50 | 120 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAR302 | 2 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | Uncoated | 2 | 45° HELIX | R ±0.015 All Sizes | DATA P.695

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR302 06 05 | 6 | 0.5 | 15 | 50 | 6 |
| WAR302 06 10 | 6 | 1 | 15 | 50 | 6 |
| WAR302 06 15 | 6 | 1.5 | 15 | 50 | 6 |
| WAR302 06 20 | 6 | 2 | 15 | 50 | 6 |
| WAR302 08 05 | 8 | 0.5 | 20 | 60 | 8 |
| WAR302 08 10 | 8 | 1 | 20 | 60 | 8 |
| WAR302 08 15 | 8 | 1.5 | 20 | 60 | 8 |
| WAR302 08 20 | 8 | 2 | 20 | 60 | 8 |
| WAR302 08 30 | 8 | 3 | 20 | 60 | 8 |
| WAR302 10 05 | 10 | 0.5 | 25 | 70 | 10 |
| WAR302 10 10 | 10 | 1 | 25 | 70 | 10 |
| WAR302 10 15 | 10 | 1.5 | 25 | 70 | 10 |
| WAR302 10 20 | 10 | 2 | 25 | 70 | 10 |
| WAR302 10 30 | 10 | 3 | 25 | 70 | 10 |
| WAR302 10 40 | 10 | 4 | 25 | 70 | 10 |
| WAR302 12 10 | 12 | 1 | 30 | 75 | 12 |
| WAR302 12 20 | 12 | 2 | 30 | 75 | 12 |

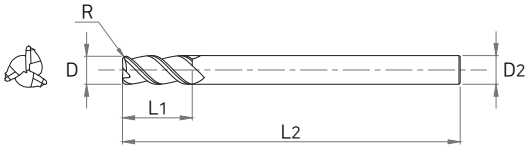
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR302 12 30 | 12 | 3 | 30 | 75 | 12 |
| WAR302 12 40 | 12 | 4 | 30 | 75 | 12 |
| WAR302 14 10 | 14 | 1 | 35 | 80 | 14 |
| WAR302 14 20 | 14 | 2 | 35 | 80 | 14 |
| WAR302 14 30 | 14 | 3 | 35 | 80 | 14 |
| WAR302 14 40 | 14 | 4 | 35 | 80 | 14 |
| WAR302 14 50 | 14 | 5 | 35 | 80 | 14 |
| WAR302 16 10 | 16 | 1 | 40 | 90 | 16 |
| WAR302 16 20 | 16 | 2 | 40 | 90 | 16 |
| WAR302 16 30 | 16 | 3 | 40 | 90 | 16 |
| WAR302 16 40 | 16 | 4 | 40 | 90 | 16 |
| WAR302 16 50 | 16 | 5 | 40 | 90 | 16 |
| WAR302 20 10 | 20 | 1 | 45 | 100 | 20 |
| WAR302 20 20 | 20 | 2 | 45 | 100 | 20 |
| WAR302 20 30 | 20 | 3 | 45 | 100 | 20 |
| WAR302 20 40 | 20 | 4 | 45 | 100 | 20 |
| WAR302 20 50 | 20 | 5 | 45 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAR303 | 3 FLUTES RADIUS ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | Uncoated | 3 | 45° HELIX | R ±0.015 All Sizes | DATA P.694

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR303 06 05 | 6 | 0.5 | 15 | 50 | 6 |
| WAR303 06 10 | 6 | 1 | 15 | 50 | 6 |
| WAR303 06 15 | 6 | 1.5 | 15 | 50 | 6 |
| WAR303 06 20 | 6 | 2 | 15 | 50 | 6 |
| WAR303 08 05 | 8 | 0.5 | 20 | 60 | 8 |
| WAR303 08 10 | 8 | 1 | 20 | 60 | 8 |
| WAR303 08 15 | 8 | 1.5 | 20 | 60 | 8 |
| WAR303 08 20 | 8 | 2 | 20 | 60 | 8 |
| WAR303 10 05 | 10 | 0.5 | 25 | 70 | 10 |
| WAR303 10 10 | 10 | 1 | 25 | 70 | 10 |
| WAR303 10 15 | 10 | 1.5 | 25 | 70 | 10 |
| WAR303 10 20 | 10 | 2 | 25 | 70 | 10 |
| WAR303 10 30 | 10 | 3 | 25 | 70 | 10 |
| WAR303 10 40 | 10 | 4 | 25 | 70 | 10 |
| WAR303 12 10 | 12 | 1 | 30 | 75 | 12 |
| WAR303 12 20 | 12 | 2 | 30 | 75 | 12 |
| WAR303 12 30 | 12 | 3 | 30 | 75 | 12 |

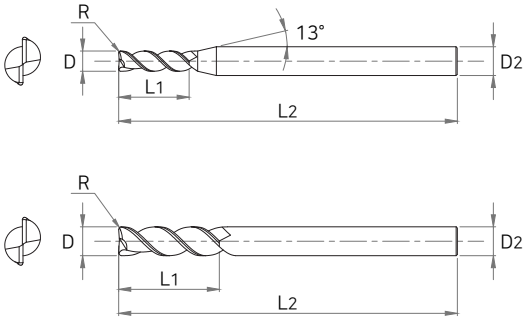
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR303 12 40 | 12 | 4 | 30 | 75 | 12 |
| WAR303 14 10 | 14 | 1 | 35 | 80 | 14 |
| WAR303 14 20 | 14 | 2 | 35 | 80 | 14 |
| WAR303 14 30 | 14 | 3 | 35 | 80 | 14 |
| WAR303 14 40 | 14 | 4 | 35 | 80 | 14 |
| WAR303 14 50 | 14 | 5 | 35 | 80 | 14 |
| WAR303 16 10 | 16 | 1 | 40 | 90 | 16 |
| WAR303 16 20 | 16 | 2 | 40 | 90 | 16 |
| WAR303 16 30 | 16 | 3 | 40 | 90 | 16 |
| WAR303 16 40 | 16 | 4 | 40 | 90 | 16 |
| WAR303 16 50 | 16 | 5 | 40 | 90 | 16 |
| WAR303 20 10 | 20 | 1 | 45 | 100 | 20 |
| WAR303 20 20 | 20 | 2 | 45 | 100 | 20 |
| WAR303 20 30 | 20 | 3 | 45 | 100 | 20 |
| WAR303 20 40 | 20 | 4 | 45 | 100 | 20 |
| WAR303 20 50 | 20 | 5 | 45 | 100 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAR502 | 2 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | D.L.C | 2 | 45° HELIX | R ±0.015 All Sizes | DATA P.696

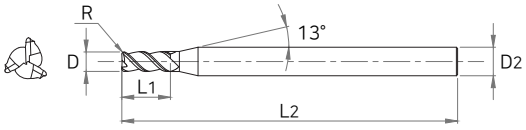
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR502 010 | 1 | 0.05 | 3 | 40 | 6 |
| WAR502 015 | 1.5 | 0.05 | 5 | 40 | 6 |
| WAR502 020 | 2 | 0.1 | 6 | 40 | 6 |
| WAR502 021 | 2 | 0.1 | 12 | 50 | 6 |
| WAR502 030 | 3 | 0.1 | 10 | 50 | 6 |
| WAR502 031 | 3 | 0.1 | 20 | 60 | 6 |
| WAR502 040 | 4 | 0.1 | 12 | 50 | 6 |
| WAR502 041 | 4 | 0.1 | 20 | 60 | 6 |
| WAR502 050 | 5 | 0.1 | 15 | 57 | 6 |
| WAR502 060 | 6 | 0.1 | 15 | 57 | 6 |
| WAR502 061 | 6 | 0.1 | 22 | 65 | 6 |
| WAR502 070 | 7 | 0.1 | 20 | 63 | 8 |
| WAR502 080 | 8 | 0.1 | 20 | 63 | 8 |
| WAR502 081 | 8 | 0.1 | 28 | 70 | 8 |
| WAR502 090 | 9 | 0.1 | 25 | 72 | 10 |
| WAR502 100 | 10 | 0.2 | 28 | 72 | 10 |
| WAR502 101 | 10 | 0.2 | 32 | 80 | 10 |
| WAR502 110 | 11 | 0.2 | 30 | 80 | 12 |
| WAR502 120 | 12 | 0.2 | 32 | 80 | 12 |
| WAR502 121 | 12 | 0.2 | 40 | 100 | 12 |

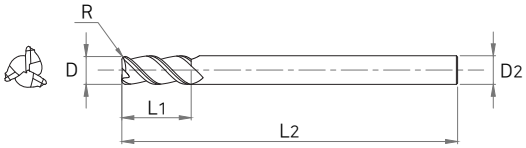
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAR503 | 3 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | D.L.C | 3 | 45° HELIX | R ±0.015 All Sizes | DATA P.697

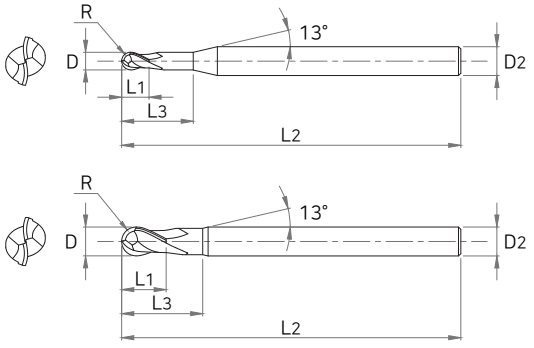
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WAR503 040 | 4 | 0.5 | 14 | 57 | 6 |
| WAR503 041 | 4 | 1 | 25 | 62 | 6 |
| WAR503 060 | 6 | 0.5 | 16 | 57 | 6 |
| WAR503 061 | 6 | 1 | 25 | 62 | 6 |
| WAR503 080 | 8 | 0.5 | 22 | 63 | 8 |
| WAR503 081 | 8 | 1 | 35 | 80 | 8 |
| WAR503 100 | 10 | 0.5 | 28 | 72 | 10 |
| WAR503 101 | 10 | 1 | 45 | 100 | 10 |
| WAR503 120 | 12 | 0.5 | 32 | 80 | 12 |
| WAR503 121 | 12 | 1 | 45 | 100 | 12 |
| WAR503 160 | 16 | 0.5 | 45 | 90 | 16 |
| WAR503 161 | 16 | 1 | 65 | 125 | 16 |
| WAR503 200 | 20 | 0.5 | 50 | 100 | 20 |
| WAR503 201 | 20 | 1 | 70 | 130 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAB312 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | Uncoated | 2 | 50° HELIX | R ±0.02 All Sizes | DATA P.699

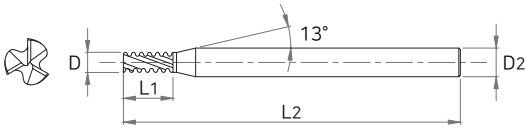
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WAB312 060 | 6 | 3 | 5.5 | 25 | 55 | 6 |
| WAB312 061 | 6 | 3 | 5.5 | 40 | 90 | 6 |
| WAB312 080 | 8 | 4 | 7 | 30 | 65 | 8 |
| WAB312 081 | 8 | 4 | 7 | 50 | 100 | 8 |
| WAB312 100 | 10 | 5 | 8.5 | 35 | 75 | 10 |
| WAB312 101 | 10 | 5 | 10 | 50 | 100 | 10 |
| WAB312 102 | 10 | 5 | 10 | 60 | 150 | 10 |
| WAB312 120 | 12 | 6 | 10.5 | 40 | 75 | 12 |
| WAB312 121 | 12 | 6 | 12 | 50 | 110 | 12 |
| WAB312 122 | 12 | 6 | 12 | 60 | 150 | 12 |
| WAB312 160 | 16 | 8 | 14 | 50 | 90 | 16 |
| WAB312 161 | 16 | 8 | 16 | 70 | 150 | 16 |
| WAB312 162 | 16 | 8 | 16 | 90 | 200 | 16 |
| WAB312 200 | 20 | 10 | 17 | 50 | 100 | 20 |

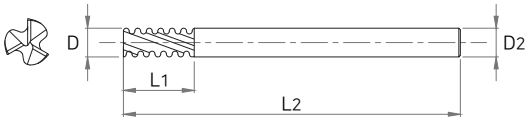
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# WAF303 | 3 FLUTES ROUGHING ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D4 ~ 6 | 0 ~ -0.048 | h6 |
| D7 ~ 10 | 0 ~ -0.058 | |
| D12 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |
| D6 ~ 12 | 0 ~ -0.03 | |

CARBIDE | Uncoated | 3 | COARSE | DIN 6535HA | DIN 6535HB | 38° HELIX | DATA P.699

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WAF303 040 | 4 | 10 | 55 | 6 |
| WAF303 050 | 5 | 15 | 55 | 6 |
| WAF303 060 | 6 | 16 | 60 | 6 |
| WAF303 061 | 6 | 25 | 80 | 6 |
| WAF303 070 | 7 | 16 | 63 | 8 |
| WAF303 080 | 8 | 20 | 65 | 8 |
| WAF303 081 | 8 | 30 | 90 | 8 |
| WAF303 090 | 9 | 19 | 72 | 10 |
| WAF303 100 | 10 | 25 | 75 | 10 |
| WAF303 101 | 10 | 40 | 100 | 10 |
| WAF303 120 | 12 | 30 | 80 | 12 |
| WAF303 121 | 12 | 50 | 110 | 12 |
| WAF303 140 | 14 | 35 | 90 | 14 |
| WAF303 160 | 16 | 42 | 100 | 16 |
| WAF303 161 | 16 | 52 | 150 | 16 |
| WAF303 162 | 16 | 65 | 125 | 16 |
| WAF303 180 | 18 | 32 | 92 | 18 |
| WAF303 200 | 20 | 38 | 104 | 20 |
| WAF303 201 | 20 | 55 | 160 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | ○ | | | ◎ | |

○ : GOOD ◎ : EXCELLENT

# STANDARD ENDMILL

Low hardness materials under HRc 30

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | E302 | | 2 FLUTES SQUARE ENDMILL | D1 | D25 | 338 |
| | 4F | E304 | | 4 FLUTES SQUARE ENDMILL | D2 | D25 | 339 |
| | 2F | E322 | | 2 FLUTES LONG SHANK SQUARE ENDMILL | D3 | D20 | 340 |
| | 2F | EL422 |  | 2 FLUTES EXTRA LONG SQUARE ENDMILL | D3 | D10 | 341 |
| | 4F | E324 | | 4 FLUTES LONG SHANK SQUARE ENDMILL | D3 | D20 | 342 |
| | 2F | EB302-W | | 2 FLUTES BRAZED SQUARE ENDMILL | D14 | D50 | 343 |
| | 4F | EB304-W | | 4 FLUTES BRAZED SQUARE ENDMILL | D14 | D50 | 344 |
| | 2F | EB322-W | | 2 FLUTES LONG BRAZED SQUARE ENDMILL | D14 | D45 | 345 |
| | 4F | EB324-W | | 4 FLUTES LONG BRAZED SQUARE ENDMILL | D14 | D50 | 346 |
| BALL | 2F | B302 | | 2 FLUTES BALL NOSE ENDMILL | R0.5 | R12.5 | 347 |
| | 4F | B304 | | 4 FLUTES BALL NOSE ENDMILL | R1.5 | R12.5 | 348 |
| | 2F | BL422 | | 2 FLUTES EXTRA LONG BALL NOSE ENDMILL | R1.5 | R10 | 349 |
| | 2F | BB302-W | | 2 FLUTES BRAZED BALL NOSE ENDMILL | R7.5 | R16 | 350 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| E | 3 | 0 | 4 | 130 | S16 |
|---|---|---|---|---|---|

| Section | Appearance | Length, Shank Type | Flutes | Cutting Dia | Shank Dia |
|---|---|---|---|---|---|
| B : Ball Endmill | 3 : Standard | 0 : Regular Length | 2 : 2 Flutes | 1 | 3 |
| E : Square Endmill | 4 : Long Length | 2 : Long Length | 4 : 4 Flutes | ~ | ~ |
| BL : Long Length Ball | | | | 50 | 42 |
| EB : Brazed Square | | | | | |
| BB : Brazed Ball | | | | | |

Ex) 4 Flutes / Cutting Dia Ø13 / Shank Dia 16 / Standard Type Square Endmill

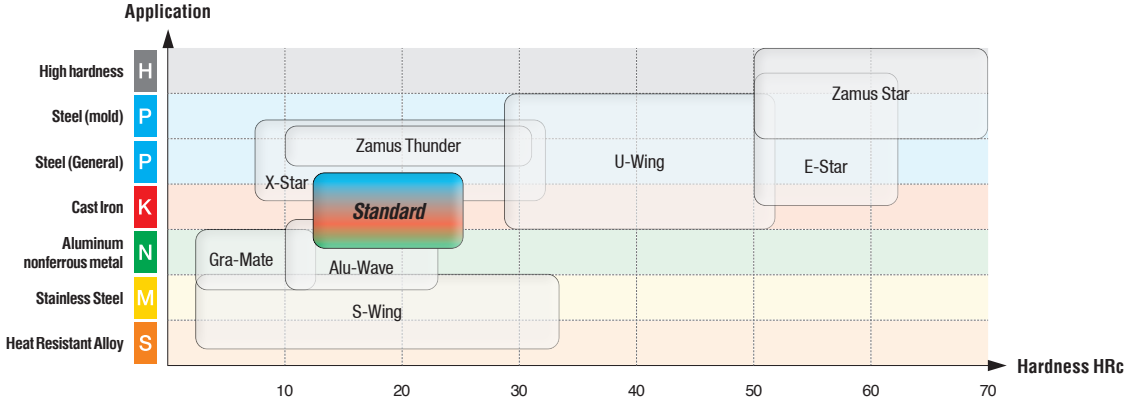
## Characteristics

· Suitable for low hardness materials under HRc 30
· Various product line : Square, Ball, Brazing type

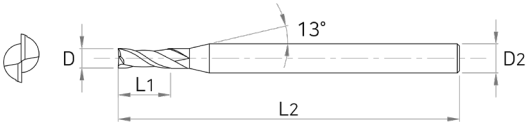
## Features

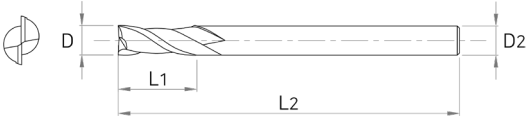
· Improved chipping resistance by using high toughness materials
· Proper cutting edge for low hardness materials

## Applications



# E302 | 2 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h7 |
| D3.5 ~ 6 | 0 ~ -0.048 | |
| D6.5 ~ 10 | 0 ~ -0.058 | |
| D10.5 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E302 010S4 | 1 | 3 | 42 | 4 |
| E302 010 | 1 | 3 | 42 | 6 |
| E302 015S4 | 1.5 | 4 | 42 | 4 |
| E302 015 | 1.5 | 4 | 42 | 6 |
| E302 020S4 | 2 | 6 | 42 | 4 |
| E302 020 | 2 | 6 | 42 | 6 |
| E302 025S4 | 2.5 | 8 | 42 | 4 |
| E302 025 | 2.5 | 8 | 42 | 6 |
| E302 030 | 3 | 10 | 50 | 6 |
| E302 035 | 3.5 | 10 | 50 | 6 |
| E302 040 | 4 | 12 | 50 | 6 |
| E302 045 | 4.5 | 14 | 50 | 6 |
| E302 050 | 5 | 15 | 50 | 6 |
| E302 055 | 5.5 | 15 | 50 | 6 |
| E302 060 | 6 | 15 | 50 | 6 |
| E302 065 | 6.5 | 18 | 60 | 8 |
| E302 070 | 7 | 20 | 60 | 8 |
| E302 075 | 7.5 | 20 | 60 | 8 |

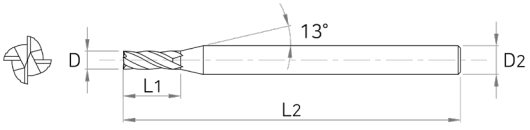
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E302 080 | 8 | 20 | 60 | 8 |
| E302 085 | 8.5 | 23 | 70 | 10 |
| E302 090 | 9 | 25 | 70 | 10 |
| E302 095 | 9.5 | 25 | 70 | 10 |
| E302 100 | 10 | 25 | 70 | 10 |
| E302 105 | 10.5 | 28 | 75 | 12 |
| E302 110 | 11 | 30 | 75 | 12 |
| E302 115 | 11.5 | 30 | 75 | 12 |
| E302 120 | 12 | 30 | 75 | 12 |
| E302 130 | 13 | 35 | 85 | 14 |
| E302 130S16 | 13 | 35 | 90 | 16 |
| E302 140 | 14 | 35 | 85 | 14 |
| E302 140S16 | 14 | 35 | 90 | 16 |
| E302 150 | 15 | 40 | 90 | 16 |
| E302 160 | 16 | 40 | 90 | 16 |
| E302 180 | 18 | 45 | 100 | 18 |
| E302 200 | 20 | 45 | 100 | 20 |
| E302 250 | 25 | 50 | 120 | 25 |

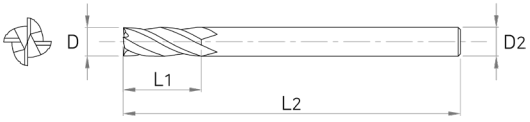
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# E304 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.04 | h7 |
| D3.5~6 | 0~-0.048 | |
| D6.5~10 | 0~-0.058 | |
| D10.5~18 | 0~-0.07 | |
| D20~ | 0~-0.084 | |

CARBIDE | Uncoated | 4 | 30° HELIX | DATA P.700

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E304 020S4 | 2 | 6 | 42 | 4 |
| E304 020 | 2 | 6 | 42 | 6 |
| E304 025 | 2.5 | 8 | 42 | 6 |
| E304 030 | 3 | 10 | 50 | 6 |
| E304 035 | 3.5 | 10 | 50 | 6 |
| E304 040 | 4 | 12 | 50 | 6 |
| E304 045 | 4.5 | 14 | 50 | 6 |
| E304 050 | 5 | 15 | 50 | 6 |
| E304 055 | 5.5 | 15 | 50 | 6 |
| E304 060 | 6 | 15 | 50 | 6 |
| E304 065 | 6.5 | 18 | 60 | 8 |
| E304 070 | 7 | 20 | 60 | 8 |
| E304 075 | 7.5 | 20 | 60 | 8 |
| E304 080 | 8 | 20 | 60 | 8 |
| E304 085 | 8.5 | 23 | 70 | 10 |
| E304 090 | 9 | 25 | 70 | 10 |

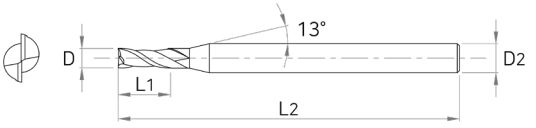
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E304 095 | 9.5 | 25 | 70 | 10 |
| E304 100 | 10 | 25 | 70 | 10 |
| E304 105 | 10.5 | 28 | 75 | 12 |
| E304 110 | 11 | 30 | 75 | 12 |
| E304 115 | 11.5 | 30 | 75 | 12 |
| E304 120 | 12 | 30 | 75 | 12 |
| E304 130 | 13 | 35 | 85 | 14 |
| E304 130S16 | 13 | 35 | 90 | 16 |
| E304 140 | 14 | 35 | 85 | 14 |
| E304 140S16 | 14 | 35 | 90 | 16 |
| E304 150 | 15 | 40 | 90 | 16 |
| E304 160 | 16 | 40 | 90 | 16 |
| E304 180 | 18 | 45 | 100 | 18 |
| E304 200 | 20 | 45 | 100 | 20 |
| E304 250 | 25 | 50 | 120 | 25 |

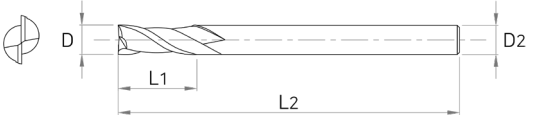
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# E322 | 2 FLUTES LONG SHANK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h7 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D12 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

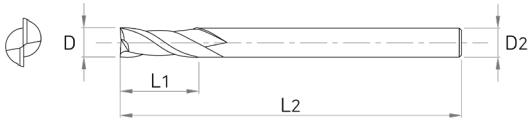
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E322 030 | 3 | 25 | 75 | 6 |
| E322 040 | 4 | 25 | 75 | 6 |
| E322 050 | 5 | 30 | 85 | 6 |
| E322 060 | 6 | 30 | 85 | 6 |
| E322 070 | 7 | 35 | 85 | 8 |
| E322 080 | 8 | 35 | 85 | 8 |
| E322 090 | 9 | 45 | 100 | 10 |
| E322 100 | 10 | 45 | 100 | 10 |
| E322 101 | 10 | 60 | 155 | 10 |
| E322 120 | 12 | 55 | 120 | 12 |
| E322 121 | 12 | 65 | 155 | 12 |
| E322 140 | 14 | 60 | 120 | 14 |
| E322 160 | 16 | 60 | 120 | 16 |
| E322 161 | 16 | 75 | 165 | 16 |
| E322 180 | 18 | 60 | 120 | 18 |
| E322 200 | 20 | 60 | 120 | 20 |
| E322 201 | 20 | 75 | 165 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# EL422 | 2 FLUTES EXTRA LONG SQUARE ENDMILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h7 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D12 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 2 | 30° HELIX | DATA P.700

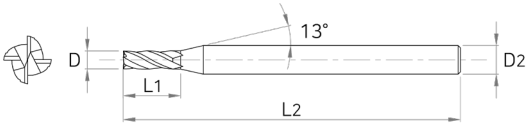
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| EL422 030 | 3 | 30 | 75 | 3 |
| EL422 040 | 4 | 30 | 75 | 4 |
| EL422 050 | 5 | 40 | 100 | 5 |
| EL422 060 | 6 | 50 | 150 | 6 |
| EL422 080 | 8 | 50 | 150 | 8 |
| EL422 100 | 10 | 60 | 150 | 10 |

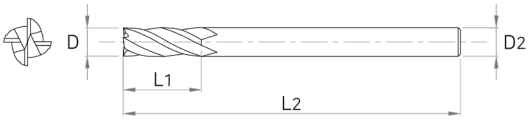
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# E324 | 4 FLUTES LONG SHANK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h7 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D12 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 4 | 30° HELIX | DATA P.700

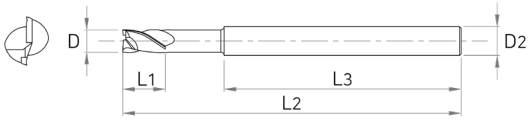
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| E324 030 | 3 | 25 | 75 | 6 |
| E324 040 | 4 | 25 | 75 | 6 |
| E324 050 | 5 | 30 | 85 | 6 |
| E324 060 | 6 | 30 | 85 | 6 |
| E324 070 | 7 | 35 | 85 | 8 |
| E324 080 | 8 | 35 | 85 | 8 |
| E324 090 | 9 | 45 | 100 | 10 |
| E324 100 | 10 | 45 | 100 | 10 |
| E324 101 | 10 | 60 | 155 | 10 |
| E324 120 | 12 | 55 | 120 | 12 |
| E324 121 | 12 | 65 | 155 | 12 |
| E324 140 | 14 | 60 | 120 | 14 |
| E324 160 | 16 | 60 | 120 | 16 |
| E324 161 | 16 | 75 | 165 | 16 |
| E324 180 | 18 | 60 | 120 | 18 |
| E324 200 | 20 | 60 | 120 | 20 |
| E324 201 | 20 | 75 | 165 | 20 |

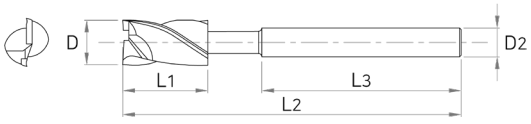
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# EB302-W | 2 FLUTES BRAZED SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h7 |

CARBIDE | Uncoated | 2 | 30° HELIX

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB302 140W | 14 | 28 | 60 | 98 | 16 |
| EB302 150W | 15 | 28 | 60 | 98 | 16 |
| EB302 160W | 16 | 28 | 60 | 98 | 16 |
| EB302 170W | 17 | 32 | 70 | 115 | 20 |
| EB302 180W | 18 | 32 | 70 | 115 | 20 |
| EB302 190W | 19 | 32 | 70 | 115 | 20 |
| EB302 200W | 20 | 32 | 70 | 115 | 20 |
| EB302 210W | 21 | 32 | 70 | 115 | 20 |
| EB302 220W | 22 | 32 | 70 | 115 | 20 |
| EB302 230W | 23 | 40 | 85 | 140 | 25 |
| EB302 240W | 24 | 40 | 85 | 140 | 25 |
| EB302 250W | 25 | 40 | 85 | 140 | 25 |
| EB302 260W | 26 | 40 | 85 | 140 | 25 |

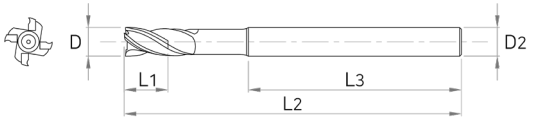
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB302 270W | 27 | 40 | 85 | 140 | 25 |
| EB302 280W | 28 | 40 | 85 | 140 | 25 |
| EB302 290W | 29 | 50 | 85 | 150 | 32 |
| EB302 300W | 30 | 50 | 85 | 150 | 32 |
| EB302 310W | 31 | 50 | 85 | 150 | 32 |
| EB302 320W | 32 | 50 | 85 | 150 | 32 |
| EB302 350W | 35 | 50 | 85 | 150 | 32 |
| EB302 360W | 36 | 50 | 85 | 150 | 32 |
| EB302 380W | 38 | 55 | 85 | 155 | 32 |
| EB302 400W | 40 | 55 | 85 | 155 | 32 |
| EB302 420W | 42 | 55 | 85 | 155 | 32 |
| EB302 450W | 45 | 63 | 85 | 160 | 32 |
| EB302 500W | 50 | 63 | 85 | 160 | 32 |

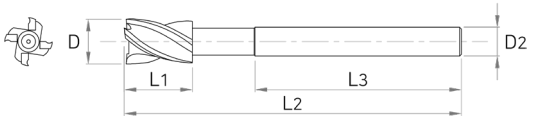
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# EB304-W | 4 FLUTES BRAZED SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h7 |

CARBIDE | Uncoated | 4 | 30° HELIX

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB304 140W | 14 | 28 | 60 | 98 | 16 |
| EB304 150W | 15 | 28 | 60 | 98 | 16 |
| EB304 160W | 16 | 28 | 60 | 98 | 16 |
| EB304 170W | 17 | 32 | 70 | 115 | 20 |
| EB304 180W | 18 | 32 | 70 | 115 | 20 |
| EB304 190W | 19 | 32 | 70 | 115 | 20 |
| EB304 200W | 20 | 32 | 70 | 115 | 20 |
| EB304 210W | 21 | 32 | 70 | 115 | 20 |
| EB304 220W | 22 | 32 | 70 | 115 | 20 |
| EB304 230W | 23 | 40 | 85 | 140 | 25 |
| EB304 240W | 24 | 40 | 85 | 140 | 25 |
| EB304 250W | 25 | 40 | 85 | 140 | 25 |
| EB304 260W | 26 | 40 | 85 | 140 | 25 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB304 270W | 27 | 40 | 85 | 140 | 25 |
| EB304 280W | 28 | 40 | 85 | 140 | 25 |
| EB304 290W | 29 | 50 | 85 | 150 | 32 |
| EB304 300W | 30 | 50 | 85 | 150 | 32 |
| EB304 310W | 31 | 50 | 85 | 150 | 32 |
| EB304 320W | 32 | 50 | 85 | 150 | 32 |
| EB304 350W | 35 | 50 | 85 | 150 | 32 |
| EB304 360W | 36 | 50 | 85 | 150 | 32 |
| EB304 380W | 38 | 55 | 85 | 155 | 32 |
| EB304 400W | 40 | 55 | 85 | 155 | 32 |
| EB304 420W | 42 | 55 | 85 | 155 | 32 |
| EB304 450W | 45 | 63 | 85 | 160 | 32 |
| EB304 500W | 50 | 63 | 85 | 160 | 32 |

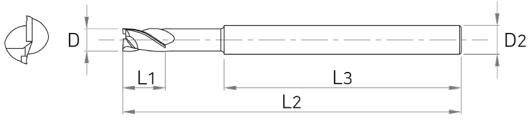
## ■ Applicable Working Material

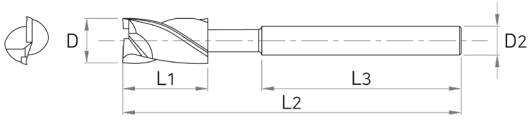
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# EB322-W

## 2 FLUTES LONG BRAZED SQUARE ENDMILL




### ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h7 |

CARBIDE | Uncoated | 2 | 30° HELIX

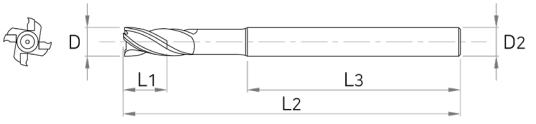
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB322 140W | 14 | 50 | 60 | 130 | 16 |
| EB322 150W | 15 | 50 | 60 | 130 | 16 |
| EB322 160W | 16 | 50 | 60 | 130 | 16 |
| EB322 180W | 18 | 60 | 60 | 140 | 20 |
| EB322 200W | 20 | 60 | 60 | 140 | 20 |
| EB322 220W | 22 | 60 | 60 | 140 | 20 |
| EB322 240W | 24 | 70 | 60 | 150 | 25 |
| EB322 250W | 25 | 70 | 60 | 150 | 25 |
| EB322 260W | 26 | 70 | 60 | 150 | 25 |
| EB322 280W | 28 | 70 | 60 | 150 | 25 |
| EB322 300W | 30 | 80 | 70 | 180 | 32 |
| EB322 320W | 32 | 90 | 70 | 190 | 32 |
| EB322 350W | 35 | 100 | 70 | 200 | 32 |
| EB322 380W | 38 | 100 | 70 | 220 | 32 |
| EB322 400W | 40 | 100 | 70 | 220 | 32 |
| EB322 450W | 45 | 120 | 80 | 230 | 32 |

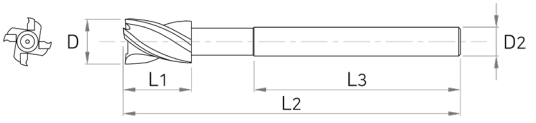
### ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# EB324-W | 4 FLUTES LONG BRAZED SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h6 |

CARBIDE | Uncoated | 4 | 30° HELIX

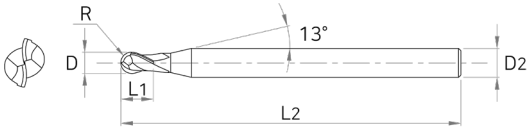
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| EB324 140W | 14 | 50 | 60 | 130 | 16 |
| EB324 150W | 15 | 50 | 60 | 130 | 16 |
| EB324 160W | 16 | 50 | 60 | 130 | 16 |
| EB324 180W | 18 | 60 | 60 | 140 | 20 |
| EB324 200W | 20 | 60 | 60 | 140 | 20 |
| EB324 220W | 22 | 60 | 60 | 140 | 20 |
| EB324 240W | 24 | 70 | 60 | 150 | 25 |
| EB324 250W | 25 | 70 | 60 | 150 | 25 |
| EB324 260W | 26 | 70 | 60 | 150 | 25 |
| EB324 280W | 28 | 70 | 60 | 150 | 25 |
| EB324 300W | 30 | 80 | 70 | 180 | 32 |
| EB324 320W | 32 | 90 | 70 | 190 | 32 |
| EB324 350W | 35 | 100 | 70 | 200 | 32 |
| EB324 380W | 38 | 100 | 70 | 220 | 32 |
| EB324 400W | 40 | 100 | 70 | 220 | 32 |
| EB324 450W | 45 | 120 | 80 | 230 | 32 |
| EB324 500W | 50 | 140 | 80 | 240 | 32 |

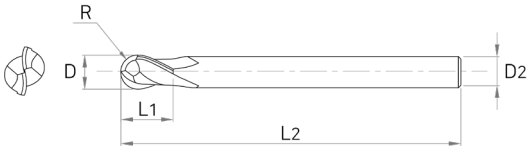
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# B302 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ 3 | 0 ~ -0.04 | h6 |
| D3.5 ~ 6 | 0 ~ -0.048 | |
| D6.5 ~ 10 | 0 ~ -0.058 | |
| D11 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.02 All Sizes | DATA P.701

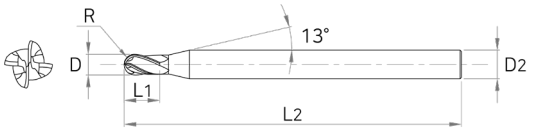
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| B302 010 | 1 | 0.5 | 3 | 50 | 6 |
| B302 015 | 1.5 | 0.75 | 4 | 50 | 6 |
| B302 020 | 2 | 1 | 6 | 60 | 6 |
| B302 025 | 2.5 | 1.25 | 6 | 60 | 6 |
| B302 030 | 3 | 1.5 | 8 | 70 | 6 |
| B302 035 | 3.5 | 1.75 | 8 | 70 | 6 |
| B302 040 | 4 | 2 | 8 | 70 | 6 |
| B302 045 | 4.5 | 2.25 | 10 | 70 | 6 |
| B302 050 | 5 | 2.5 | 12 | 80 | 6 |
| B302 055 | 5.5 | 2.75 | 12 | 80 | 6 |
| B302 060 | 6 | 3 | 12 | 90 | 6 |
| B302 065 | 6.5 | 3.25 | 12 | 90 | 8 |
| B302 070 | 7 | 3.5 | 20 | 90 | 8 |
| B302 080 | 8 | 4 | 20 | 100 | 8 |
| B302 090 | 9 | 4.5 | 25 | 100 | 10 |
| B302 100 | 10 | 5 | 25 | 100 | 10 |
| B302 110 | 11 | 5.5 | 30 | 110 | 12 |
| B302 120 | 12 | 6 | 30 | 110 | 12 |
| B302 130 | 13 | 6.5 | 35 | 120 | 14 |
| B302 140 | 14 | 7 | 35 | 120 | 14 |
| B302 150 | 15 | 7.5 | 40 | 140 | 16 |
| B302 160 | 16 | 8 | 40 | 140 | 16 |
| B302 180 | 18 | 9 | 45 | 150 | 18 |
| B302 200 | 20 | 10 | 45 | 160 | 20 |
| B302 250 | 25 | 12.5 | 50 | 180 | 25 |

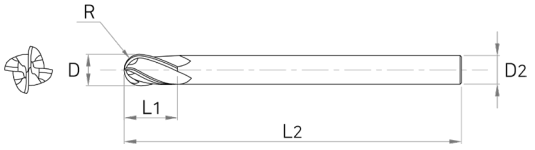
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# B304 | 4 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h6 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D11 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 4 | 30° HELIX | R ±0.02 All Sizes | DATA P.701

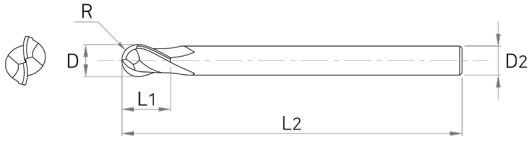
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| B304 030 | 3 | 1.5 | 8 | 70 | 6 |
| B304 040 | 4 | 2 | 8 | 70 | 6 |
| B304 050 | 5 | 2.5 | 12 | 80 | 6 |
| B304 060 | 6 | 3 | 12 | 90 | 6 |
| B304 070 | 7 | 3.5 | 20 | 90 | 8 |
| B304 080 | 8 | 4 | 20 | 100 | 8 |
| B304 090 | 9 | 4.5 | 25 | 100 | 10 |
| B304 100 | 10 | 5 | 25 | 100 | 10 |
| B304 110 | 11 | 5.5 | 30 | 110 | 12 |
| B304 120 | 12 | 6 | 30 | 110 | 12 |
| B304 130 | 13 | 6.5 | 35 | 120 | 14 |
| B304 140 | 14 | 7 | 35 | 120 | 14 |
| B304 150 | 15 | 7.5 | 40 | 140 | 16 |
| B304 160 | 16 | 8 | 40 | 140 | 16 |
| B304 180 | 18 | 9 | 45 | 150 | 18 |
| B304 200 | 20 | 10 | 45 | 160 | 20 |
| B304 250 | 25 | 12.5 | 50 | 180 | 25 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# BL422 | 2 FLUTES EXTRA LONG BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.04 | h6 |
| D4 ~ 6 | 0 ~ -0.048 | |
| D7 ~ 10 | 0 ~ -0.058 | |
| D11 ~ 18 | 0 ~ -0.07 | |
| D20 ~ | 0 ~ -0.084 | |

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.02 | DATA P.701

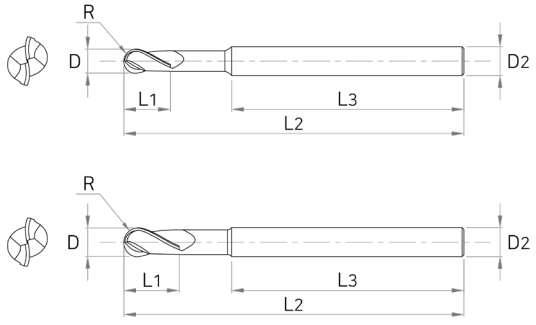
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| BL422 030 | 3 | 1.5 | 30 | 75 | 3 |
| BL422 040 | 4 | 2 | 30 | 75 | 4 |
| BL422 050 | 5 | 2.5 | 40 | 100 | 5 |
| BL422 060 | 6 | 3 | 50 | 150 | 6 |
| BL422 080 | 8 | 4 | 50 | 150 | 8 |
| BL422 090 | 9 | 4.5 | 60 | 150 | 10 |
| BL422 100 | 10 | 5 | 60 | 150 | 10 |
| BL422 120 | 12 | 6 | 75 | 150 | 12 |
| BL422 140 | 14 | 7 | 75 | 150 | 14 |
| BL422 160 | 16 | 8 | 75 | 150 | 16 |
| BL422 180 | 18 | 9 | 75 | 150 | 18 |
| BL422 200 | 20 | 10 | 75 | 150 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# BB302-W | 2 FLUTES BRAZED BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h7 |

CARBIDE | Uncoated | 2 | 30° HELIX | R ±0.005 All Sizes

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| BB302 150W | 15 | 7.5 | 28 | 55 | 100 | 16 |
| BB302 160W | 16 | 8 | 28 | 55 | 100 | 16 |
| BB302 180W | 18 | 9 | 29 | 55 | 110 | 20 |
| BB302 200W | 20 | 10 | 29 | 55 | 110 | 20 |
| BB302 220W | 22 | 11 | 36 | 60 | 110 | 25 |
| BB302 240W | 24 | 12 | 37 | 60 | 110 | 25 |
| BB302 250W | 25 | 12.5 | 38 | 60 | 120 | 25 |
| BB302 280W | 28 | 14 | 40 | 65 | 120 | 32 |
| BB302 300W | 30 | 15 | 46 | 65 | 130 | 32 |
| BB302 320W | 32 | 16 | 47 | 65 | 140 | 32 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | | | | | |

○ : GOOD ◎ : EXCELLENT

# COPPER-MATE ENDMILL

Copper, Bronze and Non-ferrous materials

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| RADIUS | 2F | RC502 | | 2 FLUTES RADIUS ENDMILL | D2 | D12 | 353 |
| BALL | 2F | BC502 | | 2 FLUTES BALL ENDMILL | R0.5 | R6 | 354 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

R C 5 0 2 020 05 09

| Appearance | Shape | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R | Shank Dia |
|---|---|---|---|---|---|---|---|
| R : Radius<br>B : Ball | C : Copper | 5 : Grade | 0 : Neck | 2 : 2 Flutes | 1<br>~<br>12 | 0.5<br>~<br>1 | 3<br>~<br>38 |

Ex) 2 Flutes / Cutting Dia Ø2 / Corner R 0.5 / Shank Dia 9 / 50 Grade / Corner Radius Neck Type Radius Endmill

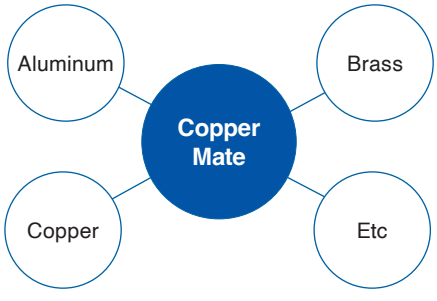
## General Features

· Suitable for Copper, Bronze and Non-ferrous materials
· Ball, Radius type

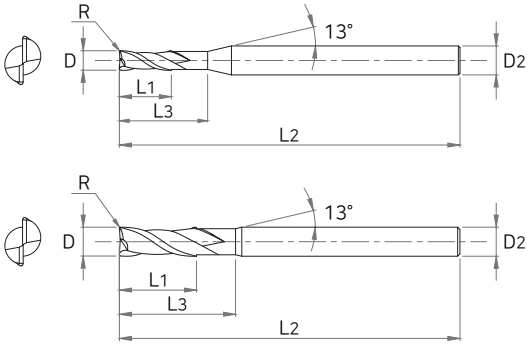
## Characteristics

· Cutting edge considered the characteristics of non-ferrous materials
· CrN coating for enhanced oxidation resistance and corrosion resistance

## Applications



# RC502 | 2 FLUTES RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D2 ~ 6 | 0 ~ -0.012 | h5 |
| D8 ~ 12 | 0 ~ -0.015 | |

CARBIDE | CrN | 2 | 30° HELIX | R ±0.01 Ø6 OR UNDER | R ±0.015 ABOVE Ø6 | DATA P.702

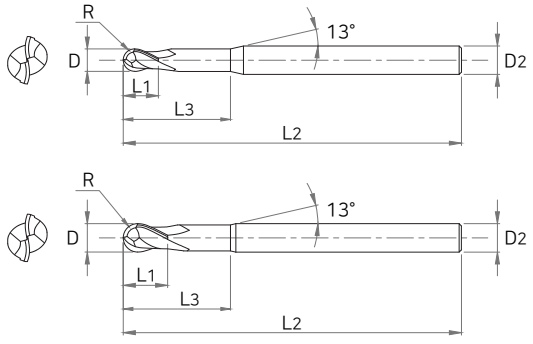
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| RC502 020 05 09 | 2 | 0.5 | 3 | 9 | 55 | 6 |
| RC502 030 05 09 | 3 | 0.5 | 4 | 9 | 55 | 6 |
| RC502 030 05 16 | 3 | 0.5 | 4 | 16 | 55 | 6 |
| RC502 030 05 20 | 3 | 0.5 | 4 | 20 | 55 | 6 |
| RC502 040 05 12 | 4 | 0.5 | 5 | 12 | 55 | 6 |
| RC502 040 05 16 | 4 | 0.5 | 5 | 16 | 55 | 6 |
| RC502 040 05 20 | 4 | 0.5 | 5 | 20 | 55 | 6 |
| RC502 060 05 20 | 6 | 0.5 | 7 | 20 | 60 | 6 |
| RC502 060 10 20 | 6 | 1 | 7 | 20 | 60 | 6 |
| RC502 080 05 25 | 8 | 0.5 | 9 | 25 | 60 | 8 |
| RC502 080 10 25 | 8 | 1 | 9 | 25 | 60 | 8 |
| RC502 100 05 32 | 10 | 0.5 | 11 | 32 | 70 | 10 |
| RC502 100 10 32 | 10 | 1 | 11 | 32 | 70 | 10 |
| RC502 120 05 38 | 12 | 0.5 | 12 | 38 | 80 | 12 |
| RC502 120 10 38 | 12 | 1 | 12 | 38 | 80 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~ HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | ○ | | | ○ | |

○ : GOOD ◎ : EXCELLENT

# BC502 | 2 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | CrN | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.702

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| BC502 010 | 1 | 0.5 | 1.5 | 3 | 50 | 6 |
| BC502 015 | 1.5 | 0.75 | 2 | 4 | 50 | 6 |
| BC502 020 | 2 | 1 | 2.5 | 5 | 50 | 6 |
| BC502 025 | 2.5 | 1.25 | 3 | 7 | 50 | 6 |
| BC502 030 | 3 | 1.5 | 4 | 10 | 60 | 6 |
| BC502 040 | 4 | 2 | 5 | 10 | 60 | 6 |
| BC502 050 | 5 | 2.5 | 6 | 12 | 60 | 6 |
| BC502 060 | 6 | 3 | 7 | 12 | 60 | 6 |
| BC502 061 | 6 | 3 | 7 | 12 | 90 | 6 |
| BC502 080 | 8 | 4 | 9 | 15 | 70 | 8 |
| BC502 081 | 8 | 4 | 9 | 16 | 100 | 8 |
| BC502 100 | 10 | 5 | 11 | 25 | 75 | 10 |
| BC502 101 | 10 | 5 | 11 | 25 | 100 | 10 |
| BC502 120 | 12 | 6 | 12 | 25 | 80 | 12 |
| BC502 121 | 12 | 6 | 12 | 25 | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | | ○ | | | ○ | |

○ : GOOD ◎ : EXCELLENT

# GRA-MATE ENDMILL

Graphite, Reinforced Plastics, Non-ferrous materials

## Contents


| Section | | EDP No | Geometry | Type | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|
| Type | Flutes | | | | Min | Max | |
| SQUARE | 2F | GE | | 2 FLUTES NECK SQUARE ENDMILL | D0.5 | D12 | 357 |
| | 4F | WGE504 | | 4 FLUTES SQUARE ENDMILL | D2 | D20 | 358 |
| RADIUS | 2F | WGR502 | | 2 FLUTES NECK RADIUS ENDMILL | D0.2 | D6 | 359 |
| | 4F | WGR504 | | 4 FLUTES RADIUS ENDMILL | D3 | D20 | 360 |
| BALL | 2F | G | | 2 FLUTES NECK BALL ENDMILL | R0.25 | R6 | 361 |
| | 4F | WGB504 | | 4 FLUTES BALL ENDMILL | R0.5 | R10 | 363 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| WG | R | 5 | 0 | 4 | 080 | 10 | 130 |
|---|---|---|---|---|---|---|---|

| Section | Appearance | Grade | Length, Shank Type | Flutes | Cutting Dia | Corner R | Shank Dia |
|---|---|---|---|---|---|---|---|
| G : Graphite | E : Square | 5 : Grade | 0 : Straight, Neck | 2 : 2 Flutes | 0.2 | 0.05 | 40 |
| WG : Winner Graphite | R : Radius | | | 4 : 4 Flutes | ~ | ~ | ~ |
| | | | | | 20 | 1 | 200 |

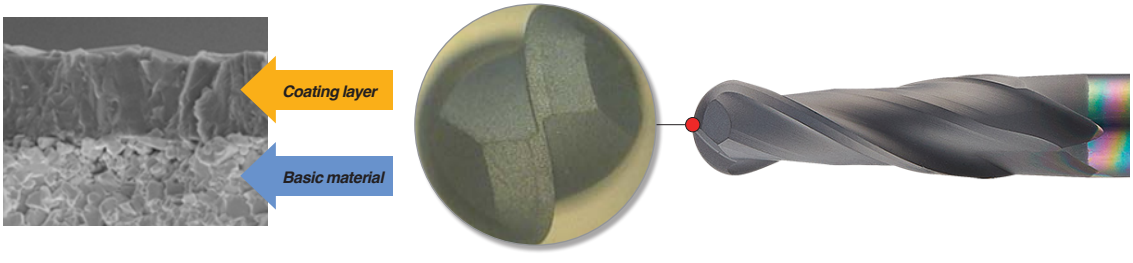
Ex) 4 Flutes / Cutting Dia Ø8 / Corner R 1.0 / Shank Dia 130 / 50 Grade / Corner Radius Endmill For Graphith

## General Features

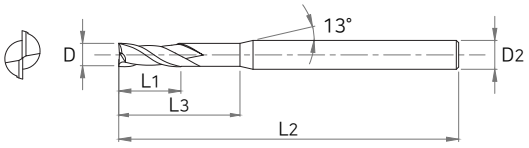
· Suitable for Graphite, Reinforced Plastics, Non-ferrous materials
· High hardness Diamond Coating for better tool life
· Maximizing and Stabilizing Coating Thickness for Improved Wear Resistance
· Various specifications for a variety of machining methods

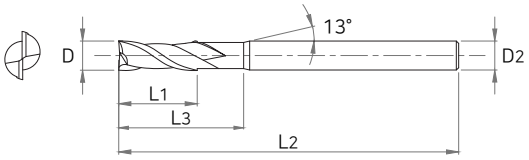
## Characteristics

· High surface hardness and tool life with high adhesion diamond coating
· Minimize accidental damage by using dedicated materials with excellent wear resistance



# GE | 2 FLUTES NECK SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | Diamond | 2 | 30° HELIX | DATA P.703

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| GE 005 010 06 | 0.5 | 1 | 6 | 50 | 4 |
| GE 006 012 06 | 0.6 | 1.2 | 6 | 50 | 4 |
| GE 006 012 10 | 0.6 | 1.2 | 10 | 50 | 4 |
| GE 007 015 06 | 0.7 | 1.5 | 6 | 50 | 4 |
| GE 008 020 06 | 0.8 | 2 | 6 | 50 | 4 |
| GE 010 03 08 | 1 | 3 | 8 | 60 | 4 |
| GE 010 03 10 | 1 | 3 | 10 | 60 | 4 |
| GE 010 03 12 | 1 | 3 | 12 | 60 | 4 |
| GE 015 04 12 | 1.5 | 4 | 12 | 60 | 4 |
| GE 020 06 12 | 2 | 6 | 12 | 60 | 4 |
| GE 020 06 12 S6 | 2 | 6 | 12 | 60 | 6 |
| GE 025 08 12 | 2.5 | 8 | 12 | 60 | 4 |
| GE 030 10 12 | 3 | 10 | 12 | 60 | 4 |
| GE 030 10 16 | 3 | 10 | 16 | 60 | 4 |
| GE 030 10 12 S6 | 3 | 10 | 12 | 60 | 6 |
| GE 030 10 16 S6 | 3 | 10 | 16 | 60 | 6 |

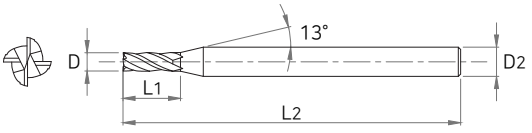
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 |
| GE 040 12S | 4 | 12 | - | 60 | 6 |
| GE 040 12 16 | 4 | 12 | 16 | 60 | 6 |
| GE 040 12 20 | 4 | 12 | 20 | 60 | 6 |
| GE 050 15 20 | 5 | 15 | 20 | 60 | 6 |
| GE 060 20S | 6 | 20 | - | 60 | 6 |
| GE 060 20 30 | 6 | 20 | 30 | 80 | 6 |
| GE 060 30 50 | 6 | 30 | 50 | 150 | 6 |
| GE 080 25S | 8 | 25 | - | 70 | 8 |
| GE 080 25 40 | 8 | 25 | 40 | 100 | 8 |
| GE 080 40 70 | 8 | 40 | 70 | 150 | 8 |
| GE 100 30S | 10 | 30 | - | 80 | 10 |
| GE 100 30 50 | 10 | 30 | 50 | 100 | 10 |
| GE 100 45 80 | 10 | 45 | 80 | 160 | 10 |
| GE 120 30S | 12 | 30 | - | 80 | 12 |
| GE 120 30 50 | 12 | 30 | 50 | 110 | 12 |
| GE 120 50 80 | 12 | 50 | 80 | 160 | 12 |

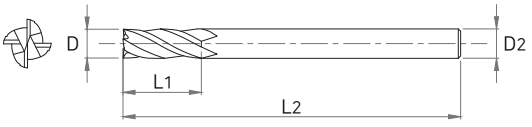
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# WGE504 | 4 FLUTES SQUARE ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | Diamond | 4 | 30° HELIX | DATA P.703

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WGE504 020 | 2 | 6 | 50 | 4 |
| WGE504 020 08 | 2 | 8 | 50 | 4 |
| WGE504 020 10 | 2 | 10 | 50 | 4 |
| WGE504 025 | 2.5 | 8 | 50 | 4 |
| WGE504 030 | 3 | 8 | 50 | 6 |
| WGE504 030 10 | 3 | 10 | 50 | 6 |
| WGE504 030 12 | 3 | 12 | 50 | 6 |
| WGE504 030 16 | 3 | 16 | 60 | 6 |
| WGE504 030 20 | 3 | 20 | 60 | 6 |
| WGE504 040 | 4 | 10 | 50 | 6 |
| WGE504 040 12 | 4 | 12 | 50 | 6 |
| WGE504 040 16 | 4 | 16 | 60 | 6 |
| WGE504 040 20 | 4 | 20 | 60 | 6 |
| WGE504 040 25 | 4 | 25 | 60 | 6 |
| WGE504 050 | 5 | 15 | 60 | 6 |
| WGE504 060 | 5 | 15 | 60 | 6 |
| WGE504 060 20 | 6 | 20 | 110 | 6 |

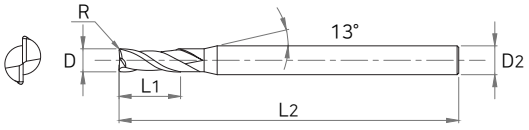
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| WGE504 060 30 | 6 | 30 | 150 | 6 |
| WGE504 080 | 8 | 20 | 70 | 8 |
| WGE504 080 30 | 8 | 30 | 110 | 8 |
| WGE504 080 40 | 8 | 40 | 150 | 8 |
| WGE504 100 | 10 | 25 | 75 | 10 |
| WGE504 100 40 | 10 | 40 | 110 | 10 |
| WGE504 100 50 | 10 | 50 | 150 | 10 |
| WGE504 120 | 12 | 30 | 80 | 12 |
| WGE504 120 50 | 12 | 50 | 120 | 12 |
| WGE504 120 60 | 12 | 60 | 160 | 12 |
| WGE504 160 | 16 | 50 | 110 | 16 |
| WGE504 160 70 | 16 | 70 | 160 | 16 |
| WGE504 160 90 | 16 | 90 | 160 | 16 |
| WGE504 160 100 | 16 | 100 | 200 | 16 |
| WGE504 200 | 20 | 70 | 160 | 20 |
| WGE504 200 90 | 20 | 90 | 160 | 20 |
| WGE504 200 100 | 20 | 100 | 200 | 20 |

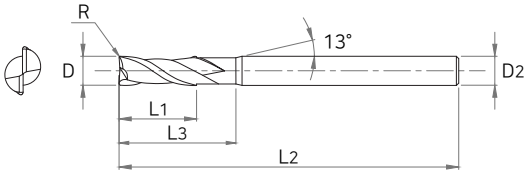
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# WGR502 | 2 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.02 | h6 |

CARBIDE | Diamond | 2 | 30° HELIX | R ±0.01 All Sizes | DATA P.704

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGR502 002 | 0.2 | - | 0.3 | - | 40 | 3 |
| WGR502 003 | 0.3 | - | 0.5 | - | 40 | 3 |
| WGR502 004 | 0.4 | - | 0.6 | - | 40 | 3 |
| WGR502 005 025 | 0.5 | 0.05 | 0.7 | 2.5 | 40 | 3 |
| WGR502 005 040 | 0.5 | 0.05 | 0.7 | 4 | 40 | 3 |
| WGR502 006 030 | 0.6 | 0.05 | 0.9 | 3 | 40 | 3 |
| WGR502 006 050 | 0.6 | 0.05 | 0.9 | 5 | 40 | 3 |
| WGR502 008 040 | 0.8 | 0.05 | 1.2 | 4 | 40 | 3 |
| WGR502 008 070 | 0.8 | 0.05 | 1.2 | 7 | 40 | 3 |
| WGR502 010 050 | 1 | 0.1 | 1.5 | 5 | 40 | 3 |
| WGR502 010 085 | 1 | 0.1 | 1.5 | 8.5 | 40 | 3 |
| WGR502 010 120 | 1 | 0.1 | 1.5 | 12 | 40 | 3 |
| WGR502 012 060 | 1.2 | 0.1 | 1.8 | 6 | 50 | 3 |
| WGR502 012 100 | 1.2 | 0.1 | 1.8 | 10 | 50 | 3 |
| WGR502 015 075 | 1.5 | 0.15 | 2.2 | 7.5 | 50 | 3 |
| WGR502 015 120 | 1.5 | 0.15 | 2.2 | 12 | 50 | 3 |
| WGR502 015 180 | 1.5 | 0.15 | 2.2 | 18 | 50 | 3 |
| WGR502 020 100 | 2 | 0.15 | 2.2 | 10 | 60 | 3 |

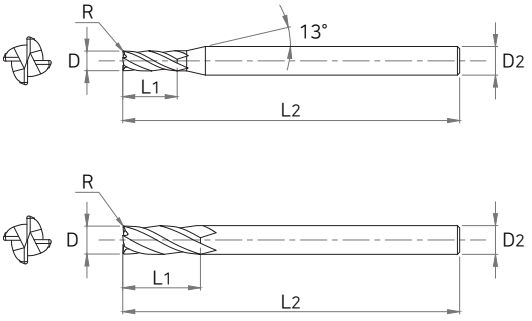
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGR502 020 160 | 2 | 0.15 | 2.2 | 16 | 60 | 3 |
| WGR502 020 250 | 2 | 0.15 | 2.2 | 25 | 60 | 3 |
| WGR502 030 100 | 3 | 0.2 | 3 | 10 | 65 | 4 |
| WGR502 030 150 | 3 | 0.2 | 3 | 15 | 65 | 4 |
| WGR502 030 200 | 3 | 0.2 | 3 | 20 | 65 | 4 |
| WGR502 030 250 | 3 | 0.2 | 3 | 25 | 75 | 4 |
| WGR502 030 300 | 3 | 0.2 | 3 | 30 | 75 | 4 |
| WGR502 040 200 | 4 | 0.2 | 4 | 20 | 65 | 6 |
| WGR502 040 300 | 4 | 0.2 | 4 | 30 | 75 | 6 |
| WGR502 040 400 | 4 | 0.2 | 4 | 40 | 90 | 6 |
| WGR502 050 200 | 5 | 0.3 | 5 | 20 | 75 | 6 |
| WGR502 050 300 | 5 | 0.3 | 5 | 30 | 75 | 6 |
| WGR502 050 400 | 5 | 0.3 | 5 | 40 | 90 | 6 |
| WGR502 050 500 | 5 | 0.3 | 5 | 50 | 90 | 6 |
| WGR502 060 300 | 6 | 0.3 | 6 | 30 | 75 | 6 |
| WGR502 060 400 | 6 | 0.3 | 6 | 40 | 90 | 6 |
| WGR502 060 500 | 6 | 0.3 | 6 | 50 | 90 | 6 |
| WGR502 060 600 | 6 | 0.3 | 6 | 60 | 100 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# WGR504 | 4 FLUTES NECK RADIUS ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 ~ 12 | 0 ~ -0.02 | h5 |
| D16 ~ 20 | 0 ~ -0.03 | |

CARBIDE | Diamond | 4 | 30° HELIX | R ±0.01 Ø12 OR UNDER | R ±0.015 ABOVE Ø12 | DATA P.704

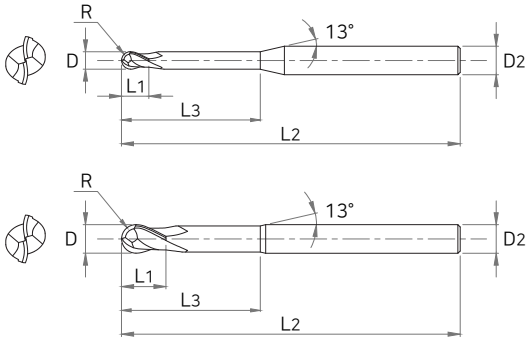
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WGR504 030 02 080 | 3 | 0.2 | 8 | 80 | 4 |
| WGR504 030 03 080 | 3 | 0.3 | 8 | 80 | 4 |
| WGR504 030 05 080 | 3 | 0.5 | 8 | 80 | 4 |
| WGR504 040 03 100 | 4 | 0.3 | 10 | 100 | 4 |
| WGR504 040 05 100 | 4 | 0.5 | 10 | 100 | 4 |
| WGR504 040 10 100 | 4 | 1 | 10 | 100 | 4 |
| WGR504 060 03 110 | 6 | 0.3 | 15 | 110 | 6 |
| WGR504 060 05 110 | 6 | 0.5 | 15 | 110 | 6 |
| WGR504 060 10 110 | 6 | 1 | 15 | 110 | 6 |
| WGR504 080 05 110 | 8 | 0.5 | 20 | 110 | 8 |
| WGR504 080 10 110 | 8 | 1 | 20 | 110 | 8 |
| WGR504 080 05 130 | 8 | 0.5 | 20 | 130 | 8 |
| WGR504 080 10 130 | 8 | 1 | 20 | 130 | 8 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | R | L1 | L2 | D2 |
| WGR504 100 05 130 | 10 | 0.5 | 25 | 130 | 10 |
| WGR504 100 10 130 | 10 | 1 | 25 | 130 | 10 |
| WGR504 100 05 150 | 10 | 0.5 | 25 | 150 | 10 |
| WGR504 100 10 150 | 10 | 1 | 25 | 150 | 10 |
| WGR504 120 05 130 | 12 | 0.5 | 30 | 130 | 12 |
| WGR504 120 10 130 | 12 | 1 | 30 | 130 | 12 |
| WGR504 120 05 150 | 12 | 0.5 | 30 | 150 | 12 |
| WGR504 120 10 150 | 12 | 1 | 30 | 150 | 12 |
| WGR504 160 05 200 | 16 | 0.5 | 32 | 200 | 16 |
| WGR504 160 10 200 | 16 | 1 | 32 | 200 | 16 |
| WGR504 200 05 200 | 20 | 0.5 | 40 | 200 | 20 |
| WGR504 200 10 200 | 20 | 1 | 40 | 200 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.03 | h6 |

CARBIDE | Diamond | 2 | 30° HELIX | R ±0.015 All Sizes | DATA P.705

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| G 005 010 03 | 0.5 | 0.25 | 1 | 3 | 50 | 4 |
| G 005 010 06 | 0.5 | 0.25 | 1 | 6 | 50 | 4 |
| G 005 010 10 | 0.5 | 0.25 | 1 | 10 | 50 | 4 |
| G 006 012 03 | 0.6 | 0.3 | 1.2 | 3 | 50 | 4 |
| G 006 012 06 | 0.6 | 0.3 | 1.2 | 6 | 50 | 4 |
| G 006 012 08 | 0.6 | 0.3 | 1.2 | 8 | 50 | 4 |
| G 006 012 10 | 0.6 | 0.3 | 1.2 | 10 | 50 | 4 |
| G 006 012 12 | 0.6 | 0.3 | 1.2 | 12 | 50 | 4 |
| G 008 016 4 | 0.8 | 0.4 | 1.6 | 4 | 50 | 4 |
| G 008 016 6 | 0.8 | 0.4 | 1.6 | 6 | 50 | 4 |
| G 008 016 8 | 0.8 | 0.4 | 1.6 | 8 | 50 | 4 |
| G 010 030 6 | 1 | 0.5 | 3 | 6 | 60 | 4 |
| G 010 030 8 | 1 | 0.5 | 3 | 8 | 60 | 4 |
| G 010 03 10 | 1 | 0.5 | 3 | 10 | 60 | 4 |
| G 010 03 12 | 1 | 0.5 | 3 | 12 | 60 | 4 |
| G 010 03 14 | 1 | 0.5 | 3 | 14 | 60 | 4 |
| G 010 03 16 | 1 | 0.5 | 3 | 16 | 60 | 4 |
| G 010 03 18 | 1 | 0.5 | 3 | 18 | 60 | 4 |
| G 010 03 20 | 1 | 0.5 | 3 | 20 | 60 | 4 |
| G 012 04 10 | 1.2 | 0.6 | 4 | 10 | 70 | 4 |
| G 015 05 10 | 1.5 | 0.75 | 5 | 10 | 60 | 4 |
| G 015 05 12 | 1.5 | 0.75 | 5 | 12 | 60 | 4 |
| G 015 05 16 | 1.5 | 0.75 | 5 | 16 | 60 | 4 |
| G 015 05 20 | 1.5 | 0.75 | 5 | 20 | 60 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| G 015 05 25 | 1.5 | 0.75 | 5 | 25 | 70 | 4 |
| G 015 05 30 | 1.5 | 0.75 | 5 | 30 | 70 | 4 |
| G 020 08 12 | 2 | 1 | 8 | 12 | 60 | 4 |
| G 020 08 16 | 2 | 1 | 8 | 16 | 60 | 4 |
| G 020 08 20 | 2 | 1 | 8 | 20 | 60 | 4 |
| G 020 08 25 | 2 | 1 | 8 | 25 | 70 | 4 |
| G 020 08 30 | 2 | 1 | 8 | 30 | 70 | 4 |
| G 020 08 35 | 2 | 1 | 8 | 35 | 80 | 4 |
| G 020 08 40 | 2 | 1 | 8 | 40 | 80 | 4 |
| G 020 10 20 | 2 | 1 | 10 | 20 | 80 | 4 |
| G 020 10 20L | 2 | 1 | 10 | 20 | 100 | 4 |
| G 025 10 20 | 2.5 | 1.25 | 10 | 20 | 80 | 4 |
| G 030 12 16 | 3 | 1.5 | 12 | 16 | 60 | 6 |
| G 030 12 20 | 3 | 1.5 | 12 | 20 | 70 | 6 |
| G 030 12 25 | 3 | 1.5 | 12 | 25 | 70 | 6 |
| G 030 12 30 | 3 | 1.5 | 12 | 30 | 80 | 6 |
| G 030 12 35 | 3 | 1.5 | 12 | 35 | 80 | 6 |
| G 030 12 40 | 3 | 1.5 | 12 | 40 | 90 | 6 |
| G 030 12 45 | 3 | 1.5 | 12 | 45 | 90 | 6 |
| G 030 15 25 | 3 | 1.5 | 15 | 25 | 80 | 4 |
| G 040 15S | 4 | 2 | 15 | - | 50 | 4 |
| G 040 15M | 4 | 2 | 15 | - | 80 | 4 |
| G 040 15L | 4 | 2 | 15 | - | 120 | 4 |
| G 040 15 20 | 4 | 2 | 15 | 20 | 60 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| G 040 15 25 | 4 | 2 | 15 | 25 | 70 | 6 |
| G 040 15 30 | 4 | 2 | 15 | 30 | 80 | 6 |
| G 040 15 35 | 4 | 2 | 15 | 35 | 80 | 6 |
| G 040 15 40 | 4 | 2 | 15 | 40 | 90 | 6 |
| G 040 15 45 | 4 | 2 | 15 | 45 | 90 | 6 |
| G 040 15 50 | 4 | 2 | 15 | 50 | 100 | 6 |
| G 040 20 30 | 4 | 2 | 20 | 30 | 80 | 4 |
| G 050 30 50 | 5 | 2.5 | 30 | 50 | 100 | 6 |
| G 050 30 50L | 5 | 2.5 | 30 | 50 | 150 | 6 |
| G 060 20L | 6 | 3 | 20 | - | 70 | 6 |
| G 060 20M | 6 | 3 | 20 | - | 100 | 6 |
| G 060 20S | 6 | 3 | 20 | - | 70 | 6 |
| G 060 30 50 | 6 | 3 | 30 | 50 | 100 | 6 |
| G 060 30 50L | 6 | 3 | 30 | | 150 | 6 |
| G 080 25L | 8 | 4 | 25 | - | 70 | 8 |

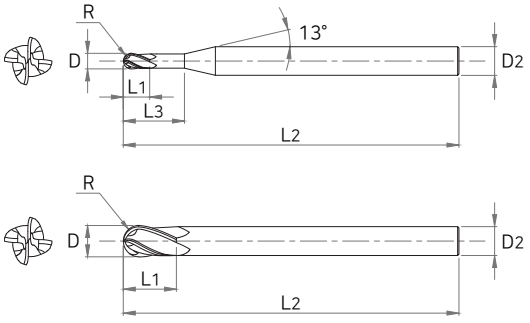
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| G 080 25M | 8 | 4 | 25 | - | 110 | 8 |
| G 080 25S | 8 | 4 | 25 | - | 160 | 8 |
| G 080 40 60 | 8 | 4 | 40 | 60 | 110 | 8 |
| G 080 40 60L | 8 | 4 | 40 | | 200 | 8 |
| G 100 30L | 10 | 5 | 30 | - | 80 | 10 |
| G 100 30M | 10 | 5 | 30 | - | 120 | 10 |
| G 100 30S | 10 | 5 | 30 | - | 170 | 10 |
| G 100 50 70 | 10 | 5 | 50 | 70 | 120 | 10 |
| G 100 50 70L | 10 | 5 | 50 | 70 | 200 | 10 |
| G 120 35S | 12 | 6 | 35 | - | 80 | 12 |
| G 120 35M | 12 | 6 | 35 | - | 130 | 12 |
| G 120 35L | 12 | 6 | 35 | - | 180 | 12 |
| G 120 55 75 | 12 | 6 | 55 | 75 | 130 | 12 |
| G 120 55 75L | 12 | 6 | 55 | 75 | 200 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# WGB504 | 4 FLUTES BALL ENDMILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D8 ~ 12 | 0 ~ -0.02 | h6 |
| D16 ~ 20 | 0 ~ -0.03 | |

CARBIDE | Diamond | 4 | 30° HELIX | R ±0.01 All Sizes | DATA P.705

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGB504 010 | 1 | 0.5 | 3 | - | 60 | 4 |
| WGB504 010 10 | 1 | 0.5 | 3 | 10 | 60 | 4 |
| WGB504 010 15 | 1 | 0.5 | 3 | 15 | 60 | 4 |
| WGB504 010 20 | 1 | 0.5 | 3 | 20 | 60 | 4 |
| WGB504 010 25 | 1 | 0.5 | 3 | 25 | 80 | 4 |
| WGB504 010 30 | 1 | 0.5 | 3 | 30 | 80 | 4 |
| WGB504 015 | 1.5 | 0.75 | 4 | - | 60 | 4 |
| WGB504 015 10 | 1.5 | 0.75 | 4 | 10 | 80 | 4 |
| WGB504 015 15 | 1.5 | 0.75 | 4 | 15 | 80 | 4 |
| WGB504 015 20 | 1.5 | 0.75 | 4 | 20 | 80 | 4 |
| WGB504 015 25 | 1.5 | 0.75 | 4 | 25 | 80 | 4 |
| WGB504 015 30 | 1.5 | 0.75 | 4 | 30 | 80 | 4 |
| WGB504 020 | 2 | 1 | 6 | - | 60 | 4 |
| WGB504 020 10 | 2 | 1 | 6 | 10 | 80 | 4 |
| WGB504 020 15 | 2 | 1 | 6 | 15 | 80 | 4 |
| WGB504 020 20 | 2 | 1 | 6 | 20 | 80 | 4 |
| WGB504 020 25 | 2 | 1 | 6 | 25 | 80 | 4 |
| WGB504 020 30 | 2 | 1 | 6 | 30 | 80 | 4 |
| WGB504 020 40 | 2 | 1 | 6 | 40 | 100 | 4 |
| WGB504 030 | 3 | 1.5 | 9 | - | 60 | 4 |
| WGB504 030 15 | 3 | 1.5 | 9 | 15 | 100 | 4 |
| WGB504 030 20 | 3 | 1.5 | 9 | 20 | 100 | 4 |
| WGB504 030 25 | 3 | 1.5 | 9 | 25 | 100 | 4 |
| WGB504 030 30 | 3 | 1.5 | 9 | 30 | 100 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGB504 030 40 | 3 | 1.5 | 9 | 40 | 100 | 4 |
| WGB504 030 50 | 3 | 1.5 | 9 | 50 | 100 | 4 |
| WGB504 040 060 | 4 | 2 | 12 | - | 60 | 4 |
| WGB504 040 080 | 4 | 2 | 12 | - | 80 | 4 |
| WGB504 040 110 | 4 | 2 | 12 | - | 110 | 4 |
| WGB504 040 130 | 4 | 2 | 12 | - | 130 | 4 |
| WGB504 040 150 | 4 | 2 | 12 | - | 150 | 4 |
| WGB504 050 080 | 5 | 2.5 | 15 | 25 | 80 | 6 |
| WGB504 050 110 | 5 | 2.5 | 15 | 25 | 110 | 6 |
| WGB504 060 090 | 6 | 3 | 20 | - | 90 | 6 |
| WGB504 060 110 | 6 | 3 | 20 | - | 110 | 6 |
| WGB504 060 130 | 6 | 3 | 20 | - | 130 | 6 |
| WGB504 060 150 | 6 | 3 | 20 | - | 150 | 6 |
| WGB504 060 180 | 6 | 3 | 20 | - | 180 | 6 |
| WGB504 080 110 | 8 | 4 | 25 | - | 110 | 8 |
| WGB504 080 130 | 8 | 4 | 25 | - | 130 | 8 |
| WGB504 080 150 | 8 | 4 | 25 | - | 150 | 8 |
| WGB504 080 200 | 8 | 4 | 25 | - | 200 | 8 |
| WGB504 100 110 | 10 | 5 | 30 | - | 110 | 10 |
| WGB504 100 130 | 10 | 5 | 30 | - | 130 | 10 |
| WGB504 100 150 | 10 | 5 | 30 | - | 150 | 10 |
| WGB504 100 180 | 10 | 5 | 30 | - | 180 | 10 |
| WGB504 100 200 | 10 | 5 | 30 | - | 200 | 10 |
| WGB504 120 110 | 12 | 6 | 35 | - | 110 | 12 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# WGB504 | 4 FLUTES BALL ENDMILL



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGB504 120 130 | 12 | 6 | 35 | - | 130 | 12 |
| WGB504 120 150 | 12 | 6 | 35 | - | 150 | 12 |
| WGB504 120 180 | 12 | 6 | 35 | - | 180 | 12 |
| WGB504 120 200 | 12 | 6 | 35 | - | 200 | 12 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | L1 | L3 | L2 | D2 |
| WGB504 160 150 | 16 | 8 | 50 | - | 150 | 16 |
| WGB504 160 200 | 16 | 8 | 50 | - | 200 | 16 |
| WGB504 200 150 | 20 | 10 | 60 | - | 150 | 20 |
| WGB504 200 200 | 20 | 10 | 60 | - | 200 | 20 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| | | | | | | ◎ | | ○ | |

○ : GOOD ◎ : EXCELLENT

# DRILL SERIES

| | | |
|---|---|---|
| NEW DOLPHIN DRILL new | 368 | |
| POWER MAX DRILL | 388 | |
| SOLID SPIRAL DRILL | 434 | |


NEW DOLPHIN

# NEW DOLPHIN DRILL

## Contents

(INCH : ◆ / METRIC : ◇)

| EDP No / SPEC | Flutes | Geometry | Length 3D | Length 4D | Length 7D | Coolant Type | Margin | Tolerance | Diameter(Ø) Min | Diameter(Ø) Max | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NDPG503 ◆◇ | 2F | | ○ | | | - | Single | h7 | 1 | 13 | 372 |
| NDPG504 ◆◇ | | | | ○ | | - | Single | h7 | 1 | 20 | 375 |
| NDPG507 ◆◇ | | | | | ○ | - | Single | h7 | 3 | 20 | 378 |
| NDPK504 (NDPR/L) ◆◇ | | | | ○ | | - | Single | h7 | 1 | 20 | 381 |
| NDPK507 (NDPR/L) ◆◇ | | | | | ○ | - | Single | h7 | 3 | 20 | 384 |

## EDP No. System

*If expressed as an integer, the decimal point is omitted.

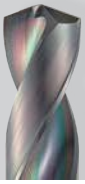
NDP G 5 04 100

| Section | Appearance | Coolant Type | Grade | Drilling Depth | Cutting Dia |
|---|---|---|---|---|---|
| NDP : New Dolphin | G (General) : General<br>K (ISO K : Cast Iron) | Internal coolant | Grade : 5 | 03 : 3D<br>04 : 4D<br>07 : 7D | Ø10<br>~<br>Ø20 |

Ex) Internal coolant / Drilling Depth 4D / Cutting Dia Ø10 / NDPG Drill

NEW DOLPHIN

It is a new brand name for all of Widin's rotating tools representing straight and dynamic image of cylindrical rotation pattern of tools when machining



## Characteristics

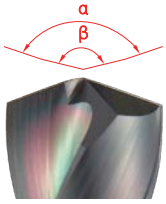
· Improved Cutting force, Stable Chip emission Reduced cutting workload, Improved working surface
· Drill for a wide range of workpieces Carbon steel, Alloy steel, Stainless etc.
· Satisfy Differing needs of the customers as 3D, 4D, 7D Standard

## Features

· Reduced cutting workload on starting by shorten cutting edge parts.
· Reduced cutting workload by Improved XR-Thinning
· Designed flutes for strength and chip emission
· Enhanced wear resistance and lubricity by AlCrN Base surface treatment.

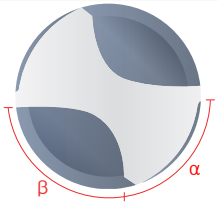
### Multi Point angle

Multi Point angle




1) Cutting force dispersion by optimal match up on point angle.
2) Enhanced strength on point by streamlined 1st Multi point angle
: Breakage reduction at the beginning of drilling

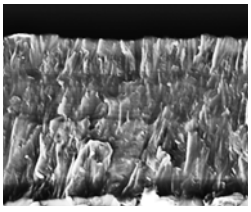
### Flute Design




Section View A - A'

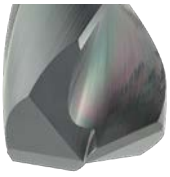
1) Flute groove for strength and chip emission (Wider β angle)
2) Improved chip emission and reduced frictional heat by improved flute roughness

### AlCrN base New Coating



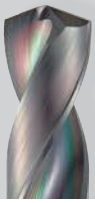
1 ) Improved chip emission by improved flute lubricity
2) Improved wear resistance and oxidation resistant by multi-layer coating

### XR-Thinning



1 ) Cutting force dispersion and reduced cutting workload by streamlined thinning design
2) Reduced hole scratch by improved chip braking

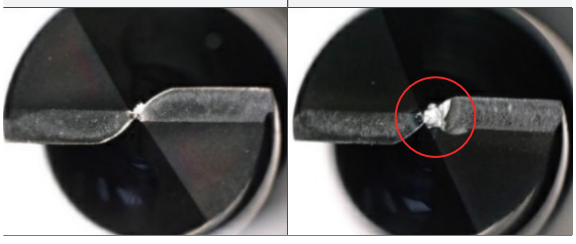
# NEW DOLPHIN DRILL



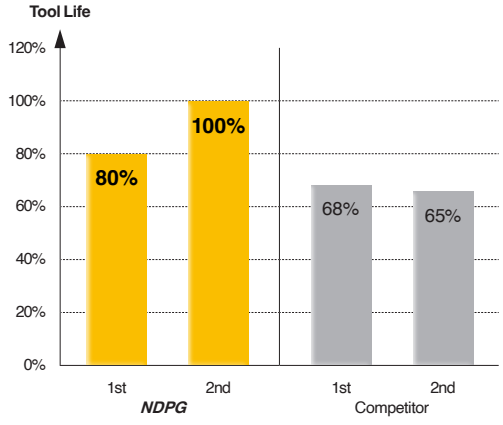
## Case Study

### Carbon steels (SM45C)

| *NDPG* | Competitor |
|---|---|

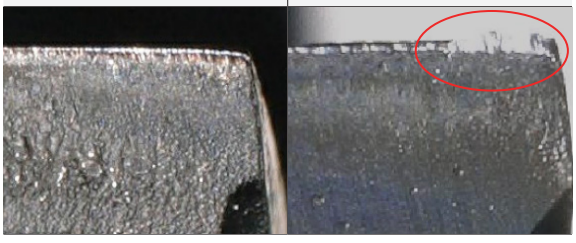


· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 120m/min, fn : 0.12mm/rev, Depth : 30mm, External Coolant

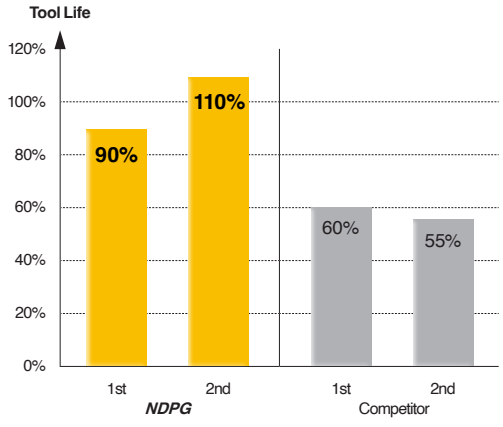



### Alloy steels (SCM440)

| *NDPG* | Competitor |
|---|---|

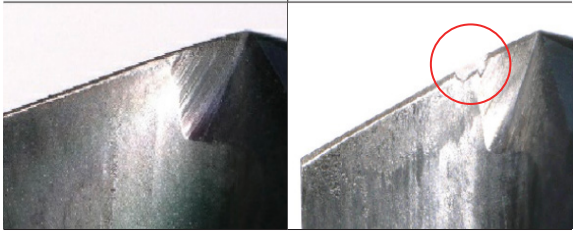


· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 100m/min, fn : 0.12mm/rev, Depth : 30mm, External Coolant

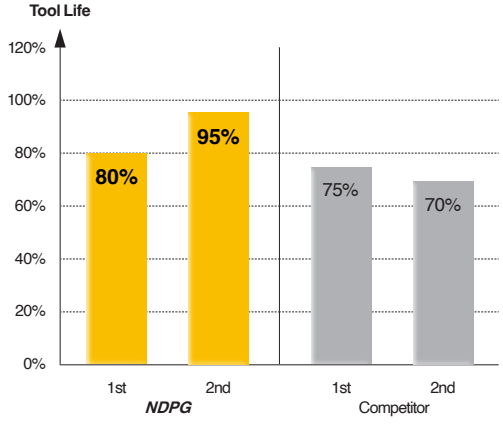


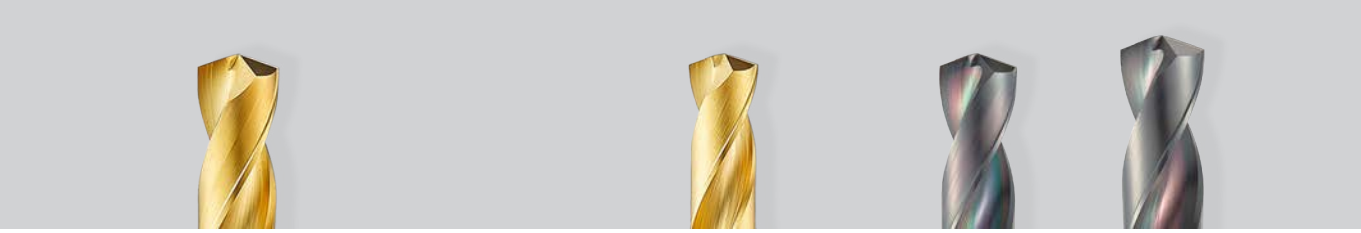

### Stainless steels (STS304)

| *NDPG* | Competitor |
|---|---|

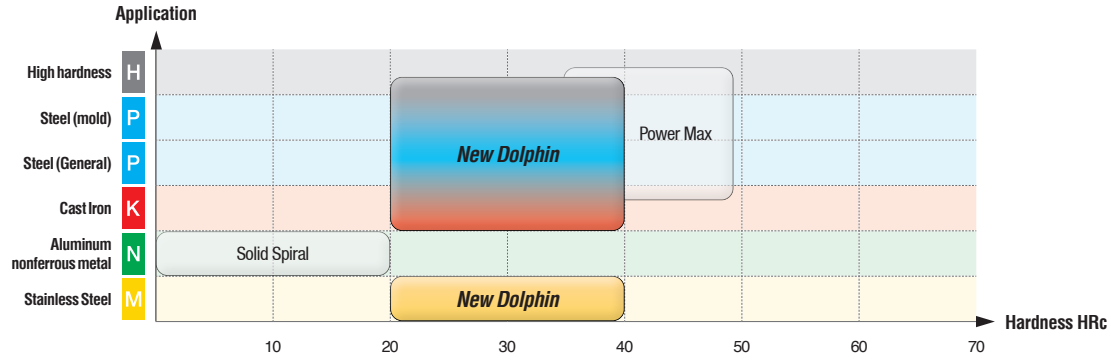


· SPEC : D6.0-50/83-6
· Cutting condition : Vc : 30m/min, fn : 0.04mm/rev, Depth : 5mm, External Coolant



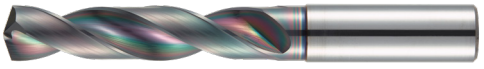


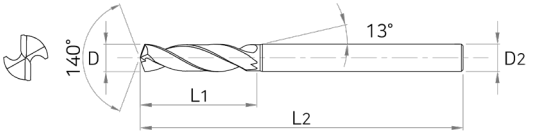
## Applications

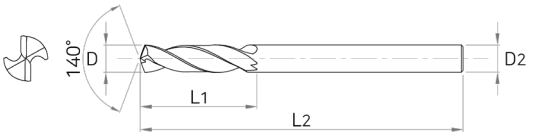


# NDPG503 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN








## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | 0 ~ -0.010 | h6 |
| D3.1 ~ D6 | 0 ~ -0.012 | |
| D6.1 ~ D10 | 0 ~ -0.015 | |
| D10.1 ~ D13 | 0 ~ -0.084 | |

CARBIDE | AlCrN | 3D | 30° HELIX | 140° | DATA P.708

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 010 | 1 | 5 | 38 | 3 | - | - |
| NDPG503 011 | 1.1 | 6 | 42 | 3 | - | - |
| NDPG503 012 | 1.2 | 6 | 42 | 3 | - | - |
| NDPG503 013 | 1.3 | 6 | 42 | 3 | - | - |
| NDPG503 014 | 1.4 | 7 | 42 | 3 | - | - |
| NDPG503 015 | 1.5 | 7 | 42 | 3 | - | - |
| NDPG503 016 | 1.6 | 8 | 42 | 3 | - | - |
| NDPG503 017 | 1.7 | 8 | 42 | 3 | - | - |
| NDPG503 018 | 1.8 | 9 | 42 | 3 | - | - |
| NDPG503 019 | 1.9 | 9 | 42 | 3 | - | - |
| NDPG503 020 | 2 | 10 | 50 | 3 | - | - |
| NDPG503 021 | 2.1 | 10 | 50 | 3 | - | - |
| NDPG503 022 | 2.2 | 11 | 50 | 3 | - | - |
| NDPG503 023 | 2.3 | 11 | 50 | 3 | - | - |
| NDPG503 024 | 2.4 | 12 | 50 | 3 | - | - |
| NDPG503 025 | 2.5 | 12 | 50 | 3 | M3x0.5 | WH1~4 |
| NDPG503 026 | 2.6 | 12 | 50 | 3 | M3x0.5 | WH5~6 |
| NDPG503 027 | 2.7 | 14 | 50 | 3 | - | - |
| NDPG503 028 | 2.8 | 14 | 50 | 3 | - | - |
| NDPG503 029 | 2.9 | 14 | 50 | 3 | - | - |
| NDPG503 030 | 3 | 14 | 55 | 3 | - | - |
| NDPG503 031 | 3.1 | 16 | 55 | 4 | - | - |
| NDPG503 03175 | 3.175 | 16 | 55 | 4 | - | - |
| NDPG503 032 | 3.2 | 16 | 55 | 4 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 03264 | 3.264 | 16 | 55 | 4 | - | - |
| NDPG503 033 | 3.3 | 16 | 55 | 4 | M4x0.7 | WH1~4 |
| NDPG503 034 | 3.4 | 16 | 55 | 4 | M4x0.7 | WH5~6 |
| NDPG503 035 | 3.5 | 16 | 55 | 4 | - | - |
| NDPG503 03572 | 3.572 | 18 | 55 | 4 | - | - |
| NDPG503 036 | 3.6 | 18 | 55 | 4 | - | - |
| NDPG503 037 | 3.7 | 18 | 55 | 4 | - | - |
| NDPG503 038 | 3.8 | 20 | 55 | 4 | - | - |
| NDPG503 039 | 3.9 | 20 | 55 | 4 | - | - |
| NDPG503 040 | 4 | 20 | 55 | 4 | - | - |
| NDPG503 04039 | 4.039 | 20 | 55 | 5 | - | - |
| NDPG503 041 | 4.1 | 20 | 55 | 5 | - | - |
| NDPG503 042 | 4.2 | 20 | 62 | 5 | M5x0.8 | WH1~4 |
| NDPG503 043 | 4.3 | 22 | 62 | 5 | M5x0.8 | WH5~6 |
| NDPG503 044 | 4.4 | 22 | 62 | 5 | - | - |
| NDPG503 045 | 4.5 | 22 | 62 | 5 | - | - |
| NDPG503 046 | 4.6 | 22 | 62 | 5 | - | - |
| NDPG503 047 | 4.7 | 22 | 62 | 5 | - | - |
| NDPG503 04763 | 4.763 | 24 | 62 | 5 | - | - |
| NDPG503 048 | 4.8 | 24 | 62 | 5 | - | - |
| NDPG503 049 | 4.9 | 24 | 62 | 5 | - | - |
| NDPG503 050 | 5 | 24 | 62 | 5 | M6x1.0 | WH1~4 |
| NDPG503 051 | 5.1 | 24 | 62 | 6 | M6x1.0 | WH5~6 |
| NDPG503 05159 | 5.159 | 28 | 66 | 6 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

# NDPG503 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 052 | 5.2 | 28 | 66 | 6 | - | - |
| NDPG503 053 | 5.3 | 28 | 66 | 6 | - | - |
| NDPG503 054 | 5.4 | 28 | 66 | 6 | - | - |
| NDPG503 055 | 5.5 | 28 | 66 | 6 | - | - |
| NDPG503 05556 | 5.556 | 28 | 66 | 6 | - | - |
| NDPG503 056 | 5.6 | 28 | 66 | 6 | - | - |
| NDPG503 057 | 5.7 | 28 | 66 | 6 | - | - |
| NDPG503 058 | 5.8 | 28 | 66 | 6 | - | - |
| NDPG503 059 | 5.9 | 28 | 66 | 6 | - | - |
| NDPG503 05953 | 5.953 | 28 | 66 | 6 | - | - |
| NDPG503 060 | 6 | 28 | 66 | 6 | - | - |
| NDPG503 061 | 6.1 | 30 | 66 | 7 | - | - |
| NDPG503 062 | 6.2 | 34 | 74 | 7 | - | - |
| NDPG503 063 | 6.3 | 34 | 74 | 7 | - | - |
| NDPG503 0635 | 6.35 | 34 | 74 | 7 | - | - |
| NDPG503 064 | 6.4 | 34 | 74 | 7 | - | - |
| NDPG503 065 | 6.5 | 34 | 74 | 7 | - | - |
| NDPG503 066 | 6.6 | 34 | 74 | 7 | - | - |
| NDPG503 067 | 6.7 | 37 | 74 | 7 | - | - |
| NDPG503 06747 | 6.747 | 37 | 74 | 7 | - | - |
| NDPG503 068 | 6.8 | 37 | 74 | 7 | M8x1.25 | WH1~4 |
| NDPG503 069 | 6.9 | 37 | 74 | 7 | M8x1.25 | WH5~6 |
| NDPG503 070 | 7 | 37 | 74 | 7 | M8x1.0 | WH1~4 |
| NDPG503 071 | 7.1 | 37 | 74 | 8 | M8x1.0 | WH5~6 |
| NDPG503 07144 | 7.144 | 40 | 79 | 8 | - | - |
| NDPG503 072 | 7.2 | 40 | 79 | 8 | - | - |
| NDPG503 073 | 7.3 | 40 | 79 | 8 | - | - |
| NDPG503 074 | 7.4 | 40 | 79 | 8 | - | - |
| NDPG503 075 | 7.5 | 40 | 79 | 8 | - | - |
| NDPG503 07541 | 7.541 | 40 | 79 | 8 | - | - |
| NDPG503 076 | 7.6 | 40 | 79 | 8 | - | - |
| NDPG503 077 | 7.7 | 40 | 79 | 8 | - | - |
| NDPG503 078 | 7.8 | 40 | 79 | 8 | - | - |
| NDPG503 079 | 7.9 | 40 | 79 | 8 | - | - |
| NDPG503 07938 | 7.938 | 40 | 79 | 8 | - | - |
| NDPG503 080 | 8 | 40 | 79 | 8 | - | - |
| NDPG503 081 | 8.1 | 40 | 79 | 9 | - | - |
| NDPG503 082 | 8.2 | 43 | 84 | 9 | - | - |
| NDPG503 083 | 8.3 | 43 | 84 | 9 | - | - |
| NDPG503 084 | 8.4 | 43 | 84 | 9 | - | - |
| NDPG503 085 | 8.5 | 43 | 84 | 9 | M10x1.5 | WH1~4 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 086 | 8.6 | 43 | 84 | 9 | M10x1.5 | WH5~6 |
| NDPG503 087 | 8.7 | 43 | 84 | 9 | - | - |
| NDPG503 08731 | 8.731 | 43 | 84 | 9 | - | - |
| NDPG503 088 | 8.8 | 43 | 84 | 9 | M10x1.25 | WH1~4 |
| NDPG503 089 | 8.9 | 43 | 84 | 9 | M10x1.25 | WH5~6 |
| NDPG503 090 | 9 | 43 | 84 | 9 | M10x1.0 | WH1~4 |
| NDPG503 091 | 9.1 | 43 | 84 | 10 | M10x1.0 | WH5~6 |
| NDPG503 092 | 9.2 | 47 | 89 | 10 | - | - |
| NDPG503 093 | 9.3 | 47 | 89 | 10 | - | - |
| NDPG503 094 | 9.4 | 47 | 89 | 10 | - | - |
| NDPG503 095 | 9.5 | 47 | 89 | 10 | - | - |
| NDPG503 09525 | 9.525 | 47 | 89 | 10 | - | - |
| NDPG503 096 | 9.6 | 47 | 89 | 10 | - | - |
| NDPG503 097 | 9.7 | 47 | 89 | 10 | - | - |
| NDPG503 098 | 9.8 | 47 | 89 | 10 | - | - |
| NDPG503 099 | 9.9 | 47 | 89 | 10 | - | - |
| NDPG503 100 | 10 | 47 | 89 | 10 | - | - |
| NDPG503 101 | 10.1 | 47 | 89 | 11 | - | - |
| NDPG503 102 | 10.2 | 51 | 95 | 11 | - | - |
| NDPG503 103 | 10.3 | 51 | 95 | 11 | M12x1.75 | WH1~2 |
| NDPG503 10319 | 10.319 | 51 | 95 | 11 | M12x1.75 | WH3~4 |
| NDPG503 104 | 10.4 | 51 | 95 | 11 | M12x1.75 | WH5~6 |
| NDPG503 105 | 10.5 | 51 | 95 | 11 | M12x1.5 | WH1~4 |
| NDPG503 106 | 10.6 | 51 | 95 | 11 | M12x1.5 | WH5~6 |
| NDPG503 107 | 10.7 | 51 | 95 | 11 | - | - |
| NDPG503 10716 | 10.716 | 51 | 95 | 11 | - | - |
| NDPG503 108 | 10.8 | 51 | 95 | 11 | M12x1.25 | WH1~4 |
| NDPG503 109 | 10.9 | 51 | 95 | 11 | M12x1.25 | WH5~6 |
| NDPG503 110 | 11 | 51 | 95 | 11 | M12x1.0 | WH1~4 |
| NDPG503 111 | 11.1 | 51 | 95 | 12 | M12x1.0 | WH5~6 |
| NDPG503 11113 | 11.113 | 54 | 102 | 12 | - | - |
| NDPG503 112 | 11.2 | 54 | 102 | 12 | - | - |
| NDPG503 113 | 11.3 | 54 | 102 | 12 | - | - |
| NDPG503 114 | 11.4 | 54 | 102 | 12 | - | - |
| NDPG503 115 | 11.5 | 54 | 102 | 12 | - | - |
| NDPG503 116 | 11.6 | 54 | 102 | 12 | - | - |
| NDPG503 117 | 11.7 | 54 | 102 | 12 | - | - |
| NDPG503 118 | 11.8 | 54 | 102 | 12 | - | - |
| NDPG503 119 | 11.9 | 54 | 102 | 12 | - | - |
| NDPG503 120 | 12 | 54 | 102 | 12 | M14x2.0 | WH1~4 |
| NDPG503 121 | 12.1 | 54 | 102 | 13 | M14x2.0 | WH5~6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 122 | 12.2 | 57 | 102 | 13 | - | - |
| NDPG503 123 | 12.3 | 57 | 102 | 13 | - | - |
| NDPG503 124 | 12.4 | 57 | 102 | 13 | - | - |
| NDPG503 125 | 12.5 | 57 | 102 | 13 | M14x1.5 | WH1~4 |
| NDPG503 126 | 12.6 | 57 | 102 | 13 | M14x1.5 | WH5~6 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG503 127 | 12.7 | 57 | 102 | 13 | - | - |
| NDPG503 128 | 12.8 | 57 | 102 | 13 | - | - |
| NDPG503 129 | 12.9 | 57 | 102 | 13 | - | - |
| NDPG503 130 | 13 | 57 | 102 | 13 | - | - |



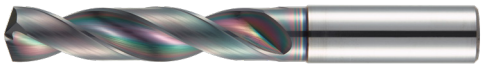
## ■ Applicable Working Material

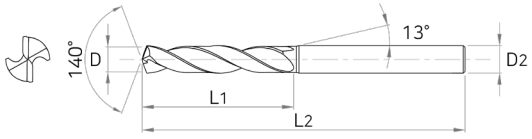
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

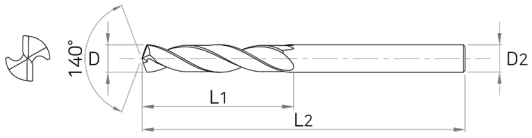
○ : GOOD ◎ : EXCELLENT

# NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | 0 ~ -0.010 | h6 |
| D3.1 ~ D6 | 0 ~ -0.012 | |
| D6.1 ~ D10 | 0 ~ -0.015 | |
| D10.1 ~ D18 | 0 ~ -0.018 | |
| D18.1 ~ | 0 ~ -0.021 | |

CARBIDE | AlCrN | 4D | 30° HELIX | 140° | DATA P.708

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 010 | 1 | 8 | 38 | 3 | - | - |
| NDPG504 011 | 1.1 | 9 | 42 | 3 | - | - |
| NDPG504 012 | 1.2 | 10 | 42 | 3 | - | - |
| NDPG504 013 | 1.3 | 10 | 42 | 3 | - | - |
| NDPG504 014 | 1.4 | 11 | 42 | 3 | - | - |
| NDPG504 015 | 1.5 | 11 | 42 | 3 | - | - |
| NDPG504 016 | 1.6 | 12 | 42 | 3 | - | - |
| NDPG504 017 | 1.7 | 12 | 42 | 3 | - | - |
| NDPG504 018 | 1.8 | 13 | 42 | 3 | - | - |
| NDPG504 019 | 1.9 | 13 | 42 | 3 | - | - |
| NDPG504 020 | 2 | 18 | 50 | 3 | - | - |
| NDPG504 021 | 2.1 | 18 | 50 | 3 | - | - |
| NDPG504 022 | 2.2 | 18 | 50 | 3 | - | - |
| NDPG504 023 | 2.3 | 18 | 50 | 3 | - | - |
| NDPG504 024 | 2.4 | 18 | 50 | 3 | - | - |
| NDPG504 025 | 2.5 | 18 | 50 | 3 | M3x0.5 | WH1~4 |
| NDPG504 026 | 2.6 | 18 | 50 | 3 | M3x0.5 | WH5~6 |
| NDPG504 027 | 2.7 | 18 | 50 | 3 | - | - |
| NDPG504 028 | 2.8 | 18 | 50 | 3 | - | - |
| NDPG504 029 | 2.9 | 18 | 50 | 3 | - | - |
| NDPG504 030 | 3 | 20 | 55 | 3 | - | - |
| NDPG504 031 | 3.1 | 20 | 55 | 4 | - | - |
| NDPG504 03175 | 3.175 | 20 | 55 | 4 | - | - |
| NDPG504 032 | 3.2 | 20 | 55 | 4 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 03264 | 3.264 | 20 | 55 | 4 | - | - |
| NDPG504 033 | 3.3 | 20 | 55 | 4 | M4x0.7 | WH1~4 |
| NDPG504 034 | 3.4 | 20 | 55 | 4 | M4x0.7 | WH 5~6 |
| NDPG504 035 | 3.5 | 20 | 55 | 4 | - | - |
| NDPG504 03572 | 3.572 | 25 | 55 | 4 | - | - |
| NDPG504 036 | 3.6 | 25 | 55 | 4 | - | - |
| NDPG504 037 | 3.7 | 25 | 55 | 4 | - | - |
| NDPG504 038 | 3.8 | 25 | 55 | 4 | - | - |
| NDPG504 039 | 3.9 | 25 | 55 | 4 | - | - |
| NDPG504 040 | 4 | 25 | 55 | 4 | - | - |
| NDPG504 04039 | 4.039 | 25 | 55 | 5 | - | - |
| NDPG504 041 | 4.1 | 25 | 55 | 5 | - | - |
| NDPG504 042 | 4.2 | 33 | 63 | 5 | M5x0.8 | WH1~4 |
| NDPG504 043 | 4.3 | 33 | 63 | 5 | M5x0.8 | WH5~6 |
| NDPG504 044 | 4.4 | 33 | 63 | 5 | - | - |
| NDPG504 045 | 4.5 | 33 | 63 | 5 | - | - |
| NDPG504 046 | 4.6 | 33 | 63 | 5 | - | - |
| NDPG504 047 | 4.7 | 33 | 63 | 5 | - | - |
| NDPG504 04763 | 4.763 | 33 | 63 | 5 | - | - |
| NDPG504 048 | 4.8 | 33 | 63 | 5 | - | - |
| NDPG504 049 | 4.9 | 33 | 63 | 5 | - | - |
| NDPG504 050 | 5 | 33 | 63 | 5 | M6x1.0 | WH1~4 |
| NDPG504 051 | 5.1 | 33 | 63 | 6 | M6x1.0 | WH5~6 |
| NDPG504 05159 | 5.159 | 36 | 66 | 6 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

# NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 052 | 5.2 | 36 | 66 | 6 | - | - |
| NDPG504 053 | 5.3 | 36 | 66 | 6 | - | - |
| NDPG504 054 | 5.4 | 36 | 66 | 6 | - | - |
| NDPG504 055 | 5.5 | 36 | 66 | 6 | - | - |
| NDPG504 05556 | 5.556 | 36 | 66 | 6 | - | - |
| NDPG504 056 | 5.6 | 36 | 66 | 6 | - | - |
| NDPG504 057 | 5.7 | 36 | 66 | 6 | - | - |
| NDPG504 058 | 5.8 | 36 | 66 | 6 | - | - |
| NDPG504 059 | 5.9 | 36 | 66 | 6 | - | - |
| NDPG504 05953 | 5.953 | 36 | 66 | 6 | - | - |
| NDPG504 060 | 6 | 36 | 66 | 6 | - | - |
| NDPG504 061 | 6.1 | 36 | 66 | 7 | - | - |
| NDPG504 062 | 6.2 | 42 | 75 | 7 | - | - |
| NDPG504 063 | 6.3 | 42 | 75 | 7 | - | - |
| NDPG504 0635 | 6.35 | 42 | 75 | 7 | - | - |
| NDPG504 064 | 6.4 | 42 | 75 | 7 | - | - |
| NDPG504 065 | 6.5 | 42 | 75 | 7 | - | - |
| NDPG504 066 | 6.6 | 42 | 75 | 7 | - | - |
| NDPG504 067 | 6.7 | 42 | 75 | 7 | - | - |
| NDPG504 06747 | 6.747 | 42 | 75 | 7 | - | - |
| NDPG504 068 | 6.8 | 42 | 75 | 7 | M8x1.25 | WH1~4 |
| NDPG504 069 | 6.9 | 42 | 75 | 7 | M8x1.25 | WH5~6 |
| NDPG504 070 | 7 | 42 | 75 | 7 | M8x1.0 | WH1~4 |
| NDPG504 071 | 7.1 | 42 | 75 | 8 | M8x1.0 | WH5~6 |
| NDPG504 07144 | 7.144 | 46 | 80 | 8 | - | - |
| NDPG504 072 | 7.2 | 46 | 80 | 8 | - | - |
| NDPG504 073 | 7.3 | 46 | 80 | 8 | - | - |
| NDPG504 074 | 7.4 | 46 | 80 | 8 | - | - |
| NDPG504 075 | 7.5 | 46 | 80 | 8 | - | - |
| NDPG504 07541 | 7.541 | 46 | 80 | 8 | - | - |
| NDPG504 076 | 7.6 | 46 | 80 | 8 | - | - |
| NDPG504 077 | 7.7 | 46 | 80 | 8 | - | - |
| NDPG504 078 | 7.8 | 46 | 80 | 8 | - | - |
| NDPG504 079 | 7.9 | 46 | 80 | 8 | - | - |
| NDPG504 07938 | 7.938 | 46 | 80 | 8 | - | - |
| NDPG504 080 | 8 | 46 | 80 | 8 | - | - |
| NDPG504 081 | 8.1 | 46 | 80 | 9 | - | - |
| NDPG504 082 | 8.2 | 50 | 85 | 9 | - | - |
| NDPG504 083 | 8.3 | 50 | 85 | 9 | - | - |
| NDPG504 084 | 8.4 | 50 | 85 | 9 | - | - |
| NDPG504 085 | 8.5 | 50 | 85 | 9 | M10x1.5 | WH1~4 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 086 | 8.6 | 50 | 85 | 9 | M10x1.5 | WH5~6 |
| NDPG504 087 | 8.7 | 50 | 85 | 9 | - | - |
| NDPG504 08731 | 8.731 | 50 | 85 | 9 | - | - |
| NDPG504 088 | 8.8 | 50 | 85 | 9 | M10x1.25 | WH1~4 |
| NDPG504 089 | 8.9 | 50 | 85 | 9 | M10x1.25 | WH5~6 |
| NDPG504 090 | 9 | 50 | 85 | 9 | M10x1.0 | WH1~4 |
| NDPG504 091 | 9.1 | 50 | 85 | 10 | M10x1.0 | WH5~6 |
| NDPG504 092 | 9.2 | 55 | 90 | 10 | - | - |
| NDPG504 093 | 9.3 | 55 | 90 | 10 | - | - |
| NDPG504 094 | 9.4 | 55 | 90 | 10 | - | - |
| NDPG504 095 | 9.5 | 55 | 90 | 10 | - | - |
| NDPG504 09525 | 9.525 | 55 | 90 | 10 | - | - |
| NDPG504 096 | 9.6 | 55 | 90 | 10 | - | - |
| NDPG504 097 | 9.7 | 55 | 90 | 10 | - | - |
| NDPG504 098 | 9.8 | 55 | 90 | 10 | - | - |
| NDPG504 099 | 9.9 | 55 | 90 | 10 | - | - |
| NDPG504 100 | 10 | 55 | 90 | 10 | - | - |
| NDPG504 101 | 10.1 | 55 | 90 | 11 | - | - |
| NDPG504 102 | 10.2 | 57 | 95 | 11 | - | - |
| NDPG504 103 | 10.3 | 57 | 95 | 11 | M12x1.75 | WH1~2 |
| NDPG504 10319 | 10.319 | 57 | 95 | 11 | M12x1.75 | WH3~4 |
| NDPG504 104 | 10.4 | 57 | 95 | 11 | M12x1.75 | WH5~6 |
| NDPG504 105 | 10.5 | 57 | 95 | 11 | M12x1.5 | WH1~4 |
| NDPG504 106 | 10.6 | 57 | 95 | 11 | M12x1.5 | WH5~6 |
| NDPG504 107 | 10.7 | 57 | 95 | 11 | - | - |
| NDPG504 10716 | 10.716 | 57 | 95 | 11 | - | - |
| NDPG504 108 | 10.8 | 57 | 95 | 11 | M12x1.25 | WH1~4 |
| NDPG504 109 | 10.9 | 57 | 95 | 11 | M12x1.25 | WH5~6 |
| NDPG504 110 | 11 | 57 | 95 | 11 | M12x1.0 | WH1~4 |
| NDPG504 111 | 11.1 | 57 | 95 | 12 | M12x1.0 | WH5~6 |
| NDPG504 11113 | 11.113 | 63 | 102 | 12 | - | - |
| NDPG504 112 | 11.2 | 63 | 102 | 12 | - | - |
| NDPG504 113 | 11.3 | 63 | 102 | 12 | - | - |
| NDPG504 114 | 11.4 | 63 | 102 | 12 | - | - |
| NDPG504 115 | 11.5 | 63 | 102 | 12 | - | - |
| NDPG504 116 | 11.6 | 63 | 102 | 12 | - | - |
| NDPG504 117 | 11.7 | 63 | 102 | 12 | - | - |
| NDPG504 118 | 11.8 | 63 | 102 | 12 | - | - |
| NDPG504 119 | 11.9 | 63 | 102 | 12 | - | - |
| NDPG504 120 | 12 | 63 | 102 | 12 | M14x2.0 | WH1~4 |
| NDPG504 121 | 12.1 | 63 | 102 | 13 | M14x2.0 | WH5~6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

# NDPG504 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 122 | 12.2 | 63 | 102 | 13 | - | - |
| NDPG504 123 | 12.3 | 63 | 102 | 13 | - | - |
| NDPG504 124 | 12.4 | 63 | 102 | 13 | - | - |
| NDPG504 125 | 12.5 | 63 | 102 | 13 | M14x1.5 | WH1~4 |
| NDPG504 126 | 12.6 | 63 | 102 | 13 | M14x1.5 | WH5~6 |
| NDPG504 127 | 12.7 | 63 | 102 | 13 | - | - |
| NDPG504 128 | 12.8 | 63 | 102 | 13 | - | - |
| NDPG504 129 | 12.9 | 63 | 102 | 13 | - | - |
| NDPG504 130 | 13 | 63 | 102 | 13 | - | - |
| NDPG504 131 | 13.1 | 63 | 102 | 14 | - | - |
| NDPG504 132 | 13.2 | 65 | 107 | 14 | - | - |
| NDPG504 133 | 13.3 | 65 | 107 | 14 | - | - |
| NDPG504 134 | 13.4 | 65 | 107 | 14 | - | - |
| NDPG504 13494 | 13.494 | 65 | 107 | 14 | - | - |
| NDPG504 135 | 13.5 | 65 | 107 | 14 | - | - |
| NDPG504 136 | 13.6 | 65 | 107 | 14 | - | - |
| NDPG504 137 | 13.7 | 65 | 107 | 14 | - | - |
| NDPG504 138 | 13.8 | 65 | 107 | 14 | - | - |
| NDPG504 139 | 13.9 | 65 | 107 | 14 | - | - |
| NDPG504 140 | 14 | 65 | 107 | 14 | M16x2.0 | WH1~4 |
| NDPG504 141 | 14.1 | 65 | 107 | 15 | M16x2.0 | WH5~6 |
| NDPG504 142 | 14.2 | 67 | 111 | 15 | - | - |
| NDPG504 143 | 14.3 | 67 | 111 | 15 | - | - |
| NDPG504 144 | 14.4 | 67 | 111 | 15 | - | - |
| NDPG504 145 | 14.5 | 67 | 111 | 15 | M16x1.5 | WH1~4 |
| NDPG504 146 | 14.6 | 67 | 111 | 15 | M16x1.5 | WH5~6 |
| NDPG504 147 | 14.7 | 67 | 111 | 15 | - | - |
| NDPG504 148 | 14.8 | 67 | 111 | 15 | - | - |
| NDPG504 149 | 14.9 | 67 | 111 | 15 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG504 150 | 15 | 67 | 111 | 15 | - | - |
| NDPG504 151 | 15.1 | 67 | 111 | 16 | - | - |
| NDPG504 152 | 15.2 | 69 | 115 | 16 | - | - |
| NDPG504 154 | 15.4 | 69 | 115 | 16 | - | - |
| NDPG504 155 | 15.5 | 69 | 115 | 16 | M18x2.5 | WH1~4 |
| NDPG504 156 | 15.6 | 69 | 115 | 16 | M18x2.5 | WH5~6 |
| NDPG504 157 | 15.7 | 69 | 115 | 16 | - | - |
| NDPG504 158 | 15.8 | 69 | 115 | 16 | - | - |
| NDPG504 15875 | 15.875 | 69 | 115 | 16 | - | - |
| NDPG504 160 | 16 | 69 | 115 | 16 | - | - |
| NDPG504 161 | 16.1 | 69 | 115 | 17 | - | - |
| NDPG504 163 | 16.3 | 71 | 119 | 17 | - | - |
| NDPG504 165 | 16.5 | 71 | 119 | 17 | M18x1.5 | WH1~6 |
| NDPG504 16669 | 16.669 | 71 | 119 | 17 | - | - |
| NDPG504 170 | 17 | 71 | 119 | 17 | - | - |
| NDPG504 171 | 17.1 | 71 | 119 | 18 | - | - |
| NDPG504 172 | 17.2 | 74 | 123 | 18 | - | - |
| NDPG504 175 | 17.5 | 74 | 123 | 18 | M20x2.5 | WH1~6 |
| NDPG504 177 | 17.7 | 74 | 123 | 18 | - | - |
| NDPG504 178 | 17.8 | 74 | 123 | 18 | - | - |
| NDPG504 180 | 18 | 74 | 123 | 18 | - | - |
| NDPG504 181 | 18.1 | 74 | 123 | 19 | - | - |
| NDPG504 182 | 18.2 | 76 | 127 | 19 | - | - |
| NDPG504 185 | 18.5 | 76 | 127 | 19 | M20x1.5 | WH1~6 |
| NDPG504 190 | 19 | 76 | 127 | 19 | - | - |
| NDPG504 191 | 19.1 | 76 | 127 | 20 | - | - |
| NDPG504 195 | 19.5 | 80 | 131 | 20 | M22x2.5 | WH1~6 |
| NDPG504 197 | 19.7 | 80 | 131 | 20 | - | - |
| NDPG504 200 | 20 | 80 | 131 | 20 | - | - |



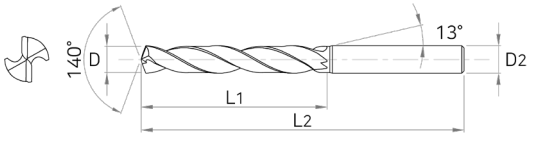
## ■ Applicable Working Material

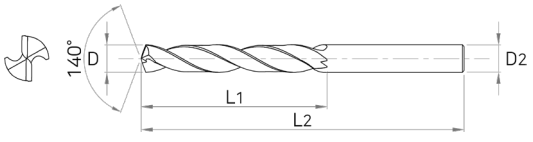
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

# NDPG507 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | 0 ~ -0.010 | h6 |
| D3.1 ~ D6 | 0 ~ -0.012 | |
| D6.1 ~ D10 | 0 ~ -0.015 | |
| D10.1 ~ D18 | 0 ~ -0.018 | |
| D18.1 ~ | 0 ~ -0.021 | |

CARBIDE | AlCrN | 7D | 30° HELIX | 140° | DATA P.708

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 030 | 3 | 45 | 80 | 3 | - | - |
| NDPG507 031 | 3.1 | 45 | 80 | 4 | - | - |
| NDPG507 03175 | 3.175 | 45 | 80 | 4 | - | - |
| NDPG507 032 | 3.2 | 45 | 80 | 4 | - | - |
| NDPG507 03264 | 3.264 | 45 | 80 | 4 | - | - |
| NDPG507 033 | 3.3 | 45 | 80 | 4 | M4x0.7 | WH1~4 |
| NDPG507 034 | 3.4 | 45 | 80 | 4 | M4x0.7 | WH5~6 |
| NDPG507 035 | 3.5 | 45 | 80 | 4 | - | - |
| NDPG507 03572 | 3.572 | 45 | 80 | 4 | - | - |
| NDPG507 036 | 3.6 | 45 | 80 | 4 | - | - |
| NDPG507 037 | 3.7 | 45 | 80 | 4 | - | - |
| NDPG507 038 | 3.8 | 45 | 80 | 4 | - | - |
| NDPG507 039 | 3.9 | 45 | 80 | 4 | - | - |
| NDPG507 040 | 4 | 45 | 80 | 4 | - | - |
| NDPG507 041 | 4.1 | 45 | 80 | 5 | - | - |
| NDPG507 042 | 4.2 | 45 | 80 | 5 | M5x0.8 | WH1~4 |
| NDPG507 043 | 4.3 | 45 | 80 | 5 | M5x0.8 | WH5~6 |
| NDPG507 044 | 4.4 | 45 | 80 | 5 | - | - |
| NDPG507 045 | 4.5 | 45 | 80 | 5 | - | - |
| NDPG507 046 | 4.6 | 45 | 80 | 5 | - | - |
| NDPG507 047 | 4.7 | 45 | 80 | 5 | - | - |
| NDPG507 04763 | 4.763 | 45 | 80 | 5 | - | - |
| NDPG507 048 | 4.8 | 45 | 80 | 5 | - | - |
| NDPG507 049 | 4.9 | 45 | 80 | 5 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 050 | 5 | 45 | 80 | 5 | M6x1.0 | WH1~4 |
| NDPG507 051 | 5.1 | 45 | 80 | 6 | M6x1.0 | WH5~6 |
| NDPG507 05159 | 5.159 | 50 | 83 | 6 | - | - |
| NDPG507 052 | 5.2 | 50 | 83 | 6 | - | - |
| NDPG507 053 | 5.3 | 50 | 83 | 6 | - | - |
| NDPG507 054 | 5.4 | 50 | 83 | 6 | - | - |
| NDPG507 055 | 5.5 | 50 | 83 | 6 | - | - |
| NDPG507 05556 | 5.556 | 50 | 83 | 6 | - | - |
| NDPG507 056 | 5.6 | 50 | 83 | 6 | - | - |
| NDPG507 057 | 5.7 | 50 | 83 | 6 | - | - |
| NDPG507 058 | 5.8 | 50 | 83 | 6 | - | - |
| NDPG507 059 | 5.9 | 50 | 83 | 6 | - | - |
| NDPG507 060 | 6 | 50 | 83 | 6 | - | - |
| NDPG507 061 | 6.1 | 50 | 83 | 7 | - | - |
| NDPG507 062 | 6.2 | 53 | 85 | 7 | - | - |
| NDPG507 063 | 6.3 | 53 | 85 | 7 | - | - |
| NDPG507 0635 | 6.35 | 53 | 85 | 7 | - | - |
| NDPG507 064 | 6.4 | 53 | 85 | 7 | - | - |
| NDPG507 065 | 6.5 | 53 | 85 | 7 | - | - |
| NDPG507 066 | 6.6 | 53 | 85 | 7 | - | - |
| NDPG507 067 | 6.7 | 53 | 85 | 7 | - | - |
| NDPG507 06747 | 6.747 | 53 | 85 | 7 | - | - |
| NDPG507 068 | 6.8 | 53 | 85 | 7 | M8x1.25 | WH1~4 |
| NDPG507 069 | 6.9 | 53 | 85 | 7 | M8x1.25 | WH5~6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

# NDPG507 | NEW DOLPHIN GENERAL PURPOSE DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 070 | 7 | 53 | 85 | 7 | M8x1.0 | WH1~4 |
| NDPG507 071 | 7.1 | 53 | 85 | 8 | M8x1.0 | WH5~6 |
| NDPG507 07144 | 7.144 | 58 | 90 | 8 | - | - |
| NDPG507 072 | 7.2 | 58 | 90 | 8 | - | - |
| NDPG507 073 | 7.3 | 58 | 90 | 8 | - | - |
| NDPG507 074 | 7.4 | 58 | 90 | 8 | - | - |
| NDPG507 075 | 7.5 | 58 | 90 | 8 | - | - |
| NDPG507 076 | 7.6 | 58 | 90 | 8 | - | - |
| NDPG507 077 | 7.7 | 58 | 90 | 8 | - | - |
| NDPG507 078 | 7.8 | 58 | 90 | 8 | - | - |
| NDPG507 079 | 7.9 | 58 | 90 | 8 | - | - |
| NDPG507 07938 | 7.938 | 58 | 90 | 8 | - | - |
| NDPG507 080 | 8 | 58 | 90 | 8 | - | - |
| NDPG507 081 | 8.1 | 58 | 90 | 9 | - | - |
| NDPG507 082 | 8.2 | 64 | 98 | 9 | - | - |
| NDPG507 083 | 8.3 | 64 | 98 | 9 | - | - |
| NDPG507 084 | 8.4 | 64 | 98 | 9 | - | - |
| NDPG507 085 | 8.5 | 64 | 98 | 9 | M10x1.5 | WH1~4 |
| NDPG507 086 | 8.6 | 64 | 98 | 9 | M10x1.5 | WH5~6 |
| NDPG507 087 | 8.7 | 64 | 98 | 9 | - | - |
| NDPG507 08731 | 8.731 | 64 | 98 | 9 | - | - |
| NDPG507 088 | 8.8 | 64 | 98 | 9 | M10x1.25 | WH1~4 |
| NDPG507 089 | 8.9 | 64 | 98 | 9 | M10x1.25 | WH5~6 |
| NDPG507 090 | 9 | 64 | 98 | 9 | M10x1.0 | WH1~4 |
| NDPG507 091 | 9.1 | 64 | 98 | 10 | M10x1.0 | WH5~6 |
| NDPG507 092 | 9.2 | 68 | 105 | 10 | - | - |
| NDPG507 093 | 9.3 | 68 | 105 | 10 | - | - |
| NDPG507 094 | 9.4 | 68 | 105 | 10 | - | - |
| NDPG507 095 | 9.5 | 68 | 105 | 10 | - | - |
| NDPG507 09525 | 9.525 | 68 | 105 | 10 | - | - |
| NDPG507 096 | 9.6 | 68 | 105 | 10 | - | - |
| NDPG507 097 | 9.7 | 68 | 105 | 10 | - | - |
| NDPG507 098 | 9.8 | 68 | 105 | 10 | - | - |
| NDPG507 099 | 9.9 | 68 | 105 | 10 | - | - |
| NDPG507 100 | 10 | 68 | 105 | 10 | - | - |
| NDPG507 101 | 10.1 | 68 | 105 | 11 | - | - |
| NDPG507 102 | 10.2 | 73 | 110 | 11 | - | - |
| NDPG507 103 | 10.3 | 73 | 110 | 11 | M12x1.75 | WH1~2 |
| NDPG507 10319 | 10.319 | 73 | 110 | 11 | M12x1.75 | WH3~4 |
| NDPG507 104 | 10.4 | 73 | 110 | 11 | M12x1.75 | WH5~6 |
| NDPG507 105 | 10.5 | 73 | 110 | 11 | M12x1.5 | WH1~4 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 106 | 10.6 | 73 | 110 | 11 | M12x1.5 | WH5~6 |
| NDPG507 107 | 10.7 | 73 | 110 | 11 | - | - |
| NDPG507 10716 | 10.716 | 73 | 110 | 11 | - | - |
| NDPG507 108 | 10.8 | 73 | 110 | 11 | M12x1.25 | WH1~4 |
| NDPG507 109 | 10.9 | 73 | 110 | 11 | M12x1.25 | WH5~6 |
| NDPG507 110 | 11 | 73 | 110 | 11 | M12x1.0 | WH1~4 |
| NDPG507 111 | 11.1 | 73 | 110 | 12 | M12x1.0 | WH5~6 |
| NDPG507 11113 | 11.113 | 80 | 120 | 12 | - | - |
| NDPG507 112 | 11.2 | 80 | 120 | 12 | - | - |
| NDPG507 113 | 11.3 | 80 | 120 | 12 | - | - |
| NDPG507 114 | 11.4 | 80 | 120 | 12 | - | - |
| NDPG507 115 | 11.5 | 80 | 120 | 12 | - | - |
| NDPG507 116 | 11.6 | 80 | 120 | 12 | - | - |
| NDPG507 117 | 11.7 | 80 | 120 | 12 | - | - |
| NDPG507 118 | 11.8 | 80 | 120 | 12 | - | - |
| NDPG507 119 | 11.9 | 80 | 120 | 12 | - | - |
| NDPG507 120 | 12 | 80 | 120 | 12 | M14x2.0 | WH1~4 |
| NDPG507 121 | 12.1 | 80 | 120 | 13 | M14x2.0 | WH5~6 |
| NDPG507 122 | 12.2 | 90 | 137 | 13 | - | - |
| NDPG507 123 | 12.3 | 90 | 137 | 13 | - | - |
| NDPG507 124 | 12.4 | 90 | 137 | 13 | - | - |
| NDPG507 125 | 12.5 | 90 | 137 | 13 | M14x1.5 | WH1~4 |
| NDPG507 126 | 12.6 | 90 | 137 | 13 | M14x1.5 | WH5~6 |
| NDPG507 127 | 12.7 | 90 | 137 | 13 | - | - |
| NDPG507 128 | 12.8 | 90 | 137 | 13 | - | - |
| NDPG507 129 | 12.9 | 90 | 137 | 13 | - | - |
| NDPG507 130 | 13 | 90 | 137 | 13 | - | - |
| NDPG507 131 | 13.1 | 90 | 137 | 14 | - | - |
| NDPG507 133 | 13.3 | 96 | 147 | 14 | - | - |
| NDPG507 134 | 13.4 | 96 | 147 | 14 | - | - |
| NDPG507 13494 | 13.494 | 96 | 147 | 14 | - | - |
| NDPG507 135 | 13.5 | 96 | 147 | 14 | - | - |
| NDPG507 136 | 13.6 | 96 | 147 | 14 | - | - |
| NDPG507 137 | 13.7 | 96 | 147 | 14 | - | - |
| NDPG507 138 | 13.8 | 96 | 147 | 14 | - | - |
| NDPG507 13891 | 13.891 | 96 | 147 | 14 | - | - |
| NDPG507 139 | 13.9 | 96 | 147 | 14 | - | - |
| NDPG507 140 | 14 | 96 | 147 | 14 | M16x2.0 | WH1~4 |
| NDPG507 141 | 14.1 | 96 | 147 | 15 | M16x2.0 | WH5~6 |
| NDPG507 142 | 14.2 | 100 | 153 | 15 | - | - |
| NDPG507 14288 | 14.288 | 100 | 153 | 15 | - | - |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 143 | 14.3 | 100 | 153 | 15 | - | - |
| NDPG507 145 | 14.5 | 100 | 153 | 15 | M16x1.5 | WH1~4 |
| NDPG507 146 | 14.6 | 100 | 153 | 15 | M16x1.5 | WH5~6 |
| NDPG507 147 | 14.7 | 100 | 153 | 15 | - | - |
| NDPG507 148 | 14.8 | 100 | 153 | 15 | - | - |
| NDPG507 149 | 14.9 | 100 | 153 | 15 | - | - |
| NDPG507 150 | 15 | 100 | 153 | 15 | - | - |
| NDPG507 151 | 15.1 | 100 | 153 | 16 | - | - |
| NDPG507 154 | 15.4 | 112 | 160 | 16 | - | - |
| NDPG507 155 | 15.5 | 112 | 160 | 16 | M18x2.5 | WH1~4 |
| NDPG507 156 | 15.6 | 112 | 160 | 16 | M18x2.5 | WH5~6 |
| NDPG507 157 | 15.7 | 112 | 160 | 16 | - | - |
| NDPG507 158 | 15.8 | 112 | 160 | 16 | - | - |
| NDPG507 15875 | 15.875 | 112 | 160 | 16 | - | - |
| NDPG507 160 | 16 | 112 | 160 | 16 | - | - |
| NDPG507 161 | 16.1 | 112 | 160 | 17 | - | - |
| NDPG507 163 | 16.3 | 112 | 160 | 17 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPG507 165 | 16.5 | 112 | 160 | 17 | M18x1.5 | WH1~6 |
| NDPG507 16669 | 16.669 | 112 | 160 | 17 | - | - |
| NDPG507 170 | 17 | 112 | 160 | 17 | - | - |
| NDPG507 171 | 17.1 | 112 | 160 | 18 | - | - |
| NDPG507 172 | 17.2 | 112 | 160 | 18 | - | - |
| NDPG507 17463 | 17.463 | 112 | 160 | 18 | - | - |
| NDPG507 175 | 17.5 | 112 | 160 | 18 | M20x2.5 | WH1~6 |
| NDPG507 177 | 17.7 | 112 | 160 | 18 | - | - |
| NDPG507 178 | 17.8 | 112 | 160 | 18 | - | - |
| NDPG507 180 | 18 | 112 | 160 | 18 | - | - |
| NDPG507 182 | 18.2 | 112 | 160 | 19 | - | - |
| NDPG507 185 | 18.5 | 112 | 160 | 19 | M20x1.5 | WH1~6 |
| NDPG507 190 | 19 | 112 | 160 | 19 | - | - |
| NDPG507 195 | 19.5 | 112 | 160 | 20 | M22x2.5 | WH1~6 |
| NDPG507 197 | 19.7 | 112 | 160 | 20 | - | - |
| NDPG507 200 | 20 | 112 | 160 | 20 | - | - |

## ■ Applicable Working Material

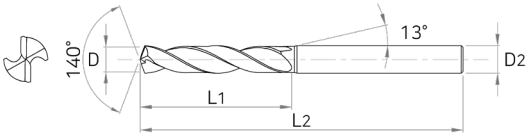
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ◎ | ◎ | ○ | ○ | | | | ○ | | ◎ |

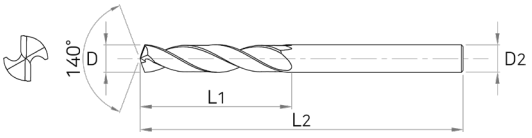
○ : GOOD ◎ : EXCELLENT

# NDPK504(NDPR/L504)

NEW DOLPHIN CAST IRON DRILL

NEW DOLPHIN






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.010 | h6 |
| D3.1~D6 | 0~-0.012 | |
| D6.1~D10 | 0~-0.015 | |
| D10.1~D18 | 0~-0.018 | |
| D18.1~ | 0~-0.021 | |

CARBIDE | AlCrN | 4D | 30° HELIX | 140° | DATA P.708

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 010 | 1 | 8 | 38 | 3 | - | - |
| NDPK504 011 | 1.1 | 9 | 42 | 3 | - | - |
| NDPK504 012 | 1.2 | 10 | 42 | 3 | - | - |
| NDPK504 013 | 1.3 | 10 | 42 | 3 | - | - |
| NDPK504 014 | 1.4 | 11 | 42 | 3 | - | - |
| NDPK504 015 | 1.5 | 11 | 42 | 3 | - | - |
| NDPK504 016 | 1.6 | 12 | 42 | 3 | - | - |
| NDPK504 017 | 1.7 | 12 | 42 | 3 | - | - |
| NDPK504 018 | 1.8 | 13 | 42 | 3 | - | - |
| NDPK504 019 | 1.9 | 13 | 42 | 3 | - | - |
| NDPK504 020 | 2 | 18 | 50 | 3 | - | - |
| NDPK504 021 | 2.1 | 18 | 50 | 3 | - | - |
| NDPK504 022 | 2.2 | 18 | 50 | 3 | - | - |
| NDPK504 023 | 2.3 | 18 | 50 | 3 | - | - |
| NDPK504 024 | 2.4 | 18 | 50 | 3 | - | - |
| NDPK504 025 | 2.5 | 18 | 50 | 3 | M3x0.5 | WH1~4 |
| NDPK504 026 | 2.6 | 18 | 50 | 3 | M3x0.5 | WH5~6 |
| NDPK504 027 | 2.7 | 18 | 50 | 3 | - | - |
| NDPK504 028 | 2.8 | 18 | 50 | 3 | - | - |
| NDPK504 029 | 2.9 | 18 | 50 | 3 | - | - |
| NDPK504 030 | 3 | 20 | 55 | 3 | - | - |
| NDPK504 031 | 3.1 | 20 | 55 | 4 | - | - |
| NDPK504 03175 | 3.175 | 20 | 55 | 4 | - | - |
| NDPK504 032 | 3.2 | 20 | 55 | 4 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 03264 | 3.264 | 20 | 55 | 4 | - | - |
| NDPK504 033 | 3.3 | 20 | 55 | 4 | M4x0.7 | WH1~4 |
| NDPK504 034 | 3.4 | 20 | 55 | 4 | M4x0.7 | WH 5~6 |
| NDPK504 035 | 3.5 | 20 | 55 | 4 | - | - |
| NDPK504 03572 | 3.572 | 25 | 55 | 4 | - | - |
| NDPK504 036 | 3.6 | 25 | 55 | 4 | - | - |
| NDPK504 037 | 3.7 | 25 | 55 | 4 | - | - |
| NDPK504 038 | 3.8 | 25 | 55 | 4 | - | - |
| NDPK504 039 | 3.9 | 25 | 55 | 4 | - | - |
| NDPK504 040 | 4 | 25 | 55 | 4 | - | - |
| NDPK504 04039 | 4.039 | 25 | 55 | 5 | - | - |
| NDPK504 041 | 4.1 | 25 | 55 | 5 | - | - |
| NDPK504 042 | 4.2 | 33 | 63 | 5 | M5x0.8 | WH1~4 |
| NDPK504 043 | 4.3 | 33 | 63 | 5 | M5x0.8 | WH5~6 |
| NDPK504 044 | 4.4 | 33 | 63 | 5 | - | - |
| NDPK504 045 | 4.5 | 33 | 63 | 5 | - | - |
| NDPK504 046 | 4.6 | 33 | 63 | 5 | - | - |
| NDPK504 047 | 4.7 | 33 | 63 | 5 | - | - |
| NDPK504 04763 | 4.763 | 33 | 63 | 5 | - | - |
| NDPK504 048 | 4.8 | 33 | 63 | 5 | - | - |
| NDPK504 049 | 4.9 | 33 | 63 | 5 | - | - |
| NDPK504 050 | 5 | 33 | 63 | 5 | M6x1.0 | WH1~4 |
| NDPK504 051 | 5.1 | 33 | 63 | 6 | M6x1.0 | WH5~6 |
| NDPK504 05159 | 5.159 | 36 | 66 | 6 | - | - |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

○ : GOOD ◎ : EXCELLENT

# NDPK504(NDPR/L504)

NEW DOLPHIN CAST IRON DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 052 | 5.2 | 36 | 66 | 6 | - | - |
| NDPK504 053 | 5.3 | 36 | 66 | 6 | - | - |
| NDPK504 054 | 5.4 | 36 | 66 | 6 | - | - |
| NDPK504 055 | 5.5 | 36 | 66 | 6 | - | - |
| NDPK504 05556 | 5.556 | 36 | 66 | 6 | - | - |
| NDPK504 056 | 5.6 | 36 | 66 | 6 | - | - |
| NDPK504 057 | 5.7 | 36 | 66 | 6 | - | - |
| NDPK504 058 | 5.8 | 36 | 66 | 6 | - | - |
| NDPK504 059 | 5.9 | 36 | 66 | 6 | - | - |
| NDPK504 05953 | 5.953 | 36 | 66 | 6 | - | - |
| NDPK504 060 | 6 | 36 | 66 | 6 | - | - |
| NDPK504 061 | 6.1 | 36 | 66 | 7 | - | - |
| NDPK504 062 | 6.2 | 42 | 75 | 7 | - | - |
| NDPK504 063 | 6.3 | 42 | 75 | 7 | - | - |
| NDPK504 0635 | 6.35 | 42 | 75 | 7 | - | - |
| NDPK504 064 | 6.4 | 42 | 75 | 7 | - | - |
| NDPK504 065 | 6.5 | 42 | 75 | 7 | - | - |
| NDPK504 066 | 6.6 | 42 | 75 | 7 | - | - |
| NDPK504 067 | 6.7 | 42 | 75 | 7 | - | - |
| NDPK504 06747 | 6.747 | 42 | 75 | 7 | - | - |
| NDPK504 068 | 6.8 | 42 | 75 | 7 | M8x1.25 | WH1~4 |
| NDPK504 069 | 6.9 | 42 | 75 | 7 | M8x1.25 | WH5~6 |
| NDPK504 070 | 7 | 42 | 75 | 7 | M8x1.0 | WH1~4 |
| NDPK504 071 | 7.1 | 42 | 75 | 8 | M8x1.0 | WH5~6 |
| NDPK504 07144 | 7.144 | 46 | 80 | 8 | - | - |
| NDPK504 072 | 7.2 | 46 | 80 | 8 | - | - |
| NDPK504 073 | 7.3 | 46 | 80 | 8 | - | - |
| NDPK504 074 | 7.4 | 46 | 80 | 8 | - | - |
| NDPK504 075 | 7.5 | 46 | 80 | 8 | - | - |
| NDPK504 07541 | 7.541 | 46 | 80 | 8 | - | - |
| NDPK504 076 | 7.6 | 46 | 80 | 8 | - | - |
| NDPK504 077 | 7.7 | 46 | 80 | 8 | - | - |
| NDPK504 078 | 7.8 | 46 | 80 | 8 | - | - |
| NDPK504 079 | 7.9 | 46 | 80 | 8 | - | - |
| NDPK504 07938 | 7.938 | 46 | 80 | 8 | - | - |
| NDPK504 080 | 8 | 46 | 80 | 8 | - | - |
| NDPK504 081 | 8.1 | 46 | 80 | 9 | - | - |
| NDPK504 082 | 8.2 | 50 | 85 | 9 | - | - |
| NDPK504 083 | 8.3 | 50 | 85 | 9 | - | - |
| NDPK504 084 | 8.4 | 50 | 85 | 9 | - | - |
| NDPK504 085 | 8.5 | 50 | 85 | 9 | M10x1.5 | WH1~4 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 086 | 8.6 | 50 | 85 | 9 | M10x1.5 | WH5~6 |
| NDPK504 087 | 8.7 | 50 | 85 | 9 | - | - |
| NDPK504 08731 | 8.731 | 50 | 85 | 9 | - | - |
| NDPK504 088 | 8.8 | 50 | 85 | 9 | M10x1.25 | WH1~4 |
| NDPK504 089 | 8.9 | 50 | 85 | 9 | M10x1.25 | WH5~6 |
| NDPK504 090 | 9 | 50 | 85 | 9 | M10x1.0 | WH1~4 |
| NDPK504 091 | 9.1 | 50 | 85 | 10 | M10x1.0 | WH5~6 |
| NDPK504 092 | 9.2 | 55 | 90 | 10 | - | - |
| NDPK504 093 | 9.3 | 55 | 90 | 10 | - | - |
| NDPK504 094 | 9.4 | 55 | 90 | 10 | - | - |
| NDPK504 095 | 9.5 | 55 | 90 | 10 | - | - |
| NDPK504 09525 | 9.525 | 55 | 90 | 10 | - | - |
| NDPK504 096 | 9.6 | 55 | 90 | 10 | - | - |
| NDPK504 097 | 9.7 | 55 | 90 | 10 | - | - |
| NDPK504 098 | 9.8 | 55 | 90 | 10 | - | - |
| NDPK504 099 | 9.9 | 55 | 90 | 10 | - | - |
| NDPK504 100 | 10 | 55 | 90 | 10 | - | - |
| NDPK504 101 | 10.1 | 55 | 90 | 11 | - | - |
| NDPK504 102 | 10.2 | 57 | 95 | 11 | - | - |
| NDPK504 103 | 10.3 | 57 | 95 | 11 | M12x1.75 | WH1~2 |
| NDPK504 10319 | 10.319 | 57 | 95 | 11 | M12x1.75 | WH3~4 |
| NDPK504 104 | 10.4 | 57 | 95 | 11 | M12x1.75 | WH5~6 |
| NDPK504 105 | 10.5 | 57 | 95 | 11 | M12x1.5 | WH1~4 |
| NDPK504 106 | 10.6 | 57 | 95 | 11 | M12x1.5 | WH5~6 |
| NDPK504 107 | 10.7 | 57 | 95 | 11 | - | - |
| NDPK504 10716 | 10.716 | 57 | 95 | 11 | - | - |
| NDPK504 108 | 10.8 | 57 | 95 | 11 | M12x1.25 | WH1~4 |
| NDPK504 109 | 10.9 | 57 | 95 | 11 | M12x1.25 | WH5~6 |
| NDPK504 110 | 11 | 57 | 95 | 11 | M12x1.0 | WH1~4 |
| NDPK504 111 | 11.1 | 57 | 95 | 12 | M12x1.0 | WH5~6 |
| NDPK504 11113 | 11.113 | 63 | 102 | 12 | - | - |
| NDPK504 112 | 11.2 | 63 | 102 | 12 | - | - |
| NDPK504 113 | 11.3 | 63 | 102 | 12 | - | - |
| NDPK504 114 | 11.4 | 63 | 102 | 12 | - | - |
| NDPK504 115 | 11.5 | 63 | 102 | 12 | - | - |
| NDPK504 116 | 11.6 | 63 | 102 | 12 | - | - |
| NDPK504 117 | 11.7 | 63 | 102 | 12 | - | - |
| NDPK504 118 | 11.8 | 63 | 102 | 12 | - | - |
| NDPK504 119 | 11.9 | 63 | 102 | 12 | - | - |
| NDPK504 120 | 12 | 63 | 102 | 12 | M14x2.0 | WH1~4 |
| NDPK504 121 | 12.1 | 63 | 102 | 13 | M14x2.0 | WH5~6 |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

○ : GOOD ◎ : EXCELLENT

# NDPK504(NDPR/L504)

NEW DOLPHIN CAST IRON DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 122 | 12.2 | 63 | 102 | 13 | - | - |
| NDPK504 123 | 12.3 | 63 | 102 | 13 | - | - |
| NDPK504 124 | 12.4 | 63 | 102 | 13 | - | - |
| NDPK504 125 | 12.5 | 63 | 102 | 13 | M14x1.5 | WH1~4 |
| NDPK504 126 | 12.6 | 63 | 102 | 13 | M14x1.5 | WH5~6 |
| NDPK504 127 | 12.7 | 63 | 102 | 13 | - | - |
| NDPK504 128 | 12.8 | 63 | 102 | 13 | - | - |
| NDPK504 129 | 12.9 | 63 | 102 | 13 | - | - |
| NDPK504 130 | 13 | 63 | 102 | 13 | - | - |
| NDPK504 131 | 13.1 | 63 | 102 | 14 | - | - |
| NDPK504 132 | 13.2 | 65 | 107 | 14 | - | - |
| NDPK504 133 | 13.3 | 65 | 107 | 14 | - | - |
| NDPK504 134 | 13.4 | 65 | 107 | 14 | - | - |
| NDPK504 13494 | 13.494 | 65 | 107 | 14 | - | - |
| NDPK504 135 | 13.5 | 65 | 107 | 14 | - | - |
| NDPK504 136 | 13.6 | 65 | 107 | 14 | - | - |
| NDPK504 137 | 13.7 | 65 | 107 | 14 | - | - |
| NDPK504 138 | 13.8 | 65 | 107 | 14 | - | - |
| NDPK504 139 | 13.9 | 65 | 107 | 14 | - | - |
| NDPK504 140 | 14 | 65 | 107 | 14 | M16x2.0 | WH1~4 |
| NDPK504 141 | 14.1 | 65 | 107 | 15 | M16x2.0 | WH5~6 |
| NDPK504 142 | 14.2 | 67 | 111 | 15 | - | - |
| NDPK504 143 | 14.3 | 67 | 111 | 15 | - | - |
| NDPK504 144 | 14.4 | 67 | 111 | 15 | - | - |
| NDPK504 145 | 14.5 | 67 | 111 | 15 | M16x1.5 | WH1~4 |
| NDPK504 146 | 14.6 | 67 | 111 | 15 | M16x1.5 | WH5~6 |
| NDPK504 147 | 14.7 | 67 | 111 | 15 | - | - |
| NDPK504 148 | 14.8 | 67 | 111 | 15 | - | - |
| NDPK504 149 | 14.9 | 67 | 111 | 15 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK504 150 | 15 | 67 | 111 | 15 | - | - |
| NDPK504 151 | 15.1 | 67 | 111 | 16 | - | - |
| NDPK504 152 | 15.2 | 69 | 115 | 16 | - | - |
| NDPK504 154 | 15.4 | 69 | 115 | 16 | - | - |
| NDPK504 155 | 15.5 | 69 | 115 | 16 | M18x2.5 | WH1~4 |
| NDPK504 156 | 15.6 | 69 | 115 | 16 | M18x2.5 | WH5~6 |
| NDPK504 157 | 15.7 | 69 | 115 | 16 | - | - |
| NDPK504 158 | 15.8 | 69 | 115 | 16 | - | - |
| NDPK504 15875 | 15.875 | 69 | 115 | 16 | - | - |
| NDPK504 160 | 16 | 69 | 115 | 16 | - | - |
| NDPK504 161 | 16.1 | 69 | 115 | 17 | - | - |
| NDPK504 163 | 16.3 | 71 | 119 | 17 | - | - |
| NDPK504 165 | 16.5 | 71 | 119 | 17 | M18x1.5 | WH1~6 |
| NDPK504 16669 | 16.669 | 71 | 119 | 17 | - | - |
| NDPK504 170 | 17 | 71 | 119 | 17 | - | - |
| NDPK504 171 | 17.1 | 71 | 119 | 18 | - | - |
| NDPK504 172 | 17.2 | 74 | 123 | 18 | - | - |
| NDPK504 175 | 17.5 | 74 | 123 | 18 | M20x2.5 | WH1~6 |
| NDPK504 177 | 17.7 | 74 | 123 | 18 | - | - |
| NDPK504 178 | 17.8 | 74 | 123 | 18 | - | - |
| NDPK504 180 | 18 | 74 | 123 | 18 | - | - |
| NDPK504 181 | 18.1 | 74 | 123 | 19 | - | - |
| NDPK504 182 | 18.2 | 76 | 127 | 19 | - | - |
| NDPK504 185 | 18.5 | 76 | 127 | 19 | M20x1.5 | WH1~6 |
| NDPK504 190 | 19 | 76 | 127 | 19 | - | - |
| NDPK504 191 | 19.1 | 76 | 127 | 20 | - | - |
| NDPK504 195 | 19.5 | 80 | 131 | 20 | M22x2.5 | WH1~6 |
| NDPK504 197 | 19.7 | 80 | 131 | 20 | - | - |
| NDPK504 200 | 20 | 80 | 131 | 20 | - | - |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

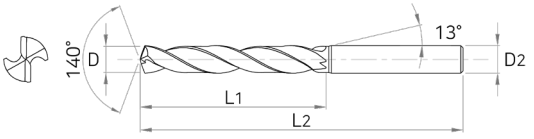
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

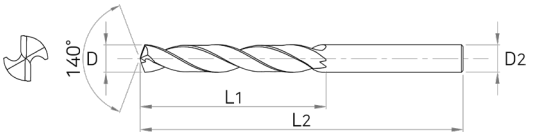
○ : GOOD ◎ : EXCELLENT

# NDPK507(NDPR/L507)

NEW DOLPHIN CAST IRON DRILL

NEW DOLPHIN




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.010 | h6 |
| D3.1~D6 | 0~-0.012 | |
| D6.1~D10 | 0~-0.015 | |
| D10.1~D18 | 0~-0.018 | |
| D18.1~ | 0~-0.021 | |

CARBIDE | AlCrN | 7D | 30° HELIX | 140° | DATA P.708

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 030 | 3 | 45 | 80 | 3 | - | - |
| NDPK507 031 | 3.1 | 45 | 80 | 4 | - | - |
| NDPK507 03175 | 3.175 | 45 | 80 | 4 | - | - |
| NDPK507 032 | 3.2 | 45 | 80 | 4 | - | - |
| NDPK507 03264 | 3.264 | 45 | 80 | 4 | - | - |
| NDPK507 033 | 3.3 | 45 | 80 | 4 | M4x0.7 | WH1~4 |
| NDPK507 034 | 3.4 | 45 | 80 | 4 | M4x0.7 | WH5~6 |
| NDPK507 035 | 3.5 | 45 | 80 | 4 | - | - |
| NDPK507 03572 | 3.572 | 45 | 80 | 4 | - | - |
| NDPK507 036 | 3.6 | 45 | 80 | 4 | - | - |
| NDPK507 037 | 3.7 | 45 | 80 | 4 | - | - |
| NDPK507 038 | 3.8 | 45 | 80 | 4 | - | - |
| NDPK507 039 | 3.9 | 45 | 80 | 4 | - | - |
| NDPK507 040 | 4 | 45 | 80 | 4 | - | - |
| NDPK507 041 | 4.1 | 45 | 80 | 5 | - | - |
| NDPK507 042 | 4.2 | 45 | 80 | 5 | M5x0.8 | WH1~4 |
| NDPK507 043 | 4.3 | 45 | 80 | 5 | M5x0.8 | WH5~6 |
| NDPK507 044 | 4.4 | 45 | 80 | 5 | - | - |
| NDPK507 045 | 4.5 | 45 | 80 | 5 | - | - |
| NDPK507 046 | 4.6 | 45 | 80 | 5 | - | - |
| NDPK507 047 | 4.7 | 45 | 80 | 5 | - | - |
| NDPK507 04763 | 4.763 | 45 | 80 | 5 | - | - |
| NDPK507 048 | 4.8 | 45 | 80 | 5 | - | - |
| NDPK507 049 | 4.9 | 45 | 80 | 5 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 050 | 5 | 45 | 80 | 5 | M6x1.0 | WH1~4 |
| NDPK507 051 | 5.1 | 45 | 80 | 6 | M6x1.0 | WH5~6 |
| NDPK507 05159 | 5.159 | 50 | 83 | 6 | - | - |
| NDPK507 052 | 5.2 | 50 | 83 | 6 | - | - |
| NDPK507 053 | 5.3 | 50 | 83 | 6 | - | - |
| NDPK507 054 | 5.4 | 50 | 83 | 6 | - | - |
| NDPK507 055 | 5.5 | 50 | 83 | 6 | - | - |
| NDPK507 05556 | 5.556 | 50 | 83 | 6 | - | - |
| NDPK507 056 | 5.6 | 50 | 83 | 6 | - | - |
| NDPK507 057 | 5.7 | 50 | 83 | 6 | - | - |
| NDPK507 058 | 5.8 | 50 | 83 | 6 | - | - |
| NDPK507 059 | 5.9 | 50 | 83 | 6 | - | - |
| NDPK507 060 | 6 | 50 | 83 | 6 | - | - |
| NDPK507 061 | 6.1 | 50 | 83 | 7 | - | - |
| NDPK507 062 | 6.2 | 53 | 85 | 7 | - | - |
| NDPK507 063 | 6.3 | 53 | 85 | 7 | - | - |
| NDPK507 0635 | 6.35 | 53 | 85 | 7 | - | - |
| NDPK507 064 | 6.4 | 53 | 85 | 7 | - | - |
| NDPK507 065 | 6.5 | 53 | 85 | 7 | - | - |
| NDPK507 066 | 6.6 | 53 | 85 | 7 | - | - |
| NDPK507 067 | 6.7 | 53 | 85 | 7 | - | - |
| NDPK507 06747 | 6.747 | 53 | 85 | 7 | - | - |
| NDPK507 068 | 6.8 | 53 | 85 | 7 | M8x1.25 | WH1~4 |
| NDPK507 069 | 6.9 | 53 | 85 | 7 | M8x1.25 | WH5~6 |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

○ : GOOD ◎ : EXCELLENT

# NDPK507(NDPR/L507)

NEW DOLPHIN CAST IRON DRILL

NEW DOLPHIN

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 070 | 7 | 53 | 85 | 7 | M8x1.0 | WH1~4 |
| NDPK507 071 | 7.1 | 53 | 85 | 8 | M8x1.0 | WH5~6 |
| NDPK507 07144 | 7.144 | 58 | 90 | 8 | - | - |
| NDPK507 072 | 7.2 | 58 | 90 | 8 | - | - |
| NDPK507 073 | 7.3 | 58 | 90 | 8 | - | - |
| NDPK507 074 | 7.4 | 58 | 90 | 8 | - | - |
| NDPK507 075 | 7.5 | 58 | 90 | 8 | - | - |
| NDPK507 076 | 7.6 | 58 | 90 | 8 | - | - |
| NDPK507 077 | 7.7 | 58 | 90 | 8 | - | - |
| NDPK507 078 | 7.8 | 58 | 90 | 8 | - | - |
| NDPK507 079 | 7.9 | 58 | 90 | 8 | - | - |
| NDPK507 07938 | 7.938 | 58 | 90 | 8 | - | - |
| NDPK507 080 | 8 | 58 | 90 | 8 | - | - |
| NDPK507 081 | 8.1 | 58 | 90 | 9 | - | - |
| NDPK507 082 | 8.2 | 64 | 98 | 9 | - | - |
| NDPK507 083 | 8.3 | 64 | 98 | 9 | - | - |
| NDPK507 084 | 8.4 | 64 | 98 | 9 | - | - |
| NDPK507 085 | 8.5 | 64 | 98 | 9 | M10x1.5 | WH1~4 |
| NDPK507 086 | 8.6 | 64 | 98 | 9 | M10x1.5 | WH5~6 |
| NDPK507 087 | 8.7 | 64 | 98 | 9 | - | - |
| NDPK507 08731 | 8.731 | 64 | 98 | 9 | - | - |
| NDPK507 088 | 8.8 | 64 | 98 | 9 | M10x1.25 | WH1~4 |
| NDPK507 089 | 8.9 | 64 | 98 | 9 | M10x1.25 | WH5~6 |
| NDPK507 090 | 9 | 64 | 98 | 9 | M10x1.0 | WH1~4 |
| NDPK507 091 | 9.1 | 64 | 98 | 10 | M10x1.0 | WH5~6 |
| NDPK507 092 | 9.2 | 68 | 105 | 10 | - | - |
| NDPK507 093 | 9.3 | 68 | 105 | 10 | - | - |
| NDPK507 094 | 9.4 | 68 | 105 | 10 | - | - |
| NDPK507 095 | 9.5 | 68 | 105 | 10 | - | - |
| NDPK507 09525 | 9.525 | 68 | 105 | 10 | - | - |
| NDPK507 096 | 9.6 | 68 | 105 | 10 | - | - |
| NDPK507 097 | 9.7 | 68 | 105 | 10 | - | - |
| NDPK507 098 | 9.8 | 68 | 105 | 10 | - | - |
| NDPK507 099 | 9.9 | 68 | 105 | 10 | - | - |
| NDPK507 100 | 10 | 68 | 105 | 10 | - | - |
| NDPK507 101 | 10.1 | 68 | 105 | 11 | - | - |
| NDPK507 102 | 10.2 | 73 | 110 | 11 | - | - |
| NDPK507 103 | 10.3 | 73 | 110 | 11 | M12x1.75 | WH1~2 |
| NDPK507 10319 | 10.319 | 73 | 110 | 11 | M12x1.75 | WH3~4 |
| NDPK507 104 | 10.4 | 73 | 110 | 11 | M12x1.75 | WH5~6 |
| NDPK507 105 | 10.5 | 73 | 110 | 11 | M12x1.5 | WH1~4 |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 106 | 10.6 | 73 | 110 | 11 | M12x1.5 | WH5~6 |
| NDPK507 107 | 10.7 | 73 | 110 | 11 | - | - |
| NDPK507 10716 | 10.716 | 73 | 110 | 11 | - | - |
| NDPK507 108 | 10.8 | 73 | 110 | 11 | M12x1.25 | WH1~4 |
| NDPK507 109 | 10.9 | 73 | 110 | 11 | M12x1.25 | WH5~6 |
| NDPK507 110 | 11 | 73 | 110 | 11 | M12x1.0 | WH1~4 |
| NDPK507 111 | 11.1 | 73 | 110 | 12 | M12x1.0 | WH5~6 |
| NDPK507 11113 | 11.113 | 80 | 120 | 12 | - | - |
| NDPK507 112 | 11.2 | 80 | 120 | 12 | - | - |
| NDPK507 113 | 11.3 | 80 | 120 | 12 | - | - |
| NDPK507 114 | 11.4 | 80 | 120 | 12 | - | - |
| NDPK507 115 | 11.5 | 80 | 120 | 12 | - | - |
| NDPK507 116 | 11.6 | 80 | 120 | 12 | - | - |
| NDPK507 117 | 11.7 | 80 | 120 | 12 | - | - |
| NDPK507 118 | 11.8 | 80 | 120 | 12 | - | - |
| NDPK507 119 | 11.9 | 80 | 120 | 12 | - | - |
| NDPK507 120 | 12 | 80 | 120 | 12 | M14x2.0 | WH1~4 |
| NDPK507 121 | 12.1 | 80 | 120 | 13 | M14x2.0 | WH5~6 |
| NDPK507 122 | 12.2 | 90 | 137 | 13 | - | - |
| NDPK507 123 | 12.3 | 90 | 137 | 13 | - | - |
| NDPK507 124 | 12.4 | 90 | 137 | 13 | - | - |
| NDPK507 125 | 12.5 | 90 | 137 | 13 | M14x1.5 | WH1~4 |
| NDPK507 126 | 12.6 | 90 | 137 | 13 | M14x1.5 | WH5~6 |
| NDPK507 127 | 12.7 | 90 | 137 | 13 | - | - |
| NDPK507 128 | 12.8 | 90 | 137 | 13 | - | - |
| NDPK507 129 | 12.9 | 90 | 137 | 13 | - | - |
| NDPK507 130 | 13 | 90 | 137 | 13 | - | - |
| NDPK507 131 | 13.1 | 90 | 137 | 14 | - | - |
| NDPK507 133 | 13.3 | 96 | 147 | 14 | - | - |
| NDPK507 134 | 13.4 | 96 | 147 | 14 | - | - |
| NDPK507 13494 | 13.494 | 96 | 147 | 14 | - | - |
| NDPK507 135 | 13.5 | 96 | 147 | 14 | - | - |
| NDPK507 136 | 13.6 | 96 | 147 | 14 | - | - |
| NDPK507 137 | 13.7 | 96 | 147 | 14 | - | - |
| NDPK507 138 | 13.8 | 96 | 147 | 14 | - | - |
| NDPK507 13891 | 13.891 | 96 | 147 | 14 | - | - |
| NDPK507 139 | 13.9 | 96 | 147 | 14 | - | - |
| NDPK507 140 | 14 | 96 | 147 | 14 | M16x2.0 | WH1~4 |
| NDPK507 141 | 14.1 | 96 | 147 | 15 | M16x2.0 | WH5~6 |
| NDPK507 142 | 14.2 | 100 | 153 | 15 | - | - |
| NDPK507 14288 | 14.288 | 100 | 153 | 15 | - | - |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 143 | 14.3 | 100 | 153 | 15 | - | - |
| NDPK507 145 | 14.5 | 100 | 153 | 15 | M16x1.5 | WH1~4 |
| NDPK507 146 | 14.6 | 100 | 153 | 15 | M16x1.5 | WH5~6 |
| NDPK507 147 | 14.7 | 100 | 153 | 15 | - | - |
| NDPK507 148 | 14.8 | 100 | 153 | 15 | - | - |
| NDPK507 149 | 14.9 | 100 | 153 | 15 | - | - |
| NDPK507 150 | 15 | 100 | 153 | 15 | - | - |
| NDPK507 151 | 15.1 | 100 | 153 | 16 | - | - |
| NDPK507 154 | 15.4 | 112 | 160 | 16 | - | - |
| NDPK507 155 | 15.5 | 112 | 160 | 16 | M18x2.5 | WH1~4 |
| NDPK507 156 | 15.6 | 112 | 160 | 16 | M18x2.5 | WH5~6 |
| NDPK507 157 | 15.7 | 112 | 160 | 16 | - | - |
| NDPK507 158 | 15.8 | 112 | 160 | 16 | - | - |
| NDPK507 15875 | 15.875 | 112 | 160 | 16 | - | - |
| NDPK507 160 | 16 | 112 | 160 | 16 | - | - |
| NDPK507 161 | 16.1 | 112 | 160 | 17 | - | - |
| NDPK507 163 | 16.3 | 112 | 160 | 17 | - | - |

| EDP No | SIZES (mm) | | | | TAP | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Size | Limit |
| NDPK507 165 | 16.5 | 112 | 160 | 17 | M18x1.5 | WH1~6 |
| NDPK507 16669 | 16.669 | 112 | 160 | 17 | - | - |
| NDPK507 170 | 17 | 112 | 160 | 17 | - | - |
| NDPK507 171 | 17.1 | 112 | 160 | 18 | - | - |
| NDPK507 172 | 17.2 | 112 | 160 | 18 | - | - |
| NDPK507 17463 | 17.463 | 112 | 160 | 18 | - | - |
| NDPK507 175 | 17.5 | 112 | 160 | 18 | M20x2.5 | WH1~6 |
| NDPK507 177 | 17.7 | 112 | 160 | 18 | - | - |
| NDPK507 178 | 17.8 | 112 | 160 | 18 | - | - |
| NDPK507 180 | 18 | 112 | 160 | 18 | - | - |
| NDPK507 182 | 18.2 | 112 | 160 | 19 | - | - |
| NDPK507 185 | 18.5 | 112 | 160 | 19 | M20x1.5 | WH1~6 |
| NDPK507 190 | 19 | 112 | 160 | 19 | - | - |
| NDPK507 195 | 19.5 | 112 | 160 | 20 | M22x2.5 | WH1~6 |
| NDPK507 197 | 19.7 | 112 | 160 | 20 | - | - |
| NDPK507 200 | 20 | 112 | 160 | 20 | - | - |

※ NDPR/L was renamed to NDPK from January 2023

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ○ | | | | | ◎ | | |

○ : GOOD ◎ : EXCELLENT

# POWER MAX DRILL

## Contents

(INCH : ◆ / METRIC : ◇)

| EDP No / SPEC | Flutes | Geometry | Length 3D | Length 5D | Length 8D | Length 10D | Length 20D | Coolant | Margin | Tolerance | Diameter(Ø) Min | Diameter(Ø) Max | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PF503 ◆◇ | 2F | | ○ | | | | | External | Single | h8 | 2 | 20 | 390 |
| PF505 ◆◇ | | | | ○ | | | | External | Single | h8 | 3 | 20 | 393 |
| SF503 ◆◇ | | | ○ | | | | | Internal | Single | h8 | 3 | 20 | 396 |
| SF505 ◆◇ | | | | ○ | | | | Internal | Single | h8 | 3.1 | 20 | 399 |
| SF508 ◆◇ | | | | | ○ | | | Internal | Single | h7 | 3 | 20 | 402 |
| SF510 ◇ | | | | | | ○ | | Internal | Double | h8 | 3 | 13 | 405 |
| SF520 ◇ | | | | | | | ○ | Internal | Double | h8 | 4.1 | 10 | 407 |
| HP503 ◇ | | | ○ | | | | | External | Double | m7 | 3 | 16 | 409 |
| HPI503 ◇ | | | ○ | | | | | Internal | Double | m7 | 3 | 20 | 411 |
| HPI505 ◆◇ | | | | ○ | | | | Internal | Double | m7 | 3 | 20 | 414 |
| HPI508-N ◆◇ | | | | | ○ | | | Internal | Double | m7 | 3 | 20 | 417 |
| P503A(F) ◇ | | | ○ | | | | | External | Single | m7 | 3 | 20 | 420 |
| P505A(F) ◇ | | | | ○ | | | | External | Single | m7 | 3 | 20 | 423 |
| PI503A(F) ◇ | | | ○ | | | | | Internal | Single | m7 | 3 | 20 | 426 |
| PI505A(F) ◇ | | | | ○ | | | | Internal | Single | m7 | 3 | 20 | 429 |
| PI508 ◇ | | | | | ○ | | | Internal | Single | m7 | 3 | 14 | 432 |

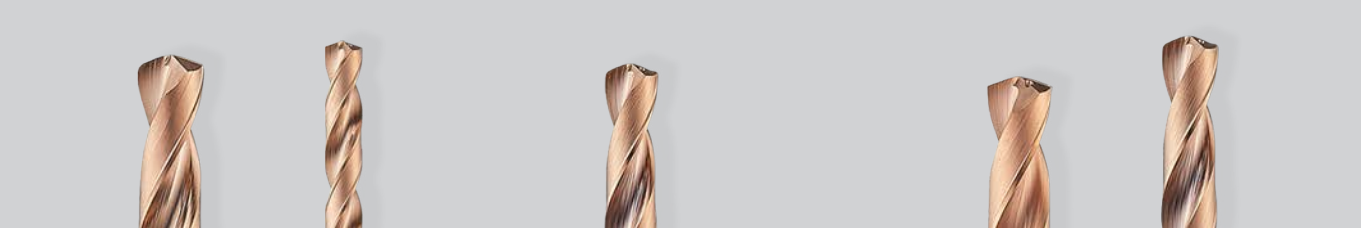
## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| P | I | 5 | 05 | A | 040 |
|---|---|---|---|---|---|

| Section | Appearance | Grade | Drilling Depth | Shank Type | Cutting Dia |
|---|---|---|---|---|---|
| P : Power Max | F : Facet Point | 5 : Grade | 03 : 3D | A : Plane | Ø3 |
| S : Spiral Coolant | I : Internal Coolant | | 05 : 5D | F : DIN 6535 HE | ~ |
| HP : High Precision | | | 08 : 8D | | Ø20 |
| | | | 10 : 10D | | |
| | | | 20 : 20D | | |

Ex) Internal Coolant / Drilling Depth 5D / Cutting Dia Ø4 / Weldon Shank Type / Power Max Drill

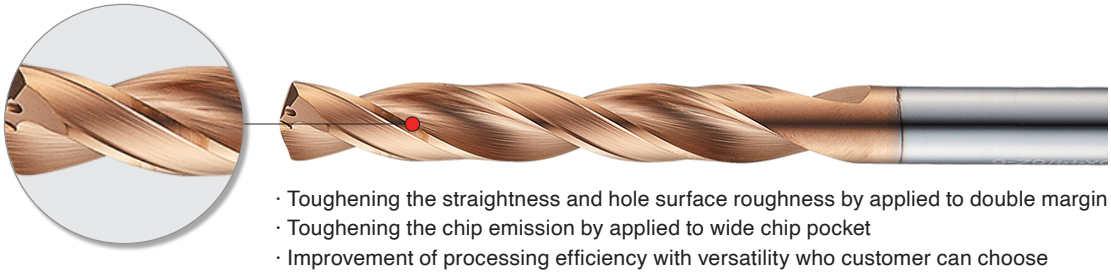


## Characteristics

· Suitable to High speed work for Alloy steels,Cast iron, Stainelss steels,Preharden Steels
[ Recommendation : ~HRc50]
· Extensive coverage of 3D ~ 20D Diameter

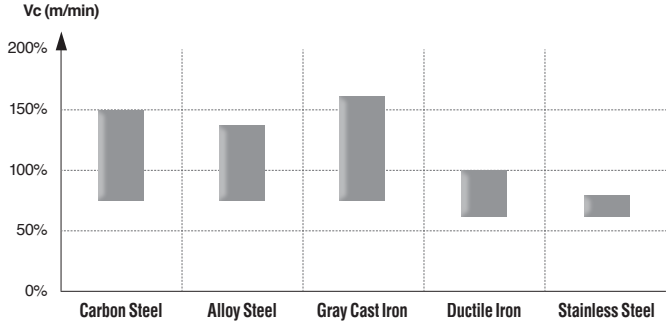
## Features

· High chipping resistance with high feed by used the high toughness material
· Toughening the surface hardness with heat resistance by appelid to TiAlN coating
· Improvement of process-ability with decrease the frictional heat by possess the internal coolant series

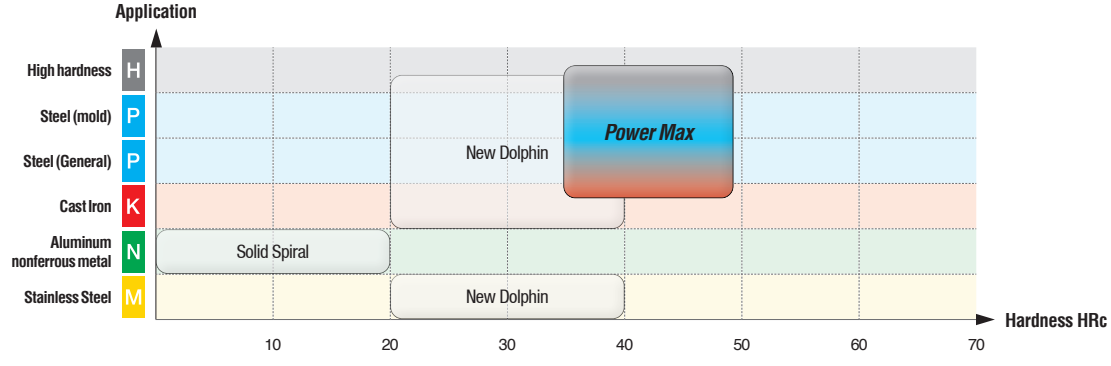


· Toughening the straightness and hole surface roughness by applied to double margin
· Toughening the chip emission by applied to wide chip pocket
· Improvement of processing efficiency with versatility who customer can choose between the external and internal coolant depends on the drilling depth

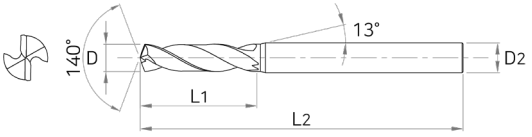
## Vc by Application area

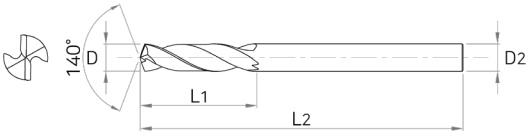



## Applications



# PF503 | HIGH SPEED DRILL - 3D




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~D6 | 0~-0.018 | |
| D6.1~D10 | 0~-0.022 | |
| D10.1~D18 | 0~-0.027 | |
| D18.1~ | 0~-0.033 | |

CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 020 | 2 | - | .0787 | 14 | 50 | 3 |
| PF503 021 | 2.1 | - | .0827 | 14 | 50 | 3 |
| PF503 022 | 2.2 | - | .0866 | 14 | 50 | 3 |
| PF503 023 | 2.3 | - | .0906 | 14 | 50 | 3 |
| PF503 024 | 2.4 | - | .0945 | 14 | 50 | 3 |
| PF503 025 | 2.5 | - | .0984 | 14 | 50 | 3 |
| PF503 026 | 2.6 | - | .1024 | 14 | 50 | 3 |
| PF503 027 | 2.7 | - | .1063 | 14 | 50 | 3 |
| PF503 028 | 2.8 | - | .1102 | 14 | 50 | 3 |
| PF503 029 | 2.9 | - | .1142 | 14 | 50 | 3 |
| PF503 030 | 3 | - | .1181 | 18 | 60 | 3 |
| PF503 031 | 3.1 | - | .1220 | 20 | 60 | 4 |
| PF503 03175 | 3.175 | 1/8 | .1250 | 20 | 60 | 4 |
| PF503 032 | 3.2 | - | .1260 | 20 | 60 | 4 |
| PF503 03264 | 3.264 | - | .1285 | 20 | 60 | 4 |
| PF503 033 | 3.3 | - | .1299 | 20 | 60 | 4 |
| PF503 034 | 3.4 | - | .1339 | 22 | 60 | 4 |
| PF503 035 | 3.5 | - | .1378 | 22 | 60 | 4 |
| PF503 03572 | 3.572 | 9/64 | .1406 | 22 | 60 | 4 |
| PF503 036 | 3.6 | - | .1417 | 22 | 60 | 4 |
| PF503 037 | 3.7 | - | .1457 | 22 | 60 | 4 |
| PF503 038 | 3.8 | - | .1496 | 24 | 60 | 4 |
| PF503 039 | 3.9 | - | .1535 | 24 | 60 | 4 |
| PF503 040 | 4 | - | .1575 | 24 | 60 | 4 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 04039 | 4.039 | - | .1590 | 24 | 60 | 4 |
| PF503 041 | 4.1 | - | .1614 | 24 | 60 | 4 |
| PF503 042 | 4.2 | - | .1654 | 26 | 62 | 5 |
| PF503 043 | 4.3 | - | .1693 | 26 | 62 | 5 |
| PF503 044 | 4.4 | - | .1732 | 26 | 62 | 5 |
| PF503 045 | 4.5 | - | .1772 | 26 | 62 | 5 |
| PF503 046 | 4.6 | - | .1811 | 26 | 62 | 5 |
| PF503 047 | 4.7 | - | .1850 | 26 | 62 | 5 |
| PF503 04763 | 4.763 | 3/16 | .1875 | 26 | 62 | 5 |
| PF503 048 | 4.8 | - | .1890 | 26 | 62 | 5 |
| PF503 049 | 4.9 | - | .1920 | 26 | 62 | 5 |
| PF503 050 | 5 | - | .1969 | 26 | 62 | 5 |
| PF503 051 | 5.1 | - | .2008 | 26 | 62 | 5 |
| PF503 05159 | 5.159 | 13/64 | .2031 | 28 | 66 | 6 |
| PF503 052 | 5.2 | - | .2047 | 28 | 66 | 6 |
| PF503 053 | 5.3 | - | .2087 | 28 | 66 | 6 |
| PF503 054 | 5.4 | - | .2126 | 28 | 66 | 6 |
| PF503 055 | 5.5 | - | .2165 | 28 | 66 | 6 |
| PF503 05558 | 5.558 | 7/32 | .2188 | 30 | 66 | 6 |
| PF503 056 | 5.6 | - | .2205 | 30 | 66 | 6 |
| PF503 057 | 5.7 | - | .2244 | 30 | 66 | 6 |
| PF503 058 | 5.8 | - | .2283 | 30 | 66 | 6 |
| PF503 059 | 5.9 | - | .2323 | 30 | 66 | 6 |
| PF503 05953 | 5.953 | 15/64 | .2344 | 30 | 66 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PF503 | HIGH SPEED DRILL - 3D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 060 | 6 | - | .2362 | 30 | 66 | 6 |
| PF503 061 | 6.1 | - | .2402 | 30 | 66 | 6 |
| PF503 062 | 6.2 | - | .2441 | 34 | 74 | 7 |
| PF503 063 | 6.3 | - | .2480 | 34 | 74 | 7 |
| PF503 0635 | 6.35 | 1/4 | .2500 | 34 | 74 | 7 |
| PF503 064 | 6.4 | - | .2520 | 34 | 74 | 7 |
| PF503 065 | 6.5 | - | .2559 | 34 | 74 | 7 |
| PF503 066 | 6.6 | - | .2598 | 34 | 74 | 7 |
| PF503 067 | 6.7 | - | .2638 | 37 | 74 | 7 |
| PF503 06747 | 6.747 | 17/64 | .2656 | 37 | 74 | 7 |
| PF503 068 | 6.8 | - | .2677 | 37 | 74 | 7 |
| PF503 069 | 6.9 | - | .2717 | 37 | 74 | 7 |
| PF503 070 | 7 | - | .2756 | 37 | 74 | 7 |
| PF503 071 | 7.1 | - | .2795 | 37 | 74 | 7 |
| PF503 07145 | 7.145 | 9/32 | .2813 | 40 | 79 | 8 |
| PF503 072 | 7.2 | - | .2835 | 40 | 79 | 8 |
| PF503 073 | 7.3 | - | .2874 | 40 | 79 | 8 |
| PF503 074 | 7.4 | - | .2913 | 40 | 79 | 8 |
| PF503 075 | 7.5 | - | .2953 | 40 | 79 | 8 |
| PF503 07541 | 7.541 | 19/64 | .2969 | 40 | 79 | 8 |
| PF503 076 | 7.6 | - | .2992 | 40 | 79 | 8 |
| PF503 077 | 7.7 | - | .3031 | 40 | 79 | 8 |
| PF503 078 | 7.8 | - | .3071 | 40 | 79 | 8 |
| PF503 079 | 7.9 | - | .3110 | 40 | 79 | 8 |
| PF503 07938 | 7.938 | 5/16 | .3125 | 40 | 79 | 8 |
| PF503 080 | 8 | - | .3150 | 40 | 79 | 8 |
| PF503 081 | 8.1 | - | .3189 | 40 | 79 | 8 |
| PF503 082 | 8.2 | - | .3228 | 43 | 84 | 9 |
| PF503 083 | 8.3 | - | .3268 | 43 | 84 | 9 |
| PF503 08334 | 8.334 | 21/64 | .3281 | 43 | 84 | 9 |
| PF503 084 | 8.4 | - | .3307 | 43 | 84 | 9 |
| PF503 085 | 8.5 | - | .3320 | 43 | 84 | 9 |
| PF503 086 | 8.6 | - | .3346 | 43 | 84 | 9 |
| PF503 087 | 8.7 | - | .3386 | 43 | 84 | 9 |
| PF503 08733 | 8.733 | - | .3425 | 43 | 84 | 9 |
| PF503 088 | 8.8 | - | .3438 | 43 | 84 | 9 |
| PF503 089 | 8.9 | - | .3465 | 43 | 84 | 9 |
| PF503 090 | 9 | - | .3504 | 43 | 84 | 9 |
| PF503 091 | 9.1 | - | .3543 | 43 | 84 | 9 |
| PF503 09129 | 9.129 | 23/64 | .3594 | 47 | 89 | 10 |
| PF503 092 | 9.2 | - | .3622 | 47 | 89 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 093 | 9.3 | - | .3661 | 47 | 89 | 10 |
| PF503 09347 | 9.347 | - | .3680 | 47 | 89 | 10 |
| PF503 094 | 9.4 | - | .3701 | 47 | 89 | 10 |
| PF503 095 | 9.5 | - | .3740 | 47 | 89 | 10 |
| PF503 09525 | 9.525 | 3/8 | .3750 | 47 | 89 | 10 |
| PF503 096 | 9.6 | - | .3780 | 47 | 89 | 10 |
| PF503 097 | 9.7 | - | .3819 | 47 | 89 | 10 |
| PF503 098 | 9.8 | - | .3858 | 47 | 89 | 10 |
| PF503 099 | 9.9 | - | .3898 | 47 | 89 | 10 |
| PF503 09921 | 9.921 | 25/64 | .3906 | 47 | 89 | 10 |
| PF503 100 | 10 | - | .3937 | 47 | 89 | 10 |
| PF503 101 | 10.1 | - | .3976 | 47 | 89 | 10 |
| PF503 102 | 10.2 | - | .4016 | 51 | 95 | 11 |
| PF503 103 | 10.3 | - | .4055 | 51 | 95 | 11 |
| PF503 1032 | 10.32 | 13/32 | .4063 | 51 | 95 | 11 |
| PF503 104 | 10.4 | - | .4094 | 51 | 95 | 11 |
| PF503 105 | 10.5 | - | .4134 | 51 | 95 | 11 |
| PF503 106 | 10.6 | - | .4173 | 51 | 95 | 11 |
| PF503 107 | 10.7 | - | .4213 | 51 | 95 | 11 |
| PF503 10716 | 10.716 | 27/64 | .4219 | 51 | 95 | 11 |
| PF503 108 | 10.8 | - | .4252 | 51 | 95 | 11 |
| PF503 109 | 10.9 | - | .4291 | 51 | 95 | 11 |
| PF503 110 | 11 | - | .4331 | 51 | 95 | 11 |
| PF503 111 | 11.1 | - | .4370 | 51 | 95 | 11 |
| PF503 11113 | 11.113 | 7/16 | .4375 | 54 | 102 | 12 |
| PF503 112 | 11.2 | - | .4409 | 54 | 102 | 12 |
| PF503 113 | 11.3 | - | .4449 | 54 | 102 | 12 |
| PF503 114 | 11.4 | - | .4488 | 54 | 102 | 12 |
| PF503 115 | 11.5 | - | .4528 | 54 | 102 | 12 |
| PF503 116 | 11.6 | - | .4531 | 54 | 102 | 12 |
| PF503 117 | 11.7 | - | .4567 | 54 | 102 | 12 |
| PF503 118 | 11.8 | - | .4606 | 54 | 102 | 12 |
| PF503 119 | 11.9 | 15/32 | .4646 | 54 | 102 | 12 |
| PF503 11908 | 11.908 | - | .4685 | 54 | 102 | 12 |
| PF503 120 | 12 | - | .4688 | 54 | 102 | 12 |
| PF503 121 | 12.1 | - | .4724 | 54 | 102 | 12 |
| PF503 122 | 12.2 | - | .4803 | 57 | 102 | 13 |
| PF503 123 | 12.3 | - | .4843 | 57 | 102 | 13 |
| PF503 12304 | 12.304 | 31/64 | .4844 | 57 | 102 | 13 |
| PF503 124 | 12.4 | - | .4882 | 57 | 102 | 13 |
| PF503 125 | 12.5 | - | .4921 | 57 | 102 | 13 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PF503 | HIGH SPEED DRILL - 3D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 126 | 12.6 | - | .4961 | 57 | 102 | 13 |
| PF503 127 | 12.7 | - | .5000 | 57 | 102 | 13 |
| PF503 128 | 12.8 | - | .5039 | 57 | 102 | 13 |
| PF503 129 | 12.9 | - | .5079 | 57 | 102 | 13 |
| PF503 130 | 13 | - | .5118 | 57 | 102 | 13 |
| PF503 13096 | 13.096 | 33/64 | .5156 | 57 | 102 | 13 |
| PF503 131 | 13.1 | - | .5157 | 57 | 102 | 13 |
| PF503 132 | 13.2 | - | .5197 | 60 | 107 | 14 |
| PF503 133 | 13.3 | - | .5236 | 60 | 107 | 14 |
| PF503 134 | 13.4 | - | .5276 | 60 | 107 | 14 |
| PF503 13494 | 13.494 | 17/32 | .5313 | 60 | 107 | 14 |
| PF503 135 | 13.5 | - | .5315 | 60 | 107 | 14 |
| PF503 136 | 13.6 | - | .5354 | 60 | 107 | 14 |
| PF503 137 | 13.7 | - | .5394 | 60 | 107 | 14 |
| PF503 138 | 13.8 | - | .5433 | 60 | 107 | 14 |
| PF503 13891 | 13.891 | 35/64 | .5469 | 60 | 107 | 14 |
| PF503 139 | 13.9 | - | .5472 | 60 | 107 | 14 |
| PF503 140 | 14 | - | .5512 | 60 | 107 | 14 |
| PF503 141 | 14.1 | - | .5551 | 60 | 107 | 14 |
| PF503 142 | 14.2 | - | .5591 | 62 | 111 | 15 |
| PF503 14288 | 14.288 | 9/16 | .5625 | 62 | 111 | 15 |
| PF503 143 | 14.3 | - | .5630 | 62 | 111 | 15 |
| PF503 144 | 14.4 | - | .5669 | 62 | 111 | 15 |
| PF503 145 | 14.5 | - | .5709 | 62 | 111 | 15 |
| PF503 146 | 14.6 | - | .5748 | 62 | 111 | 15 |
| PF503 147 | 14.7 | - | .5787 | 62 | 111 | 15 |
| PF503 148 | 14.8 | - | .5827 | 62 | 111 | 15 |
| PF503 149 | 14.9 | - | .5866 | 62 | 111 | 15 |
| PF503 150 | 15 | - | .5906 | 62 | 111 | 15 |
| PF503 15081 | 15.081 | 19/32 | .5937 | 62 | 111 | 15 |

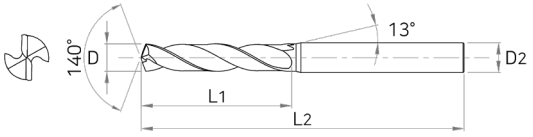
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF503 151 | 15.1 | - | .5945 | 62 | 111 | 15 |
| PF503 152 | 15.2 | - | .5984 | 64 | 115 | 16 |
| PF503 153 | 15.3 | - | .6063 | 64 | 115 | 16 |
| PF503 154 | 15.4 | - | .6102 | 64 | 115 | 16 |
| PF503 155 | 15.5 | - | .6142 | 64 | 115 | 16 |
| PF503 156 | 15.6 | - | .6181 | 64 | 115 | 16 |
| PF503 157 | 15.7 | - | .6220 | 64 | 115 | 16 |
| PF503 158 | 15.8 | - | .6250 | 64 | 115 | 16 |
| PF503 15875 | 15.875 | 5/8 | .6299 | 64 | 115 | 16 |
| PF503 160 | 16 | - | .6339 | 64 | 115 | 16 |
| PF503 161 | 16.1 | - | .3071 | 64 | 115 | 16 |
| PF503 163 | 16.3 | - | .6417 | 66 | 119 | 17 |
| PF503 165 | 16.5 | - | .6496 | 66 | 119 | 17 |
| PF503 16667 | 16.667 | 21/32 | .6562 | 66 | 119 | 17 |
| PF503 170 | 17 | - | .6693 | 66 | 119 | 17 |
| PF503 171 | 17.1 | - | .6732 | 66 | 119 | 17 |
| PF503 172 | 17.2 | - | .6772 | 66 | 123 | 18 |
| PF503 17463 | 17.463 | 11/16 | .6772 | 66 | 123 | 18 |
| PF503 175 | 17.5 | - | .6875 | 66 | 123 | 18 |
| PF503 177 | 17.7 | - | .6890 | 66 | 123 | 18 |
| PF503 178 | 17.8 | - | .6969 | 66 | 123 | 18 |
| PF503 180 | 18 | - | .7008 | 66 | 123 | 18 |
| PF503 181 | 18.1 | - | .7087 | 66 | 123 | 18 |
| PF503 182 | 18.2 | - | .7165 | 70 | 127 | 19 |
| PF503 185 | 18.5 | - | .7283 | 70 | 127 | 19 |
| PF503 190 | 19 | - | .7480 | 70 | 127 | 19 |
| PF503 191 | 19.1 | - | .7520 | 70 | 127 | 19 |
| PF503 195 | 19.5 | - | .7677 | 70 | 131 | 20 |
| PF503 197 | 19.7 | - | .7756 | 70 | 131 | 20 |
| PF503 200 | 20 | - | .7874 | 70 | 131 | 20 |

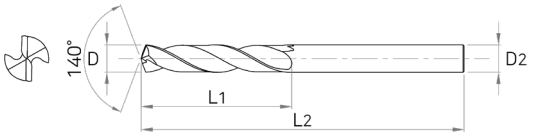
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PF505 | HIGH SPEED DRILL - 5D




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~D6 | 0~-0.018 | |
| D6.1~D10 | 0~-0.022 | |
| D10.1~D18 | 0~-0.027 | |
| D18.1~ | 0~-0.033 | |

CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 030 | 3 | - | .1181 | 25 | 60 | 3 |
| PF505 031 | 3.1 | - | .122 | 27 | 60 | 4 |
| PF505 03175 | 3.175 | 1/8 | .125 | 27 | 60 | 4 |
| PF505 032 | 3.2 | - | .126 | 27 | 60 | 4 |
| PF505 03264 | 3.264 | #30 | .1285 | 27 | 60 | 4 |
| PF505 033 | 3.3 | - | .1299 | 27 | 60 | 4 |
| PF505 034 | 3.4 | - | .1339 | 30 | 65 | 4 |
| PF505 035 | 3.5 | - | .1378 | 30 | 65 | 4 |
| PF505 03572 | 3.572 | 9/64 | .1406 | 30 | 65 | 4 |
| PF505 036 | 3.6 | - | .1417 | 30 | 65 | 4 |
| PF505 037 | 3.7 | - | .1457 | 30 | 65 | 4 |
| PF505 038 | 3.8 | - | .1496 | 33 | 71 | 4 |
| PF505 039 | 3.9 | - | .1535 | 33 | 71 | 4 |
| PF505 040 | 4 | - | .1575 | 33 | 71 | 4 |
| PF505 04039 | 4.039 | #21 | .1575 | 33 | 71 | 5 |
| PF505 041 | 4.1 | - | .159 | 33 | 71 | 5 |
| PF505 042 | 4.2 | - | .1614 | 33 | 71 | 5 |
| PF505 043 | 4.3 | - | .1654 | 36 | 71 | 5 |
| PF505 044 | 4.4 | - | .1693 | 36 | 71 | 5 |
| PF505 045 | 4.5 | - | .1732 | 36 | 71 | 5 |
| PF505 046 | 4.6 | - | .1772 | 36 | 71 | 5 |
| PF505 047 | 4.7 | - | .1811 | 36 | 71 | 5 |
| PF505 04763 | 4.763 | 3/16 | .185 | 39 | 71 | 5 |
| PF505 048 | 4.8 | - | .1875 | 39 | 71 | 5 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 049 | 4.9 | - | .189 | 39 | 71 | 5 |
| PF505 050 | 5 | - | .192 | 39 | 71 | 5 |
| PF505 051 | 5.1 | - | .2008 | 39 | 83 | 6 |
| PF505 05159 | 5.159 | 13/64 | .2031 | 39 | 83 | 6 |
| PF505 052 | 5.2 | - | .2047 | 39 | 83 | 6 |
| PF505 053 | 5.3 | - | .2087 | 39 | 83 | 6 |
| PF505 054 | 5.4 | - | .2126 | 43 | 83 | 6 |
| PF505 055 | 5.5 | - | .2165 | 43 | 83 | 6 |
| PF505 05558 | 5.558 | 7/32 | .2188 | 43 | 83 | 6 |
| PF505 056 | 5.6 | - | .2205 | 43 | 83 | 6 |
| PF505 057 | 5.7 | - | .2244 | 43 | 83 | 6 |
| PF505 058 | 5.8 | - | .2283 | 43 | 83 | 6 |
| PF505 059 | 5.9 | - | .2323 | 43 | 83 | 6 |
| PF505 05953 | 5.953 | 15/64 | .2344 | 43 | 83 | 6 |
| PF505 060 | 6 | - | .2362 | 43 | 83 | 6 |
| PF505 061 | 6.1 | - | .2402 | 47 | 87 | 7 |
| PF505 062 | 6.2 | - | .2441 | 47 | 87 | 7 |
| PF505 063 | 6.3 | - | .248 | 47 | 87 | 7 |
| PF505 065 | 6.35 | 1/4 | .25 | 47 | 87 | 7 |
| PF505 064 | 6.4 | - | .252 | 47 | 87 | 7 |
| PF505 065 | 6.5 | - | .2559 | 47 | 87 | 7 |
| PF505 066 | 6.6 | - | .2598 | 47 | 87 | 7 |
| PF505 067 | 6.7 | - | .2638 | 47 | 87 | 7 |
| PF505 06747 | 6.747 | 17/64 | .2656 | 47 | 87 | 7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PF505 | HIGH SPEED DRILL - 5D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 068 | 6.8 | - | .2677 | 47 | 87 | 7 |
| PF505 069 | 6.9 | - | .2717 | 47 | 87 | 7 |
| PF505 070 | 7 | | .2756 | 47 | 87 | 7 |
| PF505 071 | 7.1 | - | .2795 | 52 | 92 | 8 |
| PF505 07145 | 7.145 | 9/32 | .2813 | 52 | 92 | 8 |
| PF505 072 | 7.2 | - | .2835 | 52 | 92 | 8 |
| PF505 073 | 7.3 | - | .2874 | 52 | 92 | 8 |
| PF505 074 | 7.4 | - | .2913 | 52 | 92 | 8 |
| PF505 075 | 7.5 | - | .2953 | 52 | 92 | 8 |
| PF505 07541 | 7.541 | 19/64 | .2969 | 52 | 92 | 8 |
| PF505 076 | 7.6 | - | .2992 | 52 | 92 | 8 |
| PF505 077 | 7.7 | - | .3031 | 52 | 92 | 8 |
| PF505 078 | 7.8 | - | .3071 | 52 | 92 | 8 |
| PF505 079 | 7.9 | | .311 | 52 | 92 | 8 |
| PF505 07938 | 7.938 | 5/16 | .3125 | 52 | 92 | 8 |
| PF505 080 | 8 | - | .315 | 52 | 92 | 8 |
| PF505 081 | 8.1 | - | .3189 | 56 | 96 | 9 |
| PF505 082 | 8.2 | - | .3228 | 56 | 96 | 9 |
| PF505 083 | 8.3 | - | .3268 | 56 | 96 | 9 |
| PF505 08334 | 8.334 | 21/64 | .3281 | 56 | 96 | 9 |
| PF505 084 | 8.4 | - | .3307 | 56 | 96 | 9 |
| PF505 085 | 8.5 | - | .3346 | 56 | 96 | 9 |
| PF505 086 | 8.6 | - | .3386 | 56 | 96 | 9 |
| PF505 087 | 8.7 | - | .3425 | 56 | 96 | 9 |
| PF505 08733 | 8.733 | 11/32 | .3438 | 56 | 96 | 9 |
| PF505 088 | 8.8 | - | .3465 | 56 | 96 | 9 |
| PF505 089 | 8.9 | - | .3504 | 56 | 96 | 9 |
| PF505 090 | 9 | - | .3543 | 56 | 96 | 9 |
| PF505 091 | 9.1 | - | .3583 | 62 | 105 | 10 |
| PF505 09129 | 9.129 | 23/64 | .3594 | 62 | 105 | 10 |
| PF505 092 | 9.2 | - | .3622 | 62 | 105 | 10 |
| PF505 093 | 9.3 | - | .3661 | 62 | 105 | 10 |
| PF505 094 | 9.4 | - | .3701 | 62 | 105 | 10 |
| PF505 095 | 9.5 | - | .374 | 62 | 105 | 10 |
| PF505 09525 | 9.525 | 3/8 | .375 | 62 | 105 | 10 |
| PF505 096 | 9.6 | - | .378 | 62 | 105 | 10 |
| PF505 097 | 9.7 | - | .3819 | 62 | 105 | 10 |
| PF505 098 | 9.8 | - | .3858 | 62 | 105 | 10 |
| PF505 099 | 9.9 | - | .3898 | 62 | 105 | 10 |
| PF505 09921 | 9.921 | 25/64 | .3906 | 62 | 105 | 10 |
| PF505 100 | 10 | - | .3937 | 62 | 105 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 101 | 10.1 | - | .3976 | 68 | 115 | 11 |
| PF505 102 | 10.2 | - | .4016 | 68 | 115 | 11 |
| PF505 103 | 10.3 | - | .4055 | 68 | 115 | 11 |
| PF505 1032 | 10.32 | 13/32 | .4063 | 68 | 115 | 11 |
| PF505 104 | 10.4 | - | .4094 | 68 | 115 | 11 |
| PF505 105 | 10.5 | - | .4134 | 68 | 115 | 11 |
| PF505 106 | 10.6 | - | .4173 | 68 | 115 | 11 |
| PF505 107 | 10.7 | - | .4213 | 68 | 115 | 11 |
| PF505 10716 | 10.716 | 27/64 | .4219 | 68 | 115 | 11 |
| PF505 108 | 10.8 | - | .4252 | 68 | 115 | 11 |
| PF505 109 | 10.9 | - | .4291 | 68 | 115 | 11 |
| PF505 110 | 11 | - | .4331 | 68 | 115 | 11 |
| PF505 111 | 11.1 | - | .437 | 71 | 121 | 12 |
| PF505 11113 | 11.113 | 7/16 | .4375 | 71 | 121 | 12 |
| PF505 112 | 11.2 | - | .4409 | 71 | 121 | 12 |
| PF505 113 | 11.3 | - | .4449 | 71 | 121 | 12 |
| PF505 114 | 11.4 | - | .4488 | 71 | 121 | 12 |
| PF505 115 | 11.5 | - | .4528 | 71 | 121 | 12 |
| PF505 116 | 11.6 | - | .4567 | 71 | 121 | 12 |
| PF505 117 | 11.7 | - | .4606 | 71 | 121 | 12 |
| PF505 118 | 11.8 | - | .4646 | 71 | 121 | 12 |
| PF505 119 | 11.9 | - | .4685 | 71 | 121 | 12 |
| PF505 11908 | 11.908 | 15/32 | .4688 | 71 | 121 | 12 |
| PF505 120 | 12 | - | .4724 | 71 | 121 | 12 |
| PF505 121 | 12.1 | - | .4764 | 75 | 125 | 13 |
| PF505 122 | 12.2 | - | .4803 | 75 | 125 | 13 |
| PF505 123 | 12.3 | - | .4843 | 75 | 125 | 13 |
| PF505 12304 | 12.304 | 31/64 | .4844 | 75 | 125 | 13 |
| PF505 124 | 12.4 | - | .4882 | 75 | 125 | 13 |
| PF505 125 | 12.5 | - | .4921 | 75 | 125 | 13 |
| PF505 126 | 12.6 | - | .4961 | 75 | 125 | 13 |
| PF505 127 | 12.7 | - | .5 | 75 | 125 | 13 |
| PF505 128 | 12.8 | - | .5039 | 75 | 125 | 13 |
| PF505 129 | 12.9 | - | .5079 | 75 | 125 | 13 |
| PF505 130 | 13 | - | .5118 | 75 | 125 | 13 |
| PF505 13096 | 13.096 | 33/64 | .5156 | 80 | 134 | 14 |
| PF505 131 | 13.1 | - | .5157 | 80 | 134 | 14 |
| PF505 132 | 13.2 | - | .5197 | 80 | 134 | 14 |
| PF505 133 | 13.3 | - | .5236 | 80 | 134 | 14 |
| PF505 134 | 13.4 | - | .5276 | 80 | 134 | 14 |
| PF505 13494 | 13.494 | 17/32 | .5313 | 80 | 134 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PF505 | HIGH SPEED DRILL - 5D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 135 | 13.5 | - | .5315 | 80 | 134 | 14 |
| PF505 136 | 13.6 | - | .5354 | 80 | 134 | 14 |
| PF505 137 | 13.7 | - | .5394 | 80 | 134 | 14 |
| PF505 138 | 13.8 | - | .5433 | 80 | 134 | 14 |
| PF505 13891 | 13.891 | 35/64 | .5469 | 80 | 134 | 14 |
| PF505 139 | 13.9 | - | .5472 | 80 | 134 | 14 |
| PF505 140 | 14 | - | .5512 | 80 | 134 | 14 |
| PF505 141 | 14.1 | - | .5551 | 83 | 143 | 15 |
| PF505 142 | 14.2 | - | .5591 | 83 | 143 | 15 |
| PF505 14288 | 14.288 | - | .5625 | 83 | 143 | 15 |
| PF505 143 | 14.3 | - | .563 | 83 | 143 | 15 |
| PF505 144 | 14.4 | - | .5669 | 83 | 143 | 15 |
| PF505 145 | 14.5 | - | .5709 | 83 | 143 | 15 |
| PF505 146 | 14.6 | - | .5748 | 83 | 143 | 15 |
| PF505 147 | 14.7 | - | .5787 | 83 | 143 | 15 |
| PF505 148 | 14.8 | - | .5827 | 83 | 143 | 15 |
| PF505 149 | 14.9 | - | .5866 | 83 | 143 | 15 |
| PF505 150 | 15 | - | .5906 | 83 | 143 | 15 |
| PF505 15081 | 15.081 | 19/32 | .5937 | 90 | 152 | 16 |
| PF505 151 | 15.1 | - | .5945 | 90 | 152 | 16 |
| PF505 152 | 15.2 | - | .5984 | 90 | 152 | 16 |
| PF505 154 | 15.4 | - | .6063 | 90 | 152 | 16 |
| PF505 155 | 15.5 | - | .6102 | 90 | 152 | 16 |
| PF505 156 | 15.6 | - | .6142 | 90 | 152 | 16 |

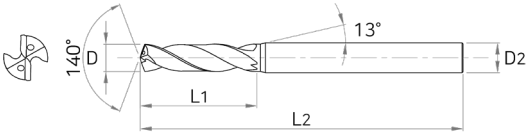
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| PF505 157 | 15.7 | - | .6181 | 90 | 152 | 16 |
| PF505 158 | 15.8 | - | .622 | 90 | 152 | 16 |
| PF505 15875 | 15.875 | 5/8 | .625 | 90 | 152 | 16 |
| PF505 160 | 16 | - | .6299 | 90 | 152 | 16 |
| PF505 161 | 16.1 | - | .6339 | 95 | 155 | 17 |
| PF505 163 | 16.3 | - | .6417 | 95 | 155 | 17 |
| PF505 165 | 16.5 | - | .6496 | 95 | 155 | 17 |
| PF505 166 67 | 16.667 | 21/32 | .6562 | 95 | 155 | 17 |
| PF505 170 | 17 | - | .6693 | 95 | 155 | 17 |
| PF505 171 | 17.1 | - | .6732 | 100 | 157 | 18 |
| PF505 172 | 17.2 | - | .6772 | 100 | 157 | 18 |
| PF505 17463 | 17.463 | 11/16 | .6875 | 100 | 157 | 18 |
| PF505 175 | 17.5 | - | .689 | 100 | 157 | 18 |
| PF505 177 | 17.7 | - | .6969 | 100 | 157 | 18 |
| PF505 178 | 17.8 | - | .7008 | 100 | 157 | 18 |
| PF505 180 | 18 | - | .7087 | 100 | 157 | 18 |
| PF505 181 | 18.1 | - | .7126 | 105 | 160 | 19 |
| PF505 182 | 18.2 | - | .7165 | 105 | 160 | 19 |
| PF505 185 | 18.5 | - | .7283 | 105 | 160 | 19 |
| PF505 190 | 19 | - | .748 | 105 | 160 | 19 |
| PF505 191 | 19.1 | - | .752 | 110 | 163 | 20 |
| PF505 195 | 19.5 | - | .7677 | 110 | 163 | 20 |
| PF505 197 | 19.7 | - | .7756 | 110 | 163 | 20 |
| PF505 200 | 20 | - | .7874 | 110 | 163 | 20 |

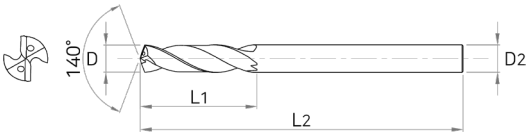
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~D6 | 0~-0.018 | |
| D6.1~D10 | 0~-0.022 | |
| D10.1~D18 | 0~-0.027 | |
| D18.1~ | 0~-0.033 | |

CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 030 | 3 | - | .1181 | 18 | 60 | 3 |
| SF503 031 | 3.1 | - | .1220 | 20 | 60 | 4 |
| SF503 03175 | 3.175 | 1/8 | .1250 | 20 | 60 | 4 |
| SF503 032 | 3.2 | - | .1260 | 20 | 60 | 4 |
| SF503 032 64 | 3.264 | - | .1285 | 20 | 60 | 4 |
| SF503 033 | 3.3 | - | .1299 | 20 | 60 | 4 |
| SF503 034 | 3.4 | - | .1339 | 22 | 60 | 4 |
| SF503 035 | 3.5 | - | .1378 | 22 | 60 | 4 |
| SF503 03572 | 3.572 | 9/64 | .1406 | 22 | 60 | 4 |
| SF503 036 | 3.6 | - | .1417 | 22 | 60 | 4 |
| SF503 037 | 3.7 | - | .1457 | 22 | 60 | 4 |
| SF503 038 | 3.8 | - | .1496 | 24 | 60 | 4 |
| SF503 039 | 3.9 | - | .1535 | 24 | 60 | 4 |
| SF503 040 | 4 | - | .1575 | 24 | 60 | 4 |
| SF503 04039 | 4.039 | - | .1590 | 24 | 62 | 5 |
| SF503 041 | 4.1 | - | .1614 | 24 | 62 | 5 |
| SF503 042 | 4.2 | - | .1654 | 26 | 62 | 5 |
| SF503 043 | 4.3 | - | .1693 | 26 | 62 | 5 |
| SF503 044 | 4.4 | - | .1732 | 26 | 62 | 5 |
| SF503 045 | 4.5 | - | .1772 | 26 | 62 | 5 |
| SF503 046 | 4.6 | - | .1811 | 26 | 62 | 5 |
| SF503 047 | 4.7 | - | .1850 | 26 | 62 | 5 |
| SF503 04763 | 4.763 | 3/16 | .1875 | 26 | 62 | 5 |
| SF503 048 | 4.8 | - | .1890 | 26 | 62 | 5 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 049 | 4.9 | - | .1920 | 26 | 62 | 5 |
| SF503 050 | 5 | - | .1969 | 26 | 62 | 5 |
| SF503 051 | 5.1 | - | .2008 | 28 | 66 | 6 |
| SF503 05159 | 5.159 | 13/64 | .2031 | 28 | 66 | 6 |
| SF503 052 | 5.2 | - | .2047 | 28 | 66 | 6 |
| SF503 053 | 5.3 | - | .2087 | 28 | 66 | 6 |
| SF503 054 | 5.4 | - | .2126 | 28 | 66 | 6 |
| SF503 055 | 5.5 | - | .2165 | 28 | 66 | 6 |
| SF503 05558 | 5.558 | 7/32 | .2188 | 30 | 66 | 6 |
| SF503 056 | 5.6 | - | .2205 | 30 | 66 | 6 |
| SF503 057 | 5.7 | - | .2244 | 30 | 66 | 6 |
| SF503 058 | 5.8 | - | .2283 | 30 | 66 | 6 |
| SF503 059 | 5.9 | - | .2323 | 30 | 66 | 6 |
| SF503 05953 | 5.953 | 15/64 | .2344 | 30 | 66 | 6 |
| SF503 060 | 6 | - | .2362 | 30 | 66 | 6 |
| SF503 061 | 6.1 | - | .2402 | 34 | 74 | 7 |
| SF503 062 | 6.2 | - | .2441 | 34 | 74 | 7 |
| SF503 063 | 6.3 | - | .2480 | 34 | 74 | 7 |
| SF503 063 5 | 6.350 | 1/4 | .2500 | 34 | 74 | 7 |
| SF503 064 | 6.4 | - | .2520 | 34 | 74 | 7 |
| SF503 065 | 6.5 | - | .2559 | 34 | 74 | 7 |
| SF503 066 | 6.6 | - | .2598 | 34 | 74 | 7 |
| SF503 067 | 6.7 | - | .2638 | 37 | 74 | 7 |
| SF503 06747 | 6.747 | 17/64 | .2656 | 37 | 74 | 7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 068 | 6.8 | - | .2677 | 37 | 74 | 7 |
| SF503 069 | 6.9 | - | .2717 | 37 | 74 | 7 |
| SF503 070 | 7 | - | .2756 | 37 | 74 | 7 |
| SF503 071 | 7.1 | - | .2795 | 40 | 79 | 8 |
| SF503 07145 | 7.145 | 9/32 | .2813 | 40 | 79 | 8 |
| SF503 072 | 7.2 | - | .2835 | 40 | 79 | 8 |
| SF503 073 | 7.3 | - | .2874 | 40 | 79 | 8 |
| SF503 074 | 7.4 | - | .2913 | 40 | 79 | 8 |
| SF503 075 | 7.5 | - | .2953 | 40 | 79 | 8 |
| SF503 07541 | 7.541 | 19/64 | .2969 | 40 | 79 | 8 |
| SF503 076 | 7.6 | - | .2992 | 40 | 79 | 8 |
| SF503 077 | 7.7 | - | .3031 | 40 | 79 | 8 |
| SF503 078 | 7.8 | - | .3071 | 40 | 79 | 8 |
| SF503 079 | 7.9 | - | .3110 | 40 | 79 | 8 |
| SF503 07938 | 7.938 | 5/16 | .3125 | 40 | 79 | 8 |
| SF503 080 | 8 | - | .3150 | 40 | 79 | 8 |
| SF503 081 | 8.1 | - | .3189 | 43 | 84 | 9 |
| SF503 082 | 8.2 | - | .3228 | 43 | 84 | 9 |
| SF503 083 | 8.3 | - | .3268 | 43 | 84 | 9 |
| SF503 08334 | 8.334 | 21/64 | .3281 | 43 | 84 | 9 |
| SF503 084 | 8.4 | - | .3307 | 43 | 84 | 9 |
| SF503 085 | 8.5 | - | .3346 | 43 | 84 | 9 |
| SF503 086 | 8.6 | - | .3386 | 43 | 84 | 9 |
| SF503 087 | 8.7 | - | .3425 | 43 | 84 | 9 |
| SF503 08733 | 8.733 | 11/32 | .3438 | 43 | 84 | 9 |
| SF503 088 | 8.8 | - | .3465 | 43 | 84 | 9 |
| SF503 089 | 8.9 | - | .3504 | 43 | 84 | 9 |
| SF503 090 | 9 | - | .3543 | 43 | 84 | 9 |
| SF503 091 | 9.1 | - | .3583 | 47 | 89 | 10 |
| SF503 09129 | 9.129 | 23/64 | .3594 | 47 | 89 | 10 |
| SF503 092 | 9.2 | - | .3622 | 47 | 89 | 10 |
| SF503 093 | 9.3 | - | .3661 | 47 | 89 | 10 |
| SF503 094 | 9.4 | - | .3701 | 47 | 89 | 10 |
| SF503 095 | 9.5 | - | .3740 | 47 | 89 | 10 |
| SF503 09525 | 9.525 | 3/8 | .3750 | 47 | 89 | 10 |
| SF503 096 | 9.6 | - | .3780 | 47 | 89 | 10 |
| SF503 097 | 9.7 | - | .3819 | 47 | 89 | 10 |
| SF503 098 | 9.8 | - | .3858 | 47 | 89 | 10 |
| SF503 099 | 9.9 | - | .3898 | 47 | 89 | 10 |
| SF503 09921 | 9.921 | 25/64 | .3906 | 47 | 89 | 10 |
| SF503 100 | 10 | - | .3937 | 47 | 89 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 101 | 10.1 | - | .3976 | 51 | 95 | 11 |
| SF503 102 | 10.2 | - | .4016 | 51 | 95 | 11 |
| SF503 103 | 10.3 | - | .4055 | 51 | 95 | 11 |
| SF503 1032 | 10.32 | 13/32 | .4063 | 51 | 95 | 11 |
| SF503 104 | 10.4 | - | .4094 | 51 | 95 | 11 |
| SF503 105 | 10.5 | - | .4134 | 51 | 95 | 11 |
| SF503 106 | 10.6 | - | .4173 | 51 | 95 | 11 |
| SF503 107 | 10.7 | - | .4213 | 51 | 95 | 11 |
| SF503 10716 | 10.716 | 27/64 | .4219 | 51 | 95 | 11 |
| SF503 108 | 10.8 | - | .4252 | 51 | 95 | 11 |
| SF503 109 | 10.9 | - | .4291 | 51 | 95 | 11 |
| SF503 110 | 11 | - | .4331 | 51 | 95 | 11 |
| SF503 111 | 11.1 | - | .4370 | 54 | 102 | 12 |
| SF503 11113 | 11.113 | 7/16 | .4375 | 54 | 102 | 12 |
| SF503 112 | 11.2 | - | .4409 | 54 | 102 | 12 |
| SF503 113 | 11.3 | - | .4449 | 54 | 102 | 12 |
| SF503 114 | 11.4 | - | .4488 | 54 | 102 | 12 |
| SF503 115 | 11.5 | - | .4528 | 54 | 102 | 12 |
| SF503 11509 | 11.509 | 29/64 | .4531 | 54 | 102 | 12 |
| SF503 116 | 11.6 | - | .4567 | 54 | 102 | 12 |
| SF503 117 | 11.7 | - | .4606 | 54 | 102 | 12 |
| SF503 118 | 11.8 | - | .4646 | 54 | 102 | 12 |
| SF503 119 | 11.9 | - | .4685 | 54 | 102 | 12 |
| SF503 11908 | 11.908 | 15/32 | .4688 | 54 | 102 | 12 |
| SF503 120 | 12 | - | .4724 | 54 | 102 | 12 |
| SF503 121 | 12.1 | - | .4764 | 57 | 102 | 13 |
| SF503 122 | 12.2 | - | .4803 | 57 | 102 | 13 |
| SF503 123 | 12.3 | - | .4843 | 57 | 102 | 13 |
| SF503 12304 | 12.304 | 31/64 | .4844 | 57 | 102 | 13 |
| SF503 124 | 12.4 | - | .4882 | 57 | 102 | 13 |
| SF503 125 | 12.5 | - | .4921 | 57 | 102 | 13 |
| SF503 126 | 12.6 | - | .4961 | 57 | 102 | 13 |
| SF503 127 | 12.7 | 1/2 | .5000 | 57 | 102 | 13 |
| SF503 128 | 12.8 | - | .5039 | 57 | 102 | 13 |
| SF503 129 | 12.9 | - | .5079 | 57 | 102 | 13 |
| SF503 130 | 13 | - | .5118 | 57 | 102 | 13 |
| SF503 13096 | 13.096 | 33/64 | .5156 | 60 | 107 | 14 |
| SF503 131 | 13.1 | - | .5157 | 60 | 107 | 14 |
| SF503 132 | 13.2 | - | .5197 | 60 | 107 | 14 |
| SF503 133 | 13.3 | - | .5236 | 60 | 107 | 14 |
| SF503 134 | 13.4 | - | .5276 | 60 | 107 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF503 | HIGH SPEED INTERNAL COOLANT DRILL - 3D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 13494 | 13.494 | 17/32 | .5313 | 60 | 107 | 14 |
| SF503 135 | 13.5 | - | .5315 | 60 | 107 | 14 |
| SF503 136 | 13.6 | - | .5354 | 60 | 107 | 14 |
| SF503 137 | 13.7 | - | .5394 | 60 | 107 | 14 |
| SF503 138 | 13.8 | - | .5433 | 60 | 107 | 14 |
| SF503 13891 | 13.891 | 35/64 | .5469 | 60 | 107 | 14 |
| SF503 139 | 13.9 | - | .5472 | 60 | 107 | 14 |
| SF503 140 | 14 | - | .5512 | 60 | 107 | 14 |
| SF503 141 | 14.1 | - | .5551 | 62 | 111 | 15 |
| SF503 142 | 14.2 | - | .5591 | 62 | 111 | 15 |
| SF503 14288 | 14.288 | 9/16 | .5625 | 62 | 111 | 15 |
| SF503 143 | 14.3 | - | .5630 | 62 | 111 | 15 |
| SF503 144 | 14.4 | - | .5669 | 62 | 111 | 15 |
| SF503 145 | 14.5 | - | .5709 | 62 | 111 | 15 |
| SF503 146 | 14.6 | - | .5748 | 62 | 111 | 15 |
| SF503 147 | 14.7 | - | .5787 | 62 | 111 | 15 |
| SF503 148 | 14.8 | - | .5827 | 62 | 111 | 15 |
| SF503 149 | 14.9 | - | .5866 | 62 | 111 | 15 |
| SF503 150 | 15 | - | .5906 | 62 | 111 | 15 |
| SF503 15081 | 15.081 | 19/32 | .5937 | 64 | 115 | 16 |
| SF503 151 | 15.1 | - | .5945 | 64 | 115 | 16 |
| SF503 152 | 15.2 | - | .5984 | 64 | 115 | 16 |
| SF503 154 | 15.4 | - | .6063 | 64 | 115 | 16 |
| SF503 155 | 15.5 | - | .6102 | 64 | 115 | 16 |
| SF503 156 | 15.6 | - | .6142 | 64 | 115 | 16 |

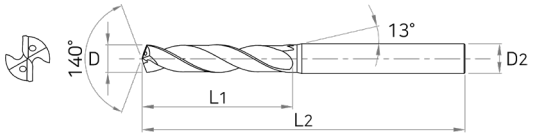
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF503 157 | 15.7 | - | .6181 | 64 | 115 | 16 |
| SF503 158 | 15.8 | - | .6220 | 64 | 115 | 16 |
| SF503 15875 | 15.875 | 5/8 | .6250 | 64 | 115 | 16 |
| SF503 160 | 16 | - | .6299 | 64 | 115 | 16 |
| SF503 161 | 16.1 | - | .6339 | 66 | 119 | 17 |
| SF503 163 | 16.3 | - | .6417 | 66 | 119 | 17 |
| SF503 165 | 16.5 | - | .6496 | 66 | 119 | 17 |
| SF503 16667 | 16.667 | 21/32 | .6562 | 66 | 119 | 17 |
| SF503 170 | 17 | - | .6693 | 66 | 119 | 17 |
| SF503 171 | 17.1 | - | .6732 | 66 | 123 | 18 |
| SF503 172 | 17.2 | - | .6772 | 66 | 123 | 18 |
| SF503 17463 | 17.463 | 11/16 | .6875 | 66 | 123 | 18 |
| SF503 175 | 17.5 | - | .6890 | 66 | 123 | 18 |
| SF503 177 | 17.7 | - | .6969 | 66 | 123 | 18 |
| SF503 178 | 17.8 | - | .7008 | 66 | 123 | 18 |
| SF503 180 | 18 | - | .7087 | 66 | 123 | 18 |
| SF503 181 | 18.1 | - | .7126 | 70 | 127 | 19 |
| SF503 182 | 18.2 | - | .7165 | 70 | 127 | 19 |
| SF503 185 | 18.5 | - | .7283 | 70 | 127 | 19 |
| SF503 190 | 19 | - | .7480 | 70 | 127 | 19 |
| SF503 191 | 19.1 | - | .7520 | 70 | 131 | 20 |
| SF503 195 | 19.5 | - | .7677 | 70 | 131 | 20 |
| SF503 197 | 19.7 | - | .7756 | 70 | 131 | 20 |
| SF503 200 | 20 | - | .7874 | 70 | 131 | 20 |

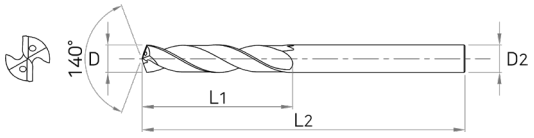
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~D6 | 0~-0.018 | |
| D6.1~D10 | 0~-0.022 | |
| D10.1~D18 | 0~-0.027 | |
| D18.1~ | 0~-0.033 | |

CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 031 | 3.1 | - | .1220 | 27 | 74 | 4 |
| SF505 03175 | 3.175 | 1/8 | .1250 | 27 | 74 | 4 |
| SF505 032 | 3.2 | - | .1260 | 27 | 74 | 4 |
| SF505 03264 | 3.264 | - | .1285 | 27 | 74 | 4 |
| SF505 033 | 3.3 | - | .1299 | 27 | 74 | 4 |
| SF505 034 | 3.4 | - | .1339 | 30 | 74 | 4 |
| SF505 035 | 3.5 | - | .1378 | 30 | 74 | 4 |
| SF505 03572 | 3.572 | 9/64 | .1406 | 30 | 74 | 4 |
| SF505 036 | 3.6 | - | .1417 | 30 | 74 | 4 |
| SF505 037 | 3.7 | - | .1457 | 30 | 74 | 4 |
| SF505 038 | 3.8 | - | .1496 | 33 | 74 | 4 |
| SF505 039 | 3.9 | - | .1535 | 33 | 74 | 4 |
| SF505 040 | 4 | - | .1575 | 33 | 74 | 4 |
| SF505 04039 | 4.039 | - | .1590 | 33 | 80 | 5 |
| SF505 041 | 4.1 | - | .1614 | 33 | 80 | 5 |
| SF505 042 | 4.2 | - | .1654 | 33 | 80 | 5 |
| SF505 043 | 4.3 | - | .1693 | 36 | 80 | 5 |
| SF505 044 | 4.4 | - | .1732 | 36 | 80 | 5 |
| SF505 045 | 4.5 | - | .1772 | 36 | 80 | 5 |
| SF505 046 | 4.6 | - | .1811 | 36 | 80 | 5 |
| SF505 047 | 4.7 | - | .1850 | 36 | 80 | 5 |
| SF505 04763 | 4.763 | 3/16 | .1875 | 39 | 80 | 5 |
| SF505 048 | 4.8 | - | .1890 | 39 | 80 | 5 |
| SF505 049 | 4.9 | - | .1920 | 39 | 80 | 5 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 050 | 5 | - | .1969 | 39 | 80 | 5 |
| SF505 051 | 5.1 | - | .2008 | 39 | 87 | 6 |
| SF505 05159 | 5.159 | 13/64 | .2031 | 39 | 87 | 6 |
| SF505 052 | 5.2 | - | .2047 | 39 | 87 | 6 |
| SF505 053 | 5.3 | - | .2087 | 39 | 87 | 6 |
| SF505 054 | 5.4 | - | .2126 | 43 | 87 | 6 |
| SF505 055 | 5.5 | - | .2165 | 43 | 87 | 6 |
| SF505 05558 | 5.558 | 7/32 | .2188 | 43 | 87 | 6 |
| SF505 056 | 5.6 | - | .2205 | 43 | 87 | 6 |
| SF505 057 | 5.7 | - | .2244 | 43 | 87 | 6 |
| SF505 058 | 5.8 | - | .2283 | 43 | 87 | 6 |
| SF505 059 | 5.9 | - | .2323 | 43 | 87 | 6 |
| SF505 05953 | 5.953 | 15/64 | .2344 | 43 | 87 | 6 |
| SF505 060 | 6 | - | .2362 | 43 | 87 | 6 |
| SF505 061 | 6.1 | - | .2402 | 47 | 95 | 7 |
| SF505 062 | 6.2 | - | .2441 | 47 | 95 | 7 |
| SF505 063 | 6.3 | - | .2480 | 47 | 95 | 7 |
| SF505 0635 | 6.350 | 1/4 | .2500 | 47 | 95 | 7 |
| SF505 064 | 6.4 | - | .2520 | 47 | 95 | 7 |
| SF505 065 | 6.5 | - | .2559 | 47 | 95 | 7 |
| SF505 066 | 6.6 | - | .2598 | 47 | 95 | 7 |
| SF505 067 | 6.7 | - | .2638 | 47 | 95 | 7 |
| SF505 06747 | 6.747 | 17/64 | .2656 | 47 | 95 | 7 |
| SF505 068 | 6.8 | - | .2677 | 47 | 95 | 7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 069 | 6.9 | - | .2717 | 47 | 95 | 7 |
| SF505 070 | 7 | - | .2756 | 47 | 95 | 7 |
| SF505 071 | 7.1 | - | .2795 | 52 | 103 | 8 |
| SF505 07145 | 7.145 | 9/32 | .2813 | 52 | 103 | 8 |
| SF505 072 | 7.2 | - | .2835 | 52 | 103 | 8 |
| SF505 073 | 7.3 | - | .2874 | 52 | 103 | 8 |
| SF505 074 | 7.4 | - | .2913 | 52 | 103 | 8 |
| SF505 075 | 7.5 | - | .2953 | 52 | 103 | 8 |
| SF505 07541 | 7.541 | 19/64 | .2969 | 52 | 103 | 8 |
| SF505 076 | 7.6 | - | .2992 | 52 | 103 | 8 |
| SF505 077 | 7.7 | - | .3031 | 52 | 103 | 8 |
| SF505 078 | 7.8 | - | .3071 | 52 | 103 | 8 |
| SF505 079 | 7.9 | - | .3110 | 52 | 103 | 8 |
| SF505 07938 | 7.938 | 5/16 | .3125 | 52 | 103 | 8 |
| SF505 080 | 8 | - | .3150 | 52 | 103 | 8 |
| SF505 081 | 8.1 | - | .3189 | 56 | 105 | 9 |
| SF505 082 | 8.2 | - | .3228 | 56 | 105 | 9 |
| SF505 083 | 8.3 | - | .3268 | 56 | 105 | 9 |
| SF505 08334 | 8.334 | 21/64 | .3281 | 56 | 105 | 9 |
| SF505 084 | 8.4 | - | .3307 | 56 | 105 | 9 |
| SF505 085 | 8.5 | - | .3346 | 56 | 105 | 9 |
| SF505 086 | 8.6 | - | .3386 | 56 | 105 | 9 |
| SF505 087 | 8.7 | - | .3425 | 56 | 105 | 9 |
| SF505 08733 | 8.733 | 11/32 | .3438 | 56 | 105 | 9 |
| SF505 088 | 8.8 | - | .3465 | 56 | 105 | 9 |
| SF505 089 | 8.9 | - | .3504 | 56 | 105 | 9 |
| SF505 090 | 9 | - | .3543 | 56 | 105 | 9 |
| SF505 091 | 9.1 | - | .3583 | 62 | 108 | 10 |
| SF505 09129 | 9.129 | 23/64 | .3594 | 62 | 108 | 10 |
| SF505 092 | 9.2 | - | .3622 | 62 | 108 | 10 |
| SF505 093 | 9.3 | - | .3661 | 62 | 108 | 10 |
| SF505 094 | 9.4 | - | .3701 | 62 | 108 | 10 |
| SF505 095 | 9.5 | - | .3740 | 62 | 108 | 10 |
| SF505 09525 | 9.525 | 3/8 | .3750 | 62 | 108 | 10 |
| SF505 096 | 9.6 | - | .3780 | 62 | 108 | 10 |
| SF505 097 | 9.7 | - | .3819 | 62 | 108 | 10 |
| SF505 098 | 9.8 | - | .3858 | 62 | 108 | 10 |
| SF505 099 | 9.9 | - | .3898 | 62 | 108 | 10 |
| SF505 09921 | 9.921 | 25/64 | .3906 | 62 | 108 | 10 |
| SF505 100 | 10 | - | .3937 | 62 | 108 | 10 |
| SF505 101 | 10.1 | - | .3976 | 68 | 125 | 11 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 102 | 10.2 | - | .4016 | 68 | 125 | 11 |
| SF505 103 | 10.3 | - | .4055 | 68 | 125 | 11 |
| SF505 1032 | 10.32 | 13/32 | .4063 | 68 | 125 | 11 |
| SF505 104 | 10.4 | - | .4094 | 68 | 125 | 11 |
| SF505 105 | 10.5 | - | .4134 | 68 | 125 | 11 |
| SF505 106 | 10.6 | - | .4173 | 68 | 125 | 11 |
| SF505 107 | 10.7 | - | .4213 | 68 | 125 | 11 |
| SF505 10716 | 10.716 | 27/64 | .4219 | 68 | 125 | 11 |
| SF505 108 | 10.8 | - | .4252 | 68 | 125 | 11 |
| SF505 109 | 10.9 | - | .4291 | 68 | 125 | 11 |
| SF505 110 | 11 | - | .4331 | 68 | 125 | 11 |
| SF505 111 | 11.1 | - | .4370 | 71 | 133 | 12 |
| SF505 11113 | 11.113 | 7/16 | .4375 | 71 | 133 | 12 |
| SF505 112 | 11.2 | - | .4409 | 71 | 133 | 12 |
| SF505 113 | 11.3 | - | .4449 | 71 | 133 | 12 |
| SF505 114 | 11.4 | - | .4488 | 71 | 133 | 12 |
| SF505 115 | 11.5 | - | .4528 | 71 | 133 | 12 |
| SF505 116 | 11.6 | - | .4567 | 71 | 133 | 12 |
| SF505 117 | 11.7 | - | .4606 | 71 | 133 | 12 |
| SF505 118 | 11.8 | - | .4646 | 71 | 133 | 12 |
| SF505 119 | 11.9 | - | .4685 | 71 | 133 | 12 |
| SF505 11908 | 11.908 | 15/32 | .4688 | 71 | 133 | 12 |
| SF505 120 | 12 | - | .4724 | 71 | 133 | 12 |
| SF505 121 | 12.1 | - | .4764 | 75 | 137 | 13 |
| SF505 122 | 12.2 | - | .4803 | 75 | 137 | 13 |
| SF505 123 | 12.3 | - | .4843 | 75 | 137 | 13 |
| SF505 12304 | 12.304 | 31/64 | .4844 | 75 | 137 | 13 |
| SF505 124 | 12.4 | - | .4882 | 75 | 137 | 13 |
| SF505 125 | 12.5 | - | .4921 | 75 | 137 | 13 |
| SF505 126 | 12.6 | - | .4961 | 75 | 137 | 13 |
| SF505 127 | 12.7 | - | .5000 | 75 | 137 | 13 |
| SF505 128 | 12.8 | - | .5039 | 75 | 137 | 13 |
| SF505 129 | 12.9 | - | .5079 | 75 | 137 | 13 |
| SF505 130 | 13 | - | .5118 | 75 | 137 | 13 |
| SF505 13096 | 13.096 | 33/64 | .5156 | 80 | 142 | 14 |
| SF505 131 | 13.1 | - | .5157 | 80 | 142 | 14 |
| SF505 132 | 13.2 | - | .5197 | 80 | 142 | 14 |
| SF505 133 | 13.3 | - | .5236 | 80 | 142 | 14 |
| SF505 134 | 13.4 | 0.5276 | .80 | 142 | 14 | 14 |
| SF505 13494 | 13.494 | - | .5313 | 80 | 142 | 14 |
| SF505 135 | 13.5 | 17/32 | .5315 | 80 | 142 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF505 | HIGH SPEED INTERNAL COOLANT DRILL - 5D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 136 | 13.6 | - | .5354 | 80 | 142 | 14 |
| SF505 137 | 13.7 | - | .5394 | 80 | 142 | 14 |
| SF505 138 | 13.8 | - | .5433 | 80 | 142 | 14 |
| SF505 13891 | 13.891 | 35/64 | .5469 | 80 | 142 | 14 |
| SF505 139 | 13.9 | - | .5472 | 80 | 142 | 14 |
| SF505 140 | 14 | - | .5512 | 80 | 142 | 14 |
| SF505 141 | 14.1 | - | .5551 | 83 | 148 | 15 |
| SF505 142 | 14.2 | - | .5591 | 83 | 148 | 15 |
| SF505 14288 | 14.288 | 9/16 | .5625 | 83 | 148 | 15 |
| SF505 143 | 14.3 | - | .5630 | 83 | 148 | 15 |
| SF505 144 | 14.4 | - | .5669 | 83 | 148 | 15 |
| SF505 145 | 14.5 | - | .5709 | 83 | 148 | 15 |
| SF505 146 | 14.6 | - | .5748 | 83 | 148 | 15 |
| SF505 147 | 14.7 | - | .5787 | 83 | 148 | 15 |
| SF505 148 | 14.8 | - | .5827 | 83 | 148 | 15 |
| SF505 149 | 14.9 | - | .5866 | 83 | 148 | 15 |
| SF505 150 | 15 | - | .5906 | 83 | 148 | 15 |
| SF505 15081 | 15.081 | 19/32 | .5937 | 90 | 152 | 16 |
| SF505 151 | 15.1 | - | .5945 | 90 | 152 | 16 |
| SF505 152 | 15.2 | - | .5984 | 90 | 152 | 16 |
| SF505 154 | 15.4 | - | .6063 | 90 | 152 | 16 |
| SF505 155 | 15.5 | - | .6102 | 90 | 152 | 16 |
| SF505 156 | 15.6 | - | .6142 | 90 | 152 | 16 |
| SF505 157 | 15.7 | - | .6181 | 90 | 152 | 16 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF505 158 | 15.8 | - | .6220 | 90 | 152 | 16 |
| SF505 15875 | 15.875 | 5/8 | .6250 | 90 | 152 | 16 |
| SF505 160 | 16 | - | .6299 | 90 | 152 | 16 |
| SF505 161 | 16.1 | - | .6339 | 95 | 155 | 17 |
| SF505 163 | 16.3 | - | .6417 | 95 | 155 | 17 |
| SF505 165 | 16.5 | - | .6496 | 95 | 155 | 17 |
| SF505 16667 | 16.667 | 21/32 | .6562 | 95 | 155 | 17 |
| SF505 170 | 17 | - | .6693 | 95 | 155 | 17 |
| SF505 171 | 17.1 | - | .6732 | 100 | 157 | 18 |
| SF505 172 | 17.2 | - | .6772 | 100 | 157 | 18 |
| SF505 17463 | 17.463 | 11/16 | .6875 | 100 | 157 | 18 |
| SF505 175 | 17.5 | - | .6890 | 100 | 157 | 18 |
| SF505 177 | 17.7 | - | .6969 | 100 | 157 | 18 |
| SF505 178 | 17.8 | - | .7008 | 100 | 157 | 18 |
| SF505 180 | 18 | - | .7087 | 100 | 157 | 18 |
| SF505 181 | 18.1 | - | .7126 | 105 | 160 | 19 |
| SF505 182 | 18.2 | - | .7165 | 105 | 160 | 19 |
| SF505 185 | 18.5 | - | .7283 | 105 | 160 | 19 |
| SF505 190 | 19 | - | .7480 | 105 | 160 | 19 |
| SF505 191 | 19.1 | - | .7520 | 110 | 163 | 20 |
| SF505 195 | 19.5 | - | .7677 | 110 | 163 | 20 |
| SF505 197 | 19.7 | - | .7756 | 110 | 163 | 20 |
| SF505 200 | 20 | - | .7874 | 110 | 163 | 20 |

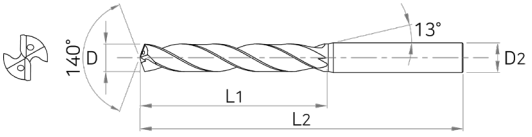


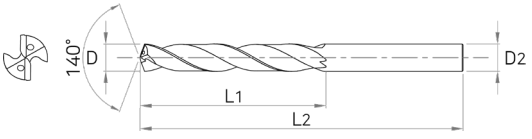
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | 0 ~ -0.014 | h6 |
| D3.1 ~ D6 | 0 ~ -0.018 | |
| D6.1 ~ D10 | 0 ~ -0.022 | |
| D10.1 ~ D13 | 0 ~ -0.027 | |

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 030 | 3 | - | .1181 | 43 | 80 | 3 |
| SF508 031 | 3.1 | - | .1120 | 43 | 80 | 4 |
| SF508 03175 | 3.175 | 1/8 | .1250 | 43 | 80 | 4 |
| SF508 032 | 3.2 | - | .1260 | 43 | 80 | 4 |
| SF508 033 | 3.3 | - | .1299 | 43 | 80 | 4 |
| SF508 034 | 3.4 | - | .1339 | 43 | 80 | 4 |
| SF508 035 | 3.5 | - | .1378 | 43 | 80 | 4 |
| SF508 03572 | 3.572 | - | .1406 | 43 | 80 | 4 |
| SF508 036 | 3.6 | - | .1417 | 43 | 80 | 4 |
| SF508 037 | 3.7 | - | .1457 | 43 | 80 | 4 |
| SF508 038 | 3.8 | - | .1496 | 49 | 87 | 4 |
| SF508 039 | 3.9 | - | .1535 | 49 | 87 | 4 |
| SF508 0397 | 3.97 | 9/64 | .1563 | 49 | 87 | 4 |
| SF508 040 | 4 | - | .1575 | 49 | 87 | 4 |
| SF508 04039 | 4.039 | - | .1590 | 49 | 87 | 5 |
| SF508 041 | 4.1 | - | .1614 | 49 | 87 | 5 |
| SF508 042 | 4.2 | - | .1654 | 49 | 87 | 5 |
| SF508 043 | 4.3 | - | .1693 | 49 | 87 | 5 |
| SF508 04366 | 4.366 | - | .1719 | 49 | 87 | 5 |
| SF508 044 | 4.4 | - | .1732 | 49 | 87 | 5 |
| SF508 045 | 4.5 | - | .1772 | 49 | 87 | 5 |
| SF508 046 | 4.6 | - | .1811 | 49 | 87 | 5 |
| SF508 047 | 4.7 | - | .1850 | 49 | 87 | 5 |
| SF508 04763 | 4.763 | 3/16 | .1875 | 56 | 94 | 5 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 048 | 4.8 | - | .1890 | 56 | 94 | 5 |
| SF508 049 | 4.9 | - | .1929 | 56 | 94 | 5 |
| SF508 050 | 5 | - | .1969 | 56 | 94 | 5 |
| SF508 051 | 5.1 | - | .2008 | 56 | 94 | 6 |
| SF508 05159 | 5.159 | 13/64 | .2031 | 56 | 94 | 6 |
| SF508 052 | 5.2 | - | .2047 | 56 | 94 | 6 |
| SF508 053 | 5.3 | - | .2087 | 56 | 94 | 6 |
| SF508 054 | 5.4 | - | .2126 | 56 | 94 | 6 |
| SF508 0541 | 5.41 | - | .2130 | 56 | 94 | 6 |
| SF508 055 | 5.5 | - | .2165 | 56 | 94 | 6 |
| SF508 05558 | 5.558 | 7/32 | .2188 | 56 | 94 | 6 |
| SF508 056 | 5.6 | - | .2205 | 56 | 94 | 6 |
| SF508 057 | 5.7 | - | .2244 | 56 | 94 | 6 |
| SF508 058 | 5.8 | - | .2283 | 56 | 94 | 6 |
| SF508 059 | 5.9 | - | .2323 | 56 | 94 | 6 |
| SF508 05953 | 5.953 | 15/64 | .2344 | 56 | 94 | 6 |
| SF508 060 | 6 | - | .2362 | 94 | 6 | |
| SF508 061 | 6.1 | - | .2402 | 67 | 105 | 7 |
| SF508 062 | 6.2 | - | .2441 | 67 | 105 | 7 |
| SF508 063 | 6.3 | - | .2480 | 67 | 105 | 7 |
| SF508 0635 | 6.35 | 1/4 | .2500 | 67 | 105 | 7 |
| SF508 064 | 6.4 | - | .2520 | 67 | 105 | 7 |
| SF508 065 | 6.5 | - | .2559 | 67 | 105 | 7 |
| SF508 06528 | 6.528 | - | .2570 | 67 | 105 | 7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 066 | 6.6 | - | .2598 | 67 | 105 | 7 |
| SF508 067 | 6.7 | - | .2638 | 67 | 105 | 7 |
| SF508 06747 | 6.747 | 17/64 | .2656 | 67 | 105 | 7 |
| SF508 068 | 6.8 | - | .2677 | 67 | 105 | 7 |
| SF508 069 | 6.9 | - | .2717 | 67 | 105 | 7 |
| SF508 070 | 7 | - | .2756 | 76 | 116 | 7 |
| SF508 071 | 7.1 | - | .2795 | 76 | 116 | 8 |
| SF508 07145 | 7.145 | 9/32 | .2813 | 76 | 116 | 8 |
| SF508 072 | 7.2 | - | .2835 | 76 | 116 | 8 |
| SF508 073 | 7.3 | - | .2874 | 76 | 116 | 8 |
| SF508 074 | 7.4 | - | .2913 | 76 | 116 | 8 |
| SF508 075 | 7.5 | - | .2953 | 76 | 116 | 8 |
| SF508 07541 | 7.541 | 19/64 | .2969 | 76 | 116 | 8 |
| SF508 076 | 7.6 | - | .2992 | 76 | 116 | 8 |
| SF508 077 | 7.7 | - | .3031 | 76 | 116 | 8 |
| SF508 078 | 7.8 | - | .0371 | 76 | 116 | 8 |
| SF508 079 | 7.9 | - | .3110 | 76 | 116 | 8 |
| SF508 07938 | 7.938 | 5/16 | .3125 | 76 | 116 | 8 |
| SF508 080 | 8 | - | .3150 | 76 | 116 | 8 |
| SF508 081 | 8.1 | - | .3189 | 87 | 131 | 9 |
| SF508 082 | 8.2 | - | .3228 | 87 | 131 | 9 |
| SF508 083 | 8.3 | - | .3268 | 87 | 131 | 9 |
| SF508 08334 | 8.334 | 21/64 | .3281 | 87 | 131 | 9 |
| SF508 084 | 8.4 | - | 3307 | 87 | 131 | 9 |
| SF508 08433 | 8.433 | - | 3320 | 87 | 131 | 9 |
| SF508 085 | 8.5 | - | .3346 | 87 | 131 | 9 |
| SF508 086 | 8.6 | - | .3386 | 87 | 131 | 9 |
| SF508 087 | 8.7 | - | .3425 | 87 | 131 | 9 |
| SF508 08733 | 8.733 | 11/32 | .3438 | 87 | 131 | 9 |
| SF508 088 | 8.8 | - | .3465 | 87 | 131 | 9 |
| SF508 089 | 8.9 | - | .3504 | 87 | 131 | 9 |
| SF508 090 | 9 | - | .3543 | 87 | 131 | 9 |
| SF508 091 | 9.1 | - | .3583 | 95 | 139 | 10 |
| SF508 09129 | 9.129 | 23/64 | .3594 | 95 | 139 | 10 |
| SF508 092 | 9.2 | - | .3622 | 95 | 139 | 10 |
| SF508 093 | 9.3 | - | .3661 | 95 | 139 | 10 |
| SF508 094 | 9.4 | - | .3701 | 95 | 139 | 10 |
| SF508 095 | 9.5 | - | .3740 | 95 | 139 | 10 |
| SF508 09525 | 9.525 | 3/8 | .3750 | 95 | 139 | 10 |
| SF508 096 | 9.6 | - | .3780 | 95 | 139 | 10 |
| SF508 097 | 9.7 | - | .3819 | 95 | 139 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 098 | 9.8 | - | .3858 | 95 | 139 | 10 |
| SF508 099 | 9.9 | - | .3898 | 95 | 139 | 10 |
| SF508 09921 | 9.921 | 25/64 | .3906 | 95 | 139 | 10 |
| SF508 100 | 10 | - | .3937 | 95 | 139 | 10 |
| SF508 101 | 10.1 | - | .3976 | 106 | 155 | 11 |
| SF508 102 | 10.2 | - | .4016 | 106 | 155 | 11 |
| SF508 103 | 10.3 | - | .4055 | 106 | 155 | 11 |
| SF508 1032 | 10.32 | 13/32 | .4063 | 106 | 155 | 11 |
| SF508 104 | 10.4 | - | .4094 | 106 | 155 | 11 |
| SF508 105 | 10.5 | - | .4134 | 106 | 155 | 11 |
| SF508 106 | 10.6 | - | .4173 | 106 | 155 | 11 |
| SF508 107 | 10.7 | - | .4213 | 106 | 155 | 11 |
| SF508 10716 | 10.716 | 27/64 | .4219 | 106 | 155 | 11 |
| SF508 108 | 10.8 | - | .4252 | 106 | 155 | 11 |
| SF508 109 | 10.9 | - | .4291 | 106 | 155 | 11 |
| SF508 110 | 11 | - | .4331 | 106 | 155 | 11 |
| SF508 111 | 11.1 | - | .4370 | 114 | 163 | 12 |
| SF508 11113 | 11.113 | 7/16 | .4375 | 114 | 163 | 12 |
| SF508 112 | 11.2 | - | .4409 | 114 | 163 | 12 |
| SF508 113 | 11.3 | - | .4449 | 114 | 163 | 12 |
| SF508 114 | 11.4 | - | .4488 | 114 | 163 | 12 |
| SF508 115 | 11.5 | - | .4528 | 114 | 163 | 12 |
| SF508 11509 | 11.509 | 29/64 | .4531 | 114 | 163 | 12 |
| SF508 116 | 11.6 | - | .4567 | 114 | 163 | 12 |
| SF508 117 | 11.7 | - | .4606 | 114 | 163 | 12 |
| SF508 118 | 11.8 | - | .4646 | 114 | 163 | 12 |
| SF508 119 | 11.9 | - | .4685 | 114 | 163 | 12 |
| SF508 11908 | 11.908 | 15/32 | .4688 | 114 | 163 | 12 |
| SF508 120 | 12 | - | .4724 | 114 | 163 | 12 |
| SF508 121 | 12.1 | - | .4764 | 133 | 182 | 13 |
| SF508 122 | 12.2 | - | .4803 | 133 | 182 | 13 |
| SF508 123 | 12.3 | - | .4843 | 133 | 182 | 13 |
| SF508 12304 | 12.304 | 31/64 | .4844 | 133 | 182 | 13 |
| SF508 125 | 12.5 | - | .4921 | 133 | 182 | 13 |
| SF508 126 | 12.6 | - | .4961 | 133 | 182 | 13 |
| SF508 127 | 12.7 | 1/2 | .5000 | 133 | 182 | 13 |
| SF508 128 | 12.8 | - | .5039 | 133 | 182 | 13 |
| SF508 129 | 12.9 | - | .5079 | 133 | 182 | 13 |
| SF508 130 | 13 | - | .5118 | 133 | 182 | 13 |
| SF508 131 | 13.1 | - | .5157 | 133 | 182 | 14 |
| SF508 132 | 13.2 | - | .5197 | 133 | 182 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF508 | HIGH SPEED INTERNAL COOLANT DRILL - 8D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 133 | 13.3 | - | .5236 | 133 | 182 | 14 |
| SF508 134 | 13.4 | - | .5276 | 133 | 182 | 14 |
| SF508 13494 | 13.494 | 17/32 | .5313 | 133 | 182 | 14 |
| SF508 135 | 13.5 | - | .5315 | 133 | 182 | 14 |
| SF508 136 | 13.6 | - | .5354 | 133 | 182 | 14 |
| SF508 137 | 13.7 | - | .5394 | 133 | 182 | 14 |
| SF508 140 | 14 | - | .5512 | 133 | 182 | 14 |
| SF508 14288 | 14.288 | 9/16 | .5625 | 152 | 204 | 15 |
| SF508 143 | 14.3 | - | .5630 | 152 | 204 | 15 |
| SF508 144 | 14.4 | - | .5669 | 152 | 204 | 15 |
| SF508 145 | 14.5 | - | .5709 | 152 | 204 | 15 |
| SF508 14683 | 14.683 | 37/64 | .5781 | 152 | 204 | 15 |
| SF508 147 | 14.7 | - | .5787 | 152 | 204 | 15 |
| SF508 150 | 15 | - | .5906 | 152 | 204 | 15 |
| SF508 15081 | 15.081 | 19/32 | .5937 | 152 | 204 | 16 |
| SF508 155 | 15.5 | - | .6102 | 152 | 204 | 16 |

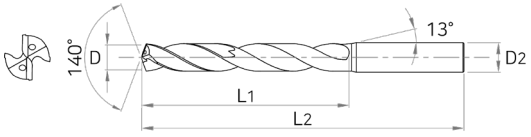
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| SF508 157 | 15.7 | - | .6181 | 152 | 204 | 16 |
| SF508 15875 | 15.875 | 5/8 | .6250 | 152 | 204 | 16 |
| SF508 160 | 16 | - | .6299 | 152 | 204 | 16 |
| SF508 165 | 16.5 | - | .6496 | 171 | 223 | 17 |
| SF508 16667 | 16.667 | 21/32 | .6562 | 171 | 223 | 17 |
| SF508 170 | 17 | - | .6693 | 171 | 223 | 17 |
| SF508 17463 | 17.463 | 11/16 | .6875 | 171 | 223 | 18 |
| SF508 175 | 17.5 | - | .6890 | 171 | 223 | 18 |
| SF508 180 | 18 | - | .7087 | 171 | 223 | 18 |
| SF508 185 | 18.5 | - | .7283 | 191 | 244 | 19 |
| SF508 190 | 19 | - | .7480 | 191 | 244 | 19 |
| SF508 1905 | 19.05 | 3/4 | .7500 | 191 | 244 | 20 |
| SF508 19446 | 19.446 | 49/64 | .7656 | 191 | 244 | 20 |
| SF508 195 | 19.5 | - | .7677 | 191 | 244 | 20 |
| SF508 200 | 20 | - | .7874 | 191 | 244 | 20 |

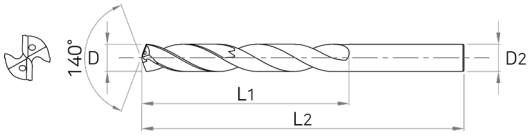
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF510 | HIGH SPEED INTERNAL COOLANT DRILL - 10D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~ D3 | 0 ~ -0.014 | h6 |
| D3.1 ~ D6 | 0 ~ -0.018 | |
| D6.1 ~ D10 | 0 ~ -0.022 | |
| D10.1 ~ D13 | 0 ~ -0.027 | |

CARBIDE | TiAlN | 10D | 30° HELIX | 140° | DATA P.710

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF510 030 | 3 | 39 | 87 | 3 |
| SF510 031 | 3.1 | 46 | 94 | 4 |
| SF510 032 | 3.2 | 46 | 94 | 4 |
| SF510 033 | 3.3 | 46 | 94 | 4 |
| SF510 034 | 3.4 | 46 | 94 | 4 |
| SF510 035 | 3.5 | 46 | 94 | 4 |
| SF510 036 | 3.6 | 52 | 101 | 4 |
| SF510 037 | 3.7 | 52 | 101 | 4 |
| SF510 038 | 3.8 | 52 | 101 | 4 |
| SF510 039 | 3.9 | 52 | 101 | 4 |
| SF510 040 | 4 | 52 | 101 | 4 |
| SF510 041 | 4.1 | 59 | 108 | 5 |
| SF510 042 | 4.2 | 59 | 108 | 5 |
| SF510 043 | 4.3 | 59 | 108 | 5 |
| SF510 044 | 4.4 | 59 | 108 | 5 |
| SF510 045 | 4.5 | 59 | 108 | 5 |
| SF510 046 | 4.6 | 66 | 117 | 5 |
| SF510 047 | 4.7 | 66 | 117 | 5 |
| SF510 048 | 4.8 | 66 | 117 | 5 |
| SF510 049 | 4.9 | 66 | 117 | 5 |
| SF510 050 | 5 | 66 | 117 | 5 |
| SF510 051 | 5.1 | 72 | 123 | 6 |
| SF510 052 | 5.2 | 72 | 123 | 6 |
| SF510 053 | 5.3 | 72 | 123 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF510 054 | 5.4 | 72 | 123 | 6 |
| SF510 055 | 5.5 | 72 | 123 | 6 |
| SF510 056 | 5.6 | 79 | 130 | 6 |
| SF510 057 | 5.7 | 79 | 130 | 6 |
| SF510 058 | 5.8 | 79 | 130 | 6 |
| SF510 059 | 5.9 | 79 | 130 | 6 |
| SF510 060 | 6 | 79 | 130 | 6 |
| SF510 061 | 6.1 | 85 | 138 | 7 |
| SF510 062 | 6.2 | 85 | 138 | 7 |
| SF510 063 | 6.3 | 85 | 138 | 7 |
| SF510 064 | 6.4 | 85 | 138 | 7 |
| SF510 065 | 6.5 | 85 | 138 | 7 |
| SF510 066 | 6.6 | 92 | 145 | 7 |
| SF510 067 | 6.7 | 92 | 145 | 7 |
| SF510 068 | 6.8 | 92 | 145 | 7 |
| SF510 069 | 6.9 | 92 | 145 | 7 |
| SF510 070 | 7 | 92 | 145 | 7 |
| SF510 071 | 7.1 | 98 | 153 | 8 |
| SF510 072 | 7.2 | 98 | 153 | 8 |
| SF510 073 | 7.3 | 98 | 153 | 8 |
| SF510 074 | 7.4 | 98 | 153 | 8 |
| SF510 075 | 7.5 | 98 | 153 | 8 |
| SF510 076 | 7.6 | 105 | 160 | 8 |
| SF510 077 | 7.7 | 105 | 160 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF510 | HIGH SPEED INTERNAL COOLANT DRILL - 10D

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF510 078 | 7.8 | 105 | 160 | 8 |
| SF510 079 | 7.9 | 105 | 160 | 8 |
| SF510 080 | 8 | 105 | 160 | 8 |
| SF510 081 | 8.1 | 111 | 166 | 9 |
| SF510 082 | 8.2 | 111 | 166 | 9 |
| SF510 083 | 8.3 | 111 | 166 | 9 |
| SF510 084 | 8.4 | 111 | 166 | 9 |
| SF510 085 | 8.5 | 111 | 166 | 9 |
| SF510 086 | 8.6 | 118 | 173 | 9 |
| SF510 087 | 8.7 | 118 | 173 | 9 |
| SF510 088 | 8.8 | 118 | 173 | 9 |
| SF510 089 | 8.9 | 118 | 173 | 9 |
| SF510 090 | 9 | 118 | 173 | 9 |
| SF510 091 | 9.1 | 124 | 179 | 10 |
| SF510 092 | 9.2 | 124 | 179 | 10 |
| SF510 093 | 9.3 | 124 | 179 | 10 |
| SF510 094 | 9.4 | 124 | 179 | 10 |
| SF510 095 | 9.5 | 124 | 179 | 10 |
| SF510 096 | 9.6 | 131 | 186 | 10 |
| SF510 097 | 9.7 | 131 | 186 | 10 |
| SF510 098 | 9.8 | 131 | 186 | 10 |
| SF510 099 | 9.9 | 131 | 186 | 10 |
| SF510 100 | 10 | 131 | 186 | 10 |
| SF510 101 | 10.1 | 138 | 193 | 11 |
| SF510 102 | 10.2 | 138 | 193 | 11 |
| SF510 103 | 10.3 | 138 | 193 | 11 |
| SF510 104 | 10.4 | 138 | 193 | 11 |

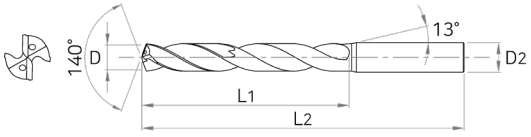
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF510 105 | 10.5 | 138 | 193 | 11 |
| SF510 106 | 10.6 | 144 | 205 | 11 |
| SF510 107 | 10.7 | 144 | 205 | 11 |
| SF510 108 | 10.8 | 144 | 205 | 11 |
| SF510 109 | 10.9 | 144 | 205 | 11 |
| SF510 110 | 11 | 144 | 205 | 11 |
| SF510 111 | 11.1 | 151 | 212 | 12 |
| SF510 112 | 11.2 | 151 | 212 | 12 |
| SF510 113 | 11.3 | 151 | 212 | 12 |
| SF510 114 | 11.4 | 151 | 212 | 12 |
| SF510 115 | 11.5 | 151 | 212 | 12 |
| SF510 116 | 11.6 | 157 | 218 | 12 |
| SF510 117 | 11.7 | 157 | 218 | 12 |
| SF510 118 | 11.8 | 157 | 218 | 12 |
| SF510 119 | 11.9 | 157 | 218 | 12 |
| SF510 120 | 12 | 157 | 218 | 12 |
| SF510 121 | 12.1 | 164 | 225 | 13 |
| SF510 122 | 12.2 | 164 | 225 | 13 |
| SF510 123 | 12.3 | 164 | 225 | 13 |
| SF510 124 | 12.4 | 164 | 225 | 13 |
| SF510 125 | 12.5 | 164 | 225 | 13 |
| SF510 126 | 12.6 | 170 | 236 | 13 |
| SF510 127 | 12.7 | 170 | 236 | 13 |
| SF510 128 | 12.8 | 170 | 236 | 13 |
| SF510 129 | 12.9 | 170 | 236 | 13 |
| SF510 130 | 13 | 170 | 236 | 13 |

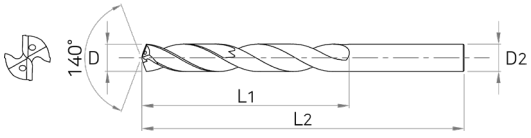
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF520 | HIGH SPEED INTERNAL COOLANT DRILL - 20D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D6 | 0~-0.018 | h6 |
| D6~10 | 0~-0.022 | |

CARBIDE | TiAlN | 20D | 30° HELIX | 140° | DATA P.710

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF520 041 | 4.1 | 104 | 155 | 5 |
| SF520 042 | 4.2 | 104 | 155 | 5 |
| SF520 043 | 4.3 | 104 | 155 | 5 |
| SF520 044 | 4.4 | 104 | 155 | 5 |
| SF520 045 | 4.5 | 104 | 155 | 5 |
| SF520 046 | 4.6 | 116 | 167 | 5 |
| SF520 047 | 4.7 | 116 | 167 | 5 |
| SF520 048 | 4.8 | 116 | 167 | 5 |
| SF520 049 | 4.9 | 116 | 167 | 5 |
| SF520 050 | 5 | 116 | 167 | 5 |
| SF520 051 | 5.1 | 127 | 178 | 6 |
| SF520 052 | 5.2 | 127 | 178 | 6 |
| SF520 053 | 5.3 | 127 | 178 | 6 |
| SF520 054 | 5.4 | 127 | 178 | 6 |
| SF520 055 | 5.5 | 127 | 178 | 6 |
| SF520 056 | 5.6 | 139 | 190 | 6 |
| SF520 057 | 5.7 | 139 | 190 | 6 |
| SF520 058 | 5.8 | 139 | 190 | 6 |
| SF520 059 | 5.9 | 139 | 190 | 6 |
| SF520 060 | 6 | 139 | 190 | 6 |
| SF520 061 | 6.1 | 150 | 203 | 7 |
| SF520 062 | 6.2 | 150 | 203 | 7 |
| SF520 063 | 6.3 | 150 | 203 | 7 |
| SF520 064 | 6.4 | 150 | 203 | 7 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF520 065 | 6.5 | 150 | 203 | 7 |
| SF520 066 | 6.6 | 162 | 215 | 7 |
| SF520 067 | 6.7 | 162 | 215 | 7 |
| SF520 068 | 6.8 | 162 | 215 | 7 |
| SF520 069 | 6.9 | 162 | 215 | 7 |
| SF520 070 | 7 | 162 | 215 | 7 |
| SF520 071 | 7.1 | 173 | 228 | 8 |
| SF520 072 | 7.2 | 173 | 228 | 8 |
| SF520 073 | 7.3 | 173 | 228 | 8 |
| SF520 074 | 7.4 | 173 | 228 | 8 |
| SF520 075 | 7.5 | 173 | 228 | 8 |
| SF520 076 | 7.6 | 185 | 240 | 8 |
| SF520 077 | 7.7 | 185 | 240 | 8 |
| SF520 078 | 7.8 | 185 | 240 | 8 |
| SF520 079 | 7.9 | 185 | 240 | 8 |
| SF520 080 | 8 | 185 | 240 | 8 |
| SF520 081 | 8.1 | 196 | 251 | 9 |
| SF520 082 | 8.2 | 196 | 251 | 9 |
| SF520 083 | 8.3 | 196 | 251 | 9 |
| SF520 084 | 8.4 | 196 | 251 | 9 |
| SF520 085 | 8.5 | 196 | 251 | 9 |
| SF520 086 | 8.6 | 208 | 263 | 9 |
| SF520 087 | 8.7 | 208 | 263 | 9 |
| SF520 088 | 8.8 | 208 | 263 | 9 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# SF520 | HIGH SPEED INTERNAL COOLANT DRILL - 20D



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF520 089 | 8.9 | 208 | 263 | 9 |
| SF520 090 | 9 | 208 | 263 | 9 |
| SF520 091 | 9.1 | 219 | 274 | 10 |
| SF520 092 | 9.2 | 219 | 274 | 10 |
| SF520 093 | 9.3 | 219 | 274 | 10 |
| SF520 094 | 9.4 | 219 | 274 | 10 |

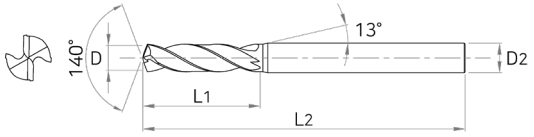
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SF520 095 | 9.5 | 219 | 274 | 10 |
| SF520 096 | 9.6 | 231 | 286 | 10 |
| SF520 097 | 9.7 | 231 | 286 | 10 |
| SF520 098 | 9.8 | 231 | 286 | 10 |
| SF520 099 | 9.9 | 231 | 286 | 10 |
| SF520 100 | 10 | 231 | 286 | 10 |

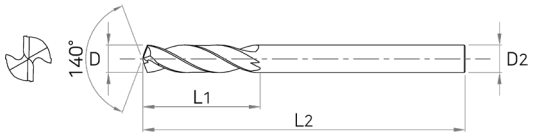
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HP503 | DOUBLE MARGIN DRILL - DIN 6537K




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.016 | |
| D6.1 ~ D10 | +0.006 ~ +0.021 | |
| D10.1 ~ D16 | +0.007 ~ +0.025 | |

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | | L1 | L2 | D2 |
| | mm | inch | | | |
| HP503 030 | 3 | .1181 | 20 | 62 | 6 |
| HP503 031 | 3.1 | .1220 | 20 | 62 | 6 |
| HP503 032 | 3.2 | .1260 | 20 | 62 | 6 |
| HP503 033 | 3.3 | .1299 | 20 | 62 | 6 |
| HP503 034 | 3.4 | .1339 | 20 | 62 | 6 |
| HP503 035 | 3.5 | .1378 | 20 | 62 | 6 |
| HP503 036 | 3.6 | .1417 | 20 | 62 | 6 |
| HP503 037 | 3.7 | .1457 | 20 | 62 | 6 |
| HP503 038 | 3.8 | .1496 | 24 | 66 | 6 |
| HP503 039 | 3.9 | .1535 | 24 | 66 | 6 |
| HP503 040 | 4 | .1575 | 24 | 66 | 6 |
| HP503 041 | 4.1 | .1614 | 24 | 66 | 6 |
| HP503 042 | 4.2 | .1654 | 24 | 66 | 6 |
| HP503 043 | 4.3 | .1693 | 24 | 66 | 6 |
| HP503 044 | 4.4 | .1732 | 24 | 66 | 6 |
| HP503 045 | 4.5 | .1772 | 24 | 66 | 6 |
| HP503 046 | 4.6 | .1811 | 24 | 66 | 6 |
| HP503 047 | 4.7 | .1850 | 24 | 66 | 6 |
| HP503 048 | 4.8 | .1890 | 28 | 66 | 6 |
| HP503 049 | 4.9 | .1929 | 28 | 66 | 6 |
| HP503 050 | 5 | .1969 | 28 | 66 | 6 |
| HP503 051 | 5.1 | .2008 | 28 | 66 | 6 |
| HP503 052 | 5.2 | .2047 | 28 | 66 | 6 |
| HP503 053 | 5.3 | .2087 | 28 | 66 | 6 |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | | L1 | L2 | D2 |
| | mm | inch | | | |
| HP503 054 | 5.4 | .2126 | 28 | 66 | 6 |
| HP503 055 | 5.5 | .2165 | 28 | 66 | 6 |
| HP503 056 | 5.6 | .2205 | 28 | 66 | 6 |
| HP503 057 | 5.7 | .2244 | 28 | 66 | 6 |
| HP503 058 | 5.8 | .2283 | 28 | 66 | 6 |
| HP503 059 | 5.9 | .2322 | 28 | 66 | 6 |
| HP503 060 | 6 | .2362 | 28 | 66 | 6 |
| HP503 061 | 6.1 | .2402 | 34 | 79 | 8 |
| HP503 062 | 6.2 | .2441 | 34 | 79 | 8 |
| HP503 063 | 6.3 | .2480 | 34 | 79 | 8 |
| HP503 064 | 6.4 | .2520 | 34 | 79 | 8 |
| HP503 065 | 6.5 | .2559 | 34 | 79 | 8 |
| HP503 066 | 6.6 | .2598 | 34 | 79 | 8 |
| HP503 067 | 6.7 | .2638 | 34 | 79 | 8 |
| HP503 068 | 6.8 | .2677 | 34 | 79 | 8 |
| HP503 069 | 6.9 | .2717 | 34 | 79 | 8 |
| HP503 070 | 7 | .2756 | 34 | 79 | 8 |
| HP503 071 | 7.1 | .2795 | 41 | 79 | 8 |
| HP503 072 | 7.2 | .2835 | 41 | 79 | 8 |
| HP503 073 | 7.3 | .2874 | 41 | 79 | 8 |
| HP503 074 | 7.4 | .2913 | 41 | 79 | 8 |
| HP503 075 | 7.5 | .2953 | 41 | 79 | 8 |
| HP503 076 | 7.6 | .2992 | 41 | 79 | 8 |
| HP503 077 | 7.7 | .3031 | 41 | 79 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HP503 | DOUBLE MARGIN DRILL - DIN 6537K



| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | | L1 | L2 | D2 |
| | mm | inch | | | |
| HP503 078 | 7.8 | .3071 | 41 | 79 | 8 |
| HP503 079 | 7.9 | .3110 | 41 | 79 | 8 |
| HP503 080 | 8 | .3150 | 41 | 79 | 8 |
| HP503 081 | 8.1 | .3189 | 47 | 89 | 10 |
| HP503 082 | 8.2 | .3228 | 47 | 89 | 10 |
| HP503 083 | 8.3 | .3268 | 47 | 89 | 10 |
| HP503 084 | 8.4 | .3307 | 47 | 89 | 10 |
| HP503 085 | 8.5 | .3346 | 47 | 89 | 10 |
| HP503 086 | 8.6 | .3386 | 47 | 89 | 10 |
| HP503 087 | 8.7 | .3425 | 47 | 89 | 10 |
| HP503 088 | 8.8 | .3465 | 47 | 89 | 10 |
| HP503 089 | 8.9 | .3504 | 47 | 89 | 10 |
| HP503 090 | 9 | .3543 | 47 | 89 | 10 |
| HP503 091 | 9.1 | .3583 | 47 | 89 | 10 |
| HP503 092 | 9.2 | .3622 | 47 | 89 | 10 |
| HP503 093 | 9.3 | .3661 | 47 | 89 | 10 |
| HP503 094 | 9.4 | .3701 | 47 | 89 | 10 |
| HP503 095 | 9.5 | .3740 | 47 | 89 | 10 |
| HP503 096 | 9.6 | .3780 | 47 | 89 | 10 |
| HP503 097 | 9.7 | .3819 | 47 | 89 | 10 |
| HP503 098 | 9.8 | .3858 | 47 | 89 | 10 |
| HP503 099 | 9.9 | .3898 | 47 | 89 | 10 |
| HP503 100 | 10 | .3937 | 47 | 89 | 10 |
| HP503 101 | 10.1 | .3976 | 55 | 102 | 12 |
| HP503 102 | 10.2 | .4016 | 55 | 102 | 12 |
| HP503 103 | 10.3 | .4055 | 55 | 102 | 12 |
| HP503 104 | 10.4 | .4094 | 55 | 102 | 12 |
| HP503 105 | 10.5 | .4134 | 55 | 102 | 12 |
| HP503 106 | 10.6 | .4173 | 55 | 102 | 12 |
| HP503 107 | 10.7 | .4213 | 55 | 102 | 12 |
| HP503 108 | 10.8 | .4252 | 55 | 102 | 12 |
| HP503 109 | 10.9 | .4291 | 55 | 102 | 12 |
| HP503 110 | 11 | .4331 | 55 | 102 | 12 |
| HP503 111 | 11.1 | .4370 | 55 | 102 | 12 |

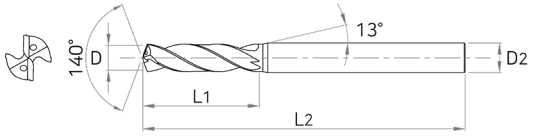
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | | L1 | L2 | D2 |
| | mm | inch | | | |
| HP503 112 | 11.2 | .4409 | 55 | 102 | 12 |
| HP503 113 | 11.3 | .4449 | 55 | 102 | 12 |
| HP503 114 | 11.4 | .4488 | 55 | 102 | 12 |
| HP503 115 | 11.5 | .4528 | 55 | 102 | 12 |
| HP503 116 | 11.6 | .4567 | 55 | 102 | 12 |
| HP503 117 | 11.7 | .4606 | 55 | 102 | 12 |
| HP503 118 | 11.8 | .4646 | 55 | 102 | 12 |
| HP503 119 | 11.9 | .4685 | 55 | 102 | 12 |
| HP503 120 | 12 | .4724 | 55 | 102 | 12 |
| HP503 121 | 12.1 | .4764 | 60 | 107 | 14 |
| HP503 122 | 12.2 | .4803 | 60 | 107 | 14 |
| HP503 123 | 12.3 | .4843 | 60 | 107 | 14 |
| HP503 124 | 12.4 | .4882 | 60 | 107 | 14 |
| HP503 125 | 12.5 | .4921 | 60 | 107 | 14 |
| HP503 126 | 12.6 | .4961 | 60 | 107 | 14 |
| HP503 127 | 12.7 | .5000 | 60 | 107 | 14 |
| HP503 128 | 12.8 | .5039 | 60 | 107 | 14 |
| HP503 129 | 12.9 | .5079 | 60 | 107 | 14 |
| HP503 130 | 13 | .5118 | 60 | 107 | 14 |
| HP503 131 | 13.1 | .5157 | 60 | 107 | 14 |
| HP503 132 | 13.2 | .5157 | 60 | 107 | 14 |
| HP503 133 | 13.3 | .5236 | 60 | 107 | 14 |
| HP503 135 | 13.5 | .5315 | 60 | 107 | 14 |
| HP503 137 | 13.7 | .5394 | 60 | 107 | 14 |
| HP503 140 | 14 | .5512 | 60 | 107 | 14 |
| HP503 142 | 14.2 | .5591 | 65 | 115 | 16 |
| HP503 143 | 14.3 | .5630 | 65 | 115 | 16 |
| HP503 145 | 14.5 | .5709 | 65 | 115 | 16 |
| HP503 146 | 14.6 | .5787 | 65 | 115 | 16 |
| HP503 148 | 14.8 | .5827 | 65 | 115 | 16 |
| HP503 150 | 15 | .5906 | 65 | 115 | 16 |
| HP503 155 | 15.5 | .6102 | 65 | 115 | 16 |
| HP503 157 | 15.7 | .6181 | 65 | 115 | 16 |
| HP503 160 | 16 | .6299 | 65 | 115 | 16 |

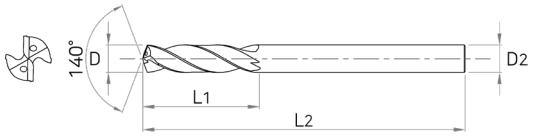
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ 6 | +0.004 ~ +0.016 | |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 030 | 3 | - | .1181 | 20 | 62 | 6 |
| HPI503 031 | 3.1 | - | .112 | 20 | 62 | 6 |
| HPI503 03175 | 3.175 | 1/8 | .125 | 20 | 62 | 6 |
| HPI503 032 | 3.2 | - | .126 | 20 | 62 | 6 |
| HPI503 03264 | 3.264 | - | .1285 | 20 | 62 | 6 |
| HPI503 033 | 3.3 | - | .1299 | 20 | 62 | 6 |
| HPI503 034 | 3.4 | - | .1339 | 20 | 62 | 6 |
| HPI503 035 | 3.5 | - | .1378 | 20 | 62 | 6 |
| HPI503 03572 | 3.572 | 9/64 | .1406 | 20 | 62 | 6 |
| HPI503 036 | 3.6 | - | .1417 | 20 | 62 | 6 |
| HPI503 037 | 3.7 | - | .1457 | 20 | 62 | 6 |
| HPI503 038 | 3.8 | - | .1496 | 24 | 66 | 6 |
| HPI503 039 | 3.9 | - | .1535 | 24 | 66 | 6 |
| HPI503 0397 | 3.97 | 5/32 | .1563 | 24 | 66 | 6 |
| HPI503 040 | 4 | - | .1575 | 24 | 66 | 6 |
| HPI503 04039 | 4.039 | - | .159 | 24 | 66 | 6 |
| HPI503 041 | 4.1 | - | .1614 | 24 | 66 | 6 |
| HPI503 042 | 4.2 | - | .1654 | 24 | 66 | 6 |
| HPI503 043 | 4.3 | - | .1693 | 24 | 66 | 6 |
| HPI503 04366 | 4.366 | - | .1719 | 24 | 66 | 6 |
| HPI503 044 | 4.4 | - | .1732 | 24 | 66 | 6 |
| HPI503 045 | 4.5 | - | .1772 | 24 | 66 | 6 |
| HPI503 046 | 4.6 | - | .1811 | 24 | 66 | 6 |
| HPI503 047 | 4.7 | - | .185 | 24 | 66 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 04763 | 4.763 | 3/16 | .1875 | 28 | 66 | 6 |
| HPI503 048 | 4.8 | - | .189 | 28 | 66 | 6 |
| HPI503 049 | 4.9 | - | .1929 | 28 | 66 | 6 |
| HPI503 050 | 5 | - | .1969 | 28 | 66 | 6 |
| HPI503 051 | 5.1 | - | .2008 | 28 | 66 | 6 |
| HPI503 05159 | 5.159 | 13/64 | .2031 | 28 | 66 | 6 |
| HPI503 052 | 5.2 | - | .2047 | 28 | 66 | 6 |
| HPI503 053 | 5.3 | - | .2087 | 28 | 66 | 6 |
| HPI503 054 | 5.4 | - | .2126 | 28 | 66 | 6 |
| HPI503 055 | 5.5 | - | .2165 | 28 | 66 | 6 |
| HPI503 05558 | 5.558 | 7/32 | .2188 | 28 | 66 | 6 |
| HPI503 056 | 5.6 | - | .2205 | 28 | 66 | 6 |
| HPI503 057 | 5.7 | - | .2244 | 28 | 66 | 6 |
| HPI503 058 | 5.8 | - | .2283 | 28 | 66 | 6 |
| HPI503 059 | 5.9 | - | .2323 | 28 | 66 | 6 |
| HPI503 05953 | 5.953 | 15/64 | .2344 | 28 | 66 | 6 |
| HPI503 060 | 6 | - | .2362 | 28 | 66 | 6 |
| HPI503 061 | 6.1 | - | .2402 | 34 | 79 | 8 |
| HPI503 062 | 6.2 | - | .2441 | 34 | 79 | 8 |
| HPI503 063 | 6.3 | - | .248 | 34 | 79 | 8 |
| HPI503 0635 | 6.35 | 1/4 | .25 | 34 | 79 | 8 |
| HPI503 064 | 6.4 | - | .252 | 34 | 79 | 8 |
| HPI503 065 | 6.5 | - | .2559 | 34 | 79 | 8 |
| HPI503 066 | 6.6 | - | .2598 | 34 | 79 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 067 | 6.7 | - | .2638 | 34 | 79 | 8 |
| HPI503 06747 | 6.747 | 17/64 | .2656 | 34 | 79 | 8 |
| HPI503 068 | 6.8 | - | .2677 | 34 | 79 | 8 |
| HPI503 069 | 6.9 | - | .2717 | 34 | 79 | 8 |
| HPI503 070 | 7 | - | .2756 | 34 | 79 | 8 |
| HPI503 071 | 7.1 | - | .2795 | 41 | 79 | 8 |
| HPI503 07145 | 7.145 | 9/32 | .2813 | 41 | 79 | 8 |
| HPI503 072 | 7.2 | - | .2835 | 41 | 79 | 8 |
| HPI503 073 | 7.3 | - | .2874 | 41 | 79 | 8 |
| HPI503 074 | 7.4 | - | .2913 | 41 | 79 | 8 |
| HPI503 075 | 7.5 | - | .2953 | 41 | 79 | 8 |
| HPI503 07541 | 7.541 | 19/64 | .2969 | 41 | 79 | 8 |
| HPI503 076 | 7.6 | - | .2992 | 41 | 79 | 8 |
| HPI503 077 | 7.7 | - | .3031 | 41 | 79 | 8 |
| HPI503 078 | 7.8 | - | .0371 | 41 | 79 | 8 |
| HPI503 079 | 7.9 | - | .311 | 41 | 79 | 8 |
| HPI503 07938 | 7.938 | 5/16 | .3125 | 41 | 79 | 8 |
| HPI503 080 | 8 | - | .315 | 41 | 79 | 8 |
| HPI503 081 | 8.1 | - | .3189 | 47 | 89 | 10 |
| HPI503 082 | 8.2 | - | .3228 | 47 | 89 | 10 |
| HPI503 083 | 8.3 | - | .3268 | 47 | 89 | 10 |
| HPI503 08334 | 8.334 | 21/64 | .3281 | 47 | 89 | 10 |
| HPI503 0834 | 8.34 | - | .3283 | 47 | 89 | 10 |
| HPI503 084 | 8.4 | - | .3307 | 47 | 89 | 10 |
| HPI503 085 | 8.5 | - | .3346 | 47 | 89 | 10 |
| HPI503 086 | 8.6 | - | .3386 | 47 | 89 | 10 |
| HPI503 087 | 8.7 | - | .3425 | 47 | 89 | 10 |
| HPI503 08733 | 8.733 | 11/32 | .3438 | 47 | 89 | 10 |
| HPI503 088 | 8.8 | - | .3465 | 47 | 89 | 10 |
| HPI503 089 | 8.9 | - | .6504 | 47 | 89 | 10 |
| HPI503 090 | 9 | - | .3543 | 47 | 89 | 10 |
| HPI503 091 | 9.1 | - | .3583 | 47 | 89 | 10 |
| HPI503 09129 | 9.129 | 23/64 | .3594 | 47 | 89 | 10 |
| HPI503 092 | 9.2 | - | .3622 | 47 | 89 | 10 |
| HPI503 093 | 9.3 | - | .3661 | 47 | 89 | 10 |
| HPI503 094 | 9.4 | - | .368 | 47 | 89 | 10 |
| HPI503 095 | 9.5 | - | .374 | 47 | 89 | 10 |
| HPI503 09525 | 9.525 | 3/8 | .375 | 47 | 89 | 10 |
| HPI503 096 | 9.6 | - | .378 | 47 | 89 | 10 |
| HPI503 097 | 9.7 | - | .3819 | 47 | 89 | 10 |
| HPI503 098 | 9.8 | - | .3858 | 47 | 89 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 099 | 9.9 | - | .3898 | 47 | 89 | 10 |
| HPI503 09921 | 9.9921 | 25/64 | .3906 | 47 | 89 | 10 |
| HPI503 100 | 10 | - | .3937 | 47 | 89 | 10 |
| HPI503 101 | 10.1 | - | .3976 | 55 | 105 | 12 |
| HPI503 102 | 10.2 | - | .4016 | 55 | 105 | 12 |
| HPI503 103 | 10.3 | - | .4055 | 55 | 105 | 12 |
| HPI503 1032 | 10.32 | 13/32 | .4063 | 55 | 105 | 12 |
| HPI503 104 | 10.4 | - | .4094 | 55 | 105 | 12 |
| HPI503 105 | 10.5 | - | .4134 | 55 | 105 | 12 |
| HPI503 106 | 10.6 | - | .4173 | 55 | 105 | 12 |
| HPI503 107 | 10.7 | - | .4213 | 55 | 105 | 12 |
| HPI503 10716 | 10.716 | 27/64 | .4219 | 55 | 105 | 12 |
| HPI503 108 | 10.8 | - | .4252 | 55 | 105 | 12 |
| HPI503 109 | 10.9 | - | .4291 | 55 | 105 | 12 |
| HPI503 110 | 11 | - | .4331 | 55 | 105 | 12 |
| HPI503 111 | 11.1 | - | .437 | 55 | 105 | 12 |
| HPI503 11113 | 11.113 | 7/16 | .4375 | 55 | 105 | 12 |
| HPI503 112 | 11.2 | - | .4409 | 55 | 105 | 12 |
| HPI503 113 | 11.3 | - | .4449 | 55 | 105 | 12 |
| HPI503 114 | 11.4 | - | .4488 | 55 | 105 | 12 |
| HPI503 115 | 11.5 | - | .4528 | 55 | 105 | 12 |
| HPI503 11509 | 11.509 | 29/64 | .4531 | 55 | 105 | 12 |
| HPI503 116 | 11.6 | - | .4567 | 55 | 105 | 12 |
| HPI503 117 | 11.7 | - | .4606 | 55 | 105 | 12 |
| HPI503 118 | 11.8 | - | .4646 | 55 | 105 | 12 |
| HPI503 119 | 11.9 | - | .4685 | 55 | 105 | 12 |
| HPI503 11908 | 11.908 | 15/32 | .4688 | 55 | 105 | 12 |
| HPI503 120 | 12 | - | .4724 | 55 | 105 | 12 |
| HPI503 121 | 12.1 | - | .4764 | 60 | 107 | 14 |
| HPI503 122 | 12.2 | - | .4803 | 60 | 107 | 14 |
| HPI503 123 | 12.3 | - | .4843 | 60 | 107 | 14 |
| HPI503 12304 | 12.304 | 31/64 | .4844 | 60 | 107 | 14 |
| HPI503 124 | 12.4 | - | .4882 | 60 | 107 | 14 |
| HPI503 125 | 12.5 | - | .4921 | 60 | 107 | 14 |
| HPI503 126 | 12.6 | - | .4961 | 60 | 107 | 14 |
| HPI503 127 | 12.7 | 1/2 | .5 | 60 | 107 | 14 |
| HPI503 128 | 12.8 | - | .5039 | 60 | 107 | 14 |
| HPI503 129 | 12.9 | - | .5079 | 60 | 107 | 14 |
| HPI503 130 | 13 | - | .5118 | 60 | 107 | 14 |
| HPI503 132 | 13.2 | - | .5197 | 60 | 107 | 14 |
| HPI503 133 | 13.3 | - | .5236 | 60 | 107 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI503 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537K

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 13494 | 13.494 | 17/32 | .5313 | 60 | 107 | 14 |
| HPI503 135 | 13.5 | - | .5315 | 60 | 107 | 14 |
| HPI503 137 | 13.7 | - | .5394 | 60 | 107 | 14 |
| HPI503 13891 | 13.891 | 35/64 | .5469 | 60 | 107 | 14 |
| HPI503 140 | 14 | - | .5512 | 60 | 107 | 14 |
| HPI503 141 | 14.1 | - | .5551 | 65 | 115 | 16 |
| HPI503 142 | 14.2 | - | .5591 | 65 | 115 | 16 |
| HPI503 14288 | 14.288 | 9/16 | .5625 | 65 | 115 | 16 |
| HPI503 145 | 14.5 | - | .5709 | 65 | 115 | 16 |
| HPI503 146 | 14.6 | - | .5746 | 65 | 115 | 16 |
| HPI503 147 | 14.7 | - | .5787 | 65 | 115 | 16 |
| HPI503 150 | 15 | - | .5906 | 65 | 115 | 16 |
| HPI503 15081 | 15.081 | 19/32 | .5937 | 65 | 115 | 16 |
| HPI503 155 | 15.5 | - | .6102 | 65 | 115 | 16 |
| HPI503 157 | 15.7 | - | .6181 | 65 | 115 | 16 |
| HPI503 158 | 15.8 | - | .622 | 65 | 115 | 16 |
| HPI503 15875 | 15.875 | 5/8 | .625 | 65 | 115 | 16 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI503 160 | 16 | - | .6299 | 65 | 115 | 16 |
| HPI503 162 | 16.2 | - | .6378 | 73 | 123 | 18 |
| HPI503 163 | 16.3 | - | .6417 | 73 | 123 | 18 |
| HPI503 165 | 16.5 | - | .6496 | 73 | 123 | 18 |
| HPI503 167 | 16.7 | - | .6575 | 73 | 123 | 18 |
| HPI503 168 | 16.8 | - | .6614 | 73 | 123 | 18 |
| HPI503 170 | 17 | - | .6693 | 73 | 123 | 18 |
| HPI503 171 | 17.1 | - | .6732 | 73 | 123 | 18 |
| HPI503 17463 | 17.463 | 11/16 | .6875 | 73 | 123 | 18 |
| HPI503 175 | 17.5 | - | .689 | 73 | 123 | 18 |
| HPI503 180 | 18 | - | .7087 | 73 | 123 | 18 |
| HPI503 185 | 18.5 | - | .7883 | 79 | 131 | 20 |
| HPI503 190 | 19 | - | .748 | 79 | 131 | 20 |
| HPI503 1905 | 19.05 | 3/4 | .75 | 79 | 131 | 20 |
| HPI503 197 | 19.7 | - | .7756 | 79 | 131 | 20 |
| HPI503 200 | 20 | - | .7874 | 79 | 131 | 20 |

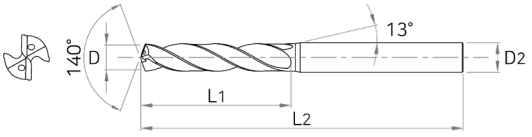


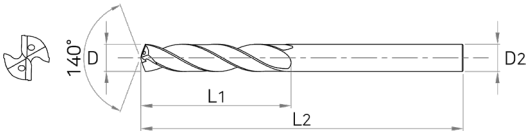
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ 6 | +0.004 ~ +0.016 | |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 030 | 3 | - | .1181 | 30 | 66 | 6 |
| HPI505 031 | 3.1 | - | .1120 | 30 | 66 | 6 |
| HPI505 03175 | 3.175 | - | .1250 | 30 | 66 | 6 |
| HPI505 032 | 3.2 | - | .1260 | 30 | 66 | 6 |
| HPI505 03264 | 3.264 | 1/8 | .1285 | 30 | 66 | 6 |
| HPI505 033 | 3.3 | - | .1299 | 30 | 66 | 6 |
| HPI505 034 | 3.4 | - | .1339 | 30 | 66 | 6 |
| HPI505 035 | 3.5 | - | .1378 | 30 | 66 | 6 |
| HPI505 03572 | 3.572 | 9/64 | .1406 | 30 | 66 | 6 |
| HPI505 036 | 3.6 | - | .1417 | 30 | 66 | 6 |
| HPI505 037 | 3.7 | - | .1457 | 30 | 66 | 6 |
| HPI505 038 | 3.8 | - | .1496 | 36 | 74 | 6 |
| HPI505 039 | 3.9 | - | .1535 | 36 | 74 | 6 |
| HPI505 0397 | 3.97 | 5/32 | .1563 | 36 | 74 | 6 |
| HPI505 040 | 4 | - | .1575 | 36 | 74 | 6 |
| HPI505 04039 | 4.039 | - | .1590 | 36 | 74 | 6 |
| HPI505 041 | 4.1 | - | .1614 | 36 | 74 | 6 |
| HPI505 042 | 4.2 | - | .1654 | 36 | 74 | 6 |
| HPI505 043 | 4.3 | - | .1693 | 36 | 74 | 6 |
| HPI505 04366 | 4.366 | - | .1719 | 36 | 74 | 6 |
| HPI505 044 | 4.4 | - | .1732 | 36 | 74 | 6 |
| HPI505 045 | 4.5 | - | .1772 | 36 | 74 | 6 |
| HPI505 0458 | 4.58 | - | .1803 | 36 | 74 | 6 |
| HPI505 046 | 4.6 | - | .1811 | 36 | 74 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 04623 | 4.623 | - | .1820 | 36 | 74 | 6 |
| HPI505 047 | 4.7 | - | .1850 | 36 | 74 | 6 |
| HPI505 04763 | 4.763 | 3/16 | .1875 | 44 | 82 | 6 |
| HPI505 048 | 4.8 | - | .1890 | 44 | 82 | 6 |
| HPI505 049 | 4.9 | - | .1929 | 44 | 82 | 6 |
| HPI505 050 | 5 | - | .1969 | 44 | 82 | 6 |
| HPI505 051 | 5.1 | - | .2008 | 44 | 82 | 6 |
| HPI505 05159 | 5.159 | 13/64 | .2031 | 44 | 82 | 6 |
| HPI505 052 | 5.2 | - | .2047 | 44 | 82 | 6 |
| HPI505 053 | 5.3 | - | .2087 | 44 | 82 | 6 |
| HPI505 054 | 5.4 | - | .2126 | 44 | 82 | 6 |
| HPI505 0541 | 5.41 | - | .2130 | 44 | 82 | 6 |
| HPI505 055 | 5.5 | - | .2165 | 44 | 82 | 6 |
| HPI505 05558 | 5.558 | 7/32 | .2188 | 44 | 82 | 6 |
| HPI505 056 | 5.6 | - | .2205 | 44 | 82 | 6 |
| HPI505 057 | 5.7 | - | .2244 | 44 | 82 | 6 |
| HPI505 058 | 5.8 | - | .2283 | 44 | 82 | 6 |
| HPI505 059 | 5.9 | - | .2323 | 44 | 82 | 6 |
| HPI505 05953 | 5.953 | 15/64 | .2344 | 44 | 82 | 6 |
| HPI505 060 | 6 | - | .2362 | 44 | 82 | 6 |
| HPI505 061 | 6.1 | - | .2402 | 53 | 91 | 8 |
| HPI505 062 | 6.2 | - | .2441 | 53 | 91 | 8 |
| HPI505 063 | 6.3 | - | .2480 | 53 | 91 | 8 |
| HPI505 0635 | 6.35 | 1/4 | .2500 | 53 | 91 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 064 | 6.4 | - | .2520 | 53 | 91 | 8 |
| HPI505 065 | 6.5 | - | .2559 | 53 | 91 | 8 |
| HPI505 06528 | 6.528 | - | .2570 | 53 | 91 | 8 |
| HPI505 066 | 6.6 | - | .2598 | 53 | 91 | 8 |
| HPI505 067 | 6.7 | - | .2638 | 53 | 91 | 8 |
| HPI505 06747 | 6.747 | 17/64 | .2656 | 53 | 91 | 8 |
| HPI505 068 | 6.8 | - | .2677 | 53 | 91 | 8 |
| HPI505 069 | 6.9 | - | .2717 | 53 | 91 | 8 |
| HPI505 06909 | 6.909 | - | .2720 | 53 | 91 | 8 |
| HPI505 070 | 7 | - | .2756 | 53 | 91 | 8 |
| HPI505 071 | 7.1 | - | .2795 | 53 | 91 | 8 |
| HPI505 07145 | 7.145 | 9/32 | .2813 | 53 | 91 | 8 |
| HPI505 072 | 7.2 | - | .2835 | 53 | 91 | 8 |
| HPI505 073 | 7.3 | - | .2874 | 53 | 91 | 8 |
| HPI505 074 | 7.4 | - | .2913 | 53 | 91 | 8 |
| HPI505 075 | 7.5 | - | .2953 | 53 | 91 | 8 |
| HPI505 07541 | 7.541 | 19/64 | .2969 | 53 | 91 | 8 |
| HPI505 076 | 7.6 | - | .2992 | 53 | 91 | 8 |
| HPI505 077 | 7.7 | - | .3031 | 53 | 91 | 8 |
| HPI505 078 | 7.8 | - | .3071 | 53 | 91 | 8 |
| HPI505 079 | 7.9 | - | .3110 | 53 | 91 | 8 |
| HPI505 07938 | 7.938 | 5/16 | .3125 | 53 | 91 | 8 |
| HPI505 080 | 8 | - | .3150 | 53 | 91 | 8 |
| HPI505 081 | 8.1 | - | .3189 | 61 | 103 | 10 |
| HPI505 082 | 8.2 | - | .3228 | 61 | 103 | 10 |
| HPI505 083 | 8.3 | - | .3268 | 61 | 103 | 10 |
| HPI505 08334 | 8.334 | 21/64 | .3281 | 61 | 103 | 10 |
| HPI505 084 | 8.4 | - | .3307 | 61 | 103 | 10 |
| HPI505 08433 | 8.433 | - | .3320 | 61 | 103 | 10 |
| HPI505 085 | 8.5 | - | .3346 | 61 | 103 | 10 |
| HPI505 086 | 8.6 | - | .3386 | 61 | 103 | 10 |
| HPI505 087 | 8.7 | - | .3425 | 61 | 103 | 10 |
| HPI505 08733 | 8.733 | 11/32 | .3438 | 61 | 103 | 10 |
| HPI505 088 | 8.8 | - | .3465 | 61 | 103 | 10 |
| HPI505 089 | 8.9 | - | .3504 | 61 | 103 | 10 |
| HPI505 090 | 9 | - | .3543 | 61 | 103 | 10 |
| HPI505 091 | 9.1 | - | .3583 | 61 | 103 | 10 |
| HPI505 09129 | 9.129 | 23/64 | .3594 | 61 | 103 | 10 |
| HPI505 092 | 9.2 | - | .3622 | 61 | 103 | 10 |
| HPI505 093 | 9.3 | - | .3661 | 61 | 103 | 10 |
| HPI505 09347 | 9.347 | - | .3680 | 61 | 103 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 094 | 9.4 | - | .3701 | 61 | 103 | 10 |
| HPI505 095 | 9.5 | - | .3740 | 61 | 103 | 10 |
| HPI505 09525 | 9.525 | 3/8 | .3750 | 61 | 103 | 10 |
| HPI505 096 | 9.6 | - | .3780 | 61 | 103 | 10 |
| HPI505 097 | 9.7 | - | .3819 | 61 | 103 | 10 |
| HPI505 09703 | 9.703 | - | .3820 | 61 | 103 | 10 |
| HPI505 09746 | 9.746 | - | .3837 | 61 | 103 | 10 |
| HPI505 098 | 9.8 | - | .3858 | 61 | 103 | 10 |
| HPI505 099 | 9.9 | - | .3898 | 61 | 103 | 10 |
| HPI505 09921 | 9.921 | 25/64 | .3906 | 61 | 103 | 10 |
| HPI505 100 | 10 | - | .3937 | 61 | 103 | 10 |
| HPI505 101 | 10.1 | - | .3976 | 71 | 118 | 12 |
| HPI505 102 | 10.2 | - | .4016 | 71 | 118 | 12 |
| HPI505 103 | 10.3 | - | .4055 | 71 | 118 | 12 |
| HPI505 1032 | 10.32 | 13/32 | .4063 | 71 | 118 | 12 |
| HPI505 104 | 10.4 | - | .4074 | 71 | 118 | 12 |
| HPI505 105 | 10.5 | - | .4134 | 71 | 118 | 12 |
| HPI505 106 | 10.6 | - | .4173 | 71 | 118 | 12 |
| HPI505 107 | 10.7 | - | .4213 | 71 | 118 | 12 |
| HPI505 10716 | 10.716 | 27/64 | .4219 | 71 | 118 | 12 |
| HPI505 108 | 10.8 | - | .4252 | 71 | 118 | 12 |
| HPI505 109 | 10.9 | - | .4291 | 71 | 118 | 12 |
| HPI505 110 | 11 | - | .4331 | 71 | 118 | 12 |
| HPI505 111 | 11.1 | - | .4370 | 71 | 118 | 12 |
| HPI505 11113 | 11.113 | 7/16 | .4375 | 71 | 118 | 12 |
| HPI505 112 | 11.2 | - | .4409 | 71 | 118 | 12 |
| HPI505 113 | 11.3 | - | .4449 | 71 | 118 | 12 |
| HPI505 114 | 11.4 | - | .4488 | 71 | 118 | 12 |
| HPI505 115 | 11.5 | - | .4528 | 71 | 118 | 12 |
| HPI505 11509 | 11.509 | 29/64 | .4531 | 71 | 118 | 12 |
| HPI505 116 | 11.6 | - | .4567 | 71 | 118 | 12 |
| HPI505 117 | 11.7 | - | .4606 | 71 | 118 | 12 |
| HPI505 118 | 11.8 | - | .4646 | 71 | 118 | 12 |
| HPI505 119 | 11.9 | - | .4685 | 71 | 118 | 12 |
| HPI505 11908 | 11.908 | 15/32 | .4688 | 71 | 118 | 12 |
| HPI505 120 | 12 | - | .4724 | 71 | 118 | 12 |
| HPI505 121 | 12.1 | - | .4764 | 77 | 124 | 14 |
| HPI505 122 | 12.2 | - | .4803 | 77 | 124 | 14 |
| HPI505 123 | 12.3 | - | .4843 | 77 | 124 | 14 |
| HPI505 12304 | 12.304 | 31/64 | .4844 | 77 | 124 | 14 |
| HPI505 124 | 12.4 | - | .4882 | 77 | 124 | 14 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI505 | DOUBLE MARGIN INTERNAL COOLANT DRILL - DIN 6537L



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 125 | 12.5 | - | .4921 | 77 | 124 | 14 |
| HPI505 126 | 12.6 | - | .4961 | 77 | 124 | 14 |
| HPI505 127 | 12.7 | 1/2 | .5 | 77 | 124 | 14 |
| HPI505 128 | 12.8 | - | .5039 | 77 | 124 | 14 |
| HPI505 129 | 12.9 | - | .5079 | 77 | 124 | 14 |
| HPI505 12903 | 12.903 | - | .508 | 77 | 124 | 14 |
| HPI505 130 | 13 | - | .5118 | 77 | 124 | 14 |
| HPI505 13096 | 13.096 | 33/64 | .5156 | 77 | 124 | 14 |
| HPI505 131 | 13.1 | - | .5157 | 77 | 124 | 14 |
| HPI505 132 | 13.2 | - | .5197 | 77 | 124 | 14 |
| HPI505 133 | 13.3 | - | .5236 | 77 | 124 | 14 |
| HPI505 134 | 13.4 | - | .5276 | 77 | 124 | 14 |
| HPI505 13494 | 13.494 | 17/32 | .5313 | 77 | 124 | 14 |
| HPI505 135 | 13.5 | - | .5315 | 77 | 124 | 14 |
| HPI505 137 | 13.7 | - | .5394 | 77 | 124 | 14 |
| HPI505 138 | 13.8 | - | .5433 | 77 | 124 | 14 |
| HPI505 13891 | 13.981 | 35/64 | .5504 | 77 | 124 | 14 |
| HPI505 140 | 14 | - | .5512 | 77 | 124 | 14 |
| HPI505 141 | 14.1 | - | .5551 | 83 | 133 | 16 |
| HPI505 142 | 14.2 | - | .5591 | 83 | 133 | 16 |
| HPI505 14288 | 14.288 | 9/16 | .5625 | 83 | 133 | 16 |
| HPI505 145 | 14.5 | - | .5709 | 83 | 133 | 16 |
| HPI505 146 | 14.6 | - | .5748 | 83 | 133 | 16 |
| HPI505 147 | 14.7 | - | .5787 | 83 | 133 | 16 |
| HPI505 148 | 14.8 | - | .5827 | 83 | 133 | 16 |
| HPI505 149 | 14.9 | - | .5866 | 83 | 133 | 16 |
| HPI505 150 | 15 | - | .5906 | 83 | 133 | 16 |
| HPI505 15081 | 15.081 | 19/32 | .5937 | 83 | 133 | 16 |
| HPI505 151 | 15.1 | - | .5945 | 83 | 133 | 16 |
| HPI505 152 | 15.2 | - | .5984 | 83 | 133 | 16 |
| HPI505 155 | 15.5 | - | .6102 | 83 | 133 | 16 |
| HPI505 156 | 15.6 | - | .6142 | 83 | 133 | 16 |
| HPI505 157 | 15.7 | - | .6181 | 83 | 133 | 16 |
| HPI505 158 | 15.8 | - | .622 | 83 | 133 | 16 |
| HPI505 15875 | 15.875 | 5/8 | .625 | 83 | 133 | 16 |

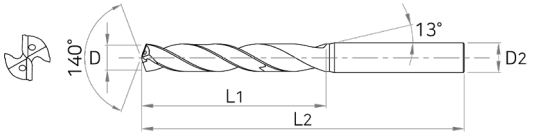
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI505 159 | 15.9 | - | .626 | 83 | 133 | 16 |
| HPI505 160 | 16 | - | .6299 | 83 | 133 | 16 |
| HPI505 16078 | 16.078 | - | .633 | 93 | 143 | 18 |
| HPI505 162 | 16.2 | - | .6378 | 93 | 143 | 18 |
| HPI505 164 | 16.4 | - | .6457 | 93 | 143 | 18 |
| HPI505 165 | 16.5 | - | .6496 | 93 | 143 | 18 |
| HPI505 166 | 16.6 | - | .6535 | 93 | 143 | 18 |
| HPI505 16667 | 16.667 | 21/32 | .6562 | 93 | 143 | 18 |
| HPI505 167 | 16.7 | - | .6575 | 93 | 143 | 18 |
| HPI505 170 | 17 | - | .6693 | 93 | 143 | 18 |
| HPI505 171 | 17.1 | - | .6732 | 93 | 143 | 18 |
| HPI505 172 | 17.2 | - | .6772 | 93 | 143 | 18 |
| HPI505 173 | 17.3 | - | .6811 | 93 | 143 | 18 |
| HPI505 17463 | 17.463 | 11/16 | .6875 | 93 | 143 | 18 |
| HPI505 175 | 17.5 | - | .689 | 93 | 143 | 18 |
| HPI505 176 | 17.6 | - | .6929 | 93 | 143 | 18 |
| HPI505 177 | 17.7 | - | .6969 | 93 | 143 | 18 |
| HPI505 178 | 17.8 | - | .7008 | 93 | 143 | 18 |
| HPI505 179 | 17.9 | - | .7047 | 93 | 143 | 18 |
| HPI505 180 | 18 | - | .7087 | 93 | 143 | 18 |
| HPI505 184 | 18.4 | - | .7244 | 101 | 153 | 20 |
| HPI505 185 | 18.5 | - | .7283 | 101 | 153 | 20 |
| HPI505 186 | 18.6 | - | .7323 | 101 | 153 | 20 |
| HPI505 188 | 18.8 | - | .7402 | 101 | 153 | 20 |
| HPI505 189 | 18.9 | - | .7441 | 101 | 153 | 20 |
| HPI505 190 | 19 | - | .748 | 101 | 153 | 20 |
| HPI505 1905 | 19.05 | 3/4 | .75 | 101 | 153 | 20 |
| HPI505 192 | 19.2 | - | .7559 | 101 | 153 | 20 |
| HPI505 19253 | 19.253 | - | .758 | 101 | 153 | 20 |
| HPI505 19446 | 19.446 | 49/64 | .7656 | 101 | 153 | 20 |
| HPI505 195 | 19.5 | - | .7677 | 101 | 153 | 20 |
| HPI505 197 | 19.7 | - | .7756 | 101 | 153 | 20 |
| HPI505 19844 | 19.844 | 25/32 | .7813 | 101 | 153 | 20 |
| HPI505 200 | 20 | - | .7874 | 101 | 153 | 20 |

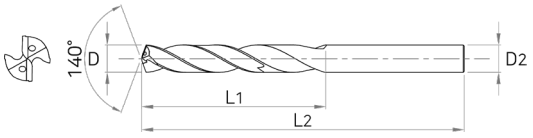
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ 6 | +0.004 ~ +0.016 | |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 030N | 3 | - | .1181 | 43 | 80 | 6 |
| HPI508 031N | 3.1 | - | .122 | 43 | 80 | 6 |
| HPI508 03175N | 3.175 | 1/8 | .125 | 43 | 80 | 6 |
| HPI508 032N | 3.2 | - | .126 | 43 | 80 | 6 |
| HPI508 03264N | 3.264 | - | .1285 | 43 | 80 | 6 |
| HPI508 033N | 3.3 | - | .1299 | 43 | 80 | 6 |
| HPI508 034N | 3.4 | - | .1339 | 43 | 80 | 6 |
| HPI508 035N | 3.5 | - | .1378 | 43 | 80 | 6 |
| HPI508 03572N | 3.572 | 9/64 | .1406 | 43 | 80 | 6 |
| HPI508 036N | 3.6 | - | .1417 | 43 | 80 | 6 |
| HPI508 037N | 3.7 | - | .1457 | 43 | 80 | 6 |
| HPI508 038N | 3.8 | - | .1496 | 49 | 87 | 6 |
| HPI508 039N | 3.9 | - | .1535 | 49 | 87 | 6 |
| HPI508 0397N | 3.97 | 5/32 | .1563 | 49 | 87 | 6 |
| HPI508 040N | 4 | - | .1575 | 49 | 87 | 6 |
| HPI508 04039N | 4.039 | - | .159 | 49 | 87 | 6 |
| HPI508 041N | 4.1 | - | .1614 | 49 | 87 | 6 |
| HPI508 042N | 4.2 | - | .1654 | 49 | 87 | 6 |
| HPI508 043N | 4.3 | - | .1693 | 49 | 87 | 6 |
| HPI508 04366N | 4.366 | - | .1719 | 49 | 87 | 6 |
| HPI508 044N | 4.4 | - | .1732 | 49 | 87 | 6 |
| HPI508 045N | 4.5 | - | .1772 | 49 | 87 | 6 |
| HPI508 046N | 4.6 | - | .1811 | 49 | 87 | 6 |
| HPI508 047N | 4.7 | - | .185 | 49 | 87 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 04763N | 4.763 | 3/16 | .1875 | 56 | 94 | 6 |
| HPI508 048N | 4.8 | - | .189 | 56 | 94 | 6 |
| HPI508 049N | 4.9 | - | .1929 | 56 | 94 | 6 |
| HPI508 050N | 5 | - | .1969 | 56 | 94 | 6 |
| HPI508 051N | 5.1 | - | .2008 | 56 | 94 | 6 |
| HPI508 05159N | 5.159 | 13/64 | .2031 | 56 | 94 | 6 |
| HPI508 052N | 5.2 | - | .2047 | 56 | 94 | 6 |
| HPI508 053N | 5.3 | - | .2087 | 56 | 94 | 6 |
| HPI508 054N | 5.4 | - | .2126 | 56 | 94 | 6 |
| HPI508 055N | 5.5 | - | .2165 | 56 | 94 | 6 |
| HPI508 05558N | 5.558 | 7/32 | .2188 | 56 | 94 | 6 |
| HPI508 056N | 5.6 | - | .2205 | 56 | 94 | 6 |
| HPI508 057N | 5.7 | - | .2244 | 56 | 94 | 6 |
| HPI508 058N | 5.8 | - | .2283 | 56 | 94 | 6 |
| HPI508 059N | 5.9 | - | .2323 | 56 | 94 | 6 |
| HPI508 05953N | 5.953 | 15/64 | .2344 | 56 | 94 | 6 |
| HPI508 060N | 6 | - | .2362 | 65 | 94 | 6 |
| HPI508 061N | 6.1 | - | .2402 | 67 | 105 | 8 |
| HPI508 062N | 6.2 | - | .2441 | 67 | 105 | 8 |
| HPI508 063N | 6.3 | - | .248 | 67 | 105 | 8 |
| HPI508 0635N | 6.35 | 1/4 | .2500 | 67 | 105 | 8 |
| HPI508 064N | 6.4 | - | .252 | 67 | 105 | 8 |
| HPI508 065N | 6.5 | - | .2559 | 67 | 105 | 8 |
| HPI508 066N | 6.6 | - | .2598 | 67 | 105 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D



| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 067N | 6.7 | - | .2638 | 67 | 105 | 8 |
| HPI508 06747N | 6.747 | 17/64 | .2656 | 67 | 105 | 8 |
| HPI508 068N | 6.8 | - | .2677 | 67 | 105 | 8 |
| HPI508 069N | 6.9 | - | .2717 | 67 | 105 | 8 |
| HPI508 070N | 7 | - | .2756 | 76 | 116 | 8 |
| HPI508 071N | 7.1 | - | .2795 | 76 | 116 | 8 |
| HPI508 07145N | 7.145 | 9/32 | .2813 | 76 | 116 | 8 |
| HPI508 072N | 7.2 | - | .2835 | 76 | 116 | 8 |
| HPI508 073N | 7.3 | - | .2874 | 76 | 116 | 8 |
| HPI508 074N | 7.4 | - | .2913 | 76 | 116 | 8 |
| HPI508 075N | 7.5 | - | .2953 | 76 | 116 | 8 |
| HPI508 07541N | 7.541 | 19/64 | .2969 | 76 | 116 | 8 |
| HPI508 076N | 7.6 | - | .2992 | 76 | 116 | 8 |
| HPI508 077N | 7.7 | - | .3031 | 76 | 116 | 8 |
| HPI508 078N | 7.8 | - | .3071 | 76 | 116 | 8 |
| HPI508 079N | 7.9 | - | .311 | 76 | 116 | 8 |
| HPI508 07938N | 7.938 | 5/16 | .3125 | 76 | 116 | 8 |
| HPI508 080N | 8 | - | .315 | 76 | 116 | 8 |
| HPI508 081N | 8.1 | - | .3189 | 87 | 131 | 10 |
| HPI508 082N | 8.2 | - | .3228 | 87 | 131 | 10 |
| HPI508 083N | 8.3 | - | .3268 | 87 | 131 | 10 |
| HPI508 08334N | 8.334 | 21/64 | .3281 | 87 | 131 | 10 |
| HPI508 084N | 8.4 | - | .3307 | 87 | 131 | 10 |
| HPI508 085N | 8.5 | - | .3346 | 87 | 131 | 10 |
| HPI508 086N | 8.6 | - | .3386 | 87 | 131 | 10 |
| HPI508 087N | 8.7 | - | .3425 | 87 | 131 | 10 |
| HPI508 08733N | 8.733 | 11/32 | .3438 | 87 | 131 | 10 |
| HPI508 088N | 8.8 | - | .3465 | 87 | 131 | 10 |
| HPI508 089N | 8.9 | - | .3504 | 87 | 131 | 10 |
| HPI508 090N | 9 | - | .3543 | 87 | 131 | 10 |
| HPI508 091N | 9.1 | - | .3583 | 95 | 139 | 10 |
| HPI508 09129N | 9.129 | 23/64 | .3594 | 95 | 139 | 10 |
| HPI508 092N | 9.2 | - | .3622 | 95 | 139 | 10 |
| HPI508 093N | 9.3 | - | .3661 | 95 | 139 | 10 |
| HPI508 094N | 9.4 | - | .3701 | 95 | 139 | 10 |
| HPI508 095N | 9.5 | - | .374 | 95 | 139 | 10 |
| HPI508 09525N | 9.525 | 3/8 | .375 | 95 | 139 | 10 |
| HPI508 096N | 9.6 | - | .378 | 95 | 139 | 10 |
| HPI508 097N | 9.7 | - | .3819 | 95 | 139 | 10 |
| HPI508 098N | 9.8 | - | .3858 | 95 | 139 | 10 |
| HPI508 099N | 9.9 | - | .3898 | 95 | 139 | 10 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 09921N | 9.921 | 25/64 | .3906 | 95 | 139 | 10 |
| HPI508 100N | 10 | - | .3937 | 95 | 139 | 10 |
| HPI508 101N | 10.1 | - | .3976 | 106 | 155 | 12 |
| HPI508 102N | 10.2 | - | .4016 | 106 | 155 | 12 |
| HPI508 103N | 10.3 | - | .4055 | 106 | 155 | 12 |
| HPI508 1032N | 10.32 | 13/32 | .4063 | 106 | 155 | 12 |
| HPI508 104N | 10.4 | - | .4094 | 106 | 155 | 12 |
| HPI508 105N | 10.5 | - | .4134 | 106 | 155 | 12 |
| HPI508 107N | 10.7 | - | .4213 | 106 | 155 | 12 |
| HPI508 10716N | 10.716 | 27/64 | .4219 | 106 | 155 | 12 |
| HPI508 108N | 10.8 | - | .4252 | 106 | 155 | 12 |
| HPI508 109N | 10.9 | - | .4291 | 106 | 155 | 12 |
| HPI508 110N | 11 | - | .4331 | 106 | 155 | 12 |
| HPI508 111N | 11.1 | - | .437 | 114 | 163 | 12 |
| HPI508 11113N | 11.113 | 7/16 | .4375 | 114 | 163 | 12 |
| HPI508 112N | 11.2 | - | .4409 | 114 | 163 | 12 |
| HPI508 113N | 11.3 | - | .4449 | 114 | 163 | 12 |
| HPI508 114N | 11.4 | - | .4488 | 114 | 163 | 12 |
| HPI508 115N | 11.5 | - | .4528 | 114 | 163 | 12 |
| HPI508 11509N | 11.509 | 29/64 | .4531 | 114 | 163 | 12 |
| HPI508 116N | 11.6 | - | .4567 | 114 | 163 | 12 |
| HPI508 117N | 11.7 | - | .4606 | 114 | 163 | 12 |
| HPI508 118N | 11.8 | - | .4646 | 114 | 163 | 12 |
| HPI508 119N | 11.9 | - | .4685 | 114 | 163 | 12 |
| HPI508 11908N | 11.908 | 15/32 | .4688 | 114 | 163 | 12 |
| HPI508 120N | 12 | - | .4724 | 114 | 163 | 12 |
| HPI508 12304N | 12.304 | 31/64 | .4844 | 133 | 182 | 14 |
| HPI508 125N | 12.5 | - | .4921 | 133 | 182 | 14 |
| HPI508 127N | 12.7 | 1/2 | .5 | 133 | 182 | 14 |
| HPI508 128N | 12.8 | - | .5039 | 133 | 182 | 14 |
| HPI508 130N | 13 | - | .5118 | 133 | 182 | 14 |
| HPI508 13494N | 13.494 | - | .5313 | 133 | 182 | 14 |
| HPI508 135N | 13.5 | - | .5315 | 133 | 182 | 14 |
| HPI508 140N | 14 | - | .5512 | 133 | 182 | 14 |
| HPI508 14288N | 14.288 | 9/16 | .5625 | 152 | 204 | 16 |
| HPI508 145N | 14.5 | - | .5709 | 152 | 204 | 16 |
| HPI508 150N | 15 | - | .5906 | 152 | 204 | 16 |
| HPI508 151N | 15.1 | - | .5945 | 152 | 204 | 16 |
| HPI508 152N | 15.2 | - | .5984 | 152 | 204 | 16 |
| HPI508 153N | 15.3 | - | .6024 | 152 | 204 | 16 |
| HPI508 155N | 15.5 | - | .6102 | 152 | 204 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# HPI508-N | DOUBLE MARGIN INTERNAL COOLANT DRILL - 8D

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 158N | 15.8 | - | .622 | 152 | 204 | 16 |
| HPI508 15875N | 15.875 | 5/8 | .625 | 152 | 204 | 16 |
| HPI508 160N | 16 | - | .6299 | 152 | 204 | 16 |
| HPI508 16078N | 16.078 | - | .633 | 171 | 223 | 18 |
| HPI508 162N | 16.2 | - | .6378 | 171 | 223 | 18 |
| HPI508 165N | 16.5 | - | .6496 | 171 | 223 | 18 |
| HPI508 170N | 17 | - | .6693 | 171 | 223 | 18 |
| HPI508 17463N | 17.463 | 11/16 | .6875 | 171 | 223 | 18 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | | | L1 | L2 | D2 |
| | mm | fraction | inch | | | |
| HPI508 175N | 17.5 | - | .689 | 171 | 223 | 18 |
| HPI508 180N | 18 | - | .7087 | 171 | 223 | 18 |
| HPI508 185N | 18.5 | - | .7283 | 191 | 244 | 20 |
| HPI508 190N | 19 | - | .748 | 191 | 244 | 20 |
| HPI508 1905N | 19.05 | 3/4 | .75 | 191 | 244 | 20 |
| HPI508 19253N | 19.253 | - | .758 | 191 | 244 | 20 |
| HPI508 198N | 19.8 | - | .7795 | 191 | 244 | 20 |
| HPI508 200N | 20 | - | .7874 | 191 | 244 | 20 |

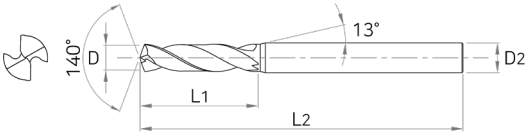


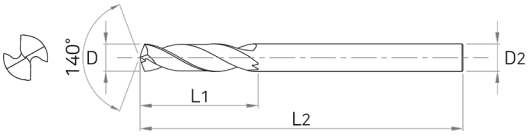
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P503A(F) | HIGH SPEED DRILL - DIN6537K




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.016 | |
| D6.1 ~ D10 | +0.006 ~ +0.021 | |
| D10.1 ~ D16 | +0.007 ~ +0.025 | |

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 030 | P503F 030 | 3 | 20 | 62 | 6 |
| P503A 031 | P503F 031 | 3.1 | 20 | 62 | 6 |
| P503A 032 | P503F 032 | 3.2 | 20 | 62 | 6 |
| P503A 033 | P503F 033 | 3.3 | 20 | 62 | 6 |
| P503A 034 | P503F 034 | 3.4 | 20 | 62 | 6 |
| P503A 035 | P503F 035 | 3.5 | 20 | 62 | 6 |
| P503A 036 | P503F 036 | 3.6 | 20 | 62 | 6 |
| P503A 037 | P503F 037 | 3.7 | 20 | 62 | 6 |
| P503A 038 | P503F 038 | 3.8 | 24 | 66 | 6 |
| P503A 039 | P503F 039 | 3.9 | 24 | 66 | 6 |
| P503A 040 | P503F 040 | 4 | 24 | 66 | 6 |
| P503A 041 | P503F 041 | 4.1 | 24 | 66 | 6 |
| P503A 042 | P503F 042 | 4.2 | 24 | 66 | 6 |
| P503A 043 | P503F 043 | 4.3 | 24 | 66 | 6 |
| P503A 044 | P503F 044 | 4.4 | 24 | 66 | 6 |
| P503A 045 | P503F 045 | 4.5 | 24 | 66 | 6 |
| P503A 046 | P503F 046 | 4.6 | 24 | 66 | 6 |
| P503A 047 | P503F 047 | 4.7 | 24 | 66 | 6 |
| P503A 048 | P503F 048 | 4.8 | 28 | 66 | 6 |
| P503A 049 | P503F 049 | 4.9 | 28 | 66 | 6 |
| P503A 050 | P503F 050 | 5 | 28 | 66 | 6 |
| P503A 051 | P503F 051 | 5.1 | 28 | 66 | 6 |
| P503A 052 | P503F 052 | 5.2 | 28 | 66 | 6 |
| P503A 053 | P503F 053 | 5.3 | 28 | 66 | 6 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 054 | P503F 054 | 5.4 | 28 | 66 | 6 |
| P503A 055 | P503F 055 | 5.5 | 28 | 66 | 6 |
| P503A 056 | P503F 056 | 5.6 | 28 | 66 | 6 |
| P503A 057 | P503F 057 | 5.7 | 28 | 66 | 6 |
| P503A 058 | P503F 058 | 5.8 | 28 | 66 | 6 |
| P503A 059 | P503F 059 | 5.9 | 28 | 66 | 6 |
| P503A 060 | P503F 060 | 6 | 28 | 66 | 6 |
| P503A 061 | P503F 061 | 6.1 | 34 | 79 | 8 |
| P503A 062 | P503F 062 | 6.2 | 34 | 79 | 8 |
| P503A 063 | P503F 063 | 6.3 | 34 | 79 | 8 |
| P503A 064 | P503F 064 | 6.4 | 34 | 79 | 8 |
| P503A 065 | P503F 065 | 6.5 | 34 | 79 | 8 |
| P503A 066 | P503F 066 | 6.6 | 34 | 79 | 8 |
| P503A 067 | P503F 067 | 6.7 | 34 | 79 | 8 |
| P503A 068 | P503F 068 | 6.8 | 34 | 79 | 8 |
| P503A 069 | P503F 069 | 6.9 | 34 | 79 | 8 |
| P503A 070 | P503F 070 | 7 | 34 | 79 | 8 |
| P503A 071 | P503F 071 | 7.1 | 41 | 79 | 8 |
| P503A 072 | P503F 072 | 7.2 | 41 | 79 | 8 |
| P503A 073 | P503F 073 | 7.3 | 41 | 79 | 8 |
| P503A 074 | P503F 074 | 7.4 | 41 | 79 | 8 |
| P503A 075 | P503F 075 | 7.5 | 41 | 79 | 8 |
| P503A 076 | P503F 076 | 7.6 | 41 | 79 | 8 |
| P503A 077 | P503F 077 | 7.7 | 41 | 79 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P503A(F) | HIGH SPEED DRILL - DIN6537K

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 078 | P503F 078 | 7.8 | 41 | 79 | 8 |
| P503A 079 | P503F 079 | 7.9 | 41 | 79 | 8 |
| P503A 080 | P503F 080 | 8 | 41 | 79 | 8 |
| P503A 081 | P503F 081 | 8.1 | 47 | 89 | 10 |
| P503A 082 | P503F 082 | 8.2 | 47 | 89 | 10 |
| P503A 083 | P503F 083 | 8.3 | 47 | 89 | 10 |
| P503A 084 | P503F 084 | 8.4 | 47 | 89 | 10 |
| P503A 085 | P503F 085 | 8.5 | 47 | 89 | 10 |
| P503A 086 | P503F 086 | 8.6 | 47 | 89 | 10 |
| P503A 087 | P503F 087 | 8.7 | 47 | 89 | 10 |
| P503A 088 | P503F 088 | 8.8 | 47 | 89 | 10 |
| P503A 089 | P503F 089 | 8.9 | 47 | 89 | 10 |
| P503A 090 | P503F 090 | 9 | 47 | 89 | 10 |
| P503A 091 | P503F 091 | 9.1 | 47 | 89 | 10 |
| P503A 092 | P503F 092 | 9.2 | 47 | 89 | 10 |
| P503A 093 | P503F 093 | 9.3 | 47 | 89 | 10 |
| P503A 094 | P503F 094 | 9.4 | 47 | 89 | 10 |
| P503A 095 | P503F 095 | 9.5 | 47 | 89 | 10 |
| P503A 096 | P503F 096 | 9.6 | 47 | 89 | 10 |
| P503A 097 | P503F 097 | 9.7 | 47 | 89 | 10 |
| P503A 098 | P503F 098 | 9.8 | 47 | 89 | 10 |
| P503A 099 | P503F 099 | 9.9 | 47 | 89 | 10 |
| P503A 100 | P503F 100 | 10 | 47 | 89 | 10 |
| P503A 101 | P503F 101 | 10.1 | 55 | 102 | 12 |
| P503A 102 | P503F 102 | 10.2 | 55 | 102 | 12 |
| P503A 103 | P503F 103 | 10.3 | 55 | 102 | 12 |
| P503A 104 | P503F 104 | 10.4 | 55 | 102 | 12 |
| P503A 105 | P503F 105 | 10.5 | 55 | 102 | 12 |
| P503A 106 | P503F 106 | 10.6 | 55 | 102 | 12 |
| P503A 107 | P503F 107 | 10.7 | 55 | 102 | 12 |
| P503A 108 | P503F 108 | 10.8 | 55 | 102 | 12 |
| P503A 109 | P503F 109 | 10.9 | 55 | 102 | 12 |
| P503A 110 | P503F 110 | 11 | 55 | 102 | 12 |
| P503A 111 | P503F 111 | 11.1 | 55 | 102 | 12 |
| P503A 112 | P503F 112 | 11.2 | 55 | 102 | 12 |
| P503A 113 | P503F 113 | 11.3 | 55 | 102 | 12 |
| P503A 114 | P503F 114 | 11.4 | 55 | 102 | 12 |
| P503A 115 | P503F 115 | 11.5 | 55 | 102 | 12 |
| P503A 116 | P503F 116 | 11.6 | 55 | 102 | 12 |
| P503A 117 | P503F 117 | 11.7 | 55 | 102 | 12 |
| P503A 118 | P503F 118 | 11.8 | 55 | 102 | 12 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 119 | P503F 119 | 11.9 | 55 | 102 | 12 |
| P503A 120 | P503F 120 | 12 | 55 | 102 | 12 |
| P503A 121 | P503F 121 | 12.1 | 60 | 107 | 14 |
| P503A 122 | P503F 122 | 12.2 | 60 | 107 | 14 |
| P503A 123 | P503F 123 | 12.3 | 60 | 107 | 14 |
| P503A 124 | P503F 124 | 12.4 | 60 | 107 | 14 |
| P503A 125 | P503F 125 | 12.5 | 60 | 107 | 14 |
| P503A 126 | P503F 126 | 12.6 | 60 | 107 | 14 |
| P503A 127 | P503F 127 | 12.7 | 60 | 107 | 14 |
| P503A 128 | P503F 128 | 12.8 | 60 | 107 | 14 |
| P503A 129 | P503F 129 | 12.9 | 60 | 107 | 14 |
| P503A 130 | P503F 130 | 13 | 60 | 107 | 14 |
| P503A 131 | P503F 131 | 13.1 | 60 | 107 | 14 |
| P503A 132 | P503F 132 | 13.2 | 60 | 107 | 14 |
| P503A 133 | P503F 133 | 13.3 | 60 | 107 | 14 |
| P503A 134 | P503F 134 | 13.4 | 60 | 107 | 14 |
| P503A 135 | P503F 135 | 13.5 | 60 | 107 | 14 |
| P503A 136 | P503F 136 | 13.6 | 60 | 107 | 14 |
| P503A 137 | P503F 137 | 13.7 | 60 | 107 | 14 |
| P503A 138 | P503F 138 | 13.8 | 60 | 107 | 14 |
| P503A 139 | P503F 139 | 13.9 | 60 | 107 | 14 |
| P503A 140 | P503F 140 | 14 | 60 | 107 | 14 |
| P503A 141 | P503F 141 | 14.1 | 65 | 115 | 16 |
| P503A 142 | P503F 142 | 14.2 | 65 | 115 | 16 |
| P503A 143 | P503F 143 | 14.3 | 65 | 115 | 16 |
| P503A 144 | P503F 144 | 14.4 | 65 | 115 | 16 |
| P503A 145 | P503F 145 | 14.5 | 65 | 115 | 16 |
| P503A 146 | P503F 146 | 14.6 | 65 | 115 | 16 |
| P503A 147 | P503F 147 | 14.7 | 65 | 115 | 16 |
| P503A 148 | P503F 148 | 14.8 | 65 | 115 | 16 |
| P503A 149 | P503F 149 | 14.9 | 65 | 115 | 16 |
| P503A 150 | P503F 150 | 15 | 65 | 115 | 16 |
| P503A 151 | P503F 151 | 15.1 | 65 | 115 | 16 |
| P503A 152 | P503F 152 | 15.2 | 65 | 115 | 16 |
| P503A 153 | P503F 153 | 15.3 | 65 | 115 | 16 |
| P503A 154 | P503F 154 | 15.4 | 65 | 115 | 16 |
| P503A 155 | P503F 155 | 15.5 | 65 | 115 | 16 |
| P503A 156 | P503F 156 | 15.6 | 65 | 115 | 16 |
| P503A 157 | P503F 157 | 15.7 | 65 | 115 | 16 |
| P503A 158 | P503F 158 | 15.8 | 65 | 115 | 16 |
| P503A 159 | P503F 159 | 15.9 | 65 | 115 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P503A(F) | HIGH SPEED DRILL - DIN6537K



| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 160 | P503F 160 | 16 | 65 | 115 | 16 |
| P503A 161 | P503F 161 | 16.1 | 73 | 123 | 18 |
| P503A 163 | P503F 163 | 16.3 | 73 | 123 | 18 |
| P503A 165 | P503F 165 | 16.5 | 73 | 123 | 18 |
| P503A 170 | P503F 170 | 17 | 73 | 123 | 18 |
| P503A 171 | P503F 171 | 17.1 | 73 | 123 | 18 |
| P503A 172 | P503F 172 | 17.2 | 73 | 123 | 18 |
| P503A 175 | P503F 175 | 17.5 | 73 | 123 | 18 |
| P503A 177 | P503F 177 | 17.7 | 73 | 123 | 18 |
| P503A 178 | P503F 178 | 17.8 | 73 | 123 | 18 |

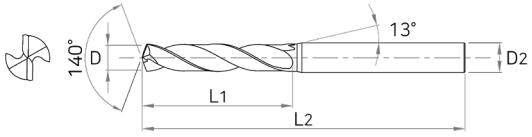
| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P503A 180 | P503F 180 | 18 | 73 | 123 | 18 |
| P503A 181 | P503F 181 | 18.1 | 79 | 131 | 20 |
| P503A 182 | P503F 182 | 18.2 | 79 | 131 | 20 |
| P503A 185 | P503F 185 | 18.5 | 79 | 131 | 20 |
| P503A 190 | P503F 190 | 19 | 79 | 131 | 20 |
| P503A 191 | P503F 191 | 19.1 | 79 | 131 | 20 |
| P503A 195 | P503F 195 | 19.5 | 79 | 131 | 20 |
| P503A 197 | P503F 197 | 19.7 | 79 | 131 | 20 |
| P503A 200 | P503F 200 | 20 | 79 | 131 | 20 |

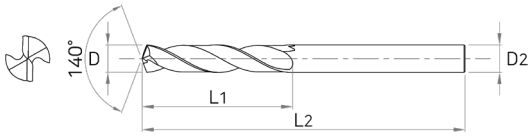
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P505A(F) | HIGH SPEED DRILL - DIN 6537L




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ 6 | +0.004 ~ +0.016 | |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P505A 030 | P505F 030 | 3 | 28 | 66 | 6 |
| P505A 031 | P505F 031 | 3.1 | 28 | 66 | 6 |
| P505A 032 | P505F 032 | 3.2 | 28 | 66 | 6 |
| P505A 033 | P505F 033 | 3.3 | 28 | 66 | 6 |
| P505A 034 | P505F 034 | 3.4 | 28 | 66 | 6 |
| P505A 035 | P505F 035 | 3.5 | 28 | 66 | 6 |
| P505A 036 | P505F 036 | 3.6 | 28 | 66 | 6 |
| P505A 037 | P505F 037 | 3.7 | 28 | 66 | 6 |
| P505A 038 | P505F 038 | 3.8 | 36 | 74 | 6 |
| P505A 039 | P505F 039 | 3.9 | 36 | 74 | 6 |
| P505A 040 | P505F 040 | 4 | 36 | 74 | 6 |
| P505A 041 | P505F 041 | 4.1 | 36 | 74 | 6 |
| P505A 042 | P505F 042 | 4.2 | 36 | 74 | 6 |
| P505A 043 | P505F 043 | 4.3 | 36 | 74 | 6 |
| P505A 044 | P505F 044 | 4.4 | 36 | 74 | 6 |
| P505A 045 | P505F 045 | 4.5 | 36 | 74 | 6 |
| P505A 046 | P505F 046 | 4.6 | 36 | 74 | 6 |
| P505A 047 | P505F 047 | 4.7 | 36 | 74 | 6 |
| P505A 048 | P505F 048 | 4.8 | 44 | 82 | 6 |
| P505A 049 | P505F 049 | 4.9 | 44 | 82 | 6 |
| P505A 050 | P505F 050 | 5 | 44 | 82 | 6 |
| P505A 051 | P505F 051 | 5.1 | 44 | 82 | 6 |
| P505A 052 | P505F 052 | 5.2 | 44 | 82 | 6 |
| P505A 053 | P505F 053 | 5.3 | 44 | 82 | 6 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P505A 054 | P505F 054 | 5.4 | 44 | 82 | 6 |
| P505A 055 | P505F 055 | 5.5 | 44 | 82 | 6 |
| P505A 056 | P505F 056 | 5.6 | 44 | 82 | 6 |
| P505A 057 | P505F 057 | 5.7 | 44 | 82 | 6 |
| P505A 058 | P505F 058 | 5.8 | 44 | 82 | 6 |
| P505A 059 | P505F 059 | 5.9 | 44 | 82 | 6 |
| P505A 060 | P505F 060 | 6 | 44 | 82 | 6 |
| P505A 061 | P505F 061 | 6.1 | 53 | 91 | 8 |
| P505A 062 | P505F 062 | 6.2 | 53 | 91 | 8 |
| P505A 063 | P505F 063 | 6.3 | 53 | 91 | 8 |
| P505A 064 | P505F 064 | 6.4 | 53 | 91 | 8 |
| P505A 065 | P505F 065 | 6.5 | 53 | 91 | 8 |
| P505A 066 | P505F 066 | 6.6 | 53 | 91 | 8 |
| P505A 067 | P505F 067 | 6.7 | 53 | 91 | 8 |
| P505A 068 | P505F 068 | 6.8 | 53 | 91 | 8 |
| P505A 069 | P505F 069 | 6.9 | 53 | 91 | 8 |
| P505A 070 | P505F 070 | 7 | 53 | 91 | 8 |
| P505A 071 | P505F 071 | 7.1 | 53 | 91 | 8 |
| P505A 072 | P505F 072 | 7.2 | 53 | 91 | 8 |
| P505A 073 | P505F 073 | 7.3 | 53 | 91 | 8 |
| P505A 074 | P505F 074 | 7.4 | 53 | 91 | 8 |
| P505A 075 | P505F 075 | 7.5 | 53 | 91 | 8 |
| P505A 076 | P505F 076 | 7.6 | 53 | 91 | 8 |
| P505A 077 | P505F 077 | 7.7 | 53 | 91 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P505A(F) | HIGH SPEED DRILL - DIN 6537L



| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P505A 078 | P505F 078 | 7.8 | 53 | 91 | 8 |
| P505A 079 | P505F 079 | 7.9 | 53 | 91 | 8 |
| P505A 080 | P505F 080 | 8 | 53 | 91 | 8 |
| P505A 081 | P505F 081 | 8.1 | 61 | 103 | 10 |
| P505A 082 | P505F 082 | 8.2 | 61 | 103 | 10 |
| P505A 083 | P505F 083 | 8.3 | 61 | 103 | 10 |
| P505A 084 | P505F 084 | 8.4 | 61 | 103 | 10 |
| P505A 085 | P505F 085 | 8.5 | 61 | 103 | 10 |
| P505A 086 | P505F 086 | 8.6 | 61 | 103 | 10 |
| P505A 087 | P505F 087 | 8.7 | 61 | 103 | 10 |
| P505A 088 | P505F 088 | 8.8 | 61 | 103 | 10 |
| P505A 089 | P505F 089 | 8.9 | 61 | 103 | 10 |
| P505A 090 | P505F 090 | 9 | 61 | 103 | 10 |
| P505A 091 | P505F 091 | 9.1 | 61 | 103 | 10 |
| P505A 092 | P505F 092 | 9.2 | 61 | 103 | 10 |
| P505A 093 | P505F 093 | 9.3 | 61 | 103 | 10 |
| P505A 094 | P505F 094 | 9.4 | 61 | 103 | 10 |
| P505A 095 | P505F 095 | 9.5 | 61 | 103 | 10 |
| P505A 096 | P505F 096 | 9.6 | 61 | 103 | 10 |
| P505A 097 | P505F 097 | 9.7 | 61 | 103 | 10 |
| P505A 098 | P505F 098 | 9.8 | 61 | 103 | 10 |
| P505A 099 | P505F 099 | 9.9 | 61 | 103 | 10 |
| P505A 100 | P505F 100 | 10 | 61 | 103 | 10 |
| P505A 101 | P505F 101 | 10.1 | 71 | 118 | 12 |
| P505A 102 | P505F 102 | 10.2 | 71 | 118 | 12 |
| P505A 103 | P505F 103 | 10.3 | 71 | 118 | 12 |
| P505A 104 | P505F 104 | 10.4 | 71 | 118 | 12 |
| P505A 105 | P505F 105 | 10.5 | 71 | 118 | 12 |
| P505A 106 | P505F 106 | 10.6 | 71 | 118 | 12 |
| P505A 107 | P505F 107 | 10.7 | 71 | 118 | 12 |
| P505A 108 | P505F 108 | 10.8 | 71 | 118 | 12 |
| P505A 109 | P505F 109 | 10.9 | 71 | 118 | 12 |
| P505A 110 | P505F 110 | 11 | 71 | 118 | 12 |
| P505A 111 | P505F 111 | 11.1 | 71 | 118 | 12 |
| P505A 112 | P505F 112 | 11.2 | 71 | 118 | 12 |
| P505A 113 | P505F 113 | 11.3 | 71 | 118 | 12 |
| P505A 114 | P505F 114 | 11.4 | 71 | 118 | 12 |
| P505A 115 | P505F 115 | 11.5 | 71 | 118 | 12 |
| P505A 116 | P505F 116 | 11.6 | 71 | 118 | 12 |
| P505A 117 | P505F 117 | 11.7 | 71 | 118 | 12 |
| P505A 118 | P505F 118 | 11.8 | 71 | 118 | 12 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| P505A 119 | P505F 119 | 11.9 | 71 | 118 | 12 |
| P505A 120 | P505F 120 | 12 | 71 | 118 | 12 |
| P505A 121 | P505F 121 | 12.1 | 77 | 124 | 14 |
| P505A 122 | P505F 122 | 12.2 | 77 | 124 | 14 |
| P505A 123 | P505F 123 | 12.3 | 77 | 124 | 14 |
| P505A 124 | P505F 124 | 12.4 | 77 | 124 | 14 |
| P505A 125 | P505F 125 | 12.5 | 77 | 124 | 14 |
| P505A 126 | P505F 126 | 12.6 | 77 | 124 | 14 |
| P505A 127 | P505F 127 | 12.7 | 77 | 124 | 14 |
| P505A 128 | P505F 128 | 12.8 | 77 | 124 | 14 |
| P505A 129 | P505F 129 | 12.9 | 77 | 124 | 14 |
| P505A 130 | P505F 130 | 13 | 77 | 124 | 14 |
| P505A 131 | P505F 131 | 13.1 | 77 | 124 | 14 |
| P505A 132 | P505F 132 | 13.2 | 77 | 124 | 14 |
| P505A 133 | P505F 133 | 13.3 | 77 | 124 | 14 |
| P505A 134 | P505F 134 | 13.4 | 77 | 124 | 14 |
| P505A 135 | P505F 135 | 13.5 | 77 | 124 | 14 |
| P505A 136 | P505F 136 | 13.6 | 77 | 124 | 14 |
| P505A 137 | P505F 137 | 13.7 | 77 | 124 | 14 |
| P505A 138 | P505F 138 | 13.8 | 77 | 124 | 14 |
| P505A 139 | P505F 139 | 13.9 | 77 | 124 | 14 |
| P505A 140 | P505F 140 | 14 | 77 | 124 | 14 |
| P505A 141 | P505F 141 | 14.1 | 83 | 133 | 16 |
| P505A 142 | P505F 142 | 14.2 | 83 | 133 | 16 |
| P505A 143 | P505F 143 | 14.3 | 83 | 133 | 16 |
| P505A 144 | P505F 144 | 14.4 | 83 | 133 | 16 |
| P505A 145 | P505F 145 | 14.5 | 83 | 133 | 16 |
| P505A 146 | P505F 146 | 14.6 | 83 | 133 | 16 |
| P505A 147 | P505F 147 | 14.7 | 83 | 133 | 16 |
| P505A 148 | P505F 148 | 14.8 | 83 | 133 | 16 |
| P505A 149 | P505F 149 | 14.9 | 83 | 133 | 16 |
| P505A 150 | P505F 150 | 15 | 83 | 133 | 16 |
| P505A 151 | P505F 151 | 15.1 | 83 | 133 | 16 |
| P505A 152 | P505F 152 | 15.2 | 83 | 133 | 16 |
| P505A 153 | P505F 153 | 15.3 | 83 | 133 | 16 |
| P505A 154 | P505F 154 | 15.4 | 83 | 133 | 16 |
| P505A 155 | P505F 155 | 15.5 | 83 | 133 | 16 |
| P505A 156 | P505F 156 | 15.6 | 83 | 133 | 16 |
| P505A 157 | P505F 157 | 15.7 | 83 | 133 | 16 |
| P505A 158 | P505F 158 | 15.8 | 83 | 133 | 16 |
| P505A 159 | P505F 159 | 15.9 | 83 | 133 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# P505A(F) | HIGH SPEED DRILL - DIN 6537L

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| P505A 160 | P505F 160 | 16 | 83 | 133 | 16 |
| P505A 161 | P505F 161 | 16.1 | 93 | 143 | 18 |
| P505A 162 | P505F 162 | 16.2 | 93 | 143 | 18 |
| P505A 163 | P505F 163 | 16.3 | 93 | 143 | 18 |
| P505A 164 | P505F 164 | 16.4 | 93 | 143 | 18 |
| P505A 165 | P505F 165 | 16.5 | 93 | 143 | 18 |
| P505A 166 | P505F 166 | 16.6 | 93 | 143 | 18 |
| P505A 167 | P505F 167 | 16.7 | 93 | 143 | 18 |
| P505A 168 | P505F 168 | 16.8 | 93 | 143 | 18 |
| P505A 169 | P505F 169 | 16.9 | 93 | 143 | 18 |
| P505A 170 | P505F 170 | 17 | 93 | 143 | 18 |
| P505A 171 | P505F 171 | 17.1 | 93 | 143 | 18 |
| P505A 172 | P505F 172 | 17.2 | 93 | 143 | 18 |
| P505A 173 | P505F 173 | 17.3 | 93 | 143 | 18 |
| P505A 174 | P505F 174 | 17.4 | 93 | 143 | 18 |
| P505A 175 | P505F 175 | 17.5 | 93 | 143 | 18 |
| P505A 176 | P505F 176 | 17.6 | 93 | 143 | 18 |
| P505A 177 | P505F 177 | 17.7 | 93 | 143 | 18 |
| P505A 178 | P505F 178 | 17.8 | 93 | 143 | 18 |
| P505A 179 | P505F 179 | 17.9 | 93 | 143 | 18 |
| P505A 180 | P505F 180 | 18 | 93 | 143 | 18 |

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| P505A 181 | P505F 181 | 18.1 | 101 | 153 | 20 |
| P505A 182 | P505F 182 | 18.2 | 101 | 153 | 20 |
| P505A 183 | P505F 183 | 18.3 | 101 | 153 | 20 |
| P505A 184 | P505F 184 | 18.4 | 101 | 153 | 20 |
| P505A 185 | P505F 185 | 18.5 | 101 | 153 | 20 |
| P505A 186 | P505F 186 | 18.6 | 101 | 153 | 20 |
| P505A 187 | P505F 187 | 18.7 | 101 | 153 | 20 |
| P505A 188 | P505F 188 | 18.8 | 101 | 153 | 20 |
| P505A 189 | P505F 189 | 18.9 | 101 | 153 | 20 |
| P505A 190 | P505F 190 | 19 | 101 | 153 | 20 |
| P505A 191 | P505F 191 | 19.1 | 101 | 153 | 20 |
| P505A 192 | P505F 192 | 19.2 | 101 | 153 | 20 |
| P505A 193 | P505F 193 | 19.3 | 101 | 153 | 20 |
| P505A 194 | P505F 194 | 19.4 | 101 | 153 | 20 |
| P505A 195 | P505F 195 | 19.5 | 101 | 153 | 20 |
| P505A 196 | P505F 196 | 19.6 | 101 | 153 | 20 |
| P505A 197 | P505F 197 | 19.7 | 101 | 153 | 20 |
| P505A 198 | P505F 198 | 19.8 | 101 | 153 | 20 |
| P505A 199 | P505F 199 | 19.9 | 101 | 153 | 20 |
| P505A 200 | P505F 200 | 20 | 101 | 153 | 20 |

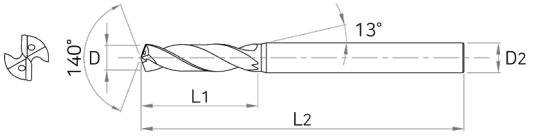


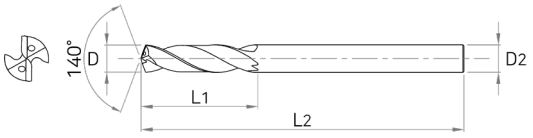
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ 6 | +0.004 ~ +0.016 | |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

DIN 6537K | CARBIDE | TiAlN | 3D | 30° HELIX | 140° | DATA P.709

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI503A 030 | PI503F 030 | 3 | 20 | 62 | 6 |
| PI503A 031 | PI503F 031 | 3.1 | 20 | 62 | 6 |
| PI503A 032 | PI503F 032 | 3.2 | 20 | 62 | 6 |
| PI503A 033 | PI503F 033 | 3.3 | 20 | 62 | 6 |
| PI503A 034 | PI503F 034 | 3.4 | 20 | 62 | 6 |
| PI503A 035 | PI503F 035 | 3.5 | 20 | 62 | 6 |
| PI503A 036 | PI503F 036 | 3.6 | 20 | 62 | 6 |
| PI503A 037 | PI503F 037 | 3.7 | 20 | 62 | 6 |
| PI503A 038 | PI503F 038 | 3.8 | 24 | 66 | 6 |
| PI503A 039 | PI503F 039 | 3.9 | 24 | 66 | 6 |
| PI503A 040 | PI503F 040 | 4 | 24 | 66 | 6 |
| PI503A 041 | PI503F 041 | 4.1 | 24 | 66 | 6 |
| PI503A 042 | PI503F 042 | 4.2 | 24 | 66 | 6 |
| PI503A 043 | PI503F 043 | 4.3 | 24 | 66 | 6 |
| PI503A 044 | PI503F 044 | 4.4 | 24 | 66 | 6 |
| PI503A 045 | PI503F 045 | 4.5 | 24 | 66 | 6 |
| PI503A 046 | PI503F 046 | 4.6 | 24 | 66 | 6 |
| PI503A 047 | PI503F 047 | 4.7 | 24 | 66 | 6 |
| PI503A 048 | PI503F 048 | 4.8 | 28 | 66 | 6 |
| PI503A 049 | PI503F 049 | 4.9 | 28 | 66 | 6 |
| PI503A 050 | PI503F 050 | 5 | 28 | 66 | 6 |
| PI503A 051 | PI503F 051 | 5.1 | 28 | 66 | 6 |
| PI503A 052 | PI503F 052 | 5.2 | 28 | 66 | 6 |
| PI503A 053 | PI503F 053 | 5.3 | 28 | 66 | 6 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI503A 054 | PI503F 054 | 5.4 | 28 | 66 | 6 |
| PI503A 055 | PI503F 055 | 5.5 | 28 | 66 | 6 |
| PI503A 056 | PI503F 056 | 5.6 | 28 | 66 | 6 |
| PI503A 057 | PI503F 057 | 5.7 | 28 | 66 | 6 |
| PI503A 058 | PI503F 058 | 5.8 | 28 | 66 | 6 |
| PI503A 059 | PI503F 059 | 5.9 | 28 | 66 | 6 |
| PI503A 060 | PI503F 060 | 6 | 28 | 66 | 6 |
| PI503A 061 | PI503F 061 | 6.1 | 34 | 79 | 8 |
| PI503A 062 | PI503F 062 | 6.2 | 34 | 79 | 8 |
| PI503A 063 | PI503F 063 | 6.3 | 34 | 79 | 8 |
| PI503A 064 | PI503F 064 | 6.4 | 34 | 79 | 8 |
| PI503A 065 | PI503F 065 | 6.5 | 34 | 79 | 8 |
| PI503A066 | PI503F 066 | 6.6 | 34 | 79 | 8 |
| PI503A067 | PI503F 067 | 6.7 | 34 | 79 | 8 |
| PI503A068 | PI503F 068 | 6.8 | 34 | 79 | 8 |
| PI503A069 | PI503F 069 | 6.9 | 34 | 79 | 8 |
| PI503A070 | PI503F 070 | 7 | 34 | 79 | 8 |
| PI503A071 | PI503F 071 | 7.1 | 41 | 79 | 8 |
| PI503A072 | PI503F 072 | 7.2 | 41 | 79 | 8 |
| PI503A073 | PI503F 073 | 7.3 | 41 | 79 | 8 |
| PI503A074 | PI503F 074 | 7.4 | 41 | 79 | 8 |
| PI503A075 | PI503F 075 | 7.5 | 41 | 79 | 8 |
| PI503A076 | PI503F 076 | 7.6 | 41 | 79 | 8 |
| PI503A077 | PI503F 077 | 7.7 | 41 | 79 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI503A 078 | PI503F 078 | 7.8 | 41 | 79 | 8 |
| PI503A 079 | PI503F 079 | 7.9 | 41 | 79 | 8 |
| PI503A 080 | PI503F 080 | 8 | 41 | 79 | 8 |
| PI503A 081 | PI503F 081 | 8.1 | 47 | 89 | 10 |
| PI503A 082 | PI503F 082 | 8.2 | 47 | 89 | 10 |
| PI503A 083 | PI503F 083 | 8.3 | 47 | 89 | 10 |
| PI503A 084 | PI503F 084 | 8.4 | 47 | 89 | 10 |
| PI503A 085 | PI503F 085 | 8.5 | 47 | 89 | 10 |
| PI503A 086 | PI503F 086 | 8.6 | 47 | 89 | 10 |
| PI503A 087 | PI503F 087 | 8.7 | 47 | 89 | 10 |
| PI503A 088 | PI503F 088 | 8.8 | 47 | 89 | 10 |
| PI503A 089 | PI503F 089 | 8.9 | 47 | 89 | 10 |
| PI503A 090 | PI503F 090 | 9 | 47 | 89 | 10 |
| PI503A 091 | PI503F 091 | 9.1 | 47 | 89 | 10 |
| PI503A 092 | PI503F 092 | 9.2 | 47 | 89 | 10 |
| PI503A 093 | PI503F 093 | 9.3 | 47 | 89 | 10 |
| PI503A 094 | PI503F 094 | 9.4 | 47 | 89 | 10 |
| PI503A 095 | PI503F 095 | 9.5 | 47 | 89 | 10 |
| PI503A 096 | PI503F 096 | 9.6 | 47 | 89 | 10 |
| PI503A 097 | PI503F 097 | 9.7 | 47 | 89 | 10 |
| PI503A 098 | PI503F 098 | 9.8 | 47 | 89 | 10 |
| PI503A 099 | PI503F 099 | 9.9 | 47 | 89 | 10 |
| PI503A 100 | PI503F 100 | 10 | 47 | 89 | 10 |
| PI503A 101 | PI503F 101 | 10.1 | 55 | 102 | 12 |
| PI503A 102 | PI503F 102 | 10.2 | 55 | 102 | 12 |
| PI503A 103 | PI503F 103 | 10.3 | 55 | 102 | 12 |
| PI503A 104 | PI503F 104 | 10.4 | 55 | 102 | 12 |
| PI503A 105 | PI503F 105 | 10.5 | 55 | 102 | 12 |
| PI503A 106 | PI503F 106 | 10.6 | 55 | 102 | 12 |
| PI503A 107 | PI503F 107 | 10.7 | 55 | 102 | 12 |
| PI503A 108 | PI503F 108 | 10.8 | 55 | 102 | 12 |
| PI503A 109 | PI503F 109 | 10.9 | 55 | 102 | 12 |
| PI503A 110 | PI503F 110 | 11 | 55 | 102 | 12 |
| PI503A 111 | PI503F 111 | 11.1 | 55 | 102 | 12 |
| PI503A 112 | PI503F 112 | 11.2 | 55 | 102 | 12 |
| PI503A 113 | PI503F 113 | 11.3 | 55 | 102 | 12 |
| PI503A 114 | PI503F 114 | 11.4 | 55 | 102 | 12 |
| PI503A 115 | PI503F 115 | 11.5 | 55 | 102 | 12 |
| PI503A 116 | PI503F 116 | 11.6 | 55 | 102 | 12 |
| PI503A 117 | PI503F 117 | 11.7 | 55 | 102 | 12 |
| PI503A 118 | PI503F 118 | 11.8 | 55 | 102 | 12 |

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI503A 119 | PI503F 119 | 11.9 | 55 | 102 | 12 |
| PI503A 120 | PI503F 120 | 12 | 55 | 102 | 12 |
| PI503A 121 | PI503F 121 | 12.1 | 60 | 107 | 14 |
| PI503A 122 | PI503F 122 | 12.2 | 60 | 107 | 14 |
| PI503A 123 | PI503F 123 | 12.3 | 60 | 107 | 14 |
| PI503A 124 | PI503F 124 | 12.4 | 60 | 107 | 14 |
| PI503A 125 | PI503F 125 | 12.5 | 60 | 107 | 14 |
| PI503A 126 | PI503F 126 | 12.6 | 60 | 107 | 14 |
| PI503A 127 | PI503F 127 | 12.7 | 60 | 107 | 14 |
| PI503A 128 | PI503F 128 | 12.8 | 60 | 107 | 14 |
| PI503A 129 | PI503F 129 | 12.9 | 60 | 107 | 14 |
| PI503A 130 | PI503F 130 | 13 | 60 | 107 | 14 |
| PI503A 131 | PI503F 131 | 13.1 | 60 | 107 | 14 |
| PI503A 132 | PI503F 132 | 13.2 | 60 | 107 | 14 |
| PI503A 133 | PI503F 133 | 13.3 | 60 | 107 | 14 |
| PI503A 134 | PI503F 134 | 13.4 | 60 | 107 | 14 |
| PI503A 135 | PI503F 135 | 13.5 | 60 | 107 | 14 |
| PI503A 136 | PI503F 136 | 13.6 | 60 | 107 | 14 |
| PI503A 137 | PI503F 137 | 13.7 | 60 | 107 | 14 |
| PI503A 138 | PI503F 138 | 13.8 | 60 | 107 | 14 |
| PI503A 139 | PI503F 139 | 13.9 | 60 | 107 | 14 |
| PI503A 140 | PI503F 140 | 14 | 60 | 107 | 14 |
| PI503A 141 | PI503F 141 | 14.1 | 65 | 115 | 16 |
| PI503A 142 | PI503F 142 | 14.2 | 65 | 115 | 16 |
| PI503A 143 | PI503F 143 | 14.3 | 65 | 115 | 16 |
| PI503A 144 | PI503F 144 | 14.4 | 65 | 115 | 16 |
| PI503A 145 | PI503F 145 | 14.5 | 65 | 115 | 16 |
| PI503A 146 | PI503F 146 | 14.6 | 65 | 115 | 16 |
| PI503A 147 | PI503F 147 | 14.7 | 65 | 115 | 16 |
| PI503A 148 | PI503F 148 | 14.8 | 65 | 115 | 16 |
| PI503A 149 | PI503F 149 | 14.9 | 65 | 115 | 16 |
| PI503A 150 | PI503F 150 | 15 | 65 | 115 | 16 |
| PI503A 151 | PI503F 151 | 15.1 | 65 | 115 | 16 |
| PI503A 152 | PI503F 152 | 15.2 | 65 | 115 | 16 |
| PI503A 153 | PI503F 153 | 15.3 | 65 | 115 | 16 |
| PI503A 154 | PI503F 154 | 15.4 | 65 | 115 | 16 |
| PI503A 155 | PI503F 155 | 15.5 | 65 | 115 | 16 |
| PI503A 156 | PI503F 156 | 15.6 | 65 | 115 | 16 |
| PI503A 157 | PI503F 157 | 15.7 | 65 | 115 | 16 |
| PI503A 158 | PI503F 158 | 15.8 | 65 | 115 | 16 |
| PI503A 159 | PI503F 159 | 15.9 | 65 | 115 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI503A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537K



| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI503A 160 | PI503F 160 | 16 | 65 | 115 | 16 |
| PI503A 161 | PI503F 161 | 16.1 | 73 | 123 | 18 |
| PI503A 163 | PI503F 163 | 16.3 | 73 | 123 | 18 |
| PI503A 165 | PI503F 165 | 16.5 | 73 | 123 | 18 |
| PI503A 170 | PI503F 170 | 17 | 73 | 123 | 18 |
| PI503A 171 | PI503F 171 | 17.1 | 73 | 123 | 18 |
| PI503A 172 | PI503F 172 | 17.2 | 73 | 123 | 18 |
| PI503A 175 | PI503F 175 | 17.5 | 73 | 123 | 18 |
| PI503A 177 | PI503F 177 | 17.7 | 73 | 123 | 18 |
| PI503A 178 | PI503F 178 | 17.8 | 73 | 123 | 18 |

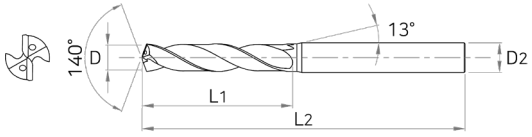
| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI503A 180 | PI503F 180 | 18 | 73 | 123 | 18 |
| PI503A 181 | PI503F 181 | 18.1 | 79 | 131 | 20 |
| PI503A 182 | PI503F 182 | 18.2 | 79 | 131 | 20 |
| PI503A 185 | PI503F 185 | 18.5 | 79 | 131 | 20 |
| PI503A 190 | PI503F 190 | 19 | 79 | 131 | 20 |
| PI503A 191 | PI503F 191 | 19.1 | 79 | 131 | 20 |
| PI503A 195 | PI503F 195 | 19.5 | 79 | 131 | 20 |
| PI503A 197 | PI503F 197 | 19.7 | 79 | 131 | 20 |
| PI503A 200 | PI503F 200 | 20 | 79 | 131 | 20 |

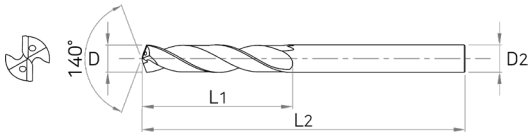
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D6.1 ~ 10 | +0.006 ~ +0.021 | |
| D10.1 ~ 18 | +0.007 ~ +0.025 | |
| D18.1 ~ | +0.008 ~ +0.029 | |

DIN 3537L | CARBIDE | TiAlN | 5D | 30° HELIX | 140° | DATA P.709

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI505A 040 | PI505F 040 | 4 | 36 | 74 | 6 |
| PI505A 041 | PI505F 041 | 4.1 | 36 | 74 | 6 |
| PI505A 042 | PI505F 042 | 4.2 | 36 | 74 | 6 |
| PI505A 043 | PI505F 043 | 4.3 | 36 | 74 | 6 |
| PI505A 044 | PI505F 044 | 4.4 | 36 | 74 | 6 |
| PI505A 045 | PI505F 045 | 4.5 | 36 | 74 | 6 |
| PI505A 046 | PI505F 046 | 4.6 | 36 | 74 | 6 |
| PI505A 047 | PI505F 047 | 4.7 | 36 | 74 | 6 |
| PI505A 048 | PI505F 048 | 4.8 | 44 | 82 | 6 |
| PI505A 049 | PI505F 049 | 4.9 | 44 | 82 | 6 |
| PI505A 050 | PI505F 050 | 5 | 44 | 82 | 6 |
| PI505A 051 | PI505F 051 | 5.1 | 44 | 82 | 6 |
| PI505A 052 | PI505F 052 | 5.2 | 44 | 82 | 6 |
| PI505A 053 | PI505F 053 | 5.3 | 44 | 82 | 6 |
| PI505A 054 | PI505F 054 | 5.4 | 44 | 82 | 6 |
| PI505A 055 | PI505F 055 | 5.5 | 44 | 82 | 6 |
| PI505A 056 | PI505F 056 | 5.6 | 44 | 82 | 6 |
| PI505A 057 | PI505F 057 | 5.7 | 44 | 82 | 6 |
| PI505A 058 | PI505F 058 | 5.8 | 44 | 82 | 6 |
| PI505A 059 | PI505F 059 | 5.9 | 44 | 82 | 6 |
| PI505A 060 | PI505F 060 | 6 | 44 | 82 | 6 |
| PI505A 061 | PI505F 061 | 6.1 | 53 | 91 | 8 |
| PI505A 062 | PI505F 062 | 6.2 | 53 | 91 | 8 |
| PI505A 063 | PI505F 063 | 6.3 | 53 | 91 | 8 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI505A 064 | PI505F 064 | 6.4 | 53 | 91 | 8 |
| PI505A 065 | PI505F 065 | 6.5 | 53 | 91 | 8 |
| PI505A 066 | PI505F 066 | 6.6 | 53 | 91 | 8 |
| PI505A 067 | PI505F 067 | 6.7 | 53 | 91 | 8 |
| PI505A 068 | PI505F 068 | 6.8 | 53 | 91 | 8 |
| PI505A 069 | PI505F 069 | 6.9 | 53 | 91 | 8 |
| PI505A 070 | PI505F 070 | 7 | 53 | 91 | 8 |
| PI505A 071 | PI505F 071 | 7.1 | 53 | 91 | 8 |
| PI505A 072 | PI505F 072 | 7.2 | 53 | 91 | 8 |
| PI505A 073 | PI505F 073 | 7.3 | 53 | 91 | 8 |
| PI505A 074 | PI505F 074 | 7.4 | 53 | 91 | 8 |
| PI505A 075 | PI505F 075 | 7.5 | 53 | 91 | 8 |
| PI505A 076 | PI505F 076 | 7.6 | 53 | 91 | 8 |
| PI505A 077 | PI505F 077 | 7.7 | 53 | 91 | 8 |
| PI505A 078 | PI505F 078 | 7.8 | 53 | 91 | 8 |
| PI505A 079 | PI505F 079 | 7.9 | 53 | 91 | 8 |
| PI505A 080 | PI505F 080 | 8 | 53 | 91 | 8 |
| PI505A 081 | PI505F 081 | 8.1 | 61 | 103 | 10 |
| PI505A 082 | PI505F 082 | 8.2 | 61 | 103 | 10 |
| PI505A 083 | PI505F 083 | 8.3 | 61 | 103 | 10 |
| PI505A 084 | PI505F 084 | 8.4 | 61 | 103 | 10 |
| PI505A 085 | PI505F 085 | 8.5 | 61 | 103 | 10 |
| PI505A 086 | PI505F 086 | 8.6 | 61 | 103 | 10 |
| PI505A 087 | PI505F 087 | 8.7 | 61 | 103 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L



| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI505A 088 | PI505F 088 | 8.8 | 61 | 103 | 10 |
| PI505A 089 | PI505F 089 | 8.9 | 61 | 103 | 10 |
| PI505A 090 | PI505F 090 | 9 | 61 | 103 | 10 |
| PI505A 091 | PI505F 091 | 9.1 | 61 | 103 | 10 |
| PI505A 092 | PI505F 092 | 9.2 | 61 | 103 | 10 |
| PI505A 093 | PI505F 093 | 9.3 | 61 | 103 | 10 |
| PI505A 094 | PI505F 094 | 9.4 | 61 | 103 | 10 |
| PI505A 095 | PI505F 095 | 9.5 | 61 | 103 | 10 |
| PI505A 096 | PI505F 096 | 9.6 | 61 | 103 | 10 |
| PI505A 097 | PI505F 097 | 9.7 | 61 | 103 | 10 |
| PI505A 098 | PI505F 098 | 9.8 | 61 | 103 | 10 |
| PI505A 099 | PI505F 099 | 9.9 | 61 | 103 | 10 |
| PI505A 100 | PI505F 100 | 10 | 61 | 103 | 10 |
| PI505A 101 | PI505F 101 | 10.1 | 71 | 118 | 12 |
| PI505A 102 | PI505F 102 | 10.2 | 71 | 118 | 12 |
| PI505A 103 | PI505F 103 | 10.3 | 71 | 118 | 12 |
| PI505A 104 | PI505F 104 | 10.4 | 71 | 118 | 12 |
| PI505A 105 | PI505F 105 | 10.5 | 71 | 118 | 12 |
| PI505A 106 | PI505F 106 | 10.6 | 71 | 118 | 12 |
| PI505A 107 | PI505F 107 | 10.7 | 71 | 118 | 12 |
| PI505A 108 | PI505F 108 | 10.8 | 71 | 118 | 12 |
| PI505A 109 | PI505F 109 | 10.9 | 71 | 118 | 12 |
| PI505A 110 | PI505F 110 | 11 | 71 | 118 | 12 |
| PI505A 111 | PI505F 111 | 11.1 | 71 | 118 | 12 |
| PI505A 112 | PI505F 112 | 11.2 | 71 | 118 | 12 |
| PI505A 113 | PI505F 113 | 11.3 | 71 | 118 | 12 |
| PI505A 114 | PI505F 114 | 11.4 | 71 | 118 | 12 |
| PI505A 115 | PI505F 115 | 11.5 | 71 | 118 | 12 |
| PI505A 116 | PI505F 116 | 11.6 | 71 | 118 | 12 |
| PI505A 117 | PI505F 117 | 11.7 | 71 | 118 | 12 |
| PI505A 118 | PI505F 118 | 11.8 | 71 | 118 | 12 |
| PI505A 119 | PI505F 119 | 11.9 | 71 | 118 | 12 |
| PI505A 120 | PI505F 120 | 12 | 71 | 118 | 12 |
| PI505A 121 | PI505F 121 | 12.1 | 77 | 124 | 14 |
| PI505A 122 | PI505F 122 | 12.2 | 77 | 124 | 14 |
| PI505A 123 | PI505F 123 | 12.3 | 77 | 124 | 14 |
| PI505A 124 | PI505F 124 | 12.4 | 77 | 124 | 14 |
| PI505A 125 | PI505F 125 | 12.5 | 77 | 124 | 14 |
| PI505A 126 | PI505F 126 | 12.6 | 77 | 124 | 14 |
| PI505A 127 | PI505F 127 | 12.7 | 77 | 124 | 14 |
| PI505A 128 | PI505F 128 | 12.8 | 77 | 124 | 14 |

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI505A 129 | PI505F 129 | 12.9 | 77 | 124 | 14 |
| PI505A 130 | PI505F 130 | 13 | 77 | 124 | 14 |
| PI505A 131 | PI505F 131 | 13.1 | 77 | 124 | 14 |
| PI505A 132 | PI505F 132 | 13.2 | 77 | 124 | 14 |
| PI505A 133 | PI505F 133 | 13.3 | 77 | 124 | 14 |
| PI505A 134 | PI505F 134 | 13.4 | 77 | 124 | 14 |
| PI505A 135 | PI505F 135 | 13.5 | 77 | 124 | 14 |
| PI505A 136 | PI505F 136 | 13.6 | 77 | 124 | 14 |
| PI505A 137 | PI505F 137 | 13.7 | 77 | 124 | 14 |
| PI505A 138 | PI505F 138 | 13.8 | 77 | 124 | 14 |
| PI505A 139 | PI505F 139 | 13.9 | 77 | 124 | 14 |
| PI505A 140 | PI505F 140 | 14 | 77 | 124 | 14 |
| PI505A 141 | PI505F 141 | 14.1 | 83 | 133 | 16 |
| PI505A 142 | PI505F 142 | 14.2 | 83 | 133 | 16 |
| PI505A 143 | PI505F 143 | 14.3 | 83 | 133 | 16 |
| PI505A 144 | PI505F 144 | 14.4 | 83 | 133 | 16 |
| PI505A 145 | PI505F 145 | 14.5 | 83 | 133 | 16 |
| PI505A 146 | PI505F 146 | 14.6 | 83 | 133 | 16 |
| PI505A 147 | PI505F 147 | 14.7 | 83 | 133 | 16 |
| PI505A 148 | PI505F 148 | 14.8 | 83 | 133 | 16 |
| PI505A 149 | PI505F 149 | 14.9 | 83 | 133 | 16 |
| PI505A 150 | PI505F 150 | 15 | 83 | 133 | 16 |
| PI505A 151 | PI505F 151 | 15.1 | 83 | 133 | 16 |
| PI505A 152 | PI505F 152 | 15.2 | 83 | 133 | 16 |
| PI505A 153 | PI505F 153 | 15.3 | 83 | 133 | 16 |
| PI505A 154 | PI505F 154 | 15.4 | 83 | 133 | 16 |
| PI505A 155 | PI505F 155 | 15.5 | 83 | 133 | 16 |
| PI505A 156 | PI505F 156 | 15.6 | 83 | 133 | 16 |
| PI505A 157 | PI505F 157 | 15.7 | 83 | 133 | 16 |
| PI505A 158 | PI505F 158 | 15.8 | 83 | 133 | 16 |
| PI505A 159 | PI505F 159 | 15.9 | 83 | 133 | 16 |
| PI505A 160 | PI505F 160 | 16 | 83 | 133 | 16 |
| PI505A 161 | PI505F 161 | 16.1 | 93 | 143 | 18 |
| PI505A 163 | PI505F 163 | 16.3 | 93 | 143 | 18 |
| PI505A 165 | PI505F 165 | 16.5 | 93 | 143 | 18 |
| PI505A 170 | PI505F 170 | 17 | 93 | 143 | 18 |
| PI505A 171 | PI505F 171 | 17.1 | 93 | 143 | 18 |
| PI505A 172 | PI505F 172 | 17.2 | 93 | 143 | 18 |
| PI505A 175 | PI505F 175 | 17.5 | 93 | 143 | 18 |
| PI505A 177 | PI505F 177 | 17.7 | 93 | 143 | 18 |
| PI505A 178 | PI505F 178 | 17.8 | 93 | 143 | 18 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI505A(F) | HIGH SPEED INTERNAL COOLANT DRILL - DIN 6537L

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI505A 180 | PI505F 180 | 18 | 93 | 143 | 18 |
| PI505A 181 | PI505F 181 | 18.1 | 101 | 153 | 20 |
| PI505A 182 | PI505F 182 | 18.2 | 101 | 153 | 20 |
| PI505A 185 | PI505F 185 | 18.5 | 101 | 153 | 20 |
| PI505A 190 | PI505F 190 | 19 | 101 | 153 | 20 |

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI505A 191 | PI505F 191 | 19.1 | 101 | 153 | 20 |
| PI505A 195 | PI505F 195 | 19.5 | 101 | 153 | 20 |
| PI505A 197 | PI505F 197 | 19.7 | 101 | 153 | 20 |
| PI505A 200 | PI505F 200 | 20 | 101 | 153 | 20 |
| | | | | | |

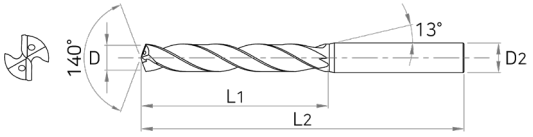


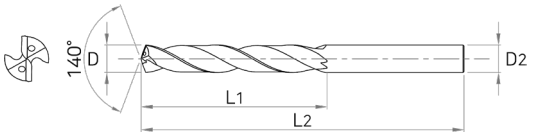
## ■ Applicable Working Material

| Carbon Steel ~ HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI508 | INTERNAL COOLANT HIGH SPEED DRILL - 8D




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D3 | +0.002 ~ +0.012 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.016 | |
| D6.1 ~ D10 | +0.006 ~ +0.021 | |
| D10.1 ~ D14 | +0.007 ~ +0.025 | |

CARBIDE | TiAlN | 8D | 30° HELIX | 140° | DATA P.709

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI508A 030 | PI508F 030 | 3 | 34 | 72 | 6 |
| PI508A 031 | PI508F 031 | 3.1 | 34 | 72 | 6 |
| PI508A 032 | PI508F 032 | 3.2 | 34 | 72 | 6 |
| PI508A 033 | PI508F 033 | 3.3 | 34 | 72 | 6 |
| PI508A 034 | PI508F 034 | 3.4 | 34 | 72 | 6 |
| PI508A 035 | PI508F 035 | 3.5 | 34 | 72 | 6 |
| PI508A 036 | PI508F 036 | 3.6 | 34 | 72 | 6 |
| PI508A 037 | PI508F 037 | 3.7 | 34 | 72 | 6 |
| PI508A 038 | PI508F 038 | 3.8 | 43 | 81 | 6 |
| PI508A 039 | PI508F 039 | 3.9 | 43 | 81 | 6 |
| PI508A 040 | PI508F 040 | 4 | 43 | 81 | 6 |
| PI508A 041 | PI508F 041 | 4.1 | 43 | 81 | 6 |
| PI508A 042 | PI508F 042 | 4.2 | 43 | 81 | 6 |
| PI508A 043 | PI508F 043 | 4.3 | 43 | 81 | 6 |
| PI508A 044 | PI508F 044 | 4.4 | 43 | 81 | 6 |
| PI508A 045 | PI508F 045 | 4.5 | 43 | 81 | 6 |
| PI508A 046 | PI508F 046 | 4.6 | 43 | 81 | 6 |
| PI508A 047 | PI508F 047 | 4.7 | 43 | 81 | 6 |
| PI508A 048 | PI508F 048 | 4.8 | 57 | 95 | 6 |
| PI508A 049 | PI508F 049 | 4.9 | 57 | 95 | 6 |
| PI508A 050 | PI508F 050 | 5 | 57 | 95 | 6 |
| PI508A 051 | PI508F 051 | 5.1 | 57 | 95 | 6 |
| PI508A 052 | PI508F 052 | 5.2 | 57 | 95 | 6 |
| PI508A 053 | PI508F 053 | 5.3 | 57 | 95 | 6 |

| EDP No | EDP No Weldon shank | SIZES (mm) D | L1 | L2 | D2 |
|---|---|---|---|---|---|
| PI508A 054 | PI508F 054 | 5.4 | 57 | 95 | 6 |
| PI508A 055 | PI508F 055 | 5.5 | 57 | 95 | 6 |
| PI508A 056 | PI508F 056 | 5.6 | 57 | 95 | 6 |
| PI508A 057 | PI508F 057 | 5.7 | 57 | 95 | 6 |
| PI508A 058 | PI508F 058 | 5.8 | 57 | 95 | 6 |
| PI508A 059 | PI508F 059 | 5.9 | 57 | 95 | 6 |
| PI508A 060 | PI508F 060 | 6 | 57 | 95 | 6 |
| PI508A 061 | PI508F 061 | 6.1 | 76 | 114 | 8 |
| PI508A 062 | PI508F 062 | 6.2 | 76 | 114 | 8 |
| PI508A 063 | PI508F 063 | 6.3 | 76 | 114 | 8 |
| PI508A 064 | PI508F 064 | 6.4 | 76 | 114 | 8 |
| PI508A 065 | PI508F 065 | 6.5 | 76 | 114 | 8 |
| PI508A 066 | PI508F 066 | 6.6 | 76 | 114 | 8 |
| PI508A 067 | PI508F 067 | 6.7 | 76 | 114 | 8 |
| PI508A 068 | PI508F 068 | 6.8 | 76 | 114 | 8 |
| PI508A 069 | PI508F 069 | 6.9 | 76 | 114 | 8 |
| PI508A 070 | PI508F 070 | 7 | 76 | 114 | 8 |
| PI508A 071 | PI508F 071 | 7.1 | 76 | 114 | 8 |
| PI508A 072 | PI508F 072 | 7.2 | 76 | 114 | 8 |
| PI508A 073 | PI508F 073 | 7.3 | 76 | 114 | 8 |
| PI508A 074 | PI508F 074 | 7.4 | 76 | 114 | 8 |
| PI508A 075 | PI508F 075 | 7.5 | 76 | 114 | 8 |
| PI508A 076 | PI508F 076 | 7.6 | 76 | 114 | 8 |
| PI508A 077 | PI508F 077 | 7.7 | 76 | 114 | 8 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel SKD61 ~HRc55 | Hardened Steel SKD11 HRc55~ | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# PI508 | INTERNAL COOLANT HIGH SPEED DRILL - 8D

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI508A 078 | PI508F 078 | 7.8 | 76 | 114 | 8 |
| PI508A 079 | PI508F 079 | 7.9 | 76 | 114 | 8 |
| PI508A 080 | PI508F 080 | 8 | 76 | 114 | 8 |
| PI508A 081 | PI508F 081 | 8.1 | 95 | 142 | 10 |
| PI508A 082 | PI508F 082 | 8.2 | 95 | 142 | 10 |
| PI508A 083 | PI508F 083 | 8.3 | 95 | 142 | 10 |
| PI508A 084 | PI508F 084 | 8.4 | 95 | 142 | 10 |
| PI508A 085 | PI508F 085 | 8.5 | 95 | 142 | 10 |
| PI508A 086 | PI508F 086 | 8.6 | 95 | 142 | 10 |
| PI508A 087 | PI508F 087 | 8.7 | 95 | 142 | 10 |
| PI508A 088 | PI508F 088 | 8.8 | 95 | 142 | 10 |
| PI508A 089 | PI508F 089 | 8.9 | 95 | 142 | 10 |
| PI508A 090 | PI508F 090 | 9 | 95 | 142 | 10 |
| PI508A 091 | PI508F 091 | 9.1 | 95 | 142 | 10 |
| PI508A 092 | PI508F 092 | 9.2 | 95 | 142 | 10 |
| PI508A 093 | PI508F 093 | 9.3 | 95 | 142 | 10 |
| PI508A 094 | PI508F 094 | 9.4 | 95 | 142 | 10 |
| PI508A 095 | PI508F 095 | 9.5 | 95 | 142 | 10 |
| PI508A 096 | PI508F 096 | 9.6 | 95 | 142 | 10 |
| PI508A 097 | PI508F 097 | 9.7 | 95 | 142 | 10 |
| PI508A 098 | PI508F 098 | 9.8 | 95 | 142 | 10 |
| PI508A 099 | PI508F 099 | 9.9 | 95 | 142 | 10 |
| PI508A 100 | PI508F 100 | 10 | 95 | 142 | 10 |
| PI508A 101 | PI508F 101 | 10.1 | 114 | 162 | 12 |
| PI508A 102 | PI508F 102 | 10.2 | 114 | 162 | 12 |
| PI508A 103 | PI508F 103 | 10.3 | 114 | 162 | 12 |
| PI508A 104 | PI508F 104 | 10.4 | 114 | 162 | 12 |
| PI508A 105 | PI508F 105 | 10.5 | 114 | 162 | 12 |
| PI508A 106 | PI508F 106 | 10.6 | 114 | 162 | 12 |
| PI508A 107 | PI508F 107 | 10.7 | 114 | 162 | 12 |
| PI508A 108 | PI508F 108 | 10.8 | 114 | 162 | 12 |
| PI508A 109 | PI508F 109 | 10.9 | 114 | 162 | 12 |

| EDP No | EDP No | SIZES (mm) | | | |
|---|---|---|---|---|---|
| | Weldon shank | D | L1 | L2 | D2 |
| PI508A 110 | PI508F 110 | 11 | 114 | 162 | 12 |
| PI508A 111 | PI508F 111 | 11.1 | 114 | 162 | 12 |
| PI508A 112 | PI508F 112 | 11.2 | 114 | 162 | 12 |
| PI508A 113 | PI508F 113 | 11.3 | 114 | 162 | 12 |
| PI508A 114 | PI508F 114 | 11.4 | 114 | 162 | 12 |
| PI508A 115 | PI508F 115 | 11.5 | 114 | 162 | 12 |
| PI508A 116 | PI508F 116 | 11.6 | 114 | 162 | 12 |
| PI508A 117 | PI508F 117 | 11.7 | 114 | 162 | 12 |
| PI508A 118 | PI508F 118 | 11.8 | 114 | 162 | 12 |
| PI508A 119 | PI508F 119 | 11.9 | 114 | 162 | 12 |
| PI508A 120 | PI508F 120 | 12 | 114 | 162 | 12 |
| PI508A 121 | PI508F 121 | 12.1 | 133 | 178 | 14 |
| PI508A 122 | PI508F 122 | 12.2 | 133 | 178 | 14 |
| PI508A 123 | PI508F 123 | 12.3 | 133 | 178 | 14 |
| PI508A 124 | PI508F 124 | 12.4 | 133 | 178 | 14 |
| PI508A 125 | PI508F 125 | 12.5 | 133 | 178 | 14 |
| PI508A 126 | PI508F 126 | 12.6 | 133 | 178 | 14 |
| PI508A 127 | PI508F 127 | 12.7 | 133 | 178 | 14 |
| PI508A 128 | PI508F 128 | 12.8 | 133 | 178 | 14 |
| PI508A 129 | PI508F 129 | 12.9 | 133 | 178 | 14 |
| PI508A 130 | PI508F 130 | 13 | 133 | 178 | 14 |
| PI508A 131 | PI508F 131 | 13.1 | 133 | 178 | 14 |
| PI508A 132 | PI508F 132 | 13.2 | 133 | 178 | 14 |
| PI508A 133 | PI508F 133 | 13.3 | 133 | 178 | 14 |
| PI508A 134 | PI508F 134 | 13.4 | 133 | 178 | 14 |
| PI508A 135 | PI508F 135 | 13.5 | 133 | 178 | 14 |
| PI508A 136 | PI508F 136 | 13.6 | 133 | 178 | 14 |
| PI508A 137 | PI508F 137 | 13.7 | 133 | 178 | 14 |
| PI508A 138 | PI508F 138 | 13.8 | 133 | 178 | 14 |
| PI508A 139 | PI508F 139 | 13.9 | 133 | 178 | 14 |
| PI508A 140 | PI508F 140 | 14 | 133 | 178 | 14 |



## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ◎ | ◎ | ○ | ○ | | | ◎ | | ○ |

○ : GOOD ◎ : EXCELLENT

# Solid Spiral Drill

## Contents

(INCH : ◆ / METRIC : ◇)

| EDP No / SPEC | Flutes | Appearance | Length 3D | 5D | 8D | 10D | 20D | Margin | Tolerance | Diameter(Ø) Min | Max | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSD ◇ | 2F | | ○ | | | | | Single | h8 | 1 | 13 | 436 |
| SSDL ◇ | | | | | ○ | | | Single | h8 | 2 | 10 | 439 |
| SSTD ◇ | | | ○ | | | | | Single | h8 | 0.5 | 13 | 441 |
| SSTDL ◇ | | | | | ○ | | | Single | h8 | 1 | 13 | 443 |
| APF505 ◆ ◇ | | | | ○ | | | | Single | 0 ~ -0.012 | 3 | 16 | 445 |

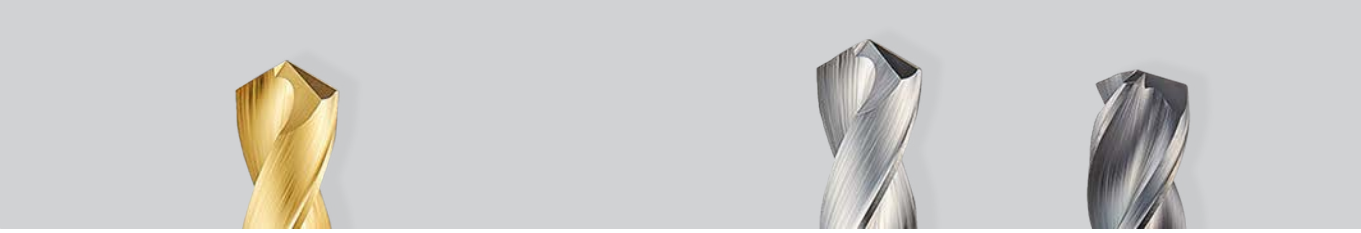
## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| SS | D | L | 051 |
|---|---|---|---|

| Section | Appearance | Drilling Depth | Cutting Dia |
|---|---|---|---|
| SS : Solid Spiral | D : Drill | L : Long | Ø0.5 |
| AP : Aluminium Power | TD : TiN Coated Drill | 505 : 5D | ~ |
| | F : Facet Point | | Ø16 |

Ex) Cutting Dia Ø5.1 / Long Type Solid Spiral Drill



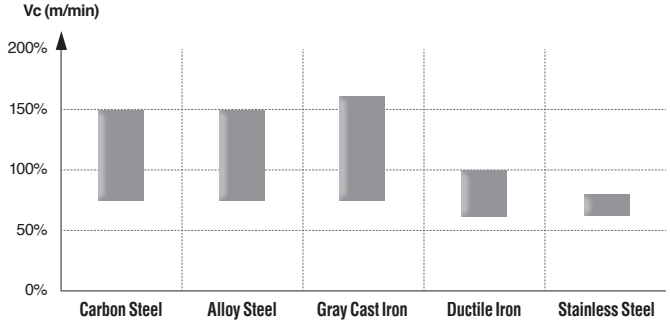
## General Features

· Suitable to work for Copper,Aluminum, Alloy steels,Non-ferrous steels
· Reasonable price and extensive coverage

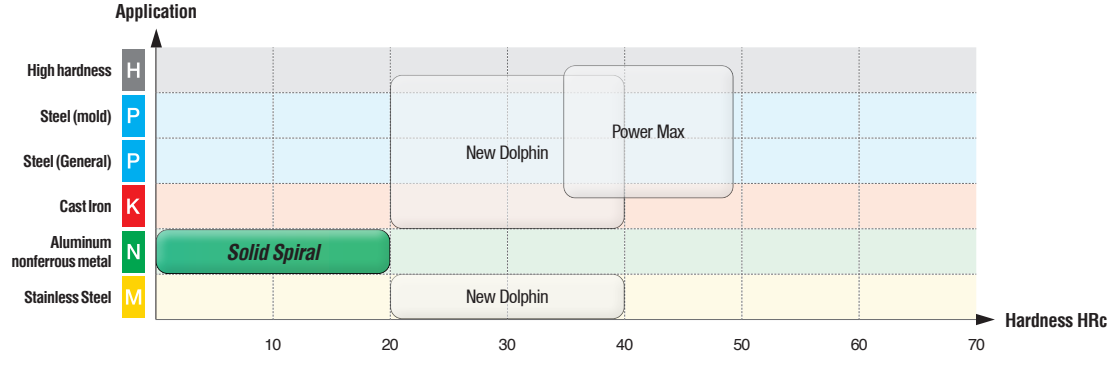
## Characteristics

· High chipping resistance by applied to the high toughness material
· Improvement of Flute hardness and excellent chip mission by applied to TiN,DLC coating
· Improve to customer variety of choice by applied to equal to Diameter with Shank Diameter

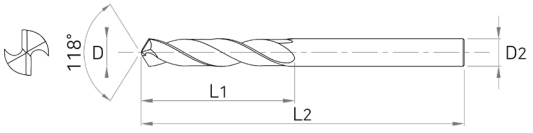
## Vc by Application area




## Applications



# SSD | NONFERROUS DRILL - REGULAR






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0 ~ -0.014 | h6 |
| D3.1 ~ 6 | 0 ~ -0.018 | |
| D6.1 ~ 10 | 0 ~ -0.022 | |
| D10.1 ~ 13 | 0 ~ -0.027 | |

CARBIDE | Uncoated | 30° HELIX | 118° | DATA P.711

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 010 | 1 | 10 | 38 | 1 |
| SSD 0105 | 1.05 | 10 | 38 | 1.05 |
| SSD 011 | 1.1 | 10 | 38 | 1.1 |
| SSD 0115 | 1.15 | 10 | 38 | 1.15 |
| SSD 012 | 1.2 | 10 | 38 | 1.2 |
| SSD 0125 | 1.25 | 10 | 38 | 1.25 |
| SSD 013 | 1.3 | 10 | 38 | 1.3 |
| SSD 0135 | 1.35 | 10 | 38 | 1.35 |
| SSD 014 | 1.4 | 10 | 38 | 1.4 |
| SSD 0145 | 1.45 | 10 | 38 | 1.45 |
| SSD 015 | 1.5 | 13 | 38 | 1.5 |
| SSD 0155 | 1.55 | 13 | 38 | 1.55 |
| SSD 016 | 1.6 | 13 | 38 | 1.6 |
| SSD 0165 | 1.65 | 13 | 38 | 1.65 |
| SSD 017 | 1.7 | 13 | 38 | 1.7 |
| SSD 0175 | 1.75 | 13 | 38 | 1.75 |
| SSD 018 | 1.8 | 13 | 38 | 1.8 |
| SSD 0185 | 1.85 | 13 | 38 | 1.85 |
| SSD 019 | 1.9 | 13 | 38 | 1.9 |
| SSD 0195 | 1.95 | 13 | 38 | 1.95 |
| SSD 020 | 2 | 16 | 45 | 2 |
| SSD 0205 | 2.05 | 16 | 45 | 2.05 |
| SSD 021 | 2.1 | 16 | 45 | 2.1 |
| SSD 0215 | 2.15 | 16 | 45 | 2.15 |
| SSD 022 | 2.2 | 16 | 45 | 2.2 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 0225 | 2.25 | 16 | 45 | 2.25 |
| SSD 023 | 2.3 | 16 | 45 | 2.3 |
| SSD 0235 | 2.35 | 16 | 45 | 2.35 |
| SSD 024 | 2.4 | 18 | 50 | 2.4 |
| SSD 0245 | 2.45 | 18 | 50 | 2.45 |
| SSD 025 | 2.5 | 20 | 50 | 2.5 |
| SSD 0255 | 2.55 | 20 | 50 | 2.55 |
| SSD 026 | 2.6 | 20 | 50 | 2.6 |
| SSD 0265 | 2.65 | 20 | 50 | 2.65 |
| SSD 027 | 2.7 | 22 | 50 | 2.7 |
| SSD 0275 | 2.75 | 22 | 50 | 2.75 |
| SSD 028 | 2.8 | 22 | 50 | 2.8 |
| SSD 0285 | 2.85 | 22 | 50 | 2.85 |
| SSD 029 | 2.9 | 22 | 50 | 2.9 |
| SSD 0295 | 2.95 | 22 | 50 | 2.95 |
| SSD 030 | 3 | 22 | 50 | 3 |
| SSD 031 | 3.1 | 25 | 50 | 3.1 |
| SSD 032 | 3.2 | 25 | 50 | 3.2 |
| SSD 033 | 3.3 | 25 | 50 | 3.3 |
| SSD 034 | 3.4 | 25 | 50 | 3.4 |
| SSD 035 | 3.5 | 25 | 50 | 3.5 |
| SSD 036 | 3.6 | 28 | 55 | 3.6 |
| SSD 037 | 3.7 | 28 | 55 | 3.7 |
| SSD 038 | 3.8 | 28 | 55 | 3.8 |
| SSD 039 | 3.9 | 28 | 55 | 3.9 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 040 | 4 | 28 | 55 | 4 |
| SSD 041 | 4.1 | 30 | 60 | 4.1 |
| SSD 042 | 4.2 | 30 | 60 | 4.2 |
| SSD 043 | 4.3 | 30 | 60 | 4.3 |
| SSD 044 | 4.4 | 30 | 60 | 4.4 |
| SSD 045 | 4.5 | 30 | 60 | 4.5 |
| SSD 046 | 4.6 | 33 | 65 | 4.6 |
| SSD 047 | 4.7 | 33 | 65 | 4.7 |
| SSD 048 | 4.8 | 35 | 65 | 4.8 |
| SSD 049 | 4.9 | 35 | 65 | 4.9 |
| SSD 050 | 5 | 35 | 65 | 5 |
| SSD 051 | 5.1 | 35 | 65 | 5.1 |
| SSD 052 | 5.2 | 35 | 65 | 5.2 |
| SSD 053 | 5.3 | 35 | 65 | 5.3 |
| SSD 054 | 5.4 | 35 | 65 | 5.4 |
| SSD 055 | 5.5 | 35 | 65 | 5.5 |
| SSD 056 | 5.6 | 38 | 75 | 5.6 |
| SSD 057 | 5.7 | 38 | 75 | 5.7 |
| SSD 058 | 5.8 | 38 | 75 | 5.8 |
| SSD 059 | 5.9 | 38 | 75 | 5.9 |
| SSD 060 | 6 | 38 | 75 | 6 |
| SSD 061 | 6.1 | 38 | 75 | 6.1 |
| SSD 062 | 6.2 | 38 | 75 | 6.2 |
| SSD 063 | 6.3 | 38 | 75 | 6.3 |
| SSD 064 | 6.4 | 38 | 75 | 6.4 |
| SSD 065 | 6.5 | 38 | 75 | 6.5 |
| SSD 066 | 6.6 | 45 | 80 | 6.6 |
| SSD 067 | 6.7 | 45 | 80 | 6.7 |
| SSD 068 | 6.8 | 45 | 80 | 6.8 |
| SSD 069 | 6.9 | 45 | 80 | 6.9 |
| SSD 070 | 7 | 45 | 80 | 7 |
| SSD 071 | 7.1 | 45 | 80 | 7.1 |
| SSD 072 | 7.2 | 45 | 80 | 7.2 |
| SSD 073 | 7.3 | 45 | 80 | 7.3 |
| SSD 074 | 7.4 | 45 | 80 | 7.4 |
| SSD 075 | 7.5 | 45 | 80 | 7.5 |
| SSD 076 | 7.6 | 50 | 85 | 7.6 |
| SSD 077 | 7.7 | 50 | 85 | 7.7 |
| SSD 078 | 7.8 | 50 | 85 | 7.8 |
| SSD 079 | 7.9 | 50 | 85 | 7.9 |
| SSD 080 | 8 | 50 | 85 | 8 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 081 | 8.1 | 50 | 85 | 8.1 |
| SSD 082 | 8.2 | 50 | 85 | 8.2 |
| SSD 083 | 8.3 | 50 | 85 | 8.3 |
| SSD 084 | 8.4 | 50 | 85 | 8.4 |
| SSD 085 | 8.5 | 50 | 85 | 8.5 |
| SSD 086 | 8.6 | 50 | 95 | 8.6 |
| SSD 087 | 8.7 | 50 | 95 | 8.7 |
| SSD 088 | 8.8 | 50 | 95 | 8.8 |
| SSD 089 | 8.9 | 50 | 95 | 8.9 |
| SSD 090 | 9 | 50 | 95 | 9 |
| SSD 091 | 9.1 | 50 | 95 | 9.1 |
| SSD 092 | 9.2 | 50 | 95 | 9.2 |
| SSD 093 | 9.3 | 50 | 95 | 9.3 |
| SSD 094 | 9.4 | 50 | 95 | 9.4 |
| SSD 095 | 9.5 | 50 | 95 | 9.5 |
| SSD 096 | 9.6 | 50 | 95 | 9.6 |
| SSD 097 | 9.7 | 50 | 95 | 9.7 |
| SSD 098 | 9.8 | 50 | 95 | 9.8 |
| SSD 099 | 9.9 | 55 | 100 | 9.9 |
| SSD 100 | 10 | 55 | 100 | 10 |
| SSD 101 | 10.1 | 55 | 115 | 10.1 |
| SSD 102 | 10.2 | 55 | 115 | 10.2 |
| SSD 103 | 10.3 | 55 | 115 | 10.3 |
| SSD 104 | 10.4 | 55 | 115 | 10.4 |
| SSD 105 | 10.5 | 55 | 115 | 10.5 |
| SSD 106 | 10.6 | 60 | 115 | 10.6 |
| SSD 107 | 10.7 | 60 | 115 | 10.7 |
| SSD 108 | 10.8 | 60 | 115 | 10.8 |
| SSD 109 | 10.9 | 60 | 115 | 10.9 |
| SSD 110 | 11 | 60 | 115 | 11 |
| SSD 111 | 11.1 | 65 | 120 | 11.1 |
| SSD 112 | 11.2 | 65 | 120 | 11.2 |
| SSD 113 | 11.3 | 65 | 120 | 11.3 |
| SSD 114 | 11.4 | 65 | 120 | 11.4 |
| SSD 115 | 11.5 | 65 | 120 | 11.5 |
| SSD 116 | 11.6 | 65 | 120 | 11.6 |
| SSD 117 | 11.7 | 65 | 120 | 11.7 |
| SSD 118 | 11.8 | 65 | 120 | 11.8 |
| SSD 119 | 11.9 | 65 | 120 | 11.9 |
| SSD 120 | 12 | 65 | 120 | 12 |
| SSD 121 | 12.1 | 70 | 125 | 12.1 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 122 | 12.2 | 70 | 125 | 12.2 |
| SSD 123 | 12.3 | 70 | 125 | 12.3 |
| SSD 124 | 12.4 | 70 | 125 | 12.4 |
| SSD 125 | 12.5 | 70 | 125 | 12.5 |
| SSD 126 | 12.6 | 70 | 125 | 12.6 |

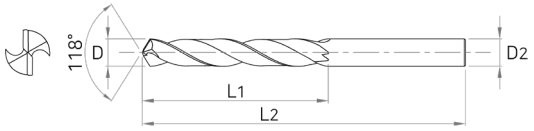
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSD 127 | 12.7 | 70 | 125 | 12.7 |
| SSD 128 | 12.8 | 70 | 125 | 12.8 |
| SSD 129 | 12.9 | 70 | 125 | 12.9 |
| SSD 130 | 13 | 75 | 130 | 13 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSDL | NONFERROUS DRILL - LONG






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~6 | 0~-0.018 | |
| D6.1~10 | 0~-0.022 | |

CARBIDE | Uncoated | 30° HELIX | 118° | DATA P.711

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSDL 010 | 1 | 25 | 65 | 1 |
| SSDL 011 | 1.1 | 25 | 65 | 1.1 |
| SSDL 012 | 1.2 | 25 | 65 | 1.2 |
| SSDL 013 | 1.3 | 25 | 65 | 1.3 |
| SSDL 014 | 1.4 | 25 | 65 | 1.4 |
| SSDL 015 | 1.5 | 25 | 65 | 1.5 |
| SSDL 016 | 1.6 | 25 | 65 | 1.6 |
| SSDL 017 | 1.7 | 25 | 65 | 1.7 |
| SSDL 018 | 1.8 | 25 | 65 | 1.8 |
| SSDL 019 | 1.9 | 25 | 65 | 1.9 |
| SSDL 020 | 2 | 30 | 65 | 2 |
| SSDL 021 | 2.1 | 30 | 65 | 2.1 |
| SSDL 022 | 2.2 | 30 | 65 | 2.2 |
| SSDL 023 | 2.3 | 30 | 65 | 2.3 |
| SSDL 024 | 2.4 | 30 | 65 | 2.4 |
| SSDL 025 | 2.5 | 35 | 70 | 2.5 |
| SSDL 026 | 2.6 | 35 | 70 | 2.6 |
| SSDL 027 | 2.7 | 35 | 70 | 2.7 |
| SSDL 028 | 2.8 | 35 | 70 | 2.8 |
| SSDL 029 | 2.9 | 35 | 70 | 2.9 |
| SSDL 030 | 3 | 42 | 73 | 3 |
| SSDL 031 | 3.1 | 42 | 73 | 3.1 |
| SSDL 032 | 3.2 | 42 | 73 | 3.2 |
| SSDL 033 | 3.3 | 42 | 73 | 3.3 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSDL 034 | 3.4 | 42 | 73 | 3.4 |
| SSDL 035 | 3.5 | 42 | 73 | 3.5 |
| SSDL 036 | 3.6 | 45 | 80 | 3.6 |
| SSDL 037 | 3.7 | 45 | 80 | 3.7 |
| SSDL 038 | 3.8 | 48 | 80 | 3.8 |
| SSDL 039 | 3.9 | 50 | 80 | 3.9 |
| SSDL 040 | 4 | 54 | 85 | 4 |
| SSDL 041 | 4.1 | 54 | 85 | 4.1 |
| SSDL 042 | 4.2 | 54 | 85 | 4.2 |
| SSDL 043 | 4.3 | 54 | 85 | 4.3 |
| SSDL 044 | 4.4 | 54 | 85 | 4.4 |
| SSDL 045 | 4.5 | 54 | 85 | 4.5 |
| SSDL 046 | 4.6 | 59 | 90 | 4.6 |
| SSDL 047 | 4.7 | 59 | 90 | 4.7 |
| SSDL 048 | 4.8 | 59 | 90 | 4.8 |
| SSDL 049 | 4.9 | 59 | 90 | 4.9 |
| SSDL 050 | 5 | 59 | 90 | 5 |
| SSDL 051 | 5.1 | 63 | 95 | 5.1 |
| SSDL 052 | 5.2 | 63 | 95 | 5.2 |
| SSDL 053 | 5.3 | 63 | 95 | 5.3 |
| SSDL 054 | 5.4 | 63 | 95 | 5.4 |
| SSDL 055 | 5.5 | 63 | 95 | 5.5 |
| SSDL 056 | 5.6 | 66 | 100 | 5.6 |
| SSDL 057 | 5.7 | 66 | 100 | 5.7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSDL | NONFERROUS DRILL - LONG



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSDL 058 | 5.8 | 66 | 100 | 5.8 |
| SSDL 059 | 5.9 | 66 | 100 | 5.9 |
| SSDL 060 | 6 | 66 | 100 | 6 |
| SSDL 061 | 6.1 | 70 | 105 | 6.1 |
| SSDL 062 | 6.2 | 70 | 105 | 6.2 |
| SSDL 063 | 6.3 | 70 | 105 | 6.3 |
| SSDL 064 | 6.4 | 70 | 105 | 6.4 |
| SSDL 065 | 6.5 | 70 | 105 | 6.5 |
| SSDL 066 | 6.6 | 73 | 105 | 6.6 |
| SSDL 067 | 6.7 | 73 | 105 | 6.7 |
| SSDL 068 | 6.8 | 73 | 105 | 6.8 |
| SSDL 069 | 6.9 | 73 | 105 | 6.9 |
| SSDL 070 | 7 | 73 | 105 | 7 |
| SSDL 071 | 7.1 | 76 | 110 | 7.1 |
| SSDL 072 | 7.2 | 76 | 110 | 7.2 |
| SSDL 073 | 7.3 | 76 | 110 | 7.3 |
| SSDL 074 | 7.4 | 76 | 110 | 7.4 |
| SSDL 075 | 7.5 | 76 | 110 | 7.5 |
| SSDL 076 | 7.6 | 80 | 115 | 7.6 |
| SSDL 077 | 7.7 | 80 | 115 | 7.7 |
| SSDL 078 | 7.8 | 80 | 115 | 7.8 |
| SSDL 079 | 7.9 | 80 | 115 | 7.9 |

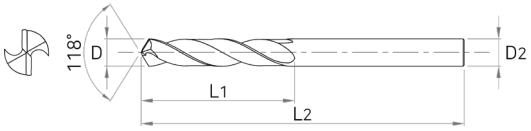
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSDL 080 | 8 | 80 | 115 | 8 |
| SSDL 081 | 8.1 | 85 | 125 | 8.1 |
| SSDL 082 | 8.2 | 85 | 125 | 8.2 |
| SSDL 083 | 8.3 | 85 | 125 | 8.3 |
| SSDL 084 | 8.4 | 85 | 125 | 8.4 |
| SSDL 085 | 8.5 | 85 | 125 | 8.5 |
| SSDL 086 | 8.6 | 85 | 125 | 8.6 |
| SSDL 087 | 8.7 | 85 | 125 | 8.7 |
| SSDL 088 | 8.8 | 85 | 125 | 8.8 |
| SSDL 089 | 8.9 | 85 | 125 | 8.9 |
| SSDL 090 | 9 | 85 | 125 | 9 |
| SSDL 091 | 9.1 | 88 | 130 | 9.1 |
| SSDL 092 | 9.2 | 88 | 130 | 9.2 |
| SSDL 093 | 9.3 | 88 | 130 | 9.3 |
| SSDL 094 | 9.4 | 88 | 130 | 9.4 |
| SSDL 095 | 9.5 | 88 | 130 | 9.5 |
| SSDL 096 | 9.6 | 90 | 130 | 9.6 |
| SSDL 097 | 9.7 | 90 | 130 | 9.7 |
| SSDL 098 | 9.8 | 90 | 130 | 9.8 |
| SSDL 099 | 9.9 | 90 | 130 | 9.9 |
| SSDL 100 | 10 | 90 | 130 | 10 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSTD | NONFERROUS TiN COATED DRILL - REGULAR






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~6 | 0~-0.018 | |
| D6.1~10 | 0~-0.022 | |
| D10.1~13 | 0~-0.027 | |

CARBIDE | TiN | 30° HELIX | 118° | DATA P.711

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTD 005 | 0.5 | 6 | 22 | 0.5 |
| SSTD 0055 | 0.55 | 7 | 24 | 0.55 |
| SSTD 006 | 0.6 | 7 | 24 | 0.6 |
| SSTD 0065 | 0.65 | 8 | 26 | 0.65 |
| SSTD 007 | 0.7 | 9 | 28 | 0.7 |
| SSTD 0075 | 0.75 | 9 | 28 | 0.75 |
| SSTD 008 | 0.8 | 10 | 30 | 0.8 |
| SSTD 0085 | 0.85 | 10 | 30 | 0.85 |
| SSTD 009 | 0.9 | 11 | 32 | 0.9 |
| SSTD 0095 | 0.95 | 11 | 32 | 0.95 |
| SSTD 010 | 1 | 10 | 38 | 1 |
| SSTD 011 | 1.1 | 10 | 38 | 1.1 |
| SSTD 012 | 1.2 | 10 | 38 | 1.2 |
| SSTD 013 | 1.3 | 10 | 38 | 1.3 |
| SSTD 014 | 1.4 | 10 | 38 | 1.4 |
| SSTD 015 | 1.5 | 13 | 38 | 1.5 |
| SSTD 016 | 1.6 | 13 | 38 | 1.6 |
| SSTD 017 | 1.7 | 13 | 38 | 1.7 |
| SSTD 018 | 1.8 | 13 | 38 | 1.8 |
| SSTD 019 | 1.9 | 13 | 38 | 1.9 |
| SSTD 020 | 2 | 16 | 45 | 2 |
| SSTD 021 | 2.1 | 16 | 45 | 2.1 |
| SSTD 022 | 2.2 | 16 | 45 | 2.2 |
| SSTD 023 | 2.3 | 16 | 45 | 2.3 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTD 024 | 2.4 | 18 | 50 | 2.4 |
| SSTD 025 | 2.5 | 20 | 50 | 2.5 |
| SSTD 026 | 2.6 | 20 | 50 | 2.6 |
| SSTD 027 | 2.7 | 22 | 50 | 2.7 |
| SSTD 028 | 2.8 | 22 | 50 | 2.8 |
| SSTD 029 | 2.9 | 22 | 50 | 2.9 |
| SSTD 030 | 3 | 22 | 50 | 3 |
| SSTD 031 | 3.1 | 25 | 50 | 3.1 |
| SSTD 032 | 3.2 | 25 | 50 | 3.2 |
| SSTD 033 | 3.3 | 25 | 50 | 3.3 |
| SSTD 034 | 3.4 | 25 | 50 | 3.4 |
| SSTD 035 | 3.5 | 25 | 50 | 3.5 |
| SSTD 036 | 3.6 | 28 | 55 | 3.6 |
| SSTD 037 | 3.7 | 28 | 55 | 3.7 |
| SSTD 038 | 3.8 | 28 | 55 | 3.8 |
| SSTD 039 | 3.9 | 28 | 55 | 3.9 |
| SSTD 040 | 4 | 28 | 55 | 4 |
| SSTD 041 | 4.1 | 30 | 60 | 4.1 |
| SSTD 042 | 4.2 | 30 | 60 | 4.2 |
| SSTD 043 | 4.3 | 30 | 60 | 4.3 |
| SSTD 044 | 4.4 | 30 | 60 | 4.4 |
| SSTD 045 | 4.5 | 30 | 60 | 4.5 |
| SSTD 046 | 4.6 | 33 | 65 | 4.6 |
| SSTD 047 | 4.7 | 33 | 65 | 4.7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSTD | NONFERROUS TiN COATED DRILL - REGULAR



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTD 048 | 4.8 | 35 | 65 | 4.8 |
| SSTD 049 | 4.9 | 35 | 65 | 4.9 |
| SSTD 050 | 5 | 35 | 65 | 5 |
| SSTD 051 | 5.1 | 35 | 65 | 5.1 |
| SSTD 052 | 5.2 | 35 | 65 | 5.2 |
| SSTD 053 | 5.3 | 35 | 65 | 5.3 |
| SSTD 054 | 5.4 | 35 | 65 | 5.4 |
| SSTD 055 | 5.5 | 35 | 65 | 5.5 |
| SSTD 056 | 5.6 | 38 | 75 | 5.6 |
| SSTD 057 | 5.7 | 38 | 75 | 5.7 |
| SSTD 058 | 5.8 | 38 | 75 | 5.8 |
| SSTD 059 | 5.9 | 38 | 75 | 5.9 |
| SSTD 060 | 6 | 38 | 75 | 6 |
| SSTD 061 | 6.1 | 38 | 75 | 6.1 |
| SSTD 062 | 6.2 | 38 | 75 | 6.2 |
| SSTD 063 | 6.3 | 38 | 75 | 6.3 |
| SSTD 064 | 6.4 | 38 | 75 | 6.4 |
| SSTD 065 | 6.5 | 38 | 75 | 6.5 |
| SSTD 066 | 6.6 | 45 | 80 | 6.6 |
| SSTD 067 | 6.7 | 45 | 80 | 6.7 |
| SSTD 068 | 6.8 | 45 | 80 | 6.8 |
| SSTD 069 | 6.9 | 45 | 80 | 6.9 |
| SSTD 070 | 7 | 45 | 80 | 7 |
| SSTD 071 | 7.1 | 45 | 80 | 7.1 |
| SSTD 072 | 7.2 | 45 | 80 | 7.2 |
| SSTD 073 | 7.3 | 45 | 80 | 7.3 |
| SSTD 074 | 7.4 | 45 | 80 | 7.4 |
| SSTD 075 | 7.5 | 45 | 80 | 7.5 |
| SSTD 076 | 7.6 | 50 | 85 | 7.6 |
| SSTD 077 | 7.7 | 50 | 85 | 7.7 |
| SSTD 078 | 7.8 | 50 | 85 | 7.8 |
| SSTD 079 | 7.9 | 50 | 85 | 7.9 |
| SSTD 080 | 8 | 50 | 85 | 8 |
| SSTD 081 | 8.1 | 50 | 85 | 8.1 |
| SSTD 082 | 8.2 | 50 | 85 | 8.2 |
| SSTD 083 | 8.3 | 50 | 85 | 8.3 |
| SSTD 084 | 8.4 | 50 | 85 | 8.4 |

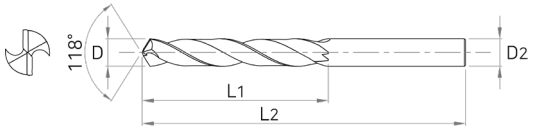
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTD 085 | 8.5 | 50 | 85 | 8.5 |
| SSTD 086 | 8.6 | 50 | 95 | 8.6 |
| SSTD 087 | 8.7 | 50 | 95 | 8.7 |
| SSTD 088 | 8.8 | 50 | 95 | 8.8 |
| SSTD 089 | 8.9 | 50 | 95 | 8.9 |
| SSTD 090 | 9 | 50 | 95 | 9 |
| SSTD 091 | 9.1 | 50 | 95 | 9.1 |
| SSTD 092 | 9.2 | 50 | 95 | 9.2 |
| SSTD 093 | 9.3 | 50 | 95 | 9.3 |
| SSTD 094 | 9.4 | 50 | 95 | 9.4 |
| SSTD 095 | 9.5 | 50 | 95 | 9.5 |
| SSTD 096 | 9.6 | 50 | 95 | 9.6 |
| SSTD 097 | 9.7 | 50 | 95 | 9.7 |
| SSTD 098 | 9.8 | 50 | 95 | 9.8 |
| SSTD 099 | 9.9 | 55 | 100 | 9.9 |
| SSTD 100 | 10 | 55 | 100 | 10 |
| SSTD 101 | 10.1 | 55 | 115 | 10.1 |
| SSTD 102 | 10.2 | 55 | 115 | 10.2 |
| SSTD 103 | 10.3 | 55 | 115 | 10.3 |
| SSTD 104 | 10.4 | 55 | 115 | 10.4 |
| SSTD 105 | 10.5 | 55 | 115 | 10.5 |
| SSTD 106 | 10.6 | 60 | 115 | 10.6 |
| SSTD 107 | 10.7 | 60 | 115 | 10.7 |
| SSTD 108 | 10.8 | 60 | 115 | 10.8 |
| SSTD 109 | 10.9 | 60 | 115 | 10.9 |
| SSTD 110 | 11 | 60 | 115 | 11 |
| SSTD 111 | 11.1 | 65 | 120 | 11.1 |
| SSTD 112 | 11.2 | 65 | 120 | 11.2 |
| SSTD 113 | 11.3 | 65 | 120 | 11.3 |
| SSTD 115 | 11.5 | 65 | 120 | 11.5 |
| SSTD 118 | 11.8 | 65 | 120 | 11.8 |
| SSTD 119 | 11.9 | 65 | 120 | 11.9 |
| SSTD 120 | 12 | 65 | 120 | 12 |
| SSTD 124 | 12.4 | 70 | 125 | 12.4 |
| SSTD 125 | 12.5 | 70 | 125 | 12.5 |
| SSTD 130 | 13 | 75 | 130 | 13 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSTDL | NON FERROUS TiN COATED DRILL - LONG






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| ~D3 | 0~-0.014 | h6 |
| D3.1~6 | 0~-0.018 | |
| D6.1~10 | 0~-0.022 | |
| D10.1~13 | 0~-0.027 | |

CARBIDE | TiN | 30° HELIX | 118° | DATA P.711

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTDL 010 | 1 | 25 | 65 | 1 |
| SSTDL 011 | 1.1 | 25 | 65 | 1.1 |
| SSTDL 012 | 1.2 | 25 | 65 | 1.2 |
| SSTDL 013 | 1.3 | 25 | 65 | 1.3 |
| SSTDL 014 | 1.4 | 25 | 65 | 1.4 |
| SSTDL 015 | 1.5 | 25 | 65 | 1.5 |
| SSTDL 016 | 1.6 | 25 | 65 | 1.6 |
| SSTDL 017 | 1.7 | 25 | 65 | 1.7 |
| SSTDL 018 | 1.8 | 25 | 65 | 1.8 |
| SSTDL 019 | 1.9 | 25 | 65 | 1.9 |
| SSTDL 020 | 2 | 30 | 65 | 2 |
| SSTDL 021 | 2.1 | 30 | 65 | 2.1 |
| SSTDL 022 | 2.2 | 30 | 65 | 2.2 |
| SSTDL 023 | 2.3 | 30 | 65 | 2.3 |
| SSTDL 024 | 2.4 | 30 | 65 | 2.4 |
| SSTDL 025 | 2.5 | 35 | 70 | 2.5 |
| SSTDL 026 | 2.6 | 35 | 70 | 2.6 |
| SSTDL 027 | 2.7 | 35 | 70 | 2.7 |
| SSTDL 028 | 2.8 | 35 | 70 | 2.8 |
| SSTDL 029 | 2.9 | 35 | 70 | 2.9 |
| SSTDL 030 | 3 | 42 | 73 | 3 |
| SSTDL 031 | 3.1 | 42 | 73 | 3.1 |
| SSTDL 032 | 3.2 | 42 | 73 | 3.2 |
| SSTDL 033 | 3.3 | 42 | 73 | 3.3 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTDL 034 | 3.4 | 42 | 73 | 3.4 |
| SSTDL 035 | 3.5 | 42 | 73 | 3.5 |
| SSTDL 036 | 3.6 | 45 | 80 | 3.6 |
| SSTDL 037 | 3.7 | 45 | 80 | 3.7 |
| SSTDL 038 | 3.8 | 48 | 80 | 3.8 |
| SSTDL 039 | 3.9 | 50 | 80 | 3.9 |
| SSTDL 040 | 4 | 54 | 85 | 4 |
| SSTDL 041 | 4.1 | 54 | 85 | 4.1 |
| SSTDL 042 | 4.2 | 54 | 85 | 4.2 |
| SSTDL 043 | 4.3 | 54 | 85 | 4.3 |
| SSTDL 044 | 4.4 | 54 | 85 | 4.4 |
| SSTDL 045 | 4.5 | 54 | 85 | 4.5 |
| SSTDL 046 | 4.6 | 59 | 90 | 4.6 |
| SSTDL 047 | 4.7 | 59 | 90 | 4.7 |
| SSTDL 048 | 4.8 | 59 | 90 | 4.8 |
| SSTDL 049 | 4.9 | 59 | 90 | 4.9 |
| SSTDL 050 | 5 | 59 | 90 | 5 |
| SSTDL 051 | 5.1 | 63 | 95 | 5.1 |
| SSTDL 052 | 5.2 | 63 | 95 | 5.2 |
| SSTDL 053 | 5.3 | 63 | 95 | 5.3 |
| SSTDL 054 | 5.4 | 63 | 95 | 5.4 |
| SSTDL 055 | 5.5 | 63 | 95 | 5.5 |
| SSTDL 056 | 5.6 | 66 | 100 | 5.6 |
| SSTDL 057 | 5.7 | 66 | 100 | 5.7 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# SSTDL | NON FERROUS TiN COATED DRILL - LONG



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTDL 058 | 5.8 | 66 | 100 | 5.8 |
| SSTDL 059 | 5.9 | 66 | 100 | 5.9 |
| SSTDL 060 | 6 | 66 | 100 | 6 |
| SSTDL 061 | 6.1 | 70 | 105 | 6.1 |
| SSTDL 062 | 6.2 | 70 | 105 | 6.2 |
| SSTDL 063 | 6.3 | 70 | 105 | 6.3 |
| SSTDL 064 | 6.4 | 70 | 105 | 6.4 |
| SSTDL 065 | 6.5 | 70 | 105 | 6.5 |
| SSTDL 066 | 6.6 | 73 | 105 | 6.6 |
| SSTDL 067 | 6.7 | 73 | 105 | 6.7 |
| SSTDL 068 | 6.8 | 73 | 105 | 6.8 |
| SSTDL 069 | 6.9 | 73 | 105 | 6.9 |
| SSTDL 070 | 7 | 73 | 105 | 7 |
| SSTDL 071 | 7.1 | 76 | 110 | 7.1 |
| SSTDL 072 | 7.2 | 76 | 110 | 7.2 |
| SSTDL 073 | 7.3 | 76 | 110 | 7.3 |
| SSTDL 074 | 7.4 | 76 | 110 | 7.4 |
| SSTDL 075 | 7.5 | 76 | 110 | 7.5 |
| SSTDL 076 | 7.6 | 80 | 115 | 7.6 |
| SSTDL 077 | 7.7 | 80 | 115 | 7.7 |
| SSTDL 078 | 7.8 | 80 | 115 | 7.8 |
| SSTDL 079 | 7.9 | 80 | 115 | 7.9 |

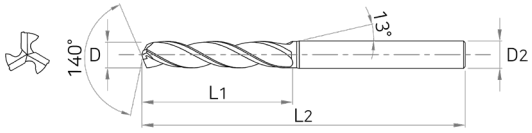
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| SSTDL 080 | 8 | 80 | 115 | 8 |
| SSTDL 081 | 8.1 | 85 | 125 | 8.1 |
| SSTDL 082 | 8.2 | 85 | 125 | 8.2 |
| SSTDL 083 | 8.3 | 85 | 125 | 8.3 |
| SSTDL 084 | 8.4 | 85 | 125 | 8.4 |
| SSTDL 085 | 8.5 | 85 | 125 | 8.5 |
| SSTDL 086 | 8.6 | 85 | 125 | 8.6 |
| SSTDL 087 | 8.7 | 85 | 125 | 8.7 |
| SSTDL 088 | 8.8 | 85 | 125 | 8.8 |
| SSTDL 089 | 8.9 | 85 | 125 | 8.9 |
| SSTDL 090 | 9 | 85 | 125 | 9 |
| SSTDL 091 | 9.1 | 88 | 130 | 9.1 |
| SSTDL 092 | 9.2 | 88 | 130 | 9.2 |
| SSTDL 093 | 9.3 | 88 | 130 | 9.3 |
| SSTDL 094 | 9.4 | 88 | 130 | 9.4 |
| SSTDL 095 | 9.5 | 88 | 130 | 9.5 |
| SSTDL 096 | 9.6 | 90 | 130 | 9.6 |
| SSTDL 097 | 9.7 | 90 | 130 | 9.7 |
| SSTDL 098 | 9.8 | 90 | 130 | 9.8 |
| SSTDL 099 | 9.9 | 90 | 130 | 9.9 |
| SSTDL 100 | 10 | 90 | 130 | 10 |

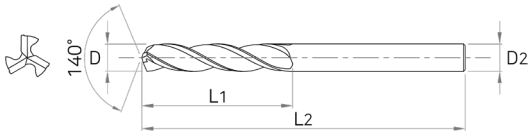
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# APF505 | 3F ALUMINUM DRILL - 5D






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.012 | h6 |

CARBIDE | D.L.C | 5D | 3 | 30° HELIX | 140° | DATA P.711

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| APF505 030 | 3 | 20 | 60 | 3 |
| APF505 03175 | 3.175 | 21.4 | 60.3 | 4 |
| APF505 03263 | 3.263 | 21.5 | 60.3 | 4 |
| APF505 035 | 3.5 | 22 | 63 | 4 |
| APF505 03572 | 3.572 | 23.8 | 63.5 | 4 |
| APF505 03967 | 3.967 | 23.8 | 63.5 | 4 |
| APF505 040 | 4 | 24 | 65 | 4 |
| APF505 045 | 4.5 | 24 | 65 | 5 |
| APF505 04762 | 4.762 | 31.75 | 69.9 | 5 |
| APF505 04800 | 4.8 | 31.8 | 69.9 | 5 |
| APF505 04851 | 4.851 | 31.8 | 69.9 | 5 |
| APF505 04914 | 4.914 | 31.75 | 69.9 | 5 |
| APF505 050 | 5 | 32 | 75 | 5 |
| APF505 05054 | 5.054 | 33.4 | 76.2 | 6 |
| APF505 05105 | 5.105 | 33.4 | 76.2 | 6 |
| APF505 05158 | 5.158 | 33.4 | 76.2 | 6 |
| APF505 05181 | 5.181 | 34.9 | 76.2 | 6 |
| APF505 05219 | 5.219 | 34.9 | 76.2 | 6 |
| APF505 05308 | 5.308 | 34.9 | 76.2 | 6 |
| APF505 05410 | 5.41 | 34.9 | 76.2 | 6 |
| APF505 055 | 5.5 | 35 | 75 | 6 |
| APF505 05556 | 5.556 | 34.9 | 76.2 | 6 |
| APF505 05613 | 5.613 | 34.9 | 76.2 | 6 |
| APF505 05791 | 5.791 | 34.9 | 76.2 | 6 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| APF505 05953 | 5.953 | 38.1 | 82.6 | 6 |
| APF505 060 | 6 | 38 | 82 | 6 |
| APF505 06045 | 6.045 | 41.3 | 82.6 | 7 |
| APF505 06146 | 6.146 | 41.3 | 82.6 | 7 |
| APF505 06248 | 6.248 | 41.3 | 82.6 | 7 |
| APF505 06350 | 6.35 | 41.3 | 82.6 | 7 |
| APF505 065 | 6.5 | 38 | 82 | 7 |
| APF505 06527 | 6.527 | 42.9 | 82.6 | 7 |
| APF505 06629 | 6.629 | 42.9 | 88.9 | 7 |
| APF505 06746 | 6.746 | 42.9 | 88.9 | 7 |
| APF505 06756 | 6.756 | 42.9 | 88.9 | 7 |
| APF505 06908 | 6.908 | 42.9 | 88.9 | 7 |
| APF505 070 | 7 | 43 | 88 | 7 |
| APF505 07035 | 7.035 | 42.9 | 88.9 | 8 |
| APF505 07142 | 7.142 | 44.5 | 88.9 | 8 |
| APF505 07366 | 7.366 | 44.5 | 88.9 | 8 |
| APF505 075 | 7.5 | 44 | 95 | 8 |
| APF505 07541 | 7.541 | 47.6 | 95.3 | 8 |
| APF505 07670 | 7.67 | 47.6 | 95.3 | 8 |
| APF505 07937 | 7.937 | 47.6 | 95.3 | 8 |
| APF505 080 | 8 | 48 | 95 | 8 |
| APF505 08026 | 8.026 | 47.6 | 95.3 | 9 |
| APF505 08204 | 8.204 | 53.2 | 95.3 | 9 |
| APF505 08333 | 8.333 | 53.2 | 101.6 | 9 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# APF505 | 3F ALUMINUM DRILL - 5D



| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| APF505 08432 | 8.432 | 53.2 | 101.6 | 9 |
| APF505 085 | 8.5 | 53 | 100 | 9 |
| APF505 08610 | 8.61 | 53.2 | 101.6 | 9 |
| APF505 08732 | 8.732 | 55.6 | 101.6 | 9 |
| APF505 08839 | 8.839 | 55.6 | 101.6 | 9 |
| APF505 090 | 9 | 55 | 100 | 9 |
| APF505 09093 | 9.093 | 57.9 | 108 | 10 |
| APF505 09128 | 9.128 | 57.9 | 108 | 10 |
| APF505 09347 | 9.347 | 57.9 | 108 | 10 |
| APF505 095 | 9.5 | 58 | 108 | 10 |
| APF505 09525 | 9.525 | 60.3 | 108 | 10 |
| APF505 09575 | 9.575 | 60.3 | 108 | 10 |
| APF505 09804 | 9.804 | 60.3 | 114.3 | 10 |
| APF505 09921 | 9.921 | 60.3 | 114.3 | 10 |
| APF505 100 | 10 | 60 | 114 | 10 |
| APF505 10083 | 10.083 | 63.5 | 114.3 | 11 |
| APF505 10261 | 10.261 | 65.1 | 114.3 | 11 |
| APF505 10317 | 10.317 | 65.1 | 114.3 | 11 |
| APF505 105 | 10.5 | 67 | 114 | 11 |
| APF505 10716 | 10.716 | 68.3 | 114.3 | 11 |
| APF505 110 | 11 | 68 | 114 | 11 |

| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| APF505 11112 | 11.112 | 71.4 | 120.7 | 12 |
| APF505 115 | 11.5 | 70 | 120 | 12 |
| APF505 11508 | 11.508 | 73 | 120.7 | 12 |
| APF505 11907 | 11.907 | 73 | 120.7 | 12 |
| APF505 120 | 12 | 73 | 120 | 12 |
| APF505 12303 | 12.303 | 76.2 | 134.9 | 13 |
| APF505 125 | 12.5 | 75 | 135 | 13 |
| APF505 127 | 12.7 | 77.8 | 136.5 | 13 |
| APF505 130 | 13 | 78 | 136 | 13 |
| APF505 13096 | 13.096 | 79.4 | 136.5 | 14 |
| APF505 13492 | 13.492 | 84.1 | 144.5 | 14 |
| APF505 13891 | 13.891 | 85.7 | 147.6 | 14 |
| APF505 140 | 14 | 86 | 148 | 14 |
| APF505 14287 | 14.287 | 88.9 | 150.8 | 15 |
| APF505 14683 | 14.683 | 88.9 | 152.4 | 15 |
| APF505 150 | 15 | 90 | 152 | 15 |
| APF505 15082 | 15.082 | 90.5 | 152.4 | 16 |
| APF505 15478 | 15.478 | 93.7 | 157.2 | 16 |
| APF505 15875 | 15.875 | 95.3 | 160.3 | 16 |
| APF505 160 | 16 | 95 | 160 | 16 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | | | | | ○ | | ○ | ◎ | ○ |

○ : GOOD ◎ : EXCELLENT

# TAP SERIES

| | | |
|---|---|---|
| **JIS CARBIDE TAP** | 450 | |
| **DIN CARBIDE TAP** | 460 | |
| **JIS HSSE TAP** | 470 | |
| **DIN HSSE TAP** | 502 | |

# JIS CARBIDE TAP

## Contents


| Series | Type | EDP No | Geometry | Surface Treatment | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|
| | | | | Coating | Uncoated | Min | Max | |
| JIS | SPIRAL | WPOM | | | ○ | M3 | M12 | 452 |
| | | WPCM | | TiCN | | M3 | M12 | 453 |
| | STRAIGHT | WSOM | | | ○ | M3 | M12 | 454 |
| | | WSCM | | TiCN | | M3 | M12 | 455 |
| | ROLL | WROM | | | ○ | M3 | M12 | 456 |
| | | WRCM | | TiCN | | M3 | M12 | 457 |
| | SPIRAL ROLL | WFOM | | | ○ | M3 | M6 | 458 |
| | | WFCM | | TiCN | | M3 | M6 | 459 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

V R 0 M 06 100 40 S

| Raw Material | Description | Surface Treatment | Thread | Size | Pitch | Chamfer Length | Oil Groove |
|---|---|---|---|---|---|---|---|
| V : HSSE | S(JIS) : Straight | O : NON | M : Meter Thread | M3 | 0.5 | 1.5 | S : 1 Groove |
| W : CARBIDE | G(DIN) : Straight | T : TiN | | ~ | ~ | 2.0 | M : 4 Groove |
| | P(JIS) : Spiral | C : TiCN | | M24 | 3.0 | 2.5 | |
| | Q(DIN) : Spiral | H : HOMO | | | | 4.0 | |
| | N(JIS) : Point | | | | | 5.0 | |
| | D(DIN) : Point | | | | | | |
| | R(JIS) : Roll | | | | | | |
| | F(JIS) : Spiral Roll | | | | | | |
| | M(DIN) : Roll | | | | | | |

Ex) Size M6 / Screw Pitch 1.0mm / Chamfer length 4 / Oil Groove 1 Uncoated HSSE Roll Tap

# TAP SERIES

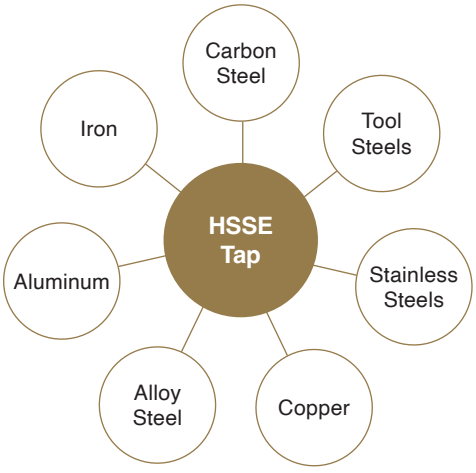
## Characteristics

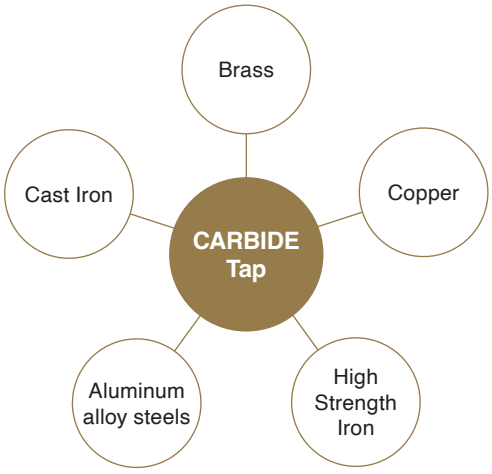
· Suitable for Alloy Steels, Carbon steels, Brass, Aluminum alloy steels
· Extend customer choice with variety of size and type

## Features

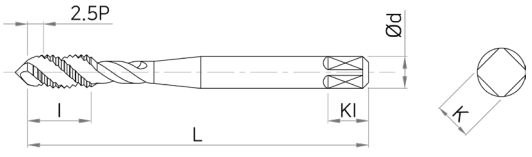
· Improvement of wear resistance and chipping resistance by applied to high toughness material
· High processability and Minimized chip deposition by applied to TiN,TiCN coating
· Response to a wide range of processing conditions by adopting the stepwise accuracy method of WH or GH

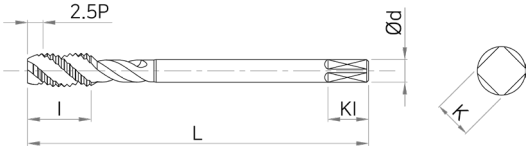
## Applications



# WPOM | JIS SPIRAL TAPS






CARBIDE | Uncoated | 15° HELIX

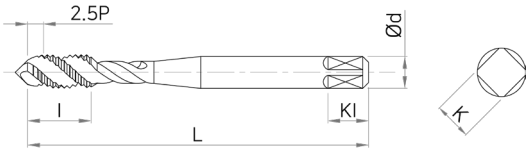
| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| WPOM 0305025 | M3 X 0.5 | WH3 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| WPOM 0407025 | M4 X 0.7 | WH3 | 52 | 13 | 5 | 4 | 7 | 3 |
| WPOM 0508025 | M5 X 0.8 | WH3 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| WPOM 0610025 | M6 X 1.0 | WH3 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| WPOM 0810025 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| WPOM 0812525 | M8 X 1.25 | WH4 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| WPOM 1010025 | M10 X 1.0 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPOM 1012525 | M10 X 1.25 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPOM 1015025 | M10 X 1.5 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPOM 1210025 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPOM 1212525 | M12 X 1.25 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPOM 1215025 | M12 X 1.5 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPOM 1217525 | M12 X 1.75 | WH5 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |

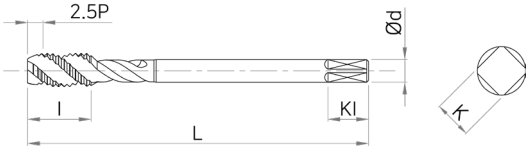
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WPCM | JIS SPIRAL TAPS




CARBIDE | TiCN | 15° HELIX

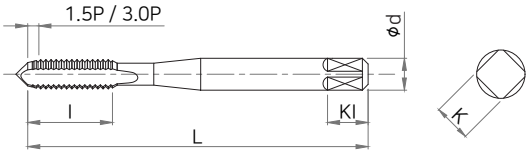
| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| WPCM 0305025 | M3 X 0.5 | WH3 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| WPCM 0407025 | M4 X 0.7 | WH3 | 52 | 13 | 5 | 4 | 7 | 3 |
| WPCM 0508025 | M5 X 0.8 | WH3 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| WPCM 0610025 | M6 X 1.0 | WH3 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| WPCM 0810025 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| WPCM 0812525 | M8 X 1.25 | WH4 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| WPCM 1010025 | M10 X 1.0 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPCM 1012525 | M10 X 1.25 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPCM 1015025 | M10 X 1.5 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| WPCM 1210025 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPCM 1212525 | M12 X 1.25 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPCM 1215025 | M12 X 1.5 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| WPCM 1217525 | M12 X 1.75 | WH5 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |

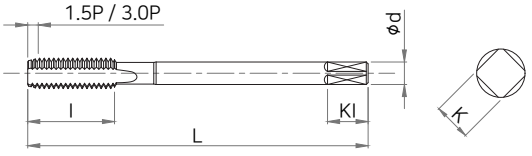
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WSOM | JIS STRAIGHT TAPS






CARBIDE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 3P | Thread Size | Limits | L | l | d | K | Kl | Z |
| WSOM 0305015 | WSOM 0305030 | M3 X 0.5 | WH3 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| WSOM 0407015 | WSOM 0407030 | M4 X 0.7 | WH3 | 52 | 13 | 5 | 4 | 7 | 3 |
| WSOM 0508015 | WSOM 0508030 | M5 X 0.8 | WH3 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| WSOM 0610015 | WSOM 0610030 | M6 X 1.0 | WH3 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| WSOM 0810015 | WSOM 0810030 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| WSOM 0812515 | WSOM 0812530 | M8 X 1.25 | WH4 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| WSOM 1010015 | WSOM 1010030 | M10 X 1.0 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSOM 1012515 | WSOM 1012530 | M10 X 1.25 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSOM 1015015 | WSOM 1015030 | M10 X 1.5 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSOM 1210015 | WSOM 1210030 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSOM 1212515 | WSOM 1212530 | M12 X 1.25 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSOM 1215015 | WSOM 1215030 | M12 X 1.5 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSOM 1217515 | WSOM 1217530 | M12 X 1.75 | WH5 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |

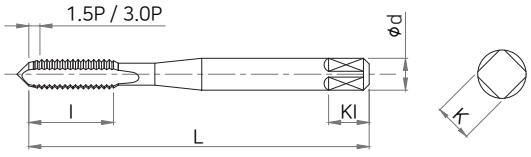
※ 1.5P Tap is removed external center as bottoming type

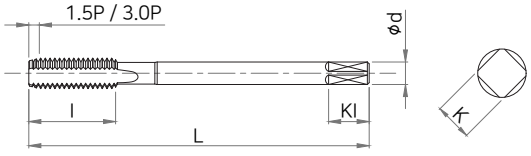
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WSCM | JIS STRAIGHT TAPS




CARBIDE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 3P | Thread Size | Limits | L | l | d | K | Kl | Z |
| WSCM 0305015 | WSCM 0305030 | M3 X 0.5 | WH3 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| WSCM 0407015 | WSCM 0407030 | M4 X 0.7 | WH3 | 52 | 13 | 5 | 4 | 7 | 3 |
| WSCM 0508015 | WSCM 0508030 | M5 X 0.8 | WH3 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| WSCM 0610015 | WSCM 0610030 | M6 X 1.0 | WH3 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| WSCM 0810015 | WSCM 0810030 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| WSCM 0812515 | WSCM 0812530 | M8 X 1.25 | WH4 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| WSCM 1010015 | WSCM 1010030 | M10 X 1.0 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSCM 1012515 | WSCM 1012530 | M10 X 1.25 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSCM 1015015 | WSCM 1015030 | M10 X 1.5 | WH4 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| WSCM 1210015 | WSCM 1210030 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSCM 1212515 | WSCM 1212530 | M12 X 1.25 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSCM 1215015 | WSCM 1215030 | M12 X 1.5 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| WSCM 1217515 | WSCM 1217530 | M12 X 1.75 | WH5 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |

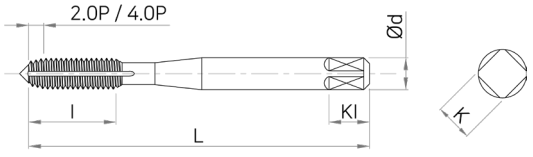
※ 1.5P Tap is removed external center as bottoming type

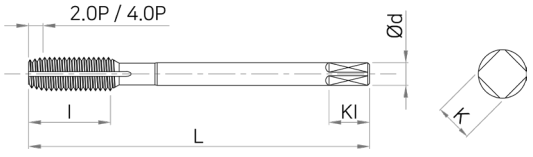
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WROM | JIS ROLL TAPS






CARBIDE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| WROM 0305020S | - | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | S |
| WROM 0305020M | WROM 0305040M | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | M |
| WROM 0407020S | - | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | S |
| WROM 0407020M | WROM 0407040M | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | M |
| WROM 0508020S | - | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | S |
| WROM 0508020M | WROM 0508040M | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | M |
| WROM 0610020S | - | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | S |
| WROM 0610020M | WROM 0610040M | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | M |
| WROM 0812520S | - | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| WROM 0812520M | WROM 0812540M | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| WROM 1012520S | - | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| WROM 1012520M | WROM 1012540M | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| WROM 1015020S | - | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| WROM 1015020M | WROM 1015040M | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| WROM 1210020S | - | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WROM 1210020M | WROM 1210040M | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WROM 1212520S | - | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WROM 1212520M | WROM 1212540M | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WROM 1215020S | - | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WROM 1215020M | WROM 1215040M | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WROM 1217520S | - | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WROM 1217520M | WROM 1217540M | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | M |

※ 2.0P Tap is removed external center as bottoming type

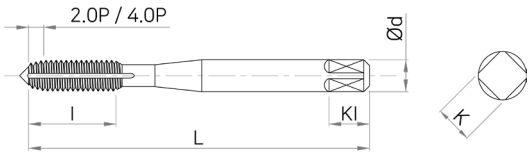
Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

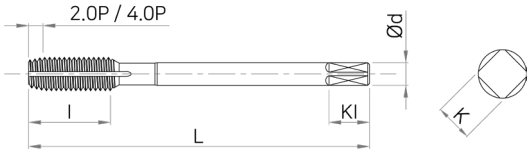
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WRCM | JIS ROLL TAPS




CARBIDE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| WRCM 0305020S | - | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | S |
| WRCM 0305020M | WRCM 0305040M | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | M |
| WRCM 0407020S | - | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | S |
| WRCM 0407020M | WRCM 0407040M | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | M |
| WRCM 0508020S | - | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | S |
| WRCM 0508020M | WRCM 0508040M | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | M |
| WRCM 0610020S | - | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | S |
| WRCM 0610020M | WRCM 0610040M | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | M |
| WRCM 0812520S | - | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| WRCM 0812520M | WRCM 0812540M | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| WRCM 1012520S | - | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| WRCM 1012520M | WRCM 1012540M | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| WRCM 1015020S | - | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| WRCM 1015020M | WRCM 1015040M | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| WRCM 1210020S | - | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WRCM 1210020M | WRCM 1210040M | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WRCM 1212520S | - | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WRCM 1212520M | WRCM 1212540M | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WRCM 1215020S | - | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WRCM 1215020M | WRCM 1215040M | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| WRCM 1217520S | - | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| WRCM 1217520M | WRCM 1217540M | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | M |

※ 2.0P Tap is removed external center as bottoming type

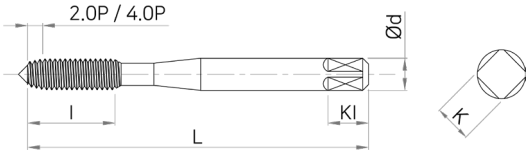
Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WFOM | JIS SPIRAL ROLL TAPS






CARBIDE | Uncoated

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl |
| WFOM 0305020 | WFOM 0305040 | M3 X 0.5 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| WFOM 03506020 | WFOM 03506040 | M3.5 X 0.6 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| WFOM 0407020 | WFOM 0407040 | M4 X 0.7 | GH7 | 52 | 20 | 5 | 4 | 7 |
| WFOM 0508020 | WFOM 0508040 | M5 X 0.8 | GH7 | 60 | 22 | 5.5 | 4.5 | 7 |
| WFOM 0610020 | WFOM 0610040 | M6 X 1.0 | GH7 | 62 | 24 | 6 | 4.5 | 7 |

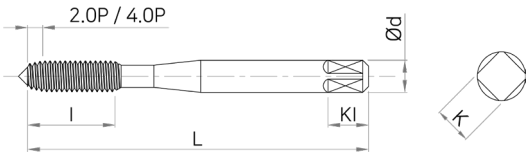
※ 2.0P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WFCM | JIS SPIRAL ROLL TAPS






CARBIDE | TiCN

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl |
| WFCM 0305020 | WFCM 0305040 | M3 X 0.5 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| WFCM 03506020 | WFCM 03506040 | M3.5 X 0.6 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| WFCM 0407020 | WFCM 0407040 | M4 X 0.7 | GH7 | 52 | 20 | 5 | 4 | 7 |
| WFCM 0508020 | WFCM 0508040 | M5 X 0.8 | GH7 | 60 | 22 | 5.5 | 4.5 | 7 |
| WFCM 0610020 | WFCM 0610040 | M6 X 1.0 | GH7 | 62 | 24 | 6 | 4.5 | 7 |

※ 2.0P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

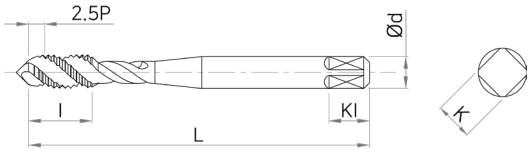
○ : GOOD ◎ : EXCELLENT

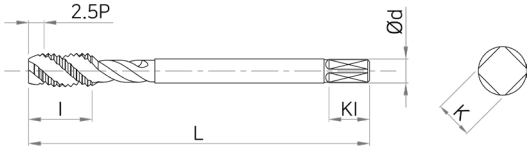
# DIN CARBIDE TAP

## Contents


| Series | Type | EDP No | Geometry | Surface Treatment | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|
| | | | | Coating | Uncoated | Min | Max | |
| DIN | SPIRAL | WQOM | | | ○ | M3 | M12 | 461 |
| | | WQCM | | TiCN | | M3 | M12 | 462 |
| | STRAIGHT | WGOM | | | ○ | M3 | M12 | 463 |
| | | WGCM | | TiCN | | M3 | M12 | 464 |
| | ROLL | WMOM | | | ○ | M3 | M12 | 465 |
| | | WMCM | | TiCN | | M3 | M12 | 467 |

# WQOM | DIN SPIRAL TAPS




DIN 371-374 376 | CARBIDE | Uncoated | 15° HELIX

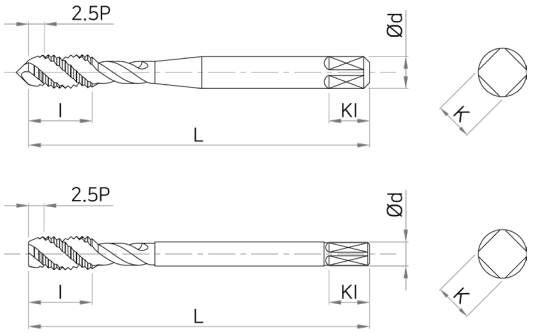
| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| WQOM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| WQOM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| WQOM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| WQOM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| WQOM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| WQOM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| WQOM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| WQOM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| WQOM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| WQOM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| WQOM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| WQOM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| WQOM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |

## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WQCM | DIN SPIRAL TAPS






DIN 371-374 376 | CARBIDE | TiCN | 15° HELIX

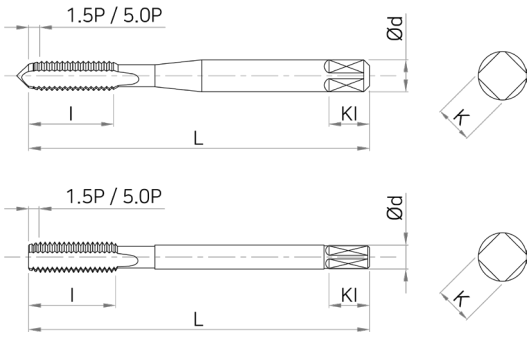
| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| WQCM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| WQCM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| WQCM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| WQCM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| WQCM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| WQCM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| WQCM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| WQCM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| WQCM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| WQCM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| WQCM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| WQCM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| WQCM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |

## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WGOM | DIN STRAIGHT TAPS




DIN 371-374 376 | CARBIDE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| WGOM 0305015 | WGOM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| WGOM 0407015 | WGOM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| WGOM 0508015 | WGOM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| WGOM 0610015 | WGOM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| WGOM 0810015 | WGOM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| WGOM 0812515 | WGOM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| WGOM 1010015 | WGOM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| WGOM 1012515 | WGOM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| WGOM 1015015 | WGOM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| WGOM 1210015 | WGOM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| WGOM 1212515 | WGOM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| WGOM 1215015 | WGOM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| WGOM 1217515 | WGOM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |

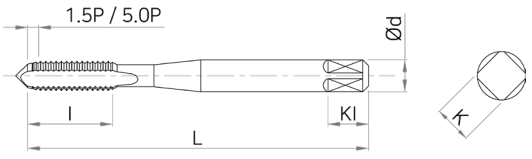
※ 1.5P Tap is removed external center as bottoming type

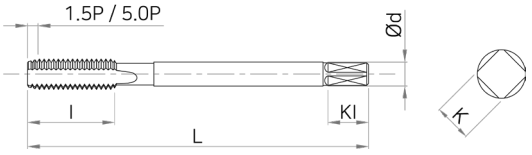
## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WGCM | DIN STRAIGHT TAPS






DIN 371-374 376 | CARBIDE | TiCN

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| WGCM 0305015 | WGCM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| WGCM 0407015 | WGCM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| WGCM 0508015 | WGCM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| WGCM 0610015 | WGCM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| WGCM 0810015 | WGCM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| WGCM 0812515 | WGCM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| WGCM 1010015 | WGCM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| WGCM 1012515 | WGCM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| WGCM 1015015 | WGCM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| WGCM 1210015 | WGCM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| WGCM 1212515 | WGCM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| WGCM 1215015 | WGCM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| WGCM 1217515 | WGCM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |

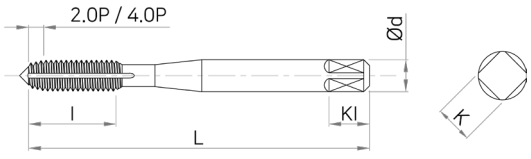
※ 1.5P Tap is removed external center as bottoming type

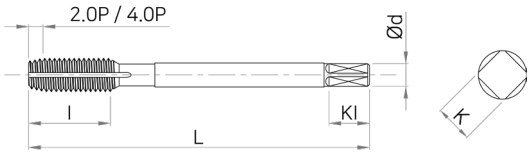
## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WMOM | DIN ROLL TAPS






DIN 371-374 376 | CARBIDE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | DIN Type |
| WMOM 0305020S | - | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | S |
| WMOM 0305020M | WMOM 0305040M | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | M |
| WMOM 0407020S | - | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | S |
| WMOM 0407020M | WMOM 0407040M | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | M |
| WMOM 0508020S | - | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | S |
| WMOM 0508020M | WMOM 0508040M | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | M |
| WMOM 0610020S | - | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | S |
| WMOM 0610020M | WMOM 0610040M | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | M |
| WMOM 0810020S | - | M8x1.0 | 6HX | 90 | 17 | 6 | 4.9 | 8 | S |
| WMOM 0810020M | WMOM 0810040M | M8x1.0 | 6HX | 90 | 17 | 6 | 4.9 | 8 | M |
| WMOM 0812520S | - | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | S |
| WMOM 0812520M | WMOM 0812540M | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | M |
| WMOM 1010020S | - | M10x1.0 | 6HX | 90 | 18 | 7 | 5.5 | 8 | S |
| WMOM 1010020M | WMOM 1010040M | M10x1.0 | 6HX | 90 | 18 | 7 | 5.5 | 8 | M |
| WMOM 1012520S | - | M10x1.25 | 6HX | 100 | 22 | 7 | 5.5 | 8 | S |
| WMOM 1012520M | WMOM 1012540M | M10x1.25 | 6HX | 100 | 22 | 7 | 5.5 | 8 | M |
| WMOM 1015020S | - | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| WMOM 1015020M | WMOM 1015040M | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| WMOM 1210020S | - | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | S |
| WMOM 1210020M | WMOM 1210040M | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | M |
| WMOM 1212520S | - | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| WMOM 1212520M | WMOM 1212540M | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | M |
| WMOM 1215020S | - | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| WMOM 1215020M | WMOM 1215040M | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WMOM | DIN ROLL TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | DIN Type |
| WMOM 1217520S | - | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | S |
| WMOM 1217520M | WMOM 1217540M | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

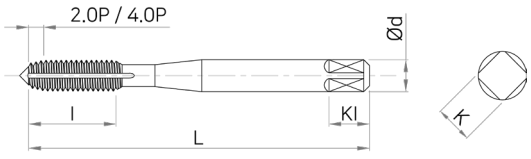


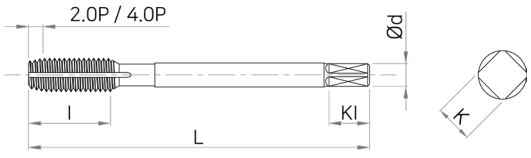
## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WMCM | DIN ROLL TAPS






DIN 371-374 376 | CARBIDE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | DIN Type |
| WMCM 0305020S | - | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | S |
| WMCM 0305020M | WMCM 0305040M | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | M |
| WMCM 0407020S | - | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | S |
| WMCM 0407020M | WMCM 0407040M | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | M |
| WMCM 0508020S | - | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | S |
| WMCM 0508020M | WMCM 0508040M | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | M |
| WMCM 0610020S | - | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | S |
| WMCM 0610020M | WMCM 0610040M | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | M |
| WMCM 0810020S | - | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | S |
| WMCM 0810020M | WMCM 0810040M | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | M |
| WMCM 0812520S | - | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | S |
| WMCM 0812520M | WMCM 0812540M | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | M |
| WMCM 1010020S | - | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | S |
| WMCM 1010020M | WMCM 1010040M | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | M |
| WMCM 1012520S | - | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| WMCM 1012520M | WMCM 1012540M | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| WMCM 1015020S | - | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| WMCM 1015020M | WMCM 1015040M | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| WMCM 1210020S | - | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | S |
| WMCM 1210020M | WMCM 1210040M | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | M |
| WMCM 1212520S | - | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| WMCM 1212520M | WMCM 1212540M | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | M |
| WMCM 1215020S | - | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| WMCM 1215020M | WMCM 1215040M | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

○ : GOOD ◎ : EXCELLENT

# WMCM | DIN ROLL TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | DIN Type |
| WMCM 1217520S | - | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | S |
| WMCM 1217520M | WMCM 1217540M | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 oil groove
Oil groove M : 4 oil groove



## ■ Applicable Working Material

| Cast Iron | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|
| FC | FCD | Cu | Bs | BsC | PB | AL | AC,ADC | MC | ZDC | - |
| ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ◎ |

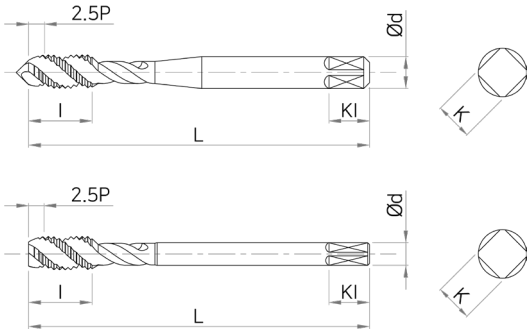
○ : GOOD ◎ : EXCELLENT

# JIS HSSE TAP

## Contents


| Series | Type | EDP No | Geometry | Surface Treatment | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|
| | | | | Coating | Uncoated | Min | Max | |
| JIS | SPIRAL | VPOM | | | ○ | M3 | M24 | 471 |
| | | VPTM | | TiN | | M3 | M24 | 473 |
| | | VPCM | | TiCN | | M3 | M24 | 475 |
| | | VPHM | | HOMO | | M3 | M24 | 477 |
| | POINT | VNOM | | | ○ | M3 | M24 | 479 |
| | | VNTM | | TiN | | M3 | M24 | 481 |
| | | VNCM | | TiCN | | M3 | M24 | 483 |
| | | VNHM | | HOMO | | M3 | M24 | 485 |
| | STRAIGHT | VSOM | | | ○ | M3 | M24 | 487 |
| | | VSTM | | TiN | | M3 | M24 | 489 |
| | | VSCM | | TiCN | | M3 | M24 | 491 |
| | | VSHM | | HOMO | | M3 | M24 | 493 |
| | ROLL | VROM | | | ○ | M3 | M12 | 495 |
| | | VRTM | | TiN | | M3 | M12 | 496 |
| | | VRCM | | TiCN | | M3 | M12 | 497 |
| | SPIRAL ROLL | VFOM | | | ○ | M3 | M6 | 498 |
| | | VFTM | | TiN | | M3 | M6 | 499 |
| | | VFCM | | TiCN | | M3 | M6 | 500 |

# VPOM | JIS SPIRAL TAPS




HSSE | Uncoated | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPOM 0305025 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VPOM 0407025 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VPOM 04507525 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VPOM 0508025 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VPOM 0610025 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VPOM 0810025 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPOM 0812525 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPOM 1012525 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPOM 1015025 | M10 X 1.5 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPOM 1210025 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPOM 1212525 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPOM 1215025 | M12 X 1.5 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPOM 1217525 | M12 X 1.75 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPOM 1415025 | M14 X 1.5 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPOM 1420025 | M14 X 2.0 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPOM 1615025 | M16 X 1.5 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPOM 1620025 | M16 X 2.0 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPOM 1815025 | M18 X 1.5 | WH2 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPOM 1825025 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPOM 2015025 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPOM 2025025 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPOM 2215025 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPOM 2225025 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPOM 2415025 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VPOM | JIS SPIRAL TAPS

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPOM 2420025 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VPOM 2430025 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 4 |

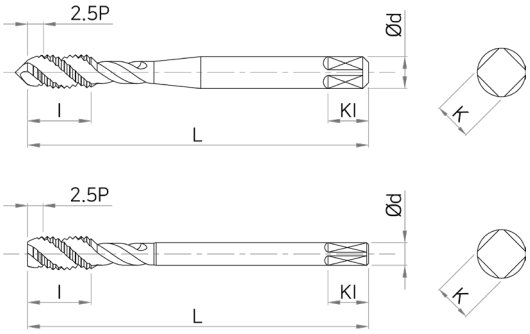


## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VPTM | JIS SPIRAL TAPS




HSSE | TiN | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPTM 0305025 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VPTM 0407025 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VPTM 04507525 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VPTM 0508025 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VPTM 0610025 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VPTM 0810025 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPTM 0812525 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPTM 1012525 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPTM 1015025 | M10 X 1.5 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPTM 1210025 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPTM 1212525 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPTM 1215025 | M12 X 1.5 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPTM 1217525 | M12 X 1.75 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPTM 1415025 | M14 X 1.5 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPTM 1420025 | M14 X 2.0 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPTM 1615025 | M16 X 1.5 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPTM 1620025 | M16 X 2.0 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPTM 1815025 | M18 X 1.5 | WH2 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPTM 1825025 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPTM 2015025 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPTM 2025025 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPTM 2215025 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPTM 2225025 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPTM 2415025 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VPTM | JIS SPIRAL TAPS

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPTM 2420025 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VPTM 2430025 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 4 |

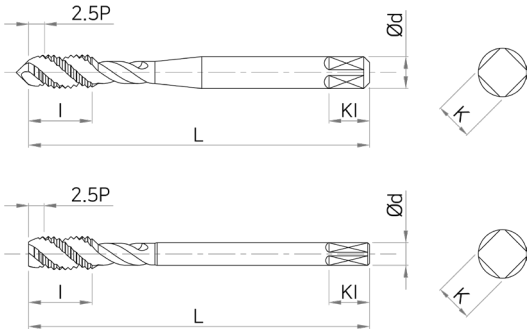


## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VPCM | JIS SPIRAL TAPS




HSSE | TiCN | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPCM 0305025 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VPCM 0407025 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VPCM 04507525 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VPCM 0508025 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VPCM 0610025 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VPCM 0810025 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPCM 0812525 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPCM 1012525 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPCM 1015025 | M10 X 1.5 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPCM 1210025 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPCM 1212525 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPCM 1215025 | M12 X 1.5 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPCM 1217525 | M12 X 1.75 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPCM 1415025 | M14 X 1.5 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPCM 1420025 | M14 X 2.0 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPCM 1615025 | M16 X 1.5 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPCM 1620025 | M16 X 2.0 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPCM 1815025 | M18 X 1.5 | WH2 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPCM 1825025 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPCM 2015025 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPCM 2025025 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPCM 2215025 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPCM 2225025 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPCM 2415025 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPCM 2420025 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VPCM 2430025 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 4 |

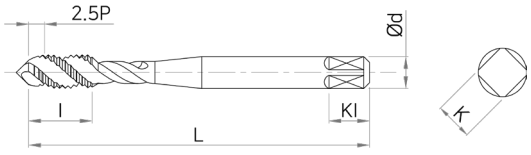


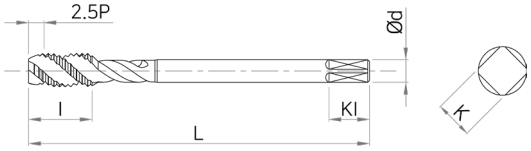
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VPHM | JIS SPIRAL TAPS




HSSE | HOMO | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPHM 0305025 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VPHM 0407025 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VPHM 04507525 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VPHM 0508025 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VPHM 0610025 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VPHM 0810025 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPHM 0812525 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VPHM 1012525 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPHM 1015025 | M10 X 1.5 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VPHM 1210025 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPHM 1212525 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPHM 1215025 | M12 X 1.5 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPHM 1217525 | M12 X 1.75 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VPHM 1415025 | M14 X 1.5 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPHM 1420025 | M14 X 2.0 | WH2 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VPHM 1615025 | M16 X 1.5 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPHM 1620025 | M16 X 2.0 | WH2 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VPHM 1815025 | M18 X 1.5 | WH2 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPHM 1825025 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VPHM 2015025 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPHM 2025025 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VPHM 2215025 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPHM 2225025 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VPHM 2415025 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VPHM 2420025 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VPHM 2430025 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 4 |

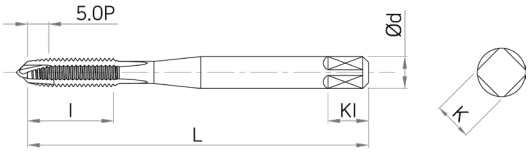


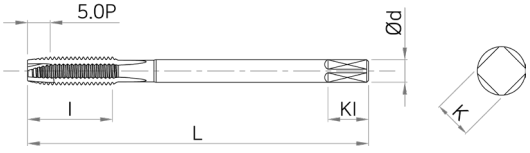
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNOM | JIS POINT TAPS




HSSE | Uncoated

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNOM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VNOM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VNOM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VNOM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VNOM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VNOM 0810050 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNOM 0812550 | M8 X 1.25 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNOM 1012550 | M10 X 1.25 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNOM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNOM 1210050 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNOM 1212550 | M12 X 1.25 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNOM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNOM 1217550 | M12 X 1.75 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNOM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNOM 1420050 | M14 X 2.0 | WH4 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNOM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNOM 1620050 | M16 X 2.0 | WH4 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNOM 1815050 | M18 X 1.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNOM 1825050 | M18 X 2.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNOM 2015050 | M20 X 1.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNOM 2025050 | M20 X 2.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNOM 2215050 | M22 X 1.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNOM 2225050 | M22 X 2.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNOM 2415050 | M24 X 1.5 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNOM 2420050 | M24 X 2.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |
| VNOM 2430050 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

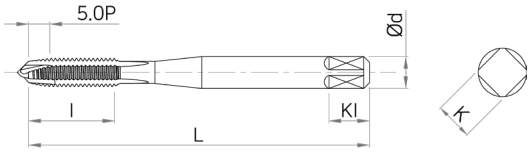


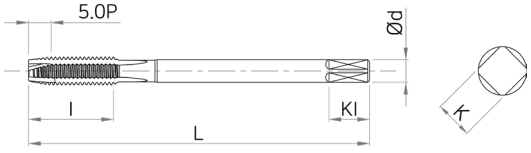
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNTM | JIS POINT TAPS




HSSE | TiN

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNTM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VNTM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VNTM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VNTM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VNTM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VNTM 0810050 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNTM 0812550 | M8 X 1.25 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNTM 1012550 | M10 X 1.25 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNTM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNTM 1210050 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNTM 1212550 | M12 X 1.25 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNTM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNTM 1217550 | M12 X 1.75 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNTM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNTM 1420050 | M14 X 2.0 | WH4 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNTM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNTM 1620050 | M16 X 2.0 | WH4 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNTM 1815050 | M18 X 1.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNTM 1825050 | M18 X 2.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNTM 2015050 | M20 X 1.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNTM 2025050 | M20 X 2.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNTM 2215050 | M22 X 1.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNTM 2225050 | M22 X 2.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNTM 2415050 | M24 X 1.5 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNTM | JIS POINT TAPS

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNTM 2420050 | M24 X 2.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |
| VNTM 2430050 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

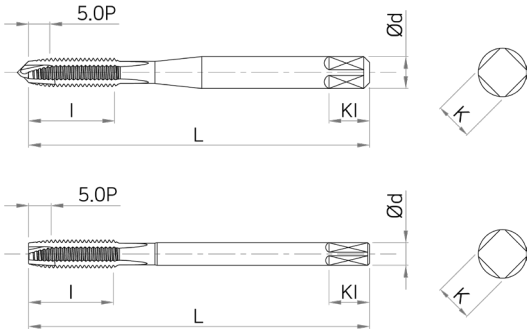


## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNCM | JIS POINT TAPS




HSSE | TiCN

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNCM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VNCM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VNCM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VNCM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VNCM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VNCM 0810050 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNCM 0812550 | M8 X 1.25 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNCM 1012550 | M10 X 1.25 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNCM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNCM 1210050 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNCM 1212550 | M12 X 1.25 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNCM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNCM 1217550 | M12 X 1.75 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNCM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNCM 1420050 | M14 X 2.0 | WH4 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNCM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNCM 1620050 | M16 X 2.0 | WH4 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNCM 1815050 | M18 X 1.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNCM 1825050 | M18 X 2.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNCM 2015050 | M20 X 1.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNCM 2025050 | M20 X 2.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNCM 2215050 | M22 X 1.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNCM 2225050 | M22 X 2.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNCM 2415050 | M24 X 1.5 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNCM 2420050 | M24 X 2.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |
| VNCM 2430050 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

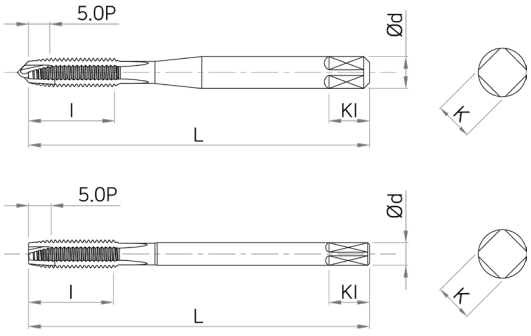


## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNHM | JIS POINT TAPS




HSSE HOMO

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNHM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VNHM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VNHM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VNHM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VNHM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VNHM 0810050 | M8 X 1.0 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNHM 0812550 | M8 X 1.25 | WH3 | 70 | 22 | 6.2 | 5 | 8 | 3 |
| VNHM 1012550 | M10 X 1.25 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNHM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 3 |
| VNHM 1210050 | M12 X 1.0 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNHM 1212550 | M12 X 1.25 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNHM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNHM 1217550 | M12 X 1.75 | WH4 | 82 | 29 | 8.5 | 6.5 | 9 | 3 |
| VNHM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNHM 1420050 | M14 X 2.0 | WH4 | 88 | 30 | 10.5 | 8 | 11 | 3 |
| VNHM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNHM 1620050 | M16 X 2.0 | WH4 | 95 | 32 | 12.5 | 10 | 13 | 3 |
| VNHM 1815050 | M18 X 1.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNHM 1825050 | M18 X 2.5 | WH4 | 100 | 37 | 14 | 11 | 14 | 3 |
| VNHM 2015050 | M20 X 1.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNHM 2025050 | M20 X 2.5 | WH4 | 105 | 37 | 15 | 12 | 15 | 3 |
| VNHM 2215050 | M22 X 1.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNHM 2225050 | M22 X 2.5 | WH4 | 115 | 38 | 17 | 13 | 16 | 3 |
| VNHM 2415050 | M24 X 1.5 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VNHM | JIS POINT TAPS

| EDP No | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VNHM 2420050 | M24 X 2.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |
| VNHM 2430050 | M24 X 3.0 | WH4 | 120 | 45 | 19 | 15 | 18 | 3 |

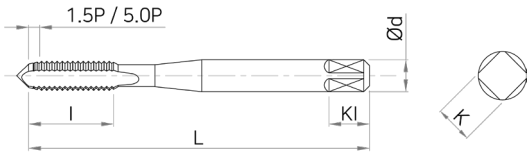


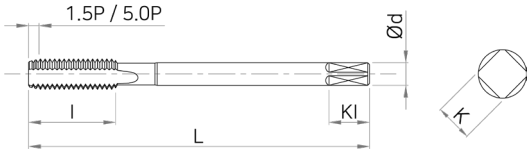
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSOM | JIS STRAIGHT TAPS




HSSE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSOM 0305015 | VSOM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VSOM 0407015 | VSOM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VSOM 04507515 | VSOM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VSOM 0508015 | VSOM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VSOM 0610015 | VSOM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VSOM 0810015 | VSOM 0810050 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSOM 0812515 | VSOM 0812550 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSOM 1012515 | VSOM 1012550 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSOM 1015015 | VSOM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSOM 1210015 | VSOM 1210050 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSOM 1212515 | VSOM 1212550 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSOM 1215015 | VSOM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSOM 1217515 | VSOM 1217550 | M12 X 1.75 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSOM 1415015 | VSOM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSOM 1420015 | VSOM 1420050 | M14 X 2.0 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSOM 1615015 | VSOM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSOM 1620015 | VSOM 1620050 | M16 X 2.0 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSOM 1815015 | VSOM 1815050 | M18 X 1.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSOM 1825015 | VSOM 1825050 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSOM 2015015 | VSOM 2015050 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSOM 2025015 | VSOM 2025050 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSOM 2215015 | VSOM 2215050 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSOM 2225015 | VSOM 2225050 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSOM 2415015 | VSOM 2415050 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSOM | JIS STRAIGHT TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSOM 2420015 | VSOM 2420050 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VSOM 2430015 | VSOM 2430050 | M24 X 3.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

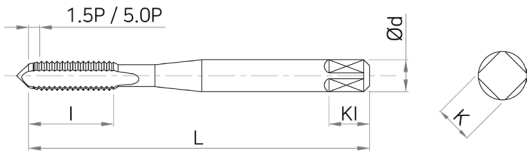


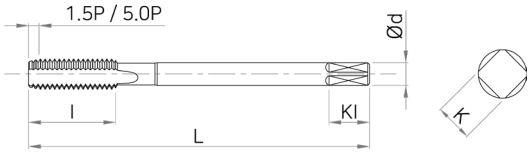
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSTM | JIS STRAIGHT TAPS




HSSE | TiN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSTM 0305015 | VSTM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VSTM 0407015 | VSTM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VSTM 04507515 | VSTM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VSTM 0508015 | VSTM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VSTM 0610015 | VSTM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VSTM 0810015 | VSTM 0810050 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSTM 0812515 | VSTM 0812550 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSTM 1012515 | VSTM 1012550 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSTM 1015015 | VSTM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSTM 1210015 | VSTM 1210050 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSTM 1212515 | VSTM 1212550 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSTM 1215015 | VSTM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSTM 1217515 | VSTM 1217550 | M12 X 1.75 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSTM 1415015 | VSTM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSTM 1420015 | VSTM 1420050 | M14 X 2.0 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSTM 1615015 | VSTM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSTM 1620015 | VSTM 1620050 | M16 X 2.0 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSTM 1815015 | VSTM 1815050 | M18 X 1.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSTM 1825015 | VSTM 1825050 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSTM 2015015 | VSTM 2015050 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSTM 2025015 | VSTM 2025050 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSTM 2215015 | VSTM 2215050 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSTM 2225015 | VSTM 2225050 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSTM 2415015 | VSTM 2415050 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSTM | JIS STRAIGHT TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSTM 2420015 | VSTM 2420050 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VSTM 2430015 | VSTM 2430050 | M24 X 3.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

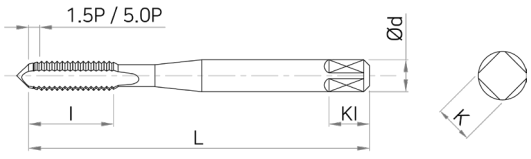


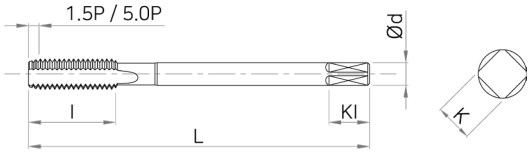
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSCM | JIS STRAIGHT TAPS




HSSE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSCM 0305015 | VSCM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VSCM 0407015 | VSCM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VSCM 04507515 | VSCM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VSCM 0508015 | VSCM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VSCM 0610015 | VSCM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VSCM 0810015 | VSCM 0810050 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSCM 0812515 | VSCM 0812550 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSCM 1012515 | VSCM 1012550 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSCM 1015015 | VSCM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSCM 1210015 | VSCM 1210050 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSCM 1212515 | VSCM 1212550 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSCM 1215015 | VSCM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSCM 1217515 | VSCM 1217550 | M12 X 1.75 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSCM 1415015 | VSCM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSCM 1420015 | VSCM 1420050 | M14 X 2.0 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSCM 1615015 | VSCM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSCM 1620015 | VSCM 1620050 | M16 X 2.0 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSCM 1815015 | VSCM 1815050 | M18 X 1.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSCM 1825015 | VSCM 1825050 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSCM 2015015 | VSCM 2015050 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSCM 2025015 | VSCM 2025050 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSCM 2215015 | VSCM 2215050 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSCM 2225015 | VSCM 2225050 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSCM 2415015 | VSCM 2415050 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSCM 2420015 | VSCM 2420050 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VSCM 2430015 | VSCM 2430050 | M24 X 3.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

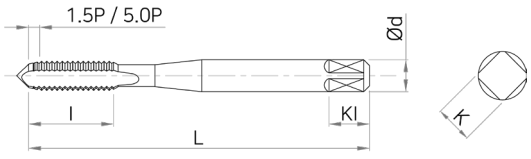


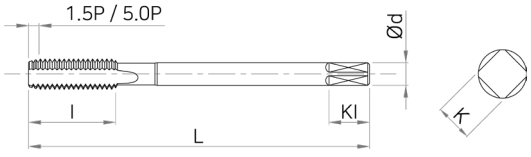
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSHM | JIS STRAIGHT TAPS






HSSE | HOMO

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSHM 0305015 | VSHM 0305050 | M3 X 0.5 | WH2 | 46 | 11 | 4 | 3.2 | 6 | 3 |
| VSHM 0407015 | VSHM 0407050 | M4 X 0.7 | WH2 | 52 | 13 | 5 | 4 | 7 | 3 |
| VSHM 04507515 | VSHM 04507550 | M4.5 X 0.75 | WH2 | 55 | 13 | 5 | 4 | 7 | 3 |
| VSHM 0508015 | VSHM 0508050 | M5 X 0.8 | WH2 | 60 | 16 | 5.5 | 4.5 | 7 | 3 |
| VSHM 0610015 | VSHM 0610050 | M6 X 1.0 | WH2 | 62 | 19 | 6 | 4.5 | 7 | 3 |
| VSHM 0810015 | VSHM 0810050 | M8 X 1.0 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSHM 0812515 | VSHM 0812550 | M8 X 1.25 | WH2 | 70 | 22 | 6.2 | 5 | 8 | 4 |
| VSHM 1012515 | VSHM 1012550 | M10 X 1.25 | WH2 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSHM 1015015 | VSHM 1015050 | M10 X 1.5 | WH3 | 75 | 24 | 7 | 5.5 | 8 | 4 |
| VSHM 1210015 | VSHM 1210050 | M12 X 1.0 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSHM 1212515 | VSHM 1212550 | M12 X 1.25 | WH2 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSHM 1215015 | VSHM 1215050 | M12 X 1.5 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSHM 1217515 | VSHM 1217550 | M12 X 1.75 | WH3 | 82 | 29 | 8.5 | 6.5 | 9 | 4 |
| VSHM 1415015 | VSHM 1415050 | M14 X 1.5 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSHM 1420015 | VSHM 1420050 | M14 X 2.0 | WH3 | 88 | 30 | 10.5 | 8 | 11 | 4 |
| VSHM 1615015 | VSHM 1615050 | M16 X 1.5 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSHM 1620015 | VSHM 1620050 | M16 X 2.0 | WH3 | 95 | 32 | 12.5 | 10 | 13 | 4 |
| VSHM 1815015 | VSHM 1815050 | M18 X 1.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSHM 1825015 | VSHM 1825050 | M18 X 2.5 | WH3 | 100 | 37 | 14 | 11 | 14 | 4 |
| VSHM 2015015 | VSHM 2015050 | M20 X 1.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSHM 2025015 | VSHM 2025050 | M20 X 2.5 | WH3 | 105 | 37 | 15 | 12 | 15 | 4 |
| VSHM 2215015 | VSHM 2215050 | M22 X 1.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSHM 2225015 | VSHM 2225050 | M22 X 2.5 | WH3 | 115 | 38 | 17 | 13 | 16 | 4 |
| VSHM 2415015 | VSHM 2415050 | M24 X 1.5 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VSHM | JIS STRAIGHT TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z |
| VSHM 2420015 | VSHM 2420050 | M24 X 2.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |
| VSHM 2430015 | VSHM 2430050 | M24 X 3.0 | WH3 | 120 | 45 | 19 | 15 | 18 | 4 |

※ 1.5P Tap is removed external center as bottoming type

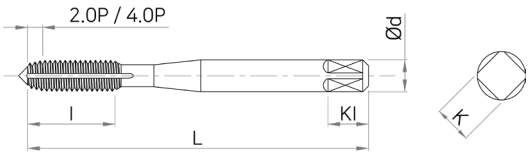


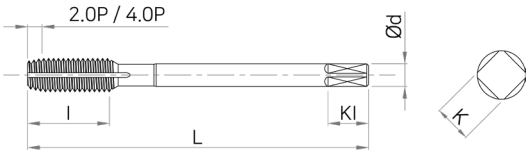
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VROM | JIS ROLL TAPS




HSSE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VROM 0305020S | - | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | S |
| VROM 0305020M | VROM 0305040M | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | M |
| VROM 0407020S | - | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | S |
| VROM 0407020M | VROM 0407040M | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | M |
| VROM 0508020S | - | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | S |
| VROM 0508020M | VROM 0508040M | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | M |
| VROM 0610020S | - | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | S |
| VROM 0610020M | VROM 0610040M | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | M |
| VROM 0810020S | - | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VROM 0810040M | VROM 0810040M | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VROM 0812520S | - | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VROM 0812520M | VROM 0812540M | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VROM 1012520S | - | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VROM 1012520M | VROM 1012540M | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VROM 1015020S | - | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VROM 1015020M | VROM 1015040M | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VROM 1210020S | - | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VROM 1210020M | VROM 1210040M | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VROM 1212520S | - | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VROM 1212520M | VROM 1212540M | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VROM 1215020S | - | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VROM 1215020M | VROM 1215040M | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VROM 1217520S | - | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VROM 1217520M | VROM 1217540M | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | M |

※ 1.5P Tap is removed external center as bottoming type

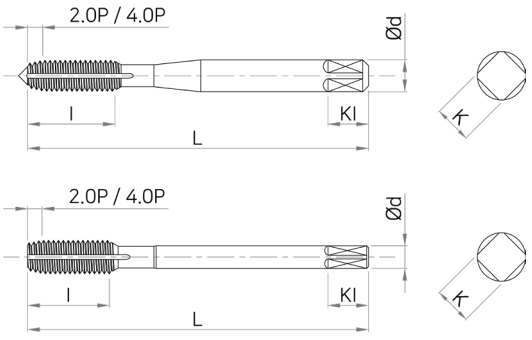
Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VRTM | JIS ROLL TAPS






HSSE | TiN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VRTM 0305020S | - | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | S |
| VRTM 0305020M | VRTM 0305040M | M3 X 0.5 | GH6 | 46 | 11 | 4 | 3.2 | 6 | M |
| VRTM 0407020S | - | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | S |
| VRTM 0407020M | VRTM 0407040M | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | M |
| VRTM 0508020S | - | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | S |
| VRTM 0508020M | VRTM 0508040M | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | M |
| VRTM 0610020S | - | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | S |
| VRTM 0610020M | VRTM 0610040M | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | M |
| VRTM 0810020S | - | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VRTM 0810020M | VRTM 0810040M | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VRTM 0812520S | - | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VRTM 0812520M | VRTM 0812540M | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VRTM 1012520S | - | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VRTM 1012520M | VRTM 1012540M | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VRTM 1015020S | - | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VRTM 1015020M | VRTM 1015040M | M10 X 1.5 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VRTM 1210020S | - | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRTM 1210020M | VRTM 1210040M | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRTM 1212520S | - | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRTM 1212520M | VRTM 1212540M | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRTM 1215020S | - | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRTM 1215020M | VRTM 1215040M | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRTM 1217520S | - | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRTM 1217520M | VRTM 1217540M | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | M |

※ 1.5P Tap is removed external center as bottoming type

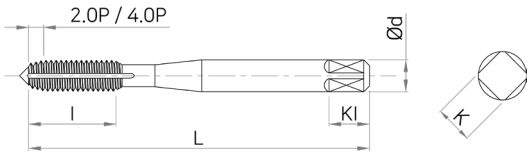
Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

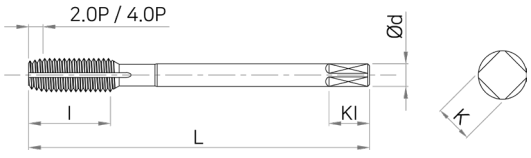
## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VRCM | JIS ROLL TAPS






HSSE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VRCM 0305020S | - | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | S |
| VRCM 0305020M | VRCM 0305040M | M3 X 0.5 | GH5 | 46 | 11 | 4 | 3.2 | 6 | M |
| VRCM 0407020S | - | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | S |
| VRCM 0407020M | VRCM 0407040M | M4 X 0.7 | GH6 | 52 | 13 | 5 | 4 | 7 | M |
| VRCM 0508020S | - | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | S |
| VRCM 0508020M | VRCM 0508040M | M5 X 0.8 | GH6 | 60 | 16 | 5.5 | 4.5 | 7 | M |
| VRCM 0610020S | - | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | S |
| VRCM 0610020M | VRCM 0610040M | M6 X 1.0 | GH7 | 62 | 19 | 6 | 4.5 | 7 | M |
| VRCM 0810020S | - | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VRCM 0810040S | VRCM 0810040M | M8 X 1.0 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VRCM 0812520S | - | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | S |
| VRCM 0812520M | VRCM 0812540M | M8 X 1.25 | GH7 | 70 | 22 | 6.2 | 5 | 8 | M |
| VRCM 1012520S | - | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VRCM 1012520M | VRCM 1012540M | M10 X 1.25 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VRCM 1015020S | - | M10 X 1.50 | GH7 | 75 | 24 | 7 | 5.5 | 8 | S |
| VRCM 1015020M | VRCM 1015040M | M10 X 1.50 | GH7 | 75 | 24 | 7 | 5.5 | 8 | M |
| VRCM 1210020S | - | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRCM 1210020M | VRCM 1210040M | M12 X 1.0 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRCM 1212520S | - | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRCM 1212520M | VRCM 1212540M | M12 X 1.25 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRCM 1215020S | - | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRCM 1215020M | VRCM 1215040M | M12 X 1.5 | GH7 | 82 | 29 | 8.5 | 6.5 | 9 | M |
| VRCM 1217520S | - | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | S |
| VRCM 1217520M | VRCM 1217540M | M12 X 1.75 | GH8 | 82 | 29 | 8.5 | 6.5 | 9 | M |

※ 1.5P Tap is removed external center as bottoming type

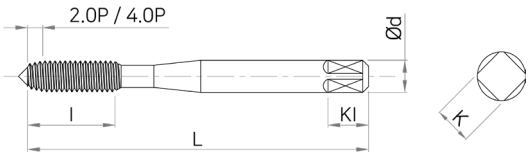
Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VFOM | JIS SPIRAL ROLL TAPS






HSSE | Uncoated

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl |
| VFOM 0305020 | VFOM 0305040 | M3 X 0.5 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFOM 03506020 | VFOM 03506040 | M3.5 X 0.6 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFOM 0407020 | VFOM 0407040 | M4 X 0.7 | GH7 | 52 | 20 | 5 | 4 | 7 |
| VFOM 0508020 | VFOM 0508040 | M5 X 0.8 | GH7 | 60 | 22 | 5.5 | 4.5 | 7 |
| VFOM 0610020 | VFOM 0610040 | M6 X 1.0 | GH7 | 62 | 24 | 6 | 4.5 | 7 |

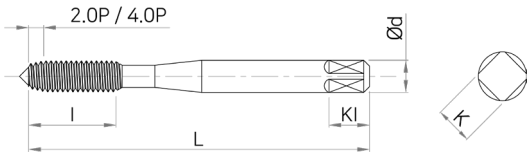
※ 2.0P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VFTM | JIS SPIRAL ROLL TAPS






HSSE | TiN

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl |
| VFTM 0305020 | VFTM 0305040 | M3 X 0.5 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFTM 03506020 | VFTM 03506040 | M3.5 X 0.6 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFTM 0407020 | VFTM 0407040 | M4 X 0.7 | GH7 | 52 | 20 | 5 | 4 | 7 |
| VFTM 0508020 | VFTM 0508040 | M5 X 0.8 | GH7 | 60 | 22 | 5.5 | 4.5 | 7 |
| VFTM 0610020 | VFTM 0610040 | M6 X 1.0 | GH7 | 62 | 24 | 6 | 4.5 | 7 |

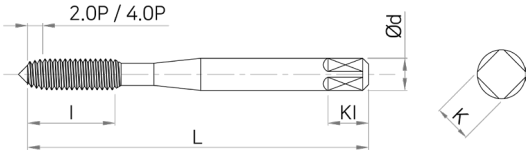
※ 2.0P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VFCM | JIS SPIRAL ROLL TAPS






HSSE | TiCN

| EDP No | | SIZES (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl |
| VFCM 0305020 | VFCM 0305040 | M3 X 0.5 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFCM 03506020 | VFCM 03506040 | M3.5 X 0.6 | GH6 | 46 | 18 | 4 | 3.2 | 6 |
| VFCM 0407020 | VFCM 0407040 | M4 X 0.7 | GH7 | 52 | 20 | 5 | 4 | 7 |
| VFCM 0508020 | VFCM 0508040 | M5 X 0.8 | GH7 | 60 | 22 | 5.5 | 4.5 | 7 |
| VFCM 0610020 | VFCM 0610040 | M6 X 1.0 | GH7 | 62 | 24 | 6 | 4.5 | 7 |

※ 2.0P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Copper | Brass | Casting Brass | Aluminum rolled material | Aluminum alloy castings | Zinc alloy castings |
|---|---|---|---|---|---|
| Cu | Bs | BsC | AL | AC, ADC | ZDC |
| ○ | ○ | ○ | ○ | ○ | ○ |

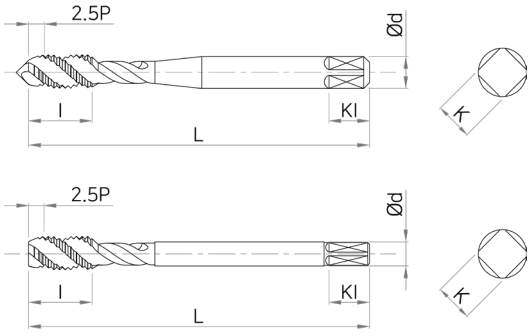
○ : GOOD ◎ : EXCELLENT

# DIN HSSE TAP

## Contents


| Series | Type | EDP No | Geometry | Surface Treatment | | Diameter(mm) | | Page |
|---|---|---|---|---|---|---|---|---|
| | | | | Coating | Uncoated | Min | Max | |
| DIN | SPIRAL | VQOM | | | ○ | M3 | M24 | 503 |
| | | VQTM | | TiN | | M3 | M24 | 505 |
| | | VQCM | | TiCN | | M3 | M24 | 507 |
| | | VQHM | | HOMO | | M3 | M24 | 509 |
| | POINT | VDOM | | | ○ | M3 | M24 | 511 |
| | | VDTM | | TiN | | M3 | M24 | 513 |
| | | VDCM | | TiCN | | M3 | M24 | 515 |
| | | VDHM | | HOMO | | M3 | M24 | 517 |
| | STRAIGHT | VGOM | | | ○ | M3 | M24 | 519 |
| | | VGTM | | TiN | | M3 | M24 | 521 |
| | | VGCM | | TiCN | | M3 | M24 | 523 |
| | | VGHM | | HOMO | | M3 | M24 | 525 |
| | ROLL | VMOM | | | ○ | M3 | M12 | 527 |
| | | VMTM | | TiN | | M3 | M12 | 529 |
| | | VMCM | | TiCN | | M3 | M12 | 531 |

# VQOM | DIN SPIRAL TAPS




DIN 371-374 376 | HSSE | Uncoated | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQOM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VQOM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VQOM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VQOM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VQOM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VQOM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VQOM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VQOM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VQOM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VQOM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VQOM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQOM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQOM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VQOM 1415025 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VQOM 1420025 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VQOM 1615025 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VQOM 1620025 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VQOM 1815025 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VQOM 1825025 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VQOM 2015025 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VQOM 2025025 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VQOM 2215025 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VQOM 2225025 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VQOM 2415025 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VQOM | DIN SPIRAL TAPS

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQOM 2420025 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VQOM 2430025 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

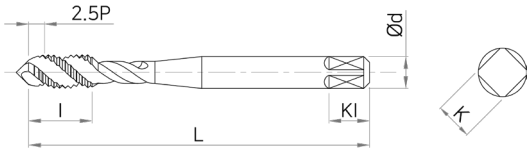


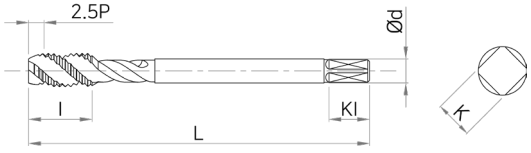
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VQTM | DIN SPIRAL TAPS




DIN 371-374 376 | HSSE | TiN | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQTM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VQTM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VQTM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VQTM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VQTM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VQTM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VQTM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VQTM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VQTM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VQTM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VQTM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQTM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQTM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VQTM 1415025 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VQTM 1420025 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VQTM 1615025 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VQTM 1620025 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VQTM 1815025 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VQTM 1825025 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VQTM 2015025 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VQTM 2025025 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VQTM 2215025 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VQTM 2225025 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VQTM 2415025 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VQTM | DIN SPIRAL TAPS

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQTM 2420025 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VQTM 2430025 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

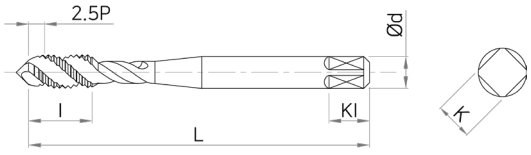


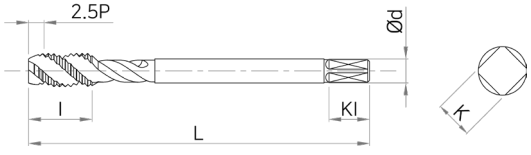
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VQCM | DIN SPIRAL TAPS




DIN 371-374 376 | HSSE | TiCN | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQCM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VQCM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VQCM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VQCM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VQCM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VQCM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VQCM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VQCM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VQCM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VQCM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VQCM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQCM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQCM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VQCM 1415025 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VQCM 1420025 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VQCM 1615025 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VQCM 1620025 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VQCM 1815025 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VQCM 1825025 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VQCM 2015025 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VQCM 2025025 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VQCM 2215025 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VQCM 2225025 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VQCM 2415025 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQCM 2420025 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VQCM 2430025 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

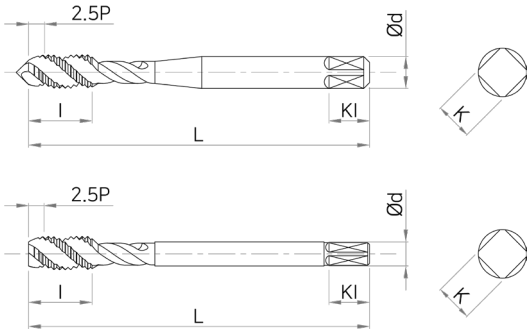


## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VQHM | DIN SPIRAL TAPS




DIN 371-374 376 | HSSE | HOMO | 35° HELIX

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQHM 0305025 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VQHM 0407025 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VQHM 0508025 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VQHM 0610025 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VQHM 0810025 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VQHM 0812525 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VQHM 1010025 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VQHM 1012525 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VQHM 1015025 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VQHM 1210025 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VQHM 1212525 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQHM 1215025 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VQHM 1217525 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VQHM 1415025 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VQHM 1420025 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VQHM 1615025 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VQHM 1620025 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VQHM 1815025 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VQHM 1825025 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VQHM 2015025 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VQHM 2025025 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VQHM 2215025 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VQHM 2225025 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VQHM 2415025 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VQHM 2420025 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VQHM 2430025 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

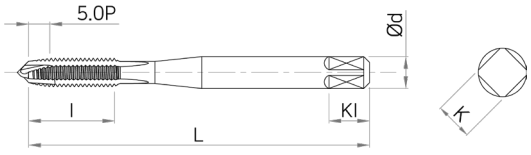


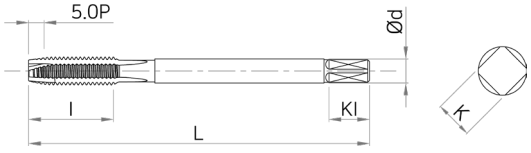
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDOM | DIN SPIRAL TAPS




DIN 371-374 376 | HSSE | Uncoated

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDOM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VDOM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VDOM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VDOM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VDOM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VDOM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VDOM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VDOM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VDOM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VDOM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VDOM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDOM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDOM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VDOM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VDOM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VDOM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VDOM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VDOM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 3 | 374 |
| VDOM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 3 | 376 |
| VDOM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 3 | 374 |
| VDOM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 3 | 376 |
| VDOM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 3 | 374 |
| VDOM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 3 | 376 |
| VDOM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDOM | DIN SPIRAL TAPS

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDOM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |
| VDOM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 3 | 376 |

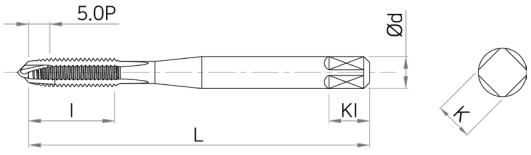


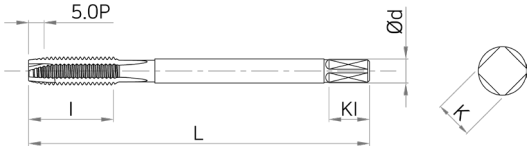
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDTM | DIN POINT TAPS




DIN 371-374 376 | HSSE | TiN

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDTM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VDTM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VDTM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VDTM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VDTM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VDTM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VDTM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VDTM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VDTM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VDTM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VDTM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDTM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDTM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VDTM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VDTM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VDTM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VDTM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VDTM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 3 | 374 |
| VDTM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 3 | 376 |
| VDTM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 3 | 374 |
| VDTM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 3 | 376 |
| VDTM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 3 | 374 |
| VDTM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 3 | 376 |
| VDTM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDTM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |
| VDTM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 3 | 376 |

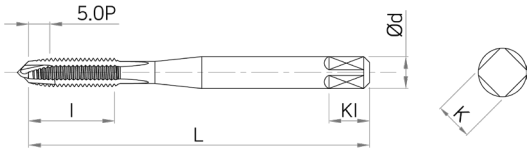


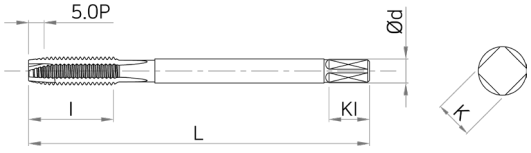
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDCM | DIN POINT TAPS




DIN 371-374 376 | HSSE | TiCN

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDCM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VDCM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VDCM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VDCM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VDCM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VDCM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VDCM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VDCM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VDCM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VDCM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VDCM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDCM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDCM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VDCM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VDCM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VDCM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VDCM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VDCM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 3 | 374 |
| VDCM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 3 | 376 |
| VDCM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 3 | 374 |
| VDCM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 3 | 376 |
| VDCM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 3 | 374 |
| VDCM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 3 | 376 |
| VDCM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDCM | DIN POINT TAPS

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDCM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |
| VDCM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 3 | 376 |

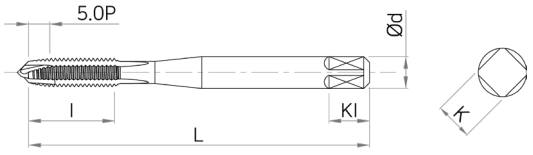


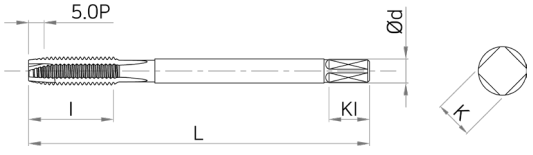
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDHM | DIN POINT TAPS




DIN 371-374 376 | HSSE | HOMO

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDHM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VDHM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VDHM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VDHM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VDHM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 3 | 374 |
| VDHM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 3 | 371 |
| VDHM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 3 | 374 |
| VDHM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 3 | 374 |
| VDHM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 3 | 371 |
| VDHM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 3 | 374 |
| VDHM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDHM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 3 | 374 |
| VDHM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 3 | 376 |
| VDHM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 3 | 374 |
| VDHM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 3 | 376 |
| VDHM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 3 | 374 |
| VDHM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 3 | 376 |
| VDHM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 3 | 374 |
| VDHM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 3 | 376 |
| VDHM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 3 | 374 |
| VDHM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 3 | 376 |
| VDHM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 3 | 374 |
| VDHM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 3 | 376 |
| VDHM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VDHM | DIN POINT TAPS

| EDP No | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VDHM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 3 | 374 |
| VDHM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 3 | 376 |

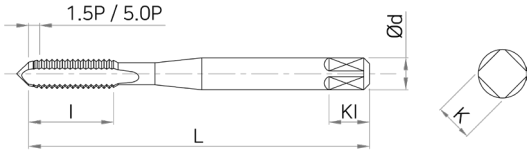


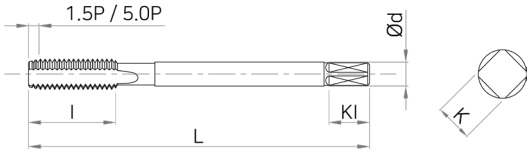
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGOM | DIN STRAIGHT TAPS




DIN 371-374 376 | HSSE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | Oil Groove |
| VGOM 0305015 | VGOM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VGOM 0407015 | VGOM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VGOM 0508015 | VGOM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VGOM 0610015 | VGOM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VGOM 0810015 | VGOM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| VGOM 0812515 | VGOM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| VGOM 1010015 | VGOM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| VGOM 1012515 | VGOM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| VGOM 1015015 | VGOM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| VGOM 1210015 | VGOM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| VGOM 1212515 | VGOM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGOM 1215015 | VGOM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGOM 1217515 | VGOM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |
| VGOM 1415015 | VGOM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 4 | 374 |
| VGOM 1420015 | VGOM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 4 | 376 |
| VGOM 1615015 | VGOM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 4 | 374 |
| VGOM 1620015 | VGOM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 4 | 376 |
| VGOM 1815015 | VGOM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VGOM 1825015 | VGOM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VGOM 2015015 | VGOM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VGOM 2025015 | VGOM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VGOM 2215015 | VGOM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VGOM 2225015 | VGOM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VGOM 2415015 | VGOM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGOM | DIN STRAIGHT TAPS

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | Oil Groove |
| VGOM 2420015 | VGOM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VGOM 2430015 | VGOM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

※ 1.5P Tap is removed external center as bottoming type

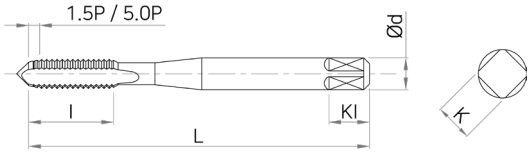


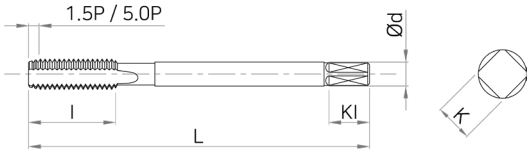
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGTM | DIN STRAIGHT TAPS




DIN 371-374 376 | HSSE | TiN

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VGTM 0305015 | VGTM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VGTM 0407015 | VGTM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VGTM 0508015 | VGTM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VGTM 0610015 | VGTM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VGTM 0810015 | VGTM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| VGTM 0812515 | VGTM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| VGTM 1010015 | VGTM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| VGTM 1012515 | VGTM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| VGTM 1015015 | VGTM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| VGTM 1210015 | VGTM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| VGTM 1212515 | VGTM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGTM 1215015 | VGTM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGTM 1217515 | VGTM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |
| VGTM 1415015 | VGTM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 4 | 374 |
| VGTM 1420015 | VGTM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 4 | 376 |
| VGTM 1615015 | VGTM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 4 | 374 |
| VGTM 1620015 | VGTM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 4 | 376 |
| VGTM 1815015 | VGTM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VGTM 1825015 | VGTM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VGTM 2015015 | VGTM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VGTM 2025015 | VGTM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VGTM 2215015 | VGTM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VGTM 2225015 | VGTM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VGTM 2415015 | VGTM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGTM | DIN STRAIGHT TAPS

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VGTM 2420015 | VGTM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VGTM 2430015 | VGTM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

※ 1.5P Tap is removed external center as bottoming type

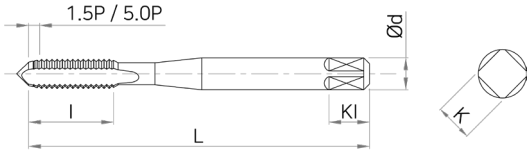


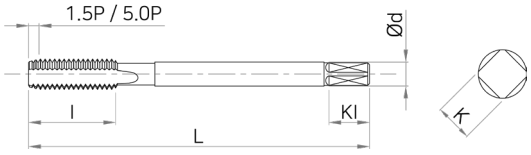
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGCM | DIN STRAIGHT TAPS




DIN 371-374 376 | HSSE | TiCN

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | KI | Z | DIN Type |
| VGCM 0305015 | VGCM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VGCM 0407015 | VGCM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VGCM 0508015 | VGCM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VGCM 0610015 | VGCM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VGCM 0810015 | VGCM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| VGCM 0812515 | VGCM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| VGCM 1010015 | VGCM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| VGCM 1012515 | VGCM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| VGCM 1015015 | VGCM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| VGCM 1210015 | VGCM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| VGCM 1212515 | VGCM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGCM 1215015 | VGCM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGCM 1217515 | VGCM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |
| VGCM 1415015 | VGCM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 4 | 374 |
| VGCM 1420015 | VGCM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 4 | 376 |
| VGCM 1615015 | VGCM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 4 | 374 |
| VGCM 1620015 | VGCM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 4 | 376 |
| VGCM 1815015 | VGCM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VGCM 1825015 | VGCM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VGCM 2015015 | VGCM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VGCM 2025015 | VGCM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VGCM 2215015 | VGCM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VGCM 2225015 | VGCM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VGCM 2415015 | VGCM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VGCM 2420015 | VGCM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VGCM 2430015 | VGCM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

※ 1.5P Tap is removed external center as bottoming type

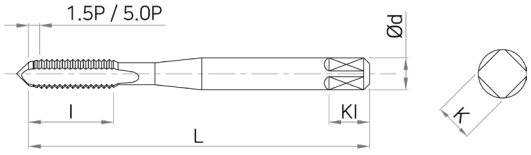


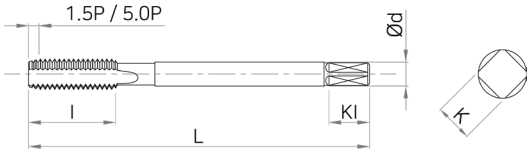
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VGHM | DIN STRAIGHT TAPS




DIN 371-374 376 | HSSE | HOMO

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VGHM 0305015 | VGHM 0305050 | M3X0.5 | 6H | 56 | 11 | 3.5 | 2.7 | 6 | 3 | 371 |
| VGHM 0407015 | VGHM 0407050 | M4X0.7 | 6H | 63 | 13 | 4.5 | 3.4 | 6 | 3 | 371 |
| VGHM 0508015 | VGHM 0508050 | M5X0.8 | 6H | 70 | 15 | 6 | 4.9 | 8 | 3 | 371 |
| VGHM 0610015 | VGHM 0610050 | M6X1.0 | 6H | 80 | 17 | 6 | 4.9 | 8 | 3 | 371 |
| VGHM 0810015 | VGHM 0810050 | M8X1.0 | 6H | 90 | 17 | 6 | 4.9 | 8 | 4 | 374 |
| VGHM 0812515 | VGHM 0812550 | M8X1.25 | 6H | 90 | 20 | 8 | 6.2 | 9 | 4 | 371 |
| VGHM 1010015 | VGHM 1010050 | M10X1.0 | 6H | 90 | 18 | 7 | 5.5 | 8 | 4 | 374 |
| VGHM 1012515 | VGHM 1012550 | M10X1.25 | 6H | 100 | 22 | 7 | 5.5 | 8 | 4 | 374 |
| VGHM 1015015 | VGHM 1015050 | M10X1.5 | 6H | 100 | 22 | 10 | 8 | 11 | 4 | 371 |
| VGHM 1210015 | VGHM 1210050 | M12X1.0 | 6H | 100 | 18 | 9 | 7 | 10 | 4 | 374 |
| VGHM 1212515 | VGHM 1212550 | M12X1.25 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGHM 1215015 | VGHM 1215050 | M12X1.5 | 6H | 100 | 22 | 9 | 7 | 10 | 4 | 374 |
| VGHM 1217515 | VGHM 1217550 | M12X1.75 | 6H | 110 | 24 | 9 | 7 | 10 | 4 | 376 |
| VGHM 1415015 | VGHM 1415050 | M14X1.5 | 6H | 100 | 22 | 11 | 9 | 12 | 4 | 374 |
| VGHM 1420015 | VGHM 1420050 | M14X2.0 | 6H | 110 | 26 | 11 | 9 | 12 | 4 | 376 |
| VGHM 1615015 | VGHM 1615050 | M16X1.5 | 6H | 100 | 22 | 12 | 9 | 12 | 4 | 374 |
| VGHM 1620015 | VGHM 1620050 | M16X2.0 | 6H | 110 | 27 | 12 | 9 | 12 | 4 | 376 |
| VGHM 1815015 | VGHM 1815050 | M18X1.5 | 6H | 110 | 25 | 14 | 11 | 14 | 4 | 374 |
| VGHM 1825015 | VGHM 1825050 | M18X2.5 | 6H | 125 | 30 | 14 | 11 | 14 | 4 | 376 |
| VGHM 2015015 | VGHM 2015050 | M20X1.5 | 6H | 125 | 25 | 16 | 12 | 15 | 4 | 374 |
| VGHM 2025015 | VGHM 2025050 | M20X2.5 | 6H | 140 | 32 | 16 | 12 | 15 | 4 | 376 |
| VGHM 2215015 | VGHM 2215050 | M22X1.5 | 6H | 125 | 25 | 18 | 14.5 | 17 | 4 | 374 |
| VGHM 2225015 | VGHM 2225050 | M22X2.5 | 6H | 140 | 32 | 18 | 14.5 | 17 | 4 | 376 |
| VGHM 2415015 | VGHM 2415050 | M24X1.5 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |

※ 1.5P Tap is removed external center as bottoming type

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

| EDP No | | SIZES (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Z | DIN Type |
| VGHM 2420015 | VGHM 2420050 | M24X2.0 | 6H | 140 | 27 | 18 | 14.5 | 17 | 4 | 374 |
| VGHM 2430015 | VGHM 2430050 | M24X3.0 | 6H | 160 | 34 | 18 | 14.5 | 17 | 4 | 376 |

※ 1.5P Tap is removed external center as bottoming type

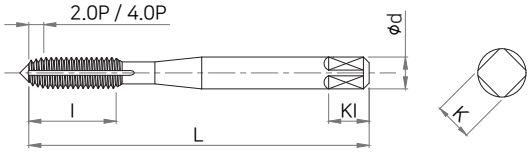


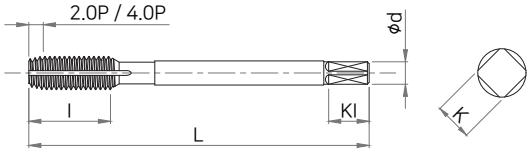
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMOM | DIN ROLL TAPS






DIN 371-374 376 | HSSE | Uncoated

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMOM 0305020S | - | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | S |
| VMOM 0305020M | VMOM 0305040M | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | M |
| VMOM 0407020S | - | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | S |
| VMOM 0407020M | VMOM 0407040M | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | M |
| VMOM 0508020S | - | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | S |
| VMOM 0508020M | VMOM 0508040M | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | M |
| VMOM 0610020S | - | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | S |
| VMOM 0610020M | VMOM 0610040M | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | M |
| VMOM 0810020S | - | M8x1.0 | 6HX | 90 | 17 | 6 | 4.9 | 8 | S |
| VMOM 0810020M | VMOM 0810040M | M8x1.0 | 6HX | 90 | 17 | 6 | 4.9 | 8 | M |
| VMOM 0812520S | - | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | S |
| VMOM 0812520M | VMOM 0812540M | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | M |
| VMOM 1010020S | - | M10x1.0 | 6HX | 90 | 18 | 7 | 5.5 | 8 | S |
| VMOM 1010020M | VMOM 1010040M | M10x1.0 | 6HX | 90 | 18 | 7 | 5.5 | 8 | M |
| VMOM 1012520S | - | M10x1.25 | 6HX | 100 | 22 | 7 | 5.5 | 8 | S |
| VMOM 1012520M | VMOM 1012540M | M10x1.25 | 6HX | 100 | 22 | 7 | 5.5 | 8 | M |
| VMOM 1015020S | - | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| VMOM 1015020M | VMOM 1015040M | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| VMOM 1210020S | - | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | S |
| VMOM 1210020M | VMOM 1210040M | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | M |
| VMOM 1212520S | - | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMOM 1212520M | VMOM 1212540M | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | M |
| VMOM 1215020S | - | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMOM 1215020M | VMOM 1215040M | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMOM | DIN ROLL TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2P | 4P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMOM 1217520S | - | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | S |
| VMOM 1217520M | VMOM 1217540M | M12x1.75 | 6HX | 100 | 24 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

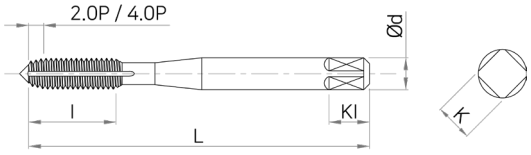


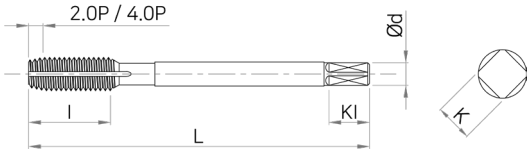
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMTM | DIN ROLL TAPS




DIN 371-374 376 | HSSE | TiN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMTM 0305020S | - | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | S |
| VMTM 0305020M | VMTM 0305040M | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | M |
| VMTM 0407020S | - | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | S |
| VMTM 0407020M | VMTM 0407040M | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | M |
| VMTM 0508020S | - | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | S |
| VMTM 0508020M | VMTM 0508040M | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | M |
| VMTM 0610020S | - | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | S |
| VMTM 0610020M | VMTM 0610040M | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | M |
| VMTM 0810020S | - | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | S |
| VMTM 0810020M | VMTM 0810040M | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | M |
| VMTM 0812520S | - | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | S |
| VMTM 0812520M | VMTM 0812540M | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | M |
| VMTM 1010020S | - | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | S |
| VMTM 1010020M | VMTM 1010040M | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | M |
| VMTM 1012520S | - | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| VMTM 1012520M | VMTM 1012540M | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| VMTM 1015020S | - | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| VMTM 1015020M | VMTM 1015040M | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| VMTM 1210020S | - | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | S |
| VMTM 1210020M | VMTM 1210040M | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | M |
| VMTM 1212520S | - | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMTM 1212520M | VMTM 1212540M | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | M |
| VMTM 1215020S | - | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMTM 1215020M | VMTM 1215040M | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMTM | DIN ROLL TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMTM 1217520S | - | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | S |
| VMTM 1217520M | VMTM 1217540M | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

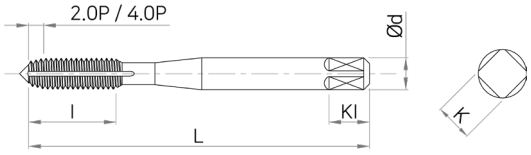


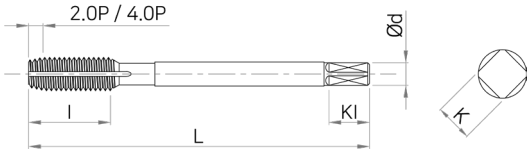
## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMCM | DIN ROLL TAPS




DIN 371-374 376 | HSSE | TiCN

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMCM0305020S | - | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | S |
| VMCM0305020M | VMCM0305040M | M3x0.5 | 6HX | 56 | 11 | 3.5 | 2.7 | 6 | M |
| VMCM0407020S | - | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | S |
| VMCM0407020M | VMCM0407040M | M4x0.7 | 6HX | 63 | 13 | 4.5 | 3.4 | 6 | M |
| VMCM0508020S | - | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | S |
| VMCM0508020M | VMCM0508040M | M5x0.8 | 6HX | 70 | 15 | 6 | 4.9 | 8 | M |
| VMCM0610020S | - | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | S |
| VMCM0610020M | VMCM0610040M | M6x1.0 | 6HX | 80 | 17 | 6 | 4.9 | 8 | M |
| VMCM0810020S | - | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | S |
| VMCM0810020M | VMCM0810040M | M8x1.0 | 6HX | 90 | 17 | 8 | 6.2 | 9 | M |
| VMCM0812520S | - | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | S |
| VMCM0812520M | VMCM0812540M | M8x1.25 | 6HX | 90 | 20 | 8 | 6.2 | 9 | M |
| VMCM1010020S | - | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | S |
| VMCM1010020M | VMCM1010040M | M10x1.0 | 6HX | 90 | 18 | 10 | 8 | 11 | M |
| VMCM1012520S | - | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| VMCM1012520M | VMCM1012540M | M10x1.25 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| VMCM1015020S | - | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | S |
| VMCM1015020M | VMCM1015040M | M10x1.5 | 6HX | 100 | 22 | 10 | 8 | 11 | M |
| VMCM1210020S | - | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | S |
| VMCM1210020M | VMCM1210040M | M12x1.0 | 6HX | 100 | 18 | 9 | 7 | 10 | M |
| VMCM1212520S | - | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMCM1212520M | VMCM1212540M | M12x1.25 | 6HX | 100 | 22 | 9 | 7 | 10 | M |
| VMCM1215020S | - | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | S |
| VMCM1215020M | VMCM1215040M | M12x1.5 | 6HX | 100 | 22 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove

## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# VMCM | DIN ROLL TAPS

| EDP No | | SIZES (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.5P | 5P | Thread Size | Limits | L | l | d | K | Kl | Oil Groove |
| VMCM1217520S | - | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | S |
| VMCM1217520M | VMCM1217540M | M12x1.75 | 6HX | 110 | 24 | 9 | 7 | 10 | M |

※ 2.0P Tap is removed external center as bottoming type

Oil groove S : 1 Oil groove
Oil groove M : 4 Oil groove



## ■ Applicable Working Material

| Medium Carbon Steels | Alloy Steel | High Strength Steels | Copper | Brass | Casting Brass | Bronze | Aluminum rolled material | Aluminum alloy castings | Magnesium alloy castings | Zinc alloy castings | Thermoplastic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C0.25% ~0.45% | SCM | FCD | Cu | Bs | BsC | PB | AL | AC, ADC | MC | ZDC | - |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# CENTERING TOOL SERIES

## CENTERING TOOL

536

# CENTERING TOOL

## Contents


| EDP No | Geometry | Type | Page |
|---|---|---|---|
| CDS | | Solid center drill | 538 |
| LDS | | NC Spotting drill | 539 |
| LDF-W | | NC Spotting drill - Multi type | 540 |
| CES302(60°) | | Centering endmill - Solid type(60°) | 541 |
| CES302(90°) | | Centering endmill - Solid type(90°) | 542 |
| CEM-W | | Centering endmill - brazed type | 543 |
| CRC | | Corner Rounding cutter | 544 |
| CFT-W | | Chamfer Tool | 545 |
| CCT | | Chamfer Cutter | 546 |
| CCF | | Chamfer Cutter Face | 547 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

| C | DS | 030 |
|---|---|---|

| Appearance | Type | Diameter |
|---|---|---|
| C : Center | DS : Drill Spotting(Metric) | 30 |
| L : Leading | DA : Drill Spotting(Inch) (Variable Point Angle) | 35 |
| CE : Centering Endmill | DF : Drill Spotting Multy Type | 40 |
| CR : Corner Rounding | S : End Mill Solid Type | |
| CF : Chamfer | M : End Mill Brazed Type | |
| CC : Chamfer Cutter | C : Cutter | |
| | T : Tool | |
| | F : Face | |

Ex) Cutting Dia Ø3.0 / Center Drill

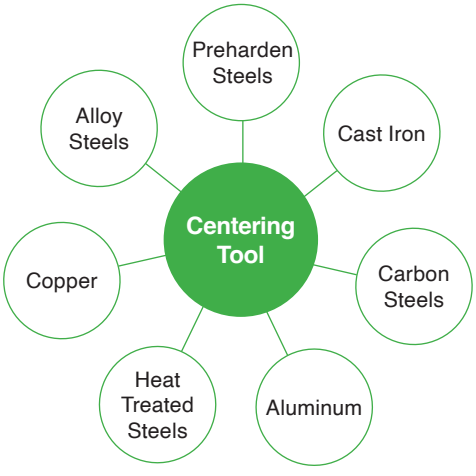
## Characteristics

· Suitable to work for Die Steels,Alloy Steels, Cast Iron, Stainless Steels, Graphite
· Processing the corners chamfering and R shape processing

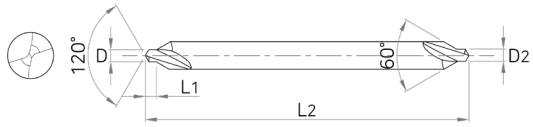
## Features

· Enough to customized work on corner chamfering and R shape processing
· Excellent retentivity for Flute hardness and High temperature harness by applied to TiAlN, AlTiN coating

## Applications



# CDS | SOLID CENTER DRILL






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h6 |

CARBIDE | Uncoated | 15° HELIX

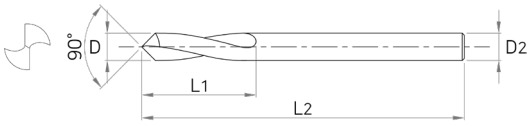
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| CDS 010 | 1 | 1 | 40 | 3 |
| CDS 015 | 1.5 | 1.5 | 40 | 4 |
| CDS 020 | 2 | 2 | 45 | 5 |
| CDS 025 | 2.5 | 2.5 | 45 | 6 |
| CDS 030 | 3 | 3 | 55 | 8 |
| CDS 040 | 4 | 4.5 | 60 | 10 |
| CDS 050 | 5 | 5.5 | 65 | 12 |

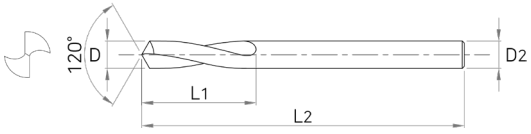
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# LDS | NC SPOTTING DRILL




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h6 |

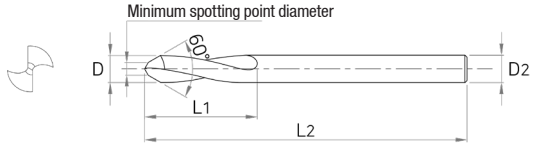
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | θ |
| LDS 030 | 3 | 9 | 50 | 3 | 90° |
| LDS 030L | 3 | 10 | 100 | 3 | 90° |
| LDS 030A | 3 | 9 | 50 | 3 | 120° |
| LDS 040 | 4 | 10 | 50 | 4 | 90° |
| LDS 040L | 4 | 12 | 100 | 4 | 90° |
| LDS 040A | 4 | 10 | 50 | 4 | 120° |
| LDS 050 | 5 | 12 | 50 | 5 | 90° |
| LDS 050A | 5 | 12 | 50 | 5 | 120° |
| LDS 060 | 6 | 13 | 60 | 6 | 90° |
| LDS 060L | 6 | 18 | 110 | 6 | 90° |
| LDS 060A | 6 | 13 | 60 | 6 | 120° |
| LDS 080 | 8 | 23 | 70 | 8 | 90° |
| LDS 080L | 8 | 23 | 150 | 8 | 90° |
| LDS 080A | 8 | 23 | 70 | 8 | 120° |
| LDS 100 | 10 | 24 | 80 | 10 | 90° |
| LDS 100L | 10 | 24 | 150 | 10 | 90° |
| LDS 100A | 10 | 24 | 80 | 10 | 120° |
| LDS 120 | 12 | 28 | 80 | 12 | 90° |
| LDS 120L | 12 | 24 | 150 | 12 | 90° |
| LDS 120A | 12 | 28 | 80 | 12 | 120° |
| LDS 160 | 16 | 32 | 90 | 16 | 90° |
| LDS 160A | 16 | 32 | 90 | 16 | 120° |
| LDS 200 | 20 | 35 | 100 | 20 | 90° |
| LDS 200A | 20 | 35 | 100 | 20 | 120° |

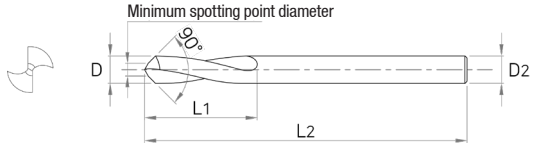
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# LDF-W | NC SPOTTING DRILL - MULTY TYPE






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h6 |

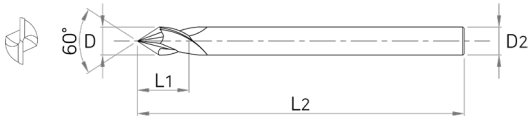
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | θ | Minimum spotting point diameter |
| LDF 0360W | 3 | 9 | 50 | 3 | 60° | 1.5 |
| LDF 0390W | 3 | 9 | 50 | 3 | 90° | 1.2 |
| LDF 0460W | 4 | 10 | 50 | 4 | 60° | 1.7 |
| LDF 0490W | 4 | 10 | 50 | 4 | 90° | 1.3 |
| LDF 0560W | 5 | 12 | 50 | 5 | 60° | 1.9 |
| LDF 0590W | 5 | 12 | 50 | 5 | 90° | 1.5 |
| LDF 0660W | 6 | 13 | 60 | 6 | 60° | 1.9 |
| LDF 0690W | 6 | 13 | 60 | 6 | 90° | 1.5 |
| LDF 0860W | 8 | 23 | 70 | 8 | 60° | 1.9 |
| LDF 0890W | 8 | 23 | 70 | 8 | 90° | 1.6 |
| LDF 1060W | 10 | 24 | 80 | 10 | 60° | 2.1 |
| LDF 1090W | 10 | 24 | 80 | 10 | 90° | 2.1 |
| LDF 1260W | 12 | 28 | 80 | 12 | 60° | 2.1 |
| LDF 1290W | 12 | 28 | 80 | 12 | 90° | 2.1 |

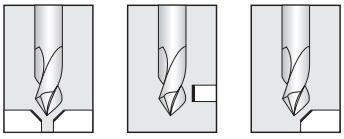
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# CES302(60°) | CENTERING ENDMILL - SOLID



## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h6 |

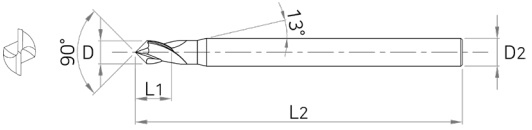
| EDP No | | SIZES (mm) | | | |
|---|---|---|---|---|---|
| non coating | coating | D | L1 | L2 | D2 |
| CES302 030-60S3 | CES302 030-60S3-C | 3 | 6 | 50 | 3 |
| CES302 040-60S4 | CES302 040-60S4-C | 4 | 8 | 50 | 4 |
| CES302 050-60S5 | CES302 050-60S5-C | 5 | 10 | 50 | 5 |
| CES302 060-60 | CES302 060-60-C | 6 | 12 | 60 | 6 |
| CES302 080-60 | CES302 080-60-C | 8 | 16 | 70 | 8 |
| CES302 100-60 | CES302 100-60-C | 10 | 18 | 70 | 10 |
| CES302 120-60 | CES302 120-60-C | 12 | 20 | 75 | 12 |

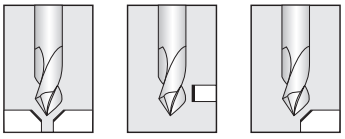
## ■ Applicable Working Material

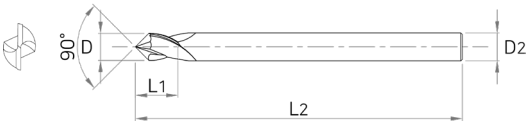
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# CES302(90°) | CENTERING ENDMILL - SOLID








## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ -0.05 | h6 |

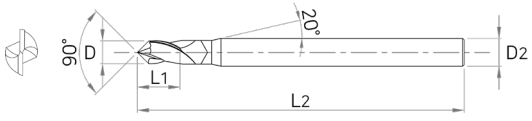
| EDP No | | SIZES (mm) | | | |
|---|---|---|---|---|---|
| non coating | coating | D | L1 | L2 | D2 |
| CES302 020S2 | CES302 020S2-C | 2 | 5 | 50 | 3 |
| CES302 030 | CES302 030-C | 3 | 6 | 50 | 6 |
| CES302 030S3 | CES302 030S3-C | 3 | 6 | 50 | 3 |
| CES302 040 | CES302 040-C | 4 | 8 | 50 | 6 |
| CES302 040S4 | CES302 040S4-C | 4 | 8 | 50 | 4 |
| CES302 050 | CES302 050-C | 5 | 10 | 50 | 6 |
| CES302 050S5 | CES302 050S5-C | 5 | 10 | 50 | 5 |
| CES302 060 | CES302 060-C | 6 | 12 | 60 | 6 |
| CES302 080 | CES302 080-C | 8 | 16 | 70 | 8 |
| CES302 100 | CES302 100-C | 10 | 18 | 70 | 10 |
| CES302 120 | CES302 120-C | 12 | 20 | 75 | 12 |
| CES302 140 | CES302 140-C | 14 | 24 | 80 | 14 |
| CES302 160 | CES302 160-C | 16 | 26 | 80 | 16 |
| CES302 200 | CES302 200-C | 20 | 32 | 100 | 20 |

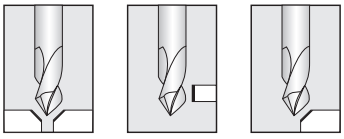
## ■ Applicable Working Material

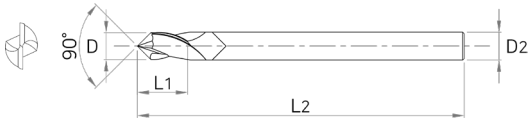
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# CEM-W | CENTERING ENDMILL - BRAZED TYPE






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h7 |

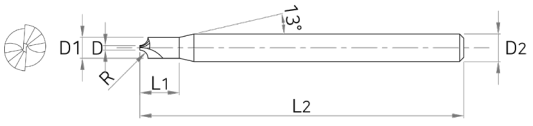
| EDP No | SIZES (mm) | | | |
|---|---|---|---|---|
| | D | L1 | L2 | D2 |
| CEM 1016W | 10 | 15 | 115 | 16 |
| CEM 1216W | 12 | 20 | 145 | 16 |
| CEM 1620W | 16 | 23 | 150 | 20 |
| CEM 2025W | 20 | 25 | 155 | 25 |

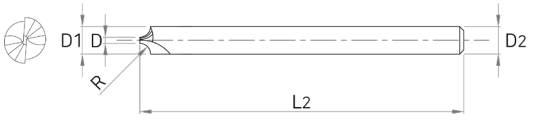
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# CRC | CORNER ROUNDING CUTTER






## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | ±0.05 | h6 |

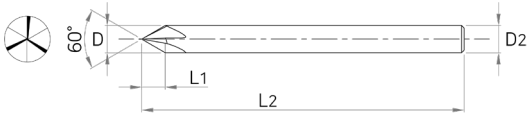
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | R | D1 | L1 | L2 | D2 |
| CRC 209 050 | 0.9 | 0.5 | 2 | 3 | 45 | 4 |
| CRC 209 075 | 0.9 | 0.75 | 2.5 | 4 | 45 | 4 |
| CRC 209 100 | 0.9 | 1 | 3 | 5 | 50 | 6 |
| CRC 259 100 | 5.9 | 1 | 8 | - | 60 | 8 |
| CRC 214 150 | 1.4 | 1.5 | 4.5 | 8 | 50 | 6 |
| CRC 249 150 | 4.9 | 1.5 | 8 | - | 60 | 8 |
| CRC 214 200 | 1.4 | 2 | 5.5 | 10 | 50 | 6 |
| CRC 239 200 | 3.9 | 2 | 8 | - | 60 | 8 |
| CRC 219 250 | 1.9 | 2.5 | 7 | 13 | 60 | 8 |
| CRC 219 300 | 1.9 | 3 | 8 | - | 60 | 8 |
| CRC 219 350 | 1.9 | 3.5 | 9 | 13 | 70 | 10 |
| CRC 219 400 | 1.9 | 4 | 10 | - | 70 | 10 |
| CRC 219 450 | 1.9 | 4.5 | 11 | 13 | 80 | 12 |
| CRC 219 500 | 1.9 | 5 | 12 | - | 80 | 12 |
| CRC 239 600 | 3.9 | 6 | 16 | - | 85 | 16 |
| CRC 259 700 | 5.9 | 7 | 20 | - | 85 | 20 |
| CRC 239 800 | 3.9 | 8 | 20 | - | 85 | 20 |

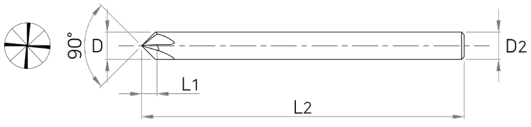
## ■ Applicable Working Material

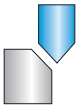
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

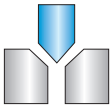
# CFT-W | CHAMFER TOOL



Available work (O)



Available work (O)

## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h6 |

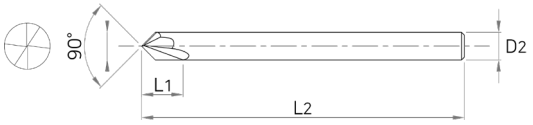
| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 | Z |
| CFT 0660W | 6 | 60° | 5.1 | 50 | 6 | 3 |
| CFT 0690W | 6 | 90° | 3 | 50 | 6 | 3 |
| CFT 0860W | 8 | 60° | 6.9 | 60 | 8 | 3 |
| CFT 0890W | 8 | 90° | 4 | 60 | 8 | 3 |
| CFT 1060W | 10 | 60° | 8.6 | 70 | 10 | 4 |
| CFT 1090W | 10 | 90° | 5 | 70 | 10 | 4 |
| CFT 1260W | 12 | 60° | 10.3 | 75 | 12 | 4 |
| CFT 1290W | 12 | 90° | 6 | 75 | 12 | 4 |

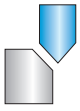
## ■ Applicable Working Material

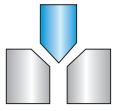
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

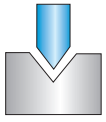
○ : GOOD ◎ : EXCELLENT

# CCT | CHAMFER CUTTER





Available work (O)


Available work (O)


Available work (△)



## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | 0 ~ +0.1 | h6 |

CARBIDE | AlTiN | 2 | 0° HELIX | DATA P.716

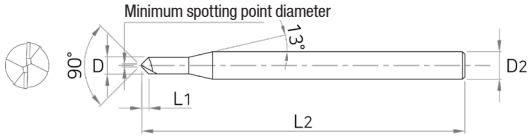
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 |
| CCT 502 030 S3 | 3 | 90 ° | 1.5 | 60 | 3 |
| CCT 502 040 S4 | 4 | | 2 | 60 | 4 |
| CCT 502 060 | 6 | | 3 | 60 | 6 |
| CCT 502 080 | 8 | | 4 | 65 | 8 |
| CCT 502 100 | 10 | | 5 | 70 | 10 |
| CCT 502 120 | 12 | | 6 | 75 | 12 |

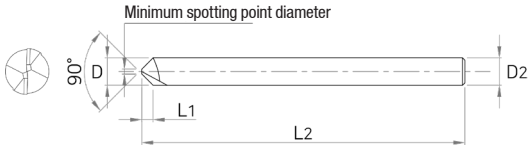
## ■ Applicable Working Material

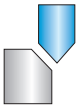
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

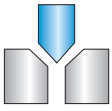
# CCF | CHAMFER CUTTER FACE



Available work (O)



Available work (O)

## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| All Sizes | ±0.01 | h6 |

CARBIDE | TiAlN | 2 | 5° HELIX | DATA P.716

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | θ | L1 | L2 | D2 | Minimum spotting point diameter |
| CCF 502 020 S4 | 2 | 90 ° | 0.85 | 50 | 4 | 0.3 |
| CCF 502 020 | 2 | | 0.85 | 50 | 6 | 0.3 |
| CCF 502 040 S4 | 4 | | 1.85 | 50 | 4 | 0.3 |
| CCF 502 040 | 4 | | 1.85 | 50 | 6 | 0.3 |
| CCF 502 060 | 6 | | 2.85 | 50 | 6 | 0.3 |
| CCF 502 080 | 8 | | 3.8 | 60 | 8 | 0.4 |
| CCF 502 100 | 10 | | 4.75 | 70 | 10 | 0.5 |
| CCF 502 120 | 12 | | 5.75 | 75 | 12 | 0.5 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | | | ○ | | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# REAMER SERIES

## REAMER

550

# REAMER

## Contents


| EDP No | Geometry | Type | Page |
|---|---|---|---|
| SSR | | Straight Flute Reamer | 551 |
| SHR | | Helical Flute Reamer | 552 |
| HRS-W | | Helical Neck Type Reamer | 553 |
| SBR | | High-Helix Broach Reamer | 555 |


## EDP No. System

*If expressed as an integer, the decimal point is omitted.

SS R 060

| Appearance | Type | Diameter |
|---|---|---|
| SS : Solid Straight | R : Reamer | 30 |
| SH : Solid Helix | S : Separate Diameter | 35 |
| HR : Neck Type Helix | | 40 |
| SB : Solid Broach | | |

Ex) Cutting Dia Ø6.0 / Solid Straight Reamer

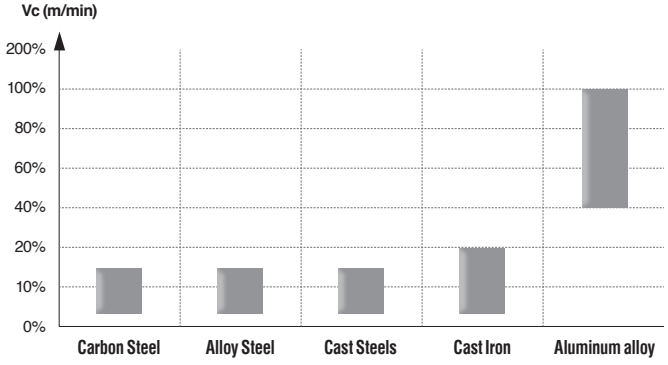
## Characteristics

· Suitable to work for Carbon Steels, Alloy Steels, Preharden Steels, Copper, Cast Iron, Aluminum
· Extend customer choice with variety of size and type

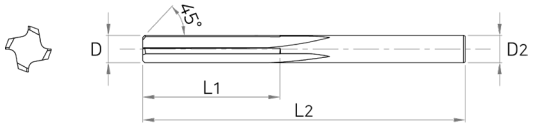
## Features

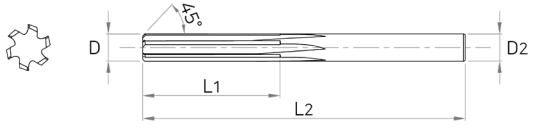
· Excellent Chip emission by applied to Helical cutting edge
· Reduced friction by applied to clearance angle of the chamfer

## Vc by Application area



# SSR | STRAIGHT FLUTE REAMER




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | +0.002 ~ +0.006 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.009 | |
| D6.1 ~ D10 | +0.006 ~ +0.012 | |
| D10.1 ~ D18 | +0.007 ~ +0.015 | |
| D18.1 ~ | +0.008 ~ +0.017 | |

| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Z |
| SSR 020 | 2 | 25 | 60 | 4 | 4 |
| SSR 025 | 2.5 | 25 | 60 | 4 | 4 |
| SSR 030 | 3 | 28 | 70 | 4 | 6 |
| SSR 035 | 3.5 | 30 | 75 | 4 | 6 |
| SSR 040 | 4 | 30 | 75 | 4 | 6 |
| SSR 045 | 4.5 | 35 | 80 | 6 | 6 |
| SSR 050 | 5 | 35 | 80 | 6 | 6 |
| SSR 055 | 5.5 | 35 | 80 | 6 | 6 |
| SSR 060 | 6 | 35 | 80 | 6 | 6 |
| SSR 065 | 6.5 | 45 | 100 | 8 | 6 |
| SSR 070 | 7 | 45 | 100 | 8 | 6 |
| SSR 080 | 8 | 45 | 100 | 8 | 6 |
| SSR 090 | 9 | 50 | 110 | 10 | 6 |
| SSR 100 | 10 | 50 | 110 | 10 | 6 |
| SSR 110 | 11 | 50 | 120 | 12 | 6 |
| SSR 120 | 12 | 50 | 120 | 12 | 6 |

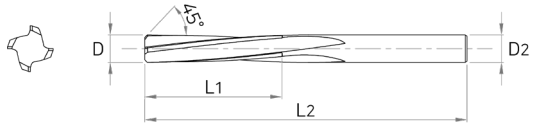


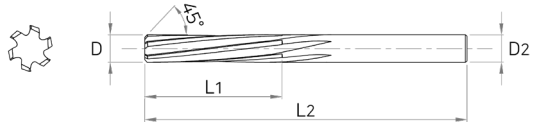
## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD400, 500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | ○ | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SHR | HELICAL FLUTE REAMER




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | +0.002 ~ +0.006 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.009 | |
| D6.1 ~ D10 | +0.006 ~ +0.012 | |
| D10.1 ~ D18 | +0.007 ~ +0.015 | |
| D18.1 ~ | +0.008 ~ +0.017 | |

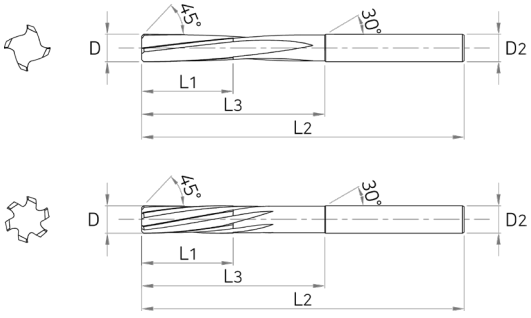
| EDP No | SIZES (mm) | | | | |
|---|---|---|---|---|---|
| | D | L1 | L2 | D2 | Z |
| SHR 020 | 2 | 25 | 60 | 4 | 4 |
| SHR 025 | 2.5 | 25 | 60 | 4 | 4 |
| SHR 030 | 3 | 28 | 70 | 4 | 6 |
| SHR 035 | 3.5 | 30 | 75 | 4 | 6 |
| SHR 040 | 4 | 30 | 75 | 4 | 6 |
| SHR 045 | 4.5 | 35 | 80 | 6 | 6 |
| SHR 050 | 5 | 35 | 80 | 6 | 6 |
| SHR 055 | 5.5 | 35 | 80 | 6 | 6 |
| SHR 060 | 6 | 35 | 80 | 6 | 6 |
| SHR 065 | 6.5 | 45 | 100 | 8 | 6 |
| SHR 070 | 7 | 45 | 100 | 8 | 6 |
| SHR 080 | 8 | 45 | 100 | 8 | 6 |
| SHR 090 | 9 | 50 | 110 | 10 | 6 |
| SHR 100 | 10 | 50 | 110 | 10 | 6 |
| SHR 110 | 11 | 50 | 120 | 12 | 6 |
| SHR 120 | 12 | 50 | 120 | 12 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD400, 500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | ○ | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# HRS-W | HELICAL FLUTE NECK REAMER




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | +0.002 ~ +0.006 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.009 | |
| D6.1 ~ D10 | +0.006 ~ +0.012 | |
| D10.1 ~ D18 | +0.007 ~ +0.015 | |
| D18.1 ~ | +0.008 ~ +0.017 | |

CARBIDE | Uncoated | 4 | 6 | 7° HELIX

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| HRS 0198W | 1.98 | 12 | 22 | 50 | 4 | 4 |
| HRS 0199W | 1.99 | 12 | 22 | 50 | 4 | 4 |
| HRS 0200W | 2 | 12 | 22 | 50 | 4 | 4 |
| HRS 0201W | 2.01 | 12 | 22 | 50 | 4 | 4 |
| HRS 0202W | 2.02 | 12 | 22 | 50 | 4 | 4 |
| HRS 0203W | 2.03 | 12 | 22 | 50 | 4 | 4 |
| HRS 0248W | 2.48 | 16 | 26 | 60 | 4 | 4 |
| HRS 0249W | 2.49 | 16 | 26 | 60 | 4 | 4 |
| HRS 0250W | 2.5 | 16 | 26 | 60 | 4 | 4 |
| HRS 0251W | 2.51 | 16 | 26 | 60 | 4 | 4 |
| HRS 0252W | 2.52 | 16 | 26 | 60 | 4 | 4 |
| HRS 0253W | 2.53 | 16 | 26 | 60 | 4 | 4 |
| HRS 0297W | 2.97 | 18 | 30 | 65 | 4 | 6 |
| HRS 0298W | 2.98 | 18 | 30 | 65 | 4 | 6 |
| HRS 0299W | 2.99 | 18 | 30 | 65 | 4 | 6 |
| HRS 0300W | 3 | 18 | 30 | 65 | 4 | 6 |
| HRS 0301W | 3.01 | 18 | 30 | 65 | 4 | 6 |
| HRS 0302W | 3.02 | 18 | 30 | 65 | 4 | 6 |
| HRS 0303W | 3.03 | 18 | 30 | 65 | 4 | 6 |
| HRS 0350W | 3.5 | 20 | 35 | 75 | 4 | 6 |
| HRS 0397W | 3.97 | 20 | 35 | 75 | 4 | 6 |
| HRS 0398W | 3.98 | 20 | 35 | 75 | 4 | 6 |
| HRS 0399W | 3.99 | 20 | 35 | 75 | 4 | 6 |
| HRS 0400W | 4 | 20 | 35 | 75 | 4 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| HRS 0401W | 4.01 | 20 | 35 | 75 | 4 | 6 |
| HRS 0402W | 4.02 | 20 | 35 | 75 | 4 | 6 |
| HRS 0403W | 4.03 | 20 | 35 | 75 | 4 | 6 |
| HRS 0450W | 4.5 | 25 | 40 | 80 | 6 | 6 |
| HRS 0497W | 4.97 | 25 | 40 | 80 | 6 | 6 |
| HRS 0498W | 4.98 | 25 | 40 | 80 | 6 | 6 |
| HRS 0499W | 4.99 | 25 | 40 | 80 | 6 | 6 |
| HRS 0500W | 5 | 25 | 40 | 80 | 6 | 6 |
| HRS 0501W | 5.01 | 25 | 40 | 80 | 6 | 6 |
| HRS 0502W | 5.02 | 25 | 40 | 80 | 6 | 6 |
| HRS 0503W | 5.03 | 25 | 40 | 80 | 6 | 6 |
| HRS 0550W | 5.5 | 25 | 45 | 80 | 6 | 6 |
| HRS 0597W | 5.97 | 25 | 45 | 80 | 6 | 6 |
| HRS 0598W | 5.98 | 25 | 45 | 80 | 6 | 6 |
| HRS 0599W | 5.99 | 25 | 45 | 80 | 6 | 6 |
| HRS 0600W | 6 | 25 | 45 | 80 | 6 | 6 |
| HRS 0601W | 6.01 | 25 | 45 | 80 | 6 | 6 |
| HRS 0602W | 6.02 | 25 | 45 | 80 | 6 | 6 |
| HRS 0603W | 6.03 | 25 | 45 | 80 | 6 | 6 |
| HRS 0650W | 6.5 | 30 | 60 | 100 | 8 | 6 |
| HRS 0700W | 7 | 30 | 60 | 100 | 8 | 6 |
| HRS 0750W | 7.5 | 33 | 65 | 100 | 8 | 6 |
| HRS 0797W | 7.97 | 33 | 65 | 100 | 8 | 6 |
| HRS 0798W | 7.98 | 33 | 65 | 100 | 8 | 6 |

## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD400, 500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | ○ | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# HRS-W | HELICAL FLUTE NECK REAMER

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| HRS 0799W | 7.99 | 33 | 65 | 100 | 8 | 6 |
| HRS 0800W | 8 | 33 | 65 | 100 | 8 | 6 |
| HRS 0801W | 8.01 | 33 | 65 | 100 | 8 | 6 |
| HRS 0802W | 8.02 | 33 | 65 | 100 | 8 | 6 |
| HRS 0803W | 8.03 | 33 | 65 | 100 | 8 | 6 |
| HRS 0850W | 8.5 | 35 | 70 | 110 | 10 | 6 |
| HRS 0900W | 9 | 35 | 70 | 110 | 10 | 6 |
| HRS 0997W | 9.97 | 35 | 70 | 110 | 10 | 6 |
| HRS 0998W | 9.98 | 35 | 70 | 110 | 10 | 6 |
| HRS 0999W | 9.99 | 35 | 70 | 110 | 10 | 6 |
| HRS 1000W | 10 | 35 | 70 | 110 | 10 | 6 |
| HRS 1001W | 10.01 | 35 | 70 | 110 | 10 | 6 |
| HRS 1002W | 10.02 | 35 | 70 | 110 | 10 | 6 |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L3 | L2 | D2 | Z |
| HRS 1003W | 10.03 | 35 | 70 | 110 | 10 | 6 |
| HRS 1004W | 10.04 | 35 | 70 | 110 | 10 | 6 |
| HRS 1005W | 10.05 | 35 | 70 | 110 | 10 | 6 |
| HRS 1100W | 11 | 40 | 80 | 120 | 12 | 6 |
| HRS 1197W | 11.97 | 40 | 80 | 120 | 12 | 6 |
| HRS 1198W | 11.98 | 40 | 80 | 120 | 12 | 6 |
| HRS 1199W | 11.99 | 40 | 80 | 120 | 12 | 6 |
| HRS 1200W | 12 | 40 | 80 | 120 | 12 | 6 |
| HRS 1201W | 12.01 | 40 | 80 | 120 | 12 | 6 |
| HRS 1202W | 12.02 | 40 | 80 | 120 | 12 | 6 |
| HRS 1203W | 12.03 | 40 | 80 | 120 | 12 | 6 |
| HRS 1204W | 12.04 | 40 | 80 | 120 | 12 | 6 |
| HRS 1205W | 12.05 | 40 | 80 | 120 | 12 | 6 |

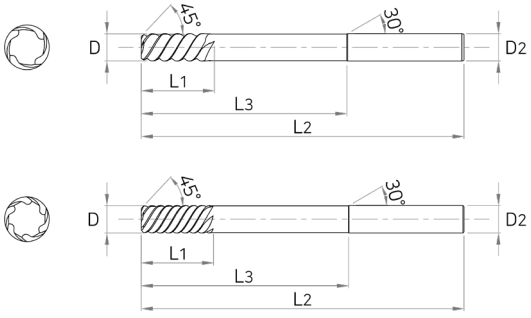


## ■ Applicable Working Material

| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD400, 500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | ○ | | ○ | ○ | ○ |

○ : GOOD ◎ : EXCELLENT

# SBR | BROACH REAMER




## ■ Tolerance

| D | | Shank Dia |
|---|---|---|
| D1 ~ D3 | +0.002 ~ +0.006 | h6 |
| D3.1 ~ D6 | +0.004 ~ +0.009 | |
| D6.1 ~ D10 | +0.006 ~ +0.012 | |
| D10.1 ~ D18 | +0.007 ~ +0.015 | |
| D18.1 ~ | +0.008 ~ +0.017 | |

| EDP No | SIZES (mm) | | | | | |
|---|---|---|---|---|---|---|
| | D | L1 | L2 | L3 | D2 | Z |
| SBR 030 | 3 | 12 | 70 | 40 | 4 | 4 |
| SBR 040 | 4 | 12 | 75 | 45 | 4 | 4 |
| SBR 050 | 5 | 16 | 80 | 45 | 6 | 4 |
| SBR 060 | 6 | 16 | 80 | 45 | 6 | 4 |
| SBR 080 | 8 | 20 | 100 | 60 | 8 | 4 |
| SBR 100 | 10 | 25 | 110 | 65 | 10 | 4 |
| SBR 120 | 12 | 28 | 120 | 70 | 12 | 4 |
| SBR 140 | 14 | 30 | 145 | 90 | 14 | 4 |
| SBR 160 | 16 | 35 | 155 | 100 | 16 | 6 |
| SBR 180 | 18 | 38 | 170 | 110 | 18 | 6 |
| SBR 200 | 20 | 40 | 180 | 120 | 20 | 6 |



## ■ Applicable Working Material

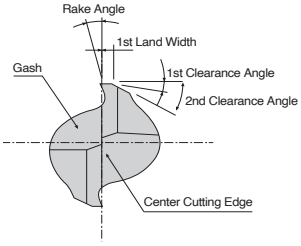
| Carbon Steel ~HB225 | Alloy Steel HB225~325 | Prehardened Steel HRc30~50 | Hardened Steel | | Copper | Graphite | Cast Iron ~FCD400, 500 | Aluminum | Stainless Steel |
|---|---|---|---|---|---|---|---|---|---|
| | | | SKD61 ~HRc55 | SKD11 HRc55~ | | | | | |
| ○ | ○ | ○ | | | ○ | | ○ | ○ | ○ |

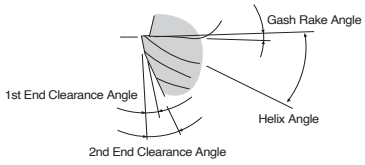
○ : GOOD ◎ : EXCELLENT

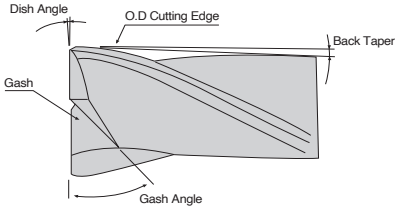
# TECHNICAL DATA

# Recommended Cutting Condition

## Nomenclature of Endmill




## Application range of Grade

| Workpiece | Grade |
|---|---|
| Carbon Steel, Alloy Steels, Tool Steel, Metal Mold Steel | • Micro Grain Carbide<br>• P30 |
| Cast Iron, Ductile | • Micro Grain Carbide<br>• K10~K20 |
| Heat Treatment Steel(HRc 40~60) | • Ultrafinest Carbide |
| Aluminium, Nonferrous Meterial | • Micro Grain Carbide<br>• K10 |

## Formula of End Milling

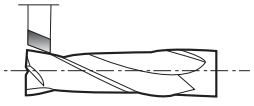
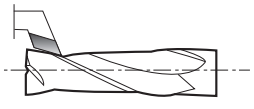
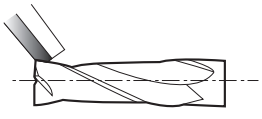
| | | | |
|---|---|---|---|
| **(1) Cutting Speed** | $V = \frac{\pi \times D \times N}{1000}$ (m/min) | V : Cutting Speed<br>D : Diameter of End Mill<br>N : End Mill revolution | (m/min)<br>(mm)<br>(RPM) |
| **(2) Feed per tooth** | $fz = \frac{F}{Z \times N}$ (mm/tooth) | fz : Feed per tooth<br>F : Table feed rate<br>Z : No. of teeth<br>N : End Mill revolution | (mm/tooth)<br>(tooth)<br>(RPM) |
| **(3) Table Feed rate** | $F = fz \times Z \times N$ | F : Feed rate<br>fz : Feed per tooth<br>Z : No. of teeth<br>N : End Mill revolution | (mm/min)<br>(mm/tooth)<br>(tooth)<br>(RPM) |
| **(4) Cutting Time** | $Tc = \frac{L}{F}$ | Tc: Cutting Time<br>F : Table feed rate<br>L : Length of cut<br>(Workpiece Length+Diameter of Endmill+α) | (min)<br>(mm/ min)<br>(mm) |

## For Regrinding

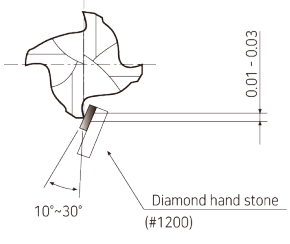
### 1. Regrinding range

| Application Range | Cutter Dia | Amount Of Flank Wear |
|---|---|---|
| Finish Machining | ~ ø10<br>ø 11 ~ ø30<br>ø 31 ~ ø50 | 0.05 ~ 0.1<br>0.1 ~ 0.25<br>0.2 ~ 0.35 |
| Rough Machining | ~ ø10<br>ø 11 ~ ø30<br>ø 31 ~ ø50 | 0.08 ~ 0.15<br>0.15 ~ 0.35<br>0.3 ~ 0.45 |

### 2. Regrinding Method of Relief

| | | |
|---|---|---|
| |  | **(1) Concave method**<br>• In case when precise outer Diameter dimension is required.<br>• In case of aluminium machining. |
| |  | **(2) Flat method**<br>• Excellent machinability<br>- Applicable to ball end mill and taper end mill.<br>• Secondary clearance angle work is required.<br>- When Diameter is large. |
| |  | **(3) Eccentric method**<br>• Excellent toughness and surface roughness.<br>• Secondary clearance angle work is not required. |

### 3. Honing




1) Recommend honing for machining mold metal and high Hardness Workpiece.
   -The amount of honing shall be less than that of feed per blade.
2) When using end mill without honing, machine for 10 to 30 seconds at feed rate of less than 0.01 mm/blade and then machine at normal feed rate.
3) Honing is not required for machining aluminium and non-ferrous metal.

# Recommended Cutting Condition

## Trouble Shooting for End Milling

| Problem | Cause | Solution |
|---|---|---|
| **(1) Rupture** | • High feed<br>• High slotting volume<br>• High protrusion volume<br>• Worn out of flute<br>• Longer cutting length | • Reduce feed<br>• Reduce slotting volume<br>• Reduce protrusion volume<br>• Regrind at the beginning<br>• Reduce cutting length |
| **(2) Wear / Burning** | • High speed<br>• Small rake angle<br>• High Hardness of material | • Reduce speed, Supply enough oil<br>• Correct to proper rake angle<br>• Supply Dry > soluble > Non-water soluble oil and do surface treatment" |
| **(3) Chattering** | • Improper cutting condition<br>• Lack of Strength in machinery and chuck<br>• Poorly fixed material<br>• High protrusion volume<br>• Large clearance of rake angle | • Adjust cutting and feed speed<br>• Replace machinery and chuck<br>• Contain a material firmly<br>• Reduce protrusion volume<br>• Reduce clearance of rake angle |
| **(4) Defective of cutting edge** | • Hige feed<br>• Small rake angle<br>• Chattering occurs<br>• Poorly sealed material<br>• High slotting volume<br>• High protrusion volume<br>• Lack of Strength in machinery | • Reduce feed<br>• Adjust angle properly<br>• Reduce Chattering by lowing the number of turning<br>• Contain a material firmly<br>• Reduce slotting volume<br>• Reduce protrusion volume<br>• Replace machinery |
| **(5) Bad Cutability** | • Worn out of cutting edge<br>• Improper endmill<br>• Small rake angle | • Regrind at the beginning<br>• Replace proper endmill<br>• Correct to proper rake angle |
| **(6) Poor chip emission** | • Low injection pressure of the oil<br>• Small chip pocket<br>• Worn out of cutting edge<br>• High slotting volume | • Increase oil volume and pressure<br>• Use fewer flute endmill or Reduce feed<br>• Regrind at the beginning<br>• Reduce slotting volume |
| **(7) Burr on surface** | • High feed<br>• Low speed<br>• Worn out of cutting edge<br>• High slotting volume | • Reduce feed<br>• Speed up<br>• Regrind at the beginning<br>• Reduce slotting volume |
| **(8) Incorrect dimension** | • Incorrect machinery or chuck<br>• Incorrect rigidity of machinery or chuck<br>• longer cutting length<br>• Fewer number of flutes | • Correct machinery or chuck<br>• Replace machinery or chuck<br>• Reduce cutting length<br>• Replace to larger number of flutes endmill |
| **(9) Fusion** | • Lack of oil or affination between tool and material | • Supply Dry > soluble > Non-water soluble oil<br>• For Alloy Steels, use active type non-water soluble oil |

## ZE702, ZE712 SERIES ▶ Slotting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 50,000 | 130 | 45,000 | 115 | 40,000 | 95 | 33,000 | 60 | 33,000 | 45 | 26,400 | 30 |
| 0.3 | 50,000 | 190 | 45,000 | 140 | 40,000 | 115 | 33,000 | 70 | 25,000 | 50 | 20,000 | 35 |
| 0.4 | 50,000 | 235 | 45,000 | 180 | 40,000 | 140 | 33,000 | 90 | 25,000 | 55 | 20,000 | 40 |
| 0.5 | 50,000 | 370 | 45,000 | 280 | 40,000 | 220 | 33,000 | 140 | 25,000 | 85 | 20,000 | 60 |
| 0.6 | 50,000 | 470 | 45,000 | 360 | 40,000 | 285 | 30,000 | 160 | 25,000 | 105 | 20,000 | 75 |
| 0.8 | 50,000 | 600 | 40,000 | 440 | 30,000 | 295 | 25,000 | 185 | 19,000 | 110 | 15,200 | 80 |
| 0.9 | 49,000 | 655 | 39,000 | 520 | 27,800 | 330 | 22,700 | 205 | 17,500 | 125 | 14,000 | 90 |
| 1 | 48,000 | 750 | 38,000 | 570 | 25,500 | 360 | 20,500 | 215 | 16,000 | 135 | 12,500 | 85 |
| 2 | 33,300 | 850 | 26,000 | 680 | 17,500 | 420 | 14,500 | 260 | 11,000 | 160 | 9,500 | 115 |
| 3 | 21,800 | 850 | 17,300 | 680 | 11,500 | 420 | 9,500 | 260 | 7,500 | 160 | 6,400 | 115 |
| 4 | 16,700 | 880 | 13,200 | 700 | 8,800 | 440 | 7,200 | 270 | 5,600 | 170 | 4,750 | 118 |
| 5 | 15,700 | 1,000 | 12,500 | 805 | 8,300 | 500 | 6,400 | 285 | 5,100 | 180 | 4,450 | 132 |
| 6 | 13,100 | 950 | 10,350 | 770 | 6,900 | 480 | 5,300 | 280 | 4,200 | 180 | 3,700 | 130 |
| 8 | 9,880 | 930 | 7,800 | 720 | 5,200 | 445 | 4,000 | 255 | 3,200 | 165 | 2,800 | 120 |
| 10 | 7,800 | 850 | 6,150 | 680 | 4,100 | 415 | 3,200 | 240 | 2,550 | 155 | 2,200 | 112 |
| 12 | 6,650 | 850 | 5,250 | 680 | 3,500 | 415 | 2,650 | 240 | 2,100 | 155 | 1,860 | 112 |
| 16 | 4,900 | 730 | 3,900 | 580 | 2,600 | 365 | 2,000 | 210 | 1,600 | 135 | 1,400 | 95 |
| 20 | 3,900 | 660 | 3,100 | 525 | 2,050 | 335 | 1,600 | 195 | 1,300 | 125 | 1,100 | 85 |

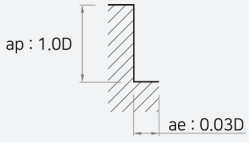
RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## ZE702, ZE712 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,050 | 38,000 | 820 | 25,500 | 510 | 20,500 | 310 | 16,000 | 190 | 12,500 | 125 |
| 2 | 33,300 | 1,200 | 26,000 | 970 | 17,500 | 600 | 14,500 | 370 | 11,000 | 230 | 9,500 | 165 |
| 3 | 21,800 | 1,200 | 17,300 | 970 | 11,500 | 600 | 9,500 | 370 | 7,500 | 230 | 6,400 | 165 |
| 4 | 16,700 | 1,250 | 13,200 | 1,000 | 8,800 | 625 | 7,200 | 385 | 5,600 | 240 | 4,750 | 170 |
| 5 | 15,700 | 1,450 | 12,500 | 1,150 | 8,300 | 710 | 6,400 | 410 | 5,100 | 260 | 4,450 | 190 |
| 6 | 13,100 | 1,350 | 10,350 | 1,100 | 6,900 | 690 | 5,300 | 400 | 4,200 | 255 | 3,700 | 185 |
| 8 | 9,880 | 1,320 | 7,800 | 1,030 | 5,200 | 635 | 4,000 | 365 | 3,200 | 235 | 2,800 | 170 |
| 10 | 7,800 | 1,200 | 6,150 | 970 | 4,100 | 590 | 3,200 | 340 | 2,550 | 220 | 2,200 | 160 |
| 12 | 6,650 | 1,200 | 5,250 | 970 | 3,500 | 590 | 2,650 | 340 | 2,100 | 220 | 1,860 | 160 |
| 16 | 4,900 | 1,050 | 3,900 | 840 | 2,600 | 520 | 2,000 | 300 | 1,600 | 190 | 1,400 | 140 |
| 20 | 3,900 | 950 | 3,100 | 750 | 2,050 | 475 | 1,600 | 275 | 1,300 | 175 | 1,100 | 125 |

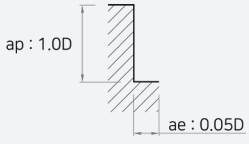
RPM = rev / min
FEED = mm / min

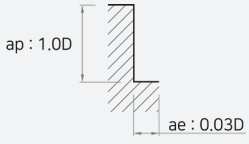



## ZE704, ZE714, ZE724 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,480 | 38,000 | 1,050 | 25,500 | 710 | 20,500 | 430 | 16,000 | 270 | 12,500 | 175 |
| 2 | 33,300 | 1,750 | 26,000 | 1,250 | 17,500 | 840 | 14,500 | 520 | 11,000 | 320 | 9,500 | 230 |
| 3 | 21,800 | 1,750 | 17,300 | 1,250 | 11,500 | 840 | 9,500 | 520 | 7,500 | 320 | 6,400 | 230 |
| 4 | 16,700 | 1,800 | 13,200 | 1,300 | 8,800 | 880 | 7,200 | 540 | 5,600 | 335 | 4,750 | 240 |
| 5 | 15,700 | 2,000 | 12,500 | 1,500 | 8,300 | 1,000 | 6,400 | 580 | 5,100 | 370 | 4,450 | 270 |
| 6 | 13,100 | 1,950 | 10,350 | 1,400 | 6,900 | 950 | 5,300 | 560 | 4,200 | 350 | 3,700 | 260 |
| 8 | 9,880 | 1,880 | 7,800 | 1,350 | 5,200 | 900 | 4,000 | 520 | 3,200 | 330 | 2,800 | 240 |
| 10 | 7,800 | 1,750 | 6,150 | 1,260 | 4,100 | 840 | 3,200 | 480 | 2,550 | 310 | 2,200 | 220 |
| 12 | 6,650 | 1,750 | 5,250 | 1,260 | 3,500 | 840 | 2,650 | 480 | 2,100 | 300 | 1,860 | 220 |
| 16 | 4,900 | 1,500 | 3,900 | 1,100 | 2,600 | 730 | 2,000 | 420 | 1,600 | 270 | 1,400 | 200 |
| 20 | 3,900 | 1,300 | 3,100 | 970 | 2,050 | 650 | 1,600 | 380 | 1,300 | 250 | 1,100 | 180 |

RPM = rev / min
FEED = mm / min

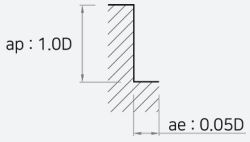


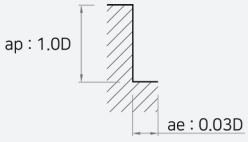



## ZE716, ZR706, ZR736 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 24,800 | 5,350 | 23,500 | 4,900 | 16,000 | 4,900 | 13,500 | 3,300 | 10,500 | 2,100 | 8,000 | 1,450 |
| 8 | 20,000 | 5,500 | 19,000 | 5,000 | 12,000 | 4,600 | 10,000 | 3,100 | 8,000 | 2,000 | 6,000 | 1,400 |
| 10 | 16,000 | 4,900 | 15,500 | 4,500 | 9,500 | 4,100 | 8,000 | 2,900 | 6,400 | 1,800 | 4,800 | 1,300 |
| 12 | 13,000 | 4,500 | 12,500 | 4,100 | 8,000 | 3,800 | 6,600 | 2,500 | 5,300 | 1,600 | 4,000 | 1,150 |
| 16 | 10,000 | 4,000 | 9,700 | 3,700 | 6,000 | 3,400 | 5,000 | 2,300 | 4,000 | 1,250 | 3,000 | 870 |
| 20 | 8,000 | 3,350 | 7,800 | 3,400 | 4,800 | 3,200 | 4,000 | 2,100 | 3,200 | 1,020 | 2,400 | 690 |

RPM = rev / min
FEED = mm / min




## ZSLNS20, ZSLNS40 SERIES

| Work-piece | Alloy Steels, Heat Resistant Steels | | | Herdened Steels | | | Herdened Steels | | | Copper, Copper alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc45 | | | HRc45 ~ HRc55 | | | HRc55 ~ HRc65 | | | - | | |
| Diameter (mm) | RPM | FEED | Ae(mm) | RPM | FEED | Ae(mm) | RPM | FEED | Ae(mm) | RPM | FEED | Ae(mm) |
| 0.4 | 34,100~50,000 | 350~590 | 0.005~0.028 | 30,500~35,200 | 295~340 | 0.003~0.020 | 18,300~24,600 | 120~200 | 0.002~0.012 | 48,000~50,000 | 790~920 | 0.008~0.048 |
| 0.5 | 25,650~33,000 | 370~470 | 0.006~0.035 | 23,750~26,000 | 285~315 | 0.004~0.025 | 14,200~18,000 | 115~130 | 0.003~0.015 | 44,000~50,000 | 800~1,150 | 0.010~0.060 |
| 0.6 | 20,900~35,200 | 330~560 | 0.007~0.030 | 19,900~22,000 | 260~290 | 0.005~0.021 | 11,900~15,500 | 100~120 | 0.003~0.013 | 37,500~50,000 | 770~1,250 | 0.011~0.051 |
| 0.8 | 16,150~26,400 | 360~590 | 0.009~0.040 | 15,200~16,700 | 280~310 | 0.006~0.028 | 9,000~11,700 | 110~125 | 0.004~0.017 | 28,500~47,000 | 770~1,300 | 0.015~0.068 |
| 1.0 | 12,300~18,700 | 350~540 | 0.011~0.028 | 10,500~11,500 | 250~280 | 0.008~0.020 | 6,300~8,050 | 100~115 | 0.005~0.012 | 22,500~34,000 | 810~1,300 | 0.018~0.048 |
| 1.2 | 10,450~17,600 | 350~590 | 0.025~0.070 | 9,100~10,000 | 250~280 | 0.015~0.042 | 5,400~7,000 | 100~115 | 0.009~0.026 | 22,500~31,500 | 950~1,350 | 0.036~0.101 |
| 1.5 | 9,100~17,600 | 430~830 | 0.017~0.077 | 7,000~8,000 | 250~280 | 0.012~0.055 | 4,300~5,500 | 100~115 | 0.007~0.033 | 14,500~25,000 | 770~1,320 | 0.028~0.132 |
| 2.0 | 6,350~10,550 | 340~570 | 0.021~0.140 | 6,100~6,700 | 270~300 | 0.015~0.100 | 3,600~4,700 | 100~120 | 0.009~0.060 | 11,500~18,500 | 770~1,250 | 0.036~0.240 |
| 3.0 | 4,300~7,050 | 550~900 | 0.056~0.210 | 3,990~4,600 | 445~515 | 0.040~0.150 | 2,400~3,200 | 105~310 | 0.024~0.090 | 9,000~13,000 | 1,400~2,110 | 0.096~0.360 |
| 4.0 | 3,200~5,300 | 400~675 | 0.074~0.280 | 3,000~3,400 | 335~380 | 0.053~0.200 | 1,800~2,400 | 75~230 | 0.032~0.120 | 6,750~9,750 | 1,050~1,575 | 0.128~0.480 |

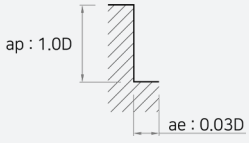
RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## ZR702, ZR732 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 33,300 | 960 | 26,000 | 776 | 17,500 | 480 | 14,500 | 296 | 11,000 | 184 | 9,500 | 132 |
| 3 | 21,800 | 960 | 17,300 | 776 | 11,500 | 480 | 9,500 | 296 | 7,500 | 184 | 6,400 | 132 |
| 4 | 16,700 | 1,000 | 13,200 | 800 | 8,800 | 500 | 7,200 | 308 | 5,600 | 192 | 4,750 | 136 |
| 5 | 15,700 | 1,160 | 12,500 | 920 | 8,300 | 568 | 6,400 | 328 | 5,100 | 208 | 4,450 | 152 |
| 6 | 13,100 | 1,080 | 10,350 | 880 | 6,900 | 552 | 5,300 | 320 | 4,200 | 204 | 3,700 | 148 |
| 8 | 9,880 | 1,056 | 7,800 | 824 | 5,200 | 508 | 4,000 | 292 | 3,200 | 188 | 2,800 | 136 |
| 10 | 7,800 | 960 | 6,150 | 776 | 4,100 | 472 | 3,200 | 272 | 2,550 | 176 | 2,200 | 128 |
| 12 | 6,650 | 960 | 5,250 | 776 | 3,500 | 472 | 2,650 | 272 | 2,100 | 176 | 1,860 | 128 |
| 16 | 4,900 | 840 | 3,900 | 672 | 2,600 | 416 | 2,000 | 240 | 1,600 | 152 | 1,400 | 112 |
| 20 | 3,900 | 760 | 3,100 | 600 | 2,050 | 380 | 1,600 | 220 | 1,300 | 140 | 1,100 | 100 |

RPM = rev / min
FEED = mm / min




## ZR702, ZR732 SERIES ▶ Slotting

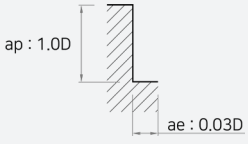
| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 33,300 | 680 | 26,000 | 544 | 17,500 | 336 | 14,500 | 208 | 11,000 | 128 | 9,500 | 92 |
| 3 | 21,800 | 680 | 17,300 | 544 | 11,500 | 336 | 9,500 | 208 | 7,500 | 128 | 6,400 | 92 |
| 4 | 16,700 | 704 | 13,200 | 560 | 8,800 | 352 | 7,200 | 216 | 5,600 | 136 | 4,750 | 94 |
| 5 | 15,700 | 800 | 12,500 | 644 | 8,300 | 400 | 6,400 | 228 | 5,100 | 144 | 4,450 | 106 |
| 6 | 13,100 | 760 | 10,350 | 616 | 6,900 | 384 | 5,300 | 224 | 4,200 | 144 | 3,700 | 104 |
| 8 | 9,880 | 744 | 7,800 | 576 | 5,200 | 356 | 4,000 | 204 | 3,200 | 132 | 2,800 | 96 |
| 10 | 7,800 | 680 | 6,150 | 544 | 4,100 | 332 | 3,200 | 192 | 2,550 | 124 | 2,200 | 90 |
| 12 | 6,650 | 680 | 5,250 | 544 | 3,500 | 332 | 2,650 | 192 | 2,100 | 124 | 1,860 | 90 |
| 16 | 4,900 | 584 | 3,900 | 464 | 2,600 | 292 | 2,000 | 168 | 1,600 | 108 | 1,400 | 78 |
| 20 | 3,900 | 528 | 3,100 | 420 | 2,050 | 268 | 1,600 | 168 | 1,300 | 100 | 1,100 | 70 |

RPM = rev / min
FEED = mm / min

## ZR704, ZR714, ZR724, ZR734 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,480 | 38,000 | 1,050 | 25,500 | 710 | 20,500 | 430 | 16,000 | 270 | 12,500 | 175 |
| 2 | 33,300 | 1,750 | 26,000 | 1,250 | 17,500 | 840 | 14,500 | 520 | 11,000 | 320 | 9,500 | 230 |
| 3 | 21,800 | 1,750 | 17,300 | 1,250 | 11,500 | 840 | 9,500 | 520 | 7,500 | 320 | 6,400 | 230 |
| 4 | 16,700 | 1,800 | 13,200 | 1,300 | 8,800 | 880 | 7,200 | 540 | 5,600 | 335 | 4,750 | 240 |
| 5 | 15,700 | 2,000 | 12,500 | 1,500 | 8,300 | 1,000 | 6,400 | 580 | 5,100 | 370 | 4,450 | 270 |
| 6 | 13,100 | 1,950 | 10,350 | 1,400 | 6,900 | 950 | 5,300 | 560 | 4,200 | 350 | 3,700 | 260 |
| 8 | 9,880 | 1,880 | 7,800 | 1,350 | 5,200 | 900 | 4,000 | 520 | 3,200 | 330 | 2,800 | 240 |
| 10 | 7,800 | 1,750 | 6,150 | 1,260 | 4,100 | 840 | 3,200 | 480 | 2,550 | 310 | 2,200 | 220 |
| 12 | 6,650 | 1,750 | 5,250 | 1,260 | 3,500 | 840 | 2,650 | 480 | 2,100 | 300 | 1,860 | 220 |
| 16 | 4,900 | 1,500 | 3,900 | 1,100 | 2,600 | 730 | 2,000 | 420 | 1,600 | 270 | 1,400 | 200 |
| 20 | 3,900 | 1,300 | 3,100 | 970 | 2,050 | 650 | 1,600 | 380 | 1,300 | 250 | 1,100 | 180 |

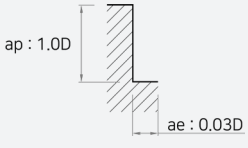
RPM = rev / min
FEED = mm / min




## ZS124, ZS1(2)04, ZS204 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 4 | 17,200 | 1,690 | 11,440 | 1,140 | 9,360 | 700 | 7,280 | 430 | 6,170 | 310 |
| 6 | 13,450 | 1,820 | 8,970 | 1,230 | 6,890 | 720 | 5,460 | 450 | 4,810 | 330 |
| 8 | 9,100 | 1,750 | 6,760 | 1,170 | 5,200 | 670 | 4,160 | 420 | 3,640 | 310 |
| 10 | 8,000 | 1,630 | 5,330 | 1,090 | 4,160 | 620 | 3,320 | 400 | 2,860 | 280 |
| 12 | 6,830 | 1,630 | 4,550 | 1,010 | 3,450 | 580 | 2,730 | 370 | 2,420 | 260 |

RPM = rev / min
FEED = mm / min

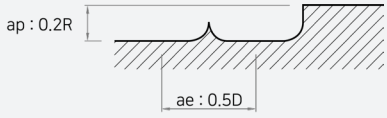


# Recommended Cutting Condition

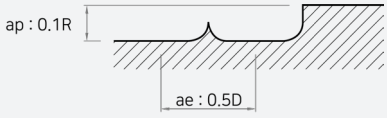
## ZSPM4 SERIES

| Workpiece | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| D X R (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 X R0.5 | 9,550 | 6,500 | 6,900 | 4,150 | 4,550 | 2,750 | 2,850 | 1,150 | 1,900 | 610 |
| 4 X R0.5 | 7,950 | 7,000 | 5,750 | 4,600 | 4,000 | 3,200 | 2,550 | 1,350 | 1,750 | 700 |
| 6 X R0.5 | 5,800 | 7,650 | 4,100 | 4,900 | 2,900 | 3,500 | 1,850 | 1,850 | 1,350 | 795 |
| 6 X R1.0 | 5,800 | 7,650 | 4,100 | 4,900 | 2,900 | 3,500 | 1,850 | 1,850 | 1,350 | 795 |
| 8 X R1.0 | 4,350 | 7,650 | 3,050 | 4,900 | 2,200 | 3,500 | 1,400 | 1,850 | 995 | 795 |
| 8 X R2.0 | 4,350 | 7,650 | 3,050 | 4,900 | 2,200 | 3,500 | 1,400 | 1,850 | 995 | 795 |
| 10 X R1.0 | 3,500 | 7,650 | 2,450 | 4,900 | 1,750 | 3,500 | 1,100 | 1,850 | 795 | 795 |
| 10 X R2.0 | 3,500 | 7,650 | 2,450 | 4,900 | 1,750 | 3,500 | 1,100 | 1,850 | 795 | 795 |
| 12 X R2.0 | 2,900 | 7,650 | 2,050 | 4,900 | 1,450 | 3,500 | 925 | 1,850 | 665 | 795 |
| 12 X R3.0 | 2,900 | 7,650 | 2,050 | 4,900 | 1,450 | 3,500 | 925 | 1,850 | 665 | 795 |

RPM = rev / min
FEED = mm / min




*ae shouldn't be over max. 0.5D

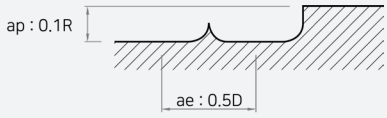



*ae shouldn't be over max. 0.5D

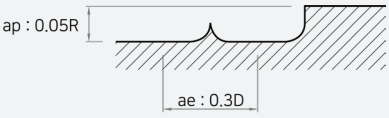
## ZSPM4 SERIES ▶ High Speed Cutting

| Workpiece | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| D X R (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 X R0.5 | 22,000 | 16,000 | 17,000 | 10,000 | 12,500 | 8,000 | 9,500 | 4,600 | 6,900 | 2,500 |
| 4 X R0.5 | 17,000 | 17,500 | 13,000 | 12,000 | 11,000 | 9,200 | 8,000 | 5,500 | 5,600 | 2,900 |
| 6 X R0.5 | 13,500 | 18,500 | 10,500 | 13,800 | 9,000 | 11,000 | 6,400 | 6,400 | 4,500 | 3,600 |
| 6 X R1.0 | 13,500 | 18,500 | 10,500 | 13,800 | 9,000 | 11,000 | 6,400 | 6,400 | 4,500 | 3,600 |
| 8 X R1.0 | 10,000 | 18,500 | 8,000 | 14,000 | 6,800 | 11,000 | 4,800 | 6,700 | 3,400 | 4,100 |
| 8 X R2.0 | 10,000 | 18,500 | 8,000 | 14,000 | 6,800 | 11,000 | 4,800 | 6,700 | 3,400 | 4,100 |
| 10 X R1.0 | 8,000 | 18,500 | 6,400 | 14,000 | 5,400 | 11,000 | 3,800 | 6,800 | 2,700 | 3,800 |
| 10 X R2.0 | 8,000 | 18,500 | 6,400 | 14,000 | 5,400 | 11,000 | 3,800 | 6,800 | 2,700 | 3,800 |
| 12 X R2.0 | 6,600 | 18,500 | 5,300 | 14,000 | 4,500 | 11,000 | 3,200 | 7,000 | 2,250 | 3,600 |
| 12 X R3.0 | 6,600 | 18,500 | 5,300 | 14,000 | 4,500 | 11,000 | 3,200 | 7,000 | 2,250 | 3,600 |

RPM = rev / min
FEED = mm / min




*ae shouldn't be over max. 0.3D




*ae shouldn't be over max. 0.3D

## ZSLNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 0.1 | 8 | 0.024 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.009 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| 0.8 | 0.1 | 4 | 0.032 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.019 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.015 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 12 | 0.012 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.2 | 4 | 0.056 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.032 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| 1 | 0.1 | 4 | 0.038 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.024 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.024 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.015 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.015 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 16 | 0.009 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.006 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.2 | 4 | 0.07 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.04 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.025 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.3 | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| 1.5 | 0.1 | 4 | 0.042 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 8 | 0.036 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 12 | 0.036 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 15 | 0.023 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.018 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.2 | 4 | 0.07 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 12 | 0.06 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 15 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.3 | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 15 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| 2 | 0.2 | 6 | 0.08 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.07 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 12 | 0.04 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 16 | 0.04 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.035 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |

# Recommended Cutting Condition

## ZSLNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 0.2 | 25 | 0.025 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 30 | 0.017 | 11,312 | 800 | 9,615 | 680 | 8,484 | 534 | 7,918 | 436 |
| 2 | 0.3 | 8 | 0.09 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |
| | | 16 | 0.06 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.037 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | 0.5 | 6 | 0.017 | 20,709 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.014 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |
| | | 12 | 0.08 | 15,309 | 1,204 | 13,013 | 1,023 | 11,482 | 802 | 10,716 | 655 |
| | | 16 | 0.08 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.05 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | | 25 | 0.05 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | | 30 | 0.03 | 11,312 | 889 | 9,615 | 756 | 8,484 | 593 | 7,918 | 484 |
| | 0.8 | 8 | 0.2 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |
| | | 16 | 0.1 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.06 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| 3 | 0.2 | 8 | 0.09 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.07 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.05 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.05 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 764 | 8,165 | 624 |
| | | 30 | 0.04 | 9,072 | 1,146 | 7,711 | 974 | 6,804 | 764 | 6,350 | 624 |
| | | 35 | 0.035 | 9,072 | 1,146 | 7,711 | 974 | 6,804 | 764 | 6,350 | 624 |
| | 0.3 | 8 | 0.13 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 16 | 0.075 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 20 | 0.075 | 11,664 | 1,274 | 9,914 | 1,083 | 8,748 | 849 | 8,165 | 693 |
| | | 30 | 0.06 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |
| | 0.5 | 8 | 0.18 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 12 | 0.13 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 16 | 0.1 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 20 | 0.1 | 11,664 | 1,274 | 9,914 | 1,083 | 8,748 | 849 | 8,165 | 693 |
| | | 30 | 0.08 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |
| | | 35 | 0.065 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |

· Please adjust the cutting depth index according to the cutting depth factors of above table.
· In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
· If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

## ZSTNR20 SERIES

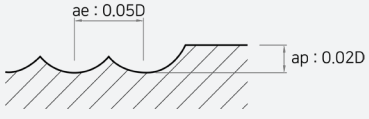
| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.2 | 0.05 | 0.5 | 0.02 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1 | 0.014 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1.5 | 0.008 | 50,000 | 240 | 45,900 | 202 | 45,900 | 170 | 45,900 | 153 |
| | | 2 | 0.008 | 42,000 | 202 | 36,700 | 176 | 36,700 | 162 | 36,700 | 147 |
| 0.3 | 0.05 | 1 | 0.021 | 50,000 | 585 | 50,000 | 456 | 50,000 | 336 | 50,000 | 320 |
| | | 1.5 | 0.016 | 50,000 | 585 | 45,000 | 456 | 45,000 | 336 | 45,000 | 320 |
| | | 2 | 0.012 | 45,000 | 530 | 45,000 | 420 | 45,000 | 300 | 45,000 | 290 |
| | | 2.5 | 0.01 | 40,000 | 471 | 40,000 | 373 | 40,000 | 267 | 40,000 | 258 |
| | | 3 | 0.008 | 35,000 | 412 | 35,000 | 326 | 30,000 | 200 | 30,000 | 194 |
| 0.4 | 0.05 | 1 | 0.025 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 1.5 | 0.02 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 2 | 0.016 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 2.5 | 0.015 | 40,500 | 480 | 40,500 | 370 | 33,400 | 270 | 30,600 | 220 |
| | | 3 | 0.014 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 3.5 | 0.012 | 36,000 | 380 | 36,000 | 300 | 29,400 | 200 | 22,920 | 180 |
| | | 4 | 0.008 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| | 0.1 | 2 | 0.028 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 3 | 0.016 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 4 | 0.01 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| 0.5 | 0.05 | 1 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.023 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 3 | 0.017 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.017 | 40,000 | 820 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.011 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.008 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | 0.1 | 1 | 0.035 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 3 | 0.02 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.02 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.013 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.013 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| 0.1 | 0.1 | 2 | 0.035 | 50,000 | 1,159 | 37,830 | 600 | 28,200 | 390 | 23,000 | 320 |
| | | 4 | 0.024 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | | 6 | 0.015 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.013 | 24,000 | 466 | 18,000 | 285 | 17,800 | 228 | 15,000 | 200 |
| | | 10 | 0.009 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| 0.8 | 0.1 | 4 | 0.032 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.019 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.015 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 12 | 0.012 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.2 | 4 | 0.056 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.032 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| 1 | 0.1 | 4 | 0.038 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.024 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |

# Recommended Cutting Condition

## DB702, DB712 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 50,000 | 1,200 | 50,000 | 1,050 | 45,000 | 960 | 40,000 | 770 | 35,000 | 674 | 31,500 | 570 |
| 0.3 | 50,000 | 1,500 | 50,000 | 1,350 | 45,000 | 1,200 | 40,000 | 965 | 35,000 | 840 | 31,500 | 700 |
| 0.4 | 50,000 | 1,900 | 50,000 | 1,700 | 45,000 | 1,500 | 40,000 | 1,200 | 35,000 | 1,050 | 31,500 | 890 |
| 0.5 | 50,000 | 2,400 | 50,000 | 2,100 | 45,000 | 1,900 | 40,000 | 1,500 | 35,000 | 1,300 | 31,500 | 1,100 |
| 0.6 | 50,000 | 2,900 | 50,000 | 2,500 | 45,000 | 2,200 | 40,000 | 1,800 | 35,000 | 1,600 | 31,500 | 1,400 |
| 0.8 | 50,000 | 3,900 | 50,000 | 3,300 | 45,000 | 3,000 | 40,000 | 2,400 | 35,000 | 2,100 | 31,500 | 1,800 |
| 1 | 50,000 | 4,800 | 50,000 | 4,200 | 45,000 | 3,800 | 40,000 | 3,000 | 35,000 | 2,600 | 35,000 | 2,300 |
| 1.5 | 50,000 | 5,400 | 48,000 | 4,500 | 43,000 | 4,000 | 37,000 | 3,100 | 33,000 | 2,700 | 29,700 | 2,300 |
| 2 | 49,700 | 5,700 | 47,800 | 4800 | 40,000 | 4,000 | 35,000 | 3,150 | 32,000 | 2,800 | 28,500 | 2,300 |
| 3 | 33,100 | 6,000 | 31,800 | 5300 | 26,500 | 4,000 | 23,500 | 3,150 | 21,000 | 2,800 | 19,000 | 2,300 |
| 4 | 24,900 | 6,000 | 23,900 | 5300 | 20,000 | 4,000 | 17,500 | 3,150 | 16,000 | 2,800 | 14,500 | 2,300 |
| 5 | 18,600 | 5,800 | 17,800 | 4900 | 15,000 | 3,750 | 13,500 | 3,050 | 11,500 | 2,550 | 10,500 | 2,100 |
| 6 | 13,900 | 4,850 | 13,400 | 4100 | 11,000 | 3,100 | 10,000 | 2,500 | 8,800 | 2,150 | 8,000 | 1,750 |
| 8 | 11,100 | 4,200 | 10,700 | 3,500 | 9,000 | 2,700 | 8,000 | 2,150 | 7,000 | 1,850 | 6,500 | 1,550 |
| 10 | 9,300 | 3,700 | 8,900 | 3,100 | 7,500 | 2,400 | 6,600 | 1,900 | 5,800 | 1,650 | 5,300 | 1,380 |
| 12 | 6,950 | 2,950 | 6,680 | 2,500 | 5,600 | 1,900 | 5,000 | 1,550 | 4,400 | 1,250 | 4,000 | 1,050 |

RPM = rev / min
FEED = mm / min




## DB703 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 57,000 | 7,100 | 55,000 | 6,000 | 46,000 | 5,000 | 40,300 | 3,900 | 36,800 | 3,500 | 32,800 | 2,900 |
| 2.5 | 57,000 | 7,100 | 55,000 | 6,000 | 46,000 | 5,000 | 40,300 | 3,900 | 36,800 | 3,500 | 32,800 | 2,900 |
| 3 | 38,000 | 7,500 | 36,600 | 6,600 | 30,500 | 5,000 | 27,000 | 3,900 | 24,200 | 3,500 | 21,900 | 2,900 |
| 4 | 28,500 | 7,500 | 27,500 | 6,600 | 23,000 | 5,000 | 20,100 | 3,900 | 18,400 | 3,500 | 16,700 | 2,900 |
| 5 | 21,500 | 7,300 | 20,500 | 6,100 | 17,300 | 4,700 | 15,500 | 3,800 | 13,200 | 3,200 | 12,100 | 2,600 |
| 6 | 16,000 | 6,100 | 15,400 | 5,100 | 12,700 | 3,900 | 11,500 | 3,100 | 10,100 | 2,700 | 9,200 | 2,200 |
| 8 | 12,700 | 5,300 | 12,300 | 4,400 | 10,400 | 3,400 | 9,200 | 2,700 | 8,100 | 2,300 | 7,500 | 1,900 |
| 10 | 10,700 | 4,600 | 10,200 | 3,900 | 8,600 | 3,000 | 7,600 | 2,400 | 6,700 | 2,100 | 6,100 | 1,700 |
| 12 | 8,000 | 3,700 | 7,700 | 3,100 | 6,400 | 2,400 | 5,800 | 1,900 | 5,100 | 1,600 | 4,600 | 1,300 |

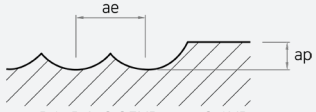
## DB734 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 62,100 | 8,600 | 59,800 | 7,200 | 50,000 | 6,000 | 43,800 | 4,700 | 40,000 | 4,200 | 35,600 | 3,500 |
| 2.5 | 62,100 | 8,600 | 59,800 | 7,200 | 50,000 | 6,000 | 43,800 | 4,700 | 40,000 | 4,200 | 35,600 | 3,500 |
| 3 | 41,400 | 9,000 | 39,800 | 8,000 | 33,100 | 6,000 | 29,400 | 4,700 | 26,300 | 4,200 | 23,800 | 3,500 |
| 4 | 31,100 | 9,000 | 29,900 | 8,000 | 25,000 | 6,000 | 21,900 | 4,700 | 20,000 | 4,200 | 18,100 | 3,500 |
| 5 | 23,300 | 8,700 | 22,300 | 7,400 | 18,800 | 5,600 | 16,900 | 4,600 | 14,400 | 3,800 | 13,100 | 3,200 |
| 6 | 17,400 | 7,300 | 16,800 | 6,200 | 13,800 | 4,700 | 12,500 | 3,800 | 11,000 | 3,200 | 10,000 | 2,600 |
| 8 | 13,900 | 6,300 | 13,400 | 5,300 | 11,300 | 4,100 | 10,000 | 3,200 | 8,800 | 2,800 | 8,100 | 2,300 |
| 10 | 11,600 | 5,600 | 11,100 | 4,700 | 9,400 | 3,600 | 8,300 | 2,900 | 7,300 | 2,500 | 6,600 | 2,100 |

## ZSLNB20 SERIES

| Work piece | Alloy Steels, Heat Resistant Steels | | | Herdened Steels | | | Herdened Steels | | | Copper, Copper alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30~HRc45 | | | HRc45~HRc55 | | | HRc55~HRc65 | | | - | | |
| Diameter (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.5 | 34,100~49,500 | 600~870 | 0.007~0.028 | 31,900~35,200 | 490~540 | 0.005~0.023 | 31,900~35,200 | 440~480 | 0.005~0.021 | 49,000~50,000 | 1,100~1,400 | 0.010~0.042 |
| 0.6 | 28,600~40,700 | 590~850 | 0.007~0.034 | 26,400~29,700 | 480~540 | 0.006~0.028 | 26,400~29,700 | 400~480 | 0.006~0.025 | 42,000~50,000 | 1,100~1,700 | 0.011~0.050 |
| 0.8 | 22,000~30,800 | 640~890 | 0.016~0.064 | 19,800~22,000 | 490~550 | 0.013~0.052 | 19,800~22,000 | 440~500 | 0.012~0.048 | 31,000~50,000 | 1,100~2,250 | 0.024~0.096 |
| 1 | 17,600~24,200 | 600~850 | 0.008~0.080 | 15,400~17,600 | 470~540 | 0.007~0.065 | 15,400~17,600 | 440~500 | 0.006~0.060 | 24,000~49,500 | 1,100~2,200 | 0.012~0.120 |
| 1.2 | 14,300~18,700 | 590~780 | 0.024~0.032 | 12,000~14,000 | 480~540 | 0.020~0.026 | 12,000~14,000 | 420~480 | 0.018~0.024 | 28,500~38,500 | 1,480~1,950 | 0.036~0.048 |
| 1.5 | 11,000~14,300 | 580~760 | 0.031~0.048 | 10,000~11,500 | 480~540 | 0.025~0.039 | 10,000~11,500 | 420~480 | 0.023~0.036 | 17,000~28,500 | 1,100~1,950 | 0.046~0.072 |
| 2 | 8,500~11,000 | 590~800 | 0.024~0.160 | 7,900~8,800 | 470~530 | 0.020~0.130 | 7,900~8,800 | 440~480 | 0.018~0.120 | 12,600~24,000 | 1,100~2,150 | 0.036~0.240 |
| 3 | 5,700~8,200 | 730~1,000 | 0.064~0.24 | 5,300~5,800 | 590~650 | 0.052~0.195 | 5,300~5,800 | 550~620 | 0.048~0.120 | 11,900~17,000 | 1,850~2,700 | 0.096~0.360 |
| 4 | 4,300~6,200 | 680~990 | 0.080~0.320 | 3,950~4,400 | 550~620 | 0.065~0.260 | 3,850~4,400 | 530~570 | 0.060~0.240 | 6,600~12,500 | 1,260~2,500 | 0.120~0.480 |

RPM = rev / min
FEED = mm / min




ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

# Recommended Cutting Condition

## ZSTNB20, ZSTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.1 | 0.2 | 1 | 0.4 | 0.017 | 40,000 | 800 | 28,000 | 504 | 26,000 | 416 | 26,000 | 364 |
| | | 1.5 | 0.4 | 0.009 | 40,000 | 800 | 28,000 | 504 | 26,000 | 416 | 26,000 | 364 |
| | | 2 | 0.9 | 0.007 | 32,000 | 461 | 22,400 | 323 | 20,800 | 266 | 20,800 | 233 |
| | | 2.5 | 0.9 | 0.004 | 26,000 | 333 | 18,200 | 204 | 16,900 | 189 | 16,900 | 162 |
| 0.15 | 0.3 | 2 | 0.4 | 0.025 | 40,000 | 1,200 | 28,000 | 756 | 26,000 | 624 | 26,000 | 546 |
| | | 3 | 0.9 | 0.013 | 32,000 | 691 | 22,400 | 484 | 20,800 | 399 | 20,800 | 349 |
| | | 4 | 0.9 | 0.01 | 26,000 | 499 | 18,200 | 306 | 16,900 | 284 | 16,900 | 243 |
| 0.2 | 0.4 | 2 | 0.4 | 0.035 | 40,000 | 1,600 | 28,000 | 1,008 | 26,000 | 832 | 26,000 | 728 |
| | | 3 | 0.4 | 0.02 | 40,000 | 1,600 | 28,000 | 1,008 | 26,000 | 832 | 26,000 | 728 |
| | | 4 | 0.4 | 0.007 | 32,000 | 922 | 22,400 | 645 | 20,800 | 532 | 20,800 | 466 |
| | | 4 | 0.9 | 0.009 | 32,000 | 922 | 22,400 | 645 | 20,800 | 532 | 20,800 | 466 |
| | | 5 | 0.4 | 0.006 | 26,000 | 666 | 18,200 | 408 | 16,900 | 379 | 16,900 | 324 |
| | | 5 | 0.9 | 0.007 | 26,000 | 666 | 18,200 | 408 | 16,900 | 379 | 16,900 | 324 |
| 0.25 | 0.5 | 4 | 0.4 | 0.04 | 40,000 | 2,000 | 28,000 | 1,260 | 26,000 | 1,040 | 26,000 | 910 |
| | | 8 | 0.9 | 0.01 | 26,000 | 728 | 18,200 | 446 | 16,900 | 414 | 16,900 | 355 |
| | | 12 | 0.9 | 0.005 | 22,400 | 627 | 15,680 | 384 | 14,560 | 357 | 14,560 | 306 |
| 0.27 | 0.54 | 2 | 0.4 | 0.05 | 40,000 | 2,160 | 28,000 | 1,361 | 26,000 | 1,123 | 26,000 | 983 |
| | | 4 | 0.4 | 0.037 | 40,000 | 2,160 | 28,000 | 1,361 | 26,000 | 1,123 | 26,000 | 983 |
| | | 5 | 0.4 | 0.031 | 40,000 | 1,512 | 28,000 | 1,176 | 26,000 | 1,040 | 26,000 | 832 |
| | | 6 | 0.4 | 0.025 | 26,000 | 1,244 | 18,200 | 871 | 16,900 | 676 | 16,900 | 629 |
| | | 6.5 | 0.4 | 0.02 | 26,000 | 1,011 | 18,200 | 619 | 16,900 | 575 | 16,900 | 493 |
| | | 7 | 0.4 | 0.015 | 26,000 | 899 | 18,200 | 585 | 16,900 | 543 | 16,900 | 465 |
| 0.3 | 0.6 | 2 | 0.4 | 0.055 | 40,000 | 2,400 | 28,000 | 1,512 | 26,000 | 1,248 | 26,000 | 1,092 |
| | | 4 | 0.4 | 0.035 | 40,000 | 2,400 | 28,000 | 1,512 | 26,000 | 1,248 | 26,000 | 1,092 |
| | | 6 | 0.4 | 0.018 | 32,000 | 1,382 | 22,400 | 968 | 20,800 | 799 | 20,800 | 699 |
| | | 6 | 0.9 | 0.02 | 32,000 | 1,382 | 22,400 | 968 | 20,800 | 799 | 20,800 | 699 |
| | | 8 | 0.9 | 0.02 | 26,000 | 998 | 18,200 | 612 | 16,900 | 568 | 16,900 | 487 |
| | | 10 | 0.4 | 0.013 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 10 | 0.9 | 0.015 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 12 | 0.9 | 0.01 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 15 | 0.4 | 0.005 | 22,400 | 753 | 15,680 | 461 | 14,560 | 367 | 14,560 | 367 |
| | | 15 | 0.9 | 0.006 | 22,400 | 753 | 15,680 | 461 | 14,560 | 367 | 14,560 | 367 |
| 0.4 | 0.8 | 4 | 0.4 | 0.062 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 6 | 0.4 | 0.045 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 8 | 0.9 | 0.026 | 25,600 | 1,475 | 17,920 | 1,032 | 16,640 | 852 | 16,640 | 745 |
| | | 12 | 0.9 | 0.02 | 20,800 | 1,065 | 14,560 | 699 | 13,520 | 606 | 13,520 | 519 |
| | | 16 | 0.9 | 0.018 | 20,800 | 932 | 14,560 | 612 | 13,520 | 530 | 13,520 | 454 |
| 0.45 | 0.9 | 4 | 0.4 | 0.063 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 8 | 0.4 | 0.05 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 12 | 0.4 | 0.037 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 16 | 0.4 | 0.024 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 18 | 0.4 | 0.018 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 20 | 0.4 | 0.015 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |
| | | 22 | 0.4 | 0.012 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |

## ZSTNB20, ZSTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.45 | 0.9 | 24 | 0.4 | 0.009 | 14,150 | 1,019 | 9,905 | 624 | 9,198 | 579 | 9,198 | 497 |
| 0.5 | 1 | 6 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 8 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 10 | 0.4 | 0.032 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 10 | 0.9 | 0.035 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 15 | 0.9 | 0.028 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.4 | 0.018 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.9 | 0.02 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 25 | 0.9 | 0.017 | 14,560 | 1,165 | 10,192 | 764 | 9,464 | 662 | 9,464 | 568 |
| | | 30 | 0.4 | 0.015 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 30 | 0.9 | 0.017 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 35 | 0.9 | 0.01 | 10,400 | 728 | 7,280 | 473 | 6,760 | 406 | 6,760 | 338 |
| | | 40 | 0.9 | 0.009 | 10,000 | 700 | 7,000 | 455 | 6,500 | 390 | 6,500 | 325 |
| | | 50 | 0.9 | 0.007 | 9,500 | 665 | 6,650 | 432 | 6,175 | 371 | 6,175 | 309 |
| | | 60 | 0.9 | 0.005 | 9,000 | 630 | 6,300 | 410 | 5,850 | 351 | 5,850 | 293 |
| | | 70 | 0.9 | 0.003 | 8,500 | 595 | 5,950 | 387 | 5,525 | 332 | 5,525 | 276 |
| 0.75 | 1.5 | 8 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 10 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 12 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 15 | 0.9 | 0.045 | 13,568 | 1,832 | 9,498 | 1,282 | 8,819 | 1,058 | 8,819 | 926 |
| | | 20 | 0.9 | 0.04 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| | | 30 | 0.9 | 0.028 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| 0.9 | 1.8 | 4 | 0.4 | 0.12 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 8 | 0.4 | 0.1 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 12 | 0.4 | 0.08 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 16 | 0.4 | 0.071 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 20 | 0.4 | 0.062 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 24 | 0.4 | 0.053 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 28 | 0.4 | 0.044 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 32 | 0.4 | 0.036 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 36 | 0.4 | 0.028 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 38 | 0.4 | 0.02 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |
| | | 40 | 0.4 | 0.015 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |
| 1 | 2 | 8 | 0.4 | 0.15 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 12 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 16 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 20 | 0.4 | 0.06 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 20 | 0.9 | 0.07 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 25 | 0.9 | 0.07 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.4 | 0.04 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 35 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.4 | 0.03 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.9 | 0.035 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |

# Recommended Cutting Condition

## ZSTNB20, ZSTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | | Depth of Cut X 100% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 2 | 50 | 0.9 | 0.17 | 8,512 | 1,192 | 5,958 | 775 | 5,533 | 664 | 5,533 | 553 |
| | | 60 | 0.9 | 0.009 | 7,235 | 1,013 | 5,065 | 658 | 4,703 | 564 | 4,703 | 470 |
| | | 70 | 0.9 | 0.005 | 6,150 | 861 | 4,305 | 560 | 3,997 | 480 | 3,997 | 400 |
| 1.5 | 3 | 8 | 0.4 | 0.32 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 16 | 0.4 | 0.22 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 20 | 0.4 | 0.15 | 12,720 | 3,434 | 8,904 | 2,137 | 8,268 | 1,736 | 8,268 | 1,488 |
| | | 30 | 0.4 | 0.08 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 30 | 0.9 | 0.09 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 40 | 0.4 | 0.06 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 40 | 0.9 | 0.07 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 50 | 0.9 | 0.05 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 60 | 0.9 | 0.03 | 7,123 | 1,710 | 4,986 | 1,047 | 4,630 | 972 | 4,630 | 833 |
| | | 70 | 0.9 | 0.02 | 6,233 | 1,496 | 4,363 | 916 | 4,051 | 851 | 4,051 | 729 |
| 2 | 4 | 20 | 1 | 0.32 | 11,900 | 2,860 | 9,000 | 2,050 | 7,800 | 1,680 | 7,800 | 1,590 |
| | | 30 | 1 | 0.23 | 11,900 | 2,570 | 9,000 | 1,850 | 7,800 | 1,520 | 7,800 | 1,430 |
| | | 40 | 1 | 0.14 | 9,500 | 1,940 | 7,200 | 1,400 | 6,200 | 1,140 | 6,200 | 1,080 |
| | | 50 | 1 | 0.11 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| | | 60 | 1 | 0.07 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| 2.5 | 5 | 30 | 1 | 0.34 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 40 | 1 | 0.25 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 60 | 1 | 0.15 | 6,200 | 1,320 | 4,700 | 950 | 4,000 | 770 | 4,000 | 720 |
| 3 | 6 | 30 | 1 | 0.45 | 8,000 | 2,000 | 6,000 | 1,430 | 5,200 | 1,170 | 5,200 | 1,110 |
| | | 40 | 1 | 0.4 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 50 | 1 | 0.32 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 60 | 1 | 0.22 | 6,400 | 1,360 | 4,800 | 970 | 4,100 | 780 | 4,100 | 740 |
| | | 70 | 1 | 0.18 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| | | 80 | 1 | 0.14 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| 4 | 8 | 50 | 1 | 0.5 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 60 | 1 | 0.43 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 70 | 1 | 0.33 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 80 | 1 | 0.25 | 4,800 | 1,100 | 3,600 | 780 | 3,100 | 640 | 3,100 | 600 |
| 5 | 10 | 60 | 1 | 0.7 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |
| | | 75 | 1 | 0.5 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |

· Please adjust the cutting depth index according to the cutting depth factors of above table.

· For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.

ex)ZSTNB2040-20-10, HRC 55, Rib processing

Cutting depth : 0.32(standard cutting depth) X 0.65 X 0.8 = 0.17mm

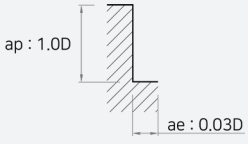
· In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.

· If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

## ESE702 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,050 | 38,000 | 820 | 25,500 | 510 | 20,500 | 310 | 16,000 | 190 | 12,500 | 125 |
| 2 | 33,300 | 1,200 | 26,000 | 970 | 17,500 | 600 | 14,500 | 370 | 11,000 | 230 | 9,500 | 165 |
| 3 | 21,800 | 1,200 | 17,300 | 970 | 11,500 | 600 | 9,500 | 370 | 7,500 | 230 | 6,400 | 165 |
| 4 | 16,700 | 1,250 | 13,200 | 1,000 | 8,800 | 625 | 7,200 | 385 | 5,600 | 240 | 4,750 | 170 |
| 5 | 15,700 | 1,450 | 12,500 | 1,150 | 8,300 | 710 | 6,400 | 410 | 5,100 | 260 | 4,450 | 190 |
| 6 | 13,100 | 1,350 | 10,350 | 1,100 | 6,900 | 690 | 5,300 | 400 | 4,200 | 255 | 3,700 | 185 |
| 8 | 9,880 | 1,320 | 7,800 | 1,030 | 5,200 | 635 | 4,000 | 365 | 3,200 | 235 | 2,800 | 170 |
| 10 | 7,800 | 1,200 | 6,150 | 970 | 4,100 | 590 | 3,200 | 340 | 2,550 | 220 | 2,200 | 160 |
| 12 | 6,650 | 1,200 | 5,250 | 970 | 3,500 | 590 | 2,650 | 340 | 2,100 | 220 | 1,860 | 160 |
| 16 | 4,900 | 1,050 | 3,900 | 840 | 2,600 | 520 | 2,000 | 300 | 1,600 | 190 | 1,400 | 140 |
| 20 | 3,900 | 950 | 3,100 | 750 | 2,050 | 475 | 1,600 | 275 | 1,300 | 175 | 1,100 | 125 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## ESE702 SERIES ▶ Slotting

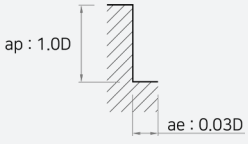
| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ~0.2 | 50,000 | 130 | 45,000 | 115 | 40,000 | 95 | 33,000 | 60 | 33,000 | 45 | 26,400 | 30 |
| 0.3 | 50,000 | 190 | 45,000 | 140 | 40,000 | 115 | 33,000 | 70 | 25,000 | 50 | 20,000 | 35 |
| 0.4 | 50,000 | 235 | 45,000 | 180 | 40,000 | 140 | 33,000 | 90 | 25,000 | 55 | 20,000 | 40 |
| 0.5 | 50,000 | 370 | 45,000 | 280 | 40,000 | 220 | 33,000 | 140 | 25,000 | 85 | 20,000 | 60 |
| 0.6 | 50,000 | 470 | 45,000 | 360 | 40,000 | 285 | 33,000 | 160 | 25,000 | 105 | 20,000 | 75 |
| 0.8 | 50,000 | 600 | 40,000 | 440 | 30,000 | 295 | 25,000 | 185 | 19,000 | 110 | 15,200 | 80 |
| 0.9 | 49,000 | 655 | 39,000 | 520 | 27,800 | 330 | 22,700 | 205 | 17,500 | 125 | 14,000 | 90 |
| 1 | 48,000 | 750 | 38,000 | 570 | 25,500 | 360 | 20,500 | 215 | 16,000 | 135 | 12,500 | 85 |
| 2 | 33,300 | 850 | 26,000 | 680 | 17,500 | 420 | 14,500 | 260 | 11,000 | 160 | 9,500 | 115 |
| 3 | 21,800 | 850 | 17,300 | 680 | 11,500 | 420 | 9,500 | 260 | 7,500 | 160 | 6,400 | 115 |
| 4 | 16,700 | 880 | 13,200 | 700 | 8,800 | 440 | 7,200 | 270 | 5,600 | 170 | 4,750 | 118 |
| 5 | 15,700 | 1,000 | 12,500 | 805 | 8,300 | 500 | 6,400 | 285 | 5,100 | 180 | 4,450 | 132 |
| 6 | 13,100 | 950 | 10,350 | 770 | 6,900 | 480 | 5,300 | 280 | 4,200 | 180 | 3,700 | 130 |
| 8 | 9,880 | 930 | 7,800 | 720 | 5,200 | 445 | 4,000 | 255 | 3,200 | 165 | 2,800 | 120 |
| 10 | 7,800 | 850 | 6,150 | 680 | 4,100 | 415 | 3,200 | 240 | 2,550 | 155 | 2,200 | 122 |
| 12 | 6,650 | 850 | 5,250 | 680 | 3,500 | 415 | 2,650 | 240 | 2,100 | 155 | 1,860 | 112 |
| 16 | 4,900 | 730 | 3,900 | 580 | 2,600 | 365 | 2,000 | 210 | 1,600 | 135 | 1,400 | 95 |
| 20 | 3,900 | 660 | 3,100 | 525 | 2,050 | 335 | 1,600 | 195 | 1,300 | 125 | 1,100 | 85 |

RPM = rev / min
FEED = mm / min

## ESE712 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,050 | 38,000 | 820 | 25,500 | 510 | 20,500 | 310 | 16,000 | 190 | 12,500 | 125 |
| 2 | 33,300 | 1,200 | 26,000 | 970 | 17,500 | 600 | 14,500 | 370 | 11,000 | 230 | 9,500 | 165 |
| 3 | 21,800 | 1,200 | 17,300 | 970 | 11,500 | 600 | 9,500 | 370 | 7,500 | 230 | 6,400 | 165 |
| 4 | 16,700 | 1,250 | 13,200 | 1,000 | 8,800 | 625 | 7,200 | 385 | 5,600 | 240 | 4,750 | 170 |
| 5 | 15,700 | 1,450 | 12,500 | 1,150 | 8,300 | 710 | 6,400 | 410 | 5,100 | 260 | 4,450 | 190 |
| 6 | 13,100 | 1,350 | 10,350 | 1,100 | 6,900 | 690 | 5,300 | 400 | 4,200 | 255 | 3,700 | 185 |
| 8 | 9,880 | 1,320 | 7,800 | 1,030 | 5,200 | 635 | 4,000 | 365 | 3,200 | 235 | 2,800 | 170 |
| 10 | 7,800 | 1,200 | 6,150 | 970 | 4,100 | 590 | 3,200 | 340 | 2,550 | 220 | 2,200 | 160 |
| 12 | 6,650 | 1,200 | 5,250 | 970 | 3,500 | 590 | 2,650 | 340 | 2,100 | 220 | 1,860 | 160 |
| 16 | 4,900 | 1,050 | 3,900 | 840 | 2,600 | 520 | 2,000 | 300 | 1,600 | 190 | 1,400 | 140 |
| 20 | 3,900 | 950 | 3,100 | 750 | 2,050 | 475 | 1,600 | 275 | 1,300 | 175 | 1,100 | 125 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## ESE712 SERIES ▶ Slotting

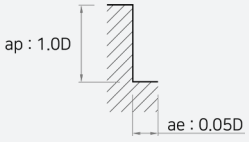
| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 50,000 | 130 | 45,000 | 115 | 40,000 | 95 | 33,000 | 60 | 33,000 | 45 | 26,400 | 30 |
| 0.3 | 50,000 | 190 | 45,000 | 140 | 40,000 | 115 | 33,000 | 70 | 25,000 | 50 | 20,000 | 35 |
| 0.4 | 50,000 | 235 | 45,000 | 180 | 40,000 | 140 | 33,000 | 90 | 25,000 | 55 | 20,000 | 40 |
| 0.5 | 50,000 | 370 | 45,000 | 280 | 40,000 | 220 | 33,000 | 140 | 25,000 | 85 | 20,000 | 60 |
| 0.6 | 50,000 | 470 | 45,000 | 360 | 40,000 | 285 | 30,000 | 160 | 25,000 | 105 | 20,000 | 75 |
| 0.8 | 50,000 | 600 | 40,000 | 440 | 30,000 | 295 | 25,000 | 185 | 19,000 | 110 | 15,200 | 80 |
| 0.9 | 49,000 | 655 | 39,000 | 520 | 27,800 | 330 | 22,700 | 205 | 17,500 | 125 | 14,000 | 90 |
| 1 | 48,000 | 750 | 38,000 | 570 | 25,500 | 360 | 20,500 | 215 | 16,000 | 135 | 12,500 | 85 |
| 2 | 33,300 | 850 | 26,000 | 680 | 17,500 | 420 | 14,500 | 260 | 11,000 | 160 | 9,500 | 115 |
| 3 | 21,800 | 850 | 17,300 | 680 | 11,500 | 420 | 9,500 | 260 | 7,500 | 160 | 6,400 | 115 |
| 4 | 16,700 | 880 | 13,200 | 700 | 8,800 | 440 | 7,200 | 270 | 5,600 | 170 | 4,750 | 118 |
| 5 | 15,700 | 1,000 | 12,500 | 805 | 8,300 | 500 | 6,400 | 285 | 5,100 | 180 | 4,450 | 132 |
| 6 | 13,100 | 950 | 10,350 | 770 | 6,900 | 480 | 5,300 | 280 | 4,200 | 180 | 3,700 | 130 |
| 8 | 9,880 | 930 | 7,800 | 720 | 5,200 | 445 | 4,000 | 255 | 3,200 | 165 | 2,800 | 120 |
| 10 | 7,800 | 850 | 6,150 | 680 | 4,100 | 415 | 3,200 | 240 | 2,550 | 155 | 2,200 | 112 |
| 12 | 6,650 | 850 | 5,250 | 680 | 3,500 | 415 | 2,650 | 240 | 2,100 | 155 | 1,860 | 112 |
| 16 | 4,900 | 730 | 3,900 | 580 | 2,600 | 365 | 2,000 | 210 | 1,600 | 135 | 1,400 | 95 |
| 20 | 3,900 | 660 | 3,100 | 525 | 2,050 | 335 | 1,600 | 195 | 1,300 | 125 | 1,100 | 85 |

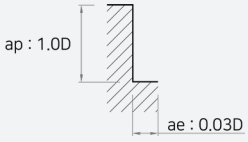
RPM = rev / min
FEED = mm / min

## ESE704, ESE714, ESE744 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,480 | 38,000 | 1,050 | 25,500 | 710 | 20,500 | 430 | 16,000 | 270 | 12,500 | 175 |
| 2 | 33,300 | 1,750 | 26,000 | 1,250 | 17,500 | 840 | 14,500 | 520 | 11,000 | 320 | 9,500 | 230 |
| 3 | 21,800 | 1,750 | 17,300 | 1,250 | 11,500 | 840 | 9,500 | 520 | 7,500 | 320 | 6,400 | 230 |
| 4 | 16,700 | 1,800 | 13,200 | 1,300 | 8,800 | 880 | 7,200 | 540 | 5,600 | 335 | 4,750 | 240 |
| 5 | 15,700 | 2,000 | 12,500 | 1,500 | 8,300 | 1,000 | 6,400 | 580 | 5,100 | 370 | 4,450 | 270 |
| 6 | 13,100 | 1,950 | 10,350 | 1,400 | 6,900 | 950 | 5,300 | 560 | 4,200 | 350 | 3,700 | 260 |
| 8 | 9,880 | 1,880 | 7,800 | 1,350 | 5,200 | 900 | 4,000 | 520 | 3,200 | 330 | 2,800 | 240 |
| 10 | 7,800 | 1,750 | 6,150 | 1,260 | 4,100 | 840 | 3,200 | 480 | 2,550 | 310 | 2,200 | 220 |
| 12 | 6,650 | 1,750 | 5,250 | 1,260 | 3,500 | 840 | 2,650 | 480 | 2,100 | 300 | 1,860 | 220 |
| 16 | 4,900 | 1,500 | 3,900 | 1,100 | 2,600 | 730 | 2,000 | 420 | 1,600 | 270 | 1,400 | 200 |
| 20 | 3,900 | 1,300 | 3,100 | 970 | 2,050 | 650 | 1,600 | 380 | 1,300 | 250 | 1,100 | 180 |

RPM = rev / min
FEED = mm / min

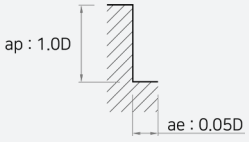


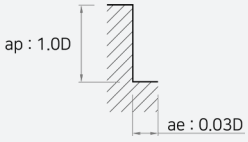




## ESE724 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 1,480 | 38,000 | 1,050 | 25,500 | 710 | 20,500 | 430 | 16,000 | 270 | 12,500 | 175 |
| 2 | 33,300 | 1,750 | 26,000 | 1,250 | 17,500 | 840 | 14,500 | 520 | 11,000 | 320 | 9,500 | 230 |
| 3 | 21,800 | 1,750 | 17,300 | 1,250 | 11,500 | 840 | 9,500 | 520 | 7,500 | 320 | 6,400 | 230 |
| 4 | 16,700 | 1,800 | 13,200 | 1,300 | 8,800 | 880 | 7,200 | 540 | 5,600 | 335 | 4,750 | 240 |
| 5 | 15,700 | 2,000 | 12,500 | 1,500 | 8,300 | 1,000 | 6,400 | 580 | 5,100 | 370 | 4,450 | 270 |
| 6 | 13,100 | 1,950 | 10,350 | 1,400 | 6,900 | 950 | 5,300 | 560 | 4,200 | 350 | 3,700 | 260 |
| 8 | 9,880 | 1,880 | 7,800 | 1,350 | 5,200 | 900 | 4,000 | 520 | 3,200 | 330 | 2,800 | 240 |
| 10 | 7,800 | 1,750 | 6,150 | 1,260 | 4,100 | 840 | 3,200 | 480 | 2,550 | 310 | 2,200 | 220 |
| 12 | 6,650 | 1,750 | 5,250 | 1,260 | 3,500 | 840 | 2,650 | 480 | 2,100 | 300 | 1,860 | 220 |
| 16 | 4,900 | 1,500 | 3,900 | 1,100 | 2,600 | 730 | 2,000 | 420 | 1,600 | 270 | 1,400 | 200 |
| 20 | 3,900 | 1,300 | 3,100 | 970 | 2,050 | 650 | 1,600 | 380 | 1,300 | 250 | 1,100 | 180 |

RPM = rev / min
FEED = mm / min



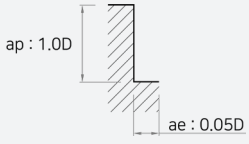



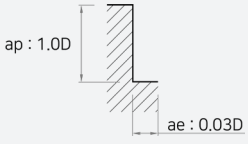
# Recommended Cutting Condition

## ESE726, ESR736 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 24,800 | 5,350 | 23,500 | 4,900 | 16,000 | 4,900 | 13,500 | 3,300 | 10,500 | 2,100 | 8,000 | 1,450 |
| 8 | 20,000 | 5,500 | 19,000 | 5,000 | 12,000 | 4,600 | 10,000 | 3,100 | 8,000 | 2,000 | 6,000 | 1,400 |
| 10 | 16,000 | 4,900 | 15,500 | 4,500 | 9,500 | 4,100 | 8,000 | 2,900 | 6,400 | 1,800 | 4,800 | 1,300 |
| 12 | 13,000 | 4,500 | 12,500 | 4,100 | 8,000 | 3,800 | 6,600 | 2,500 | 5,300 | 1,600 | 4,000 | 1,150 |
| 16 | 10,000 | 4,000 | 9,700 | 3,700 | 6,000 | 3,400 | 5,000 | 2,300 | 4,000 | 1,250 | 3,000 | 870 |
| 20 | 8,000 | 3,350 | 7,800 | 3,400 | 4,800 | 3,200 | 4,000 | 2,100 | 3,200 | 1,020 | 2,400 | 690 |

RPM = rev / min
FEED = mm / min

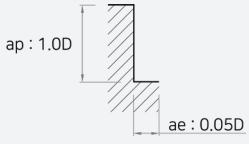


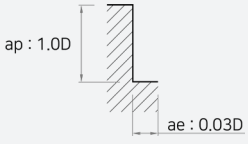




## ESE716 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 24,800 | 5,350 | 23,500 | 4,900 | 16,000 | 4,900 | 13,500 | 3,300 | 10,500 | 2,100 | 8,000 | 1,450 |
| 8 | 20,000 | 5,500 | 19,000 | 5,000 | 12,000 | 4,600 | 10,000 | 3,100 | 8,000 | 2,000 | 6,000 | 1,400 |
| 10 | 16,000 | 4,900 | 15,500 | 4,500 | 9,500 | 4,100 | 8,000 | 2,900 | 6,400 | 1,800 | 4,800 | 1,300 |
| 12 | 13,000 | 4,500 | 12,500 | 4,100 | 8,000 | 3,800 | 6,600 | 2,500 | 5,300 | 1,600 | 4,000 | 1,150 |
| 16 | 10,000 | 4,000 | 9,700 | 3,700 | 6,000 | 3,400 | 5,000 | 2,300 | 4,000 | 1,250 | 3,000 | 870 |
| 20 | 8,000 | 3,350 | 7,800 | 3,400 | 4,800 | 3,200 | 4,000 | 2,100 | 3,200 | 1,020 | 2,400 | 690 |

RPM = rev / min
FEED = mm / min



## ESRE712 SERIES ▶ Side Cutting

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.1 | 0.3 | 50,000 | 315 | 0.009 | 46,200 | 230 | 0.007 | 40,600 | 170 | 0.005 |
| | 0.5 | 50,000 | 315 | 0.006 | 46,200 | 230 | 0.005 | 40,600 | 170 | 0.004 |
| | 1 | 45,000 | 255 | 0.002 | 41,580 | 185 | 0.002 | 36,540 | 140 | 0.001 |
| 0.2 | 0.5 | 38,500 | 380 | 0.018 | 36,300 | 270 | 0.014 | 32,100 | 200 | 0.01 |
| | 1 | 38,500 | 380 | 0.013 | 36,300 | 270 | 0.01 | 32,100 | 200 | 0.007 |
| | 1.5 | 34,650 | 310 | 0.007 | 32,670 | 220 | 0.006 | 28,890 | 160 | 0.004 |
| | 2 | 34,650 | 310 | 0.005 | 32,670 | 220 | 0.004 | 28,890 | 160 | 0.003 |
| 0.3 | 1 | 34,200 | 390 | 0.019 | 32,300 | 270 | 0.015 | 28,500 | 230 | 0.011 |
| | 1.5 | 34,200 | 390 | 0.019 | 32,300 | 270 | 0.015 | 25,800 | 230 | 0.011 |
| | 2 | 30,780 | 315 | 0.011 | 29,070 | 220 | 0.008 | 25,650 | 185 | 0.006 |
| | 2.5 | 30,780 | 315 | 0.007 | 29,070 | 220 | 0.005 | 25,650 | 185 | 0.004 |
| | 3 | 30,780 | 315 | 0.007 | 29,070 | 220 | 0.005 | 25,650 | 185 | 0.004 |
| | 4 | 27,360 | 250 | 0.004 | 25,840 | 175 | 0.003 | 22,800 | 145 | 0.002 |
| | 5 | 20,520 | 165 | 0.003 | 19,380 | 115 | 0.002 | 17,100 | 95 | 0.002 |
| 0.4 | 1 | 27,400 | 540 | 0.036 | 25,800 | 380 | 0.028 | 22,800 | 280 | 0.02 |
| | 1.5 | 27,400 | 540 | 0.025 | 25,800 | 380 | 0.02 | 22,800 | 280 | 0.014 |
| | 2 | 27,400 | 540 | 0.025 | 25,800 | 380 | 0.02 | 22,800 | 280 | 0.014 |
| | 2.5 | 24,660 | 435 | 0.014 | 23,220 | 310 | 0.011 | 20,520 | 225 | 0.008 |
| | 3 | 24,660 | 435 | 0.014 | 23,220 | 310 | 0.011 | 20,520 | 225 | 0.008 |
| | 4 | 24,660 | 435 | 0.009 | 23,220 | 310 | 0.007 | 20,520 | 225 | 0.005 |
| | 5 | 21,920 | 345 | 0.009 | 20,640 | 245 | 0.007 | 18,240 | 180 | 0.005 |
| | 6 | 21,920 | 345 | 0.005 | 20,640 | 245 | 0.004 | 18,240 | 180 | 0.003 |
| | 8 | 16,440 | 225 | 0.004 | 15,480 | 160 | 0.003 | 13,680 | 120 | 0.002 |
| | 10 | 8,220 | 95 | 0.004 | 7,740 | 70 | 0.003 | 6,840 | 50 | 0.002 |
| 0.5 | 1 | 27,400 | 540 | 0.045 | 25,800 | 425 | 0.035 | 22,800 | 285 | 0.025 |
| | 1.5 | 27,400 | 540 | 0.045 | 25,800 | 425 | 0.035 | 22,800 | 285 | 0.025 |
| | 2 | 27,400 | 540 | 0.032 | 25,800 | 425 | 0.025 | 22,800 | 285 | 0.018 |
| | 2.5 | 27,400 | 540 | 0.032 | 25,800 | 425 | 0.025 | 22,800 | 285 | 0.018 |
| | 3 | 24,660 | 435 | 0.018 | 23,220 | 345 | 0.014 | 20,520 | 230 | 0.01 |
| | 4 | 24,660 | 435 | 0.018 | 23,220 | 345 | 0.014 | 20,520 | 230 | 0.01 |
| | 5 | 24,660 | 435 | 0.011 | 23,220 | 345 | 0.009 | 20,520 | 230 | 0.006 |
| | 6 | 21,920 | 345 | 0.011 | 20,640 | 270 | 0.009 | 18,240 | 180 | 0.006 |
| | 8 | 16,440 | 225 | 0.007 | 15,480 | 180 | 0.005 | 13,680 | 120 | 0.004 |
| | 10 | 16,440 | 225 | 0.005 | 15,480 | 180 | 0.004 | 13,680 | 120 | 0.003 |
| | 12 | 8,220 | 95 | 0.005 | 7,740 | 75 | 0.004 | 6,840 | 50 | 0.003 |
| | 14 | 8,220 | 95 | 0.005 | 7,740 | 75 | 0.004 | 6,840 | 50 | 0.003 |
| | 16 | 2,740 | 25 | 0.005 | 2,580 | 20 | 0.004 | 2,280 | 15 | 0.003 |
| 0.6 | 2 | 27,400 | 775 | 0.038 | 25,800 | 545 | 0.029 | 22,800 | 405 | 0.021 |
| | 3 | 27,400 | 775 | 0.038 | 25,800 | 545 | 0.029 | 22,800 | 405 | 0.021 |
| | 4 | 24,660 | 630 | 0.022 | 23,220 | 440 | 0.017 | 20,520 | 330 | 0.012 |
| | 5 | 24,660 | 630 | 0.014 | 23,220 | 440 | 0.011 | 20,520 | 330 | 0.008 |
| | 6 | 24,660 | 630 | 0.014 | 23,220 | 440 | 0.011 | 20,520 | 330 | 0.008 |
| | 8 | 21,920 | 495 | 0.008 | 20,640 | 350 | 0.006 | 18,240 | 260 | 0.005 |

# Recommended Cutting Condition

## ESRE712 SERIES ▶ Side Cutting

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.6 | 10 | 16,440 | 325 | 0.005 | 15,480 | 230 | 0.004 | 13,680 | 170 | 0.003 |
| | 12 | 16,440 | 325 | 0.005 | 15,480 | 230 | 0.004 | 13,680 | 170 | 0.003 |
| | 14 | 8,220 | 140 | 0.005 | 7,740 | 100 | 0.004 | 6,840 | 75 | 0.003 |
| | 16 | 8,220 | 140 | 0.005 | 7,740 | 100 | 0.004 | 6,840 | 75 | 0.003 |
| 0.7 | 2 | 27,400 | 775 | 0.063 | 25,800 | 545 | 0.049 | 22,800 | 405 | 0.035 |
| | 4 | 24,660 | 630 | 0.025 | 23,220 | 440 | 0.02 | 20,520 | 330 | 0.014 |
| | 6 | 24,660 | 630 | 0.016 | 23,220 | 440 | 0.012 | 20,520 | 330 | 0.009 |
| | 8 | 21,920 | 495 | 0.016 | 20,640 | 350 | 0.012 | 18,240 | 260 | 0.009 |
| | 10 | 21,920 | 495 | 0.009 | 20,640 | 350 | 0.007 | 18,240 | 260 | 0.005 |
| | 12 | 16,440 | 325 | 0.009 | 15,480 | 230 | 0.005 | 13,680 | 170 | 0.004 |
| 0.8 | 2 | 27,400 | 775 | 0.072 | 25,800 | 605 | 0.056 | 22,800 | 450 | 0.04 |
| | 3 | 27,400 | 775 | 0.05 | 25,800 | 605 | 0.039 | 22,800 | 450 | 0.028 |
| | 4 | 27,400 | 775 | 0.05 | 25,800 | 605 | 0.039 | 22,800 | 450 | 0.028 |
| | 5 | 24,660 | 630 | 0.029 | 23,220 | 490 | 0.022 | 20,520 | 365 | 0.016 |
| | 6 | 24,660 | 630 | 0.029 | 23,220 | 490 | 0.022 | 20,520 | 365 | 0.016 |
| | 8 | 24,660 | 630 | 0.018 | 23,220 | 490 | 0.014 | 20,520 | 365 | 0.01 |
| | 10 | 21,920 | 495 | 0.018 | 20,640 | 385 | 0.014 | 18,240 | 290 | 0.01 |
| | 12 | 21,920 | 495 | 0.011 | 20,640 | 385 | 0.008 | 18,240 | 290 | 0.006 |
| | 14 | 16,440 | 325 | 0.007 | 15,480 | 255 | 0.006 | 13,680 | 190 | 0.004 |
| | 16 | 16,440 | 325 | 0.007 | 15,480 | 255 | 0.006 | 13,680 | 190 | 0.004 |
| | 20 | 8,220 | 140 | 0.007 | 7,740 | 110 | 0.006 | 6,840 | 80 | 0.004 |
| 0.9 | 6 | 22,140 | 575 | 0.032 | 20,970 | 440 | 0.025 | 18,450 | 330 | 0.018 |
| | 8 | 22,140 | 575 | 0.02 | 20,970 | 440 | 0.016 | 18,450 | 330 | 0.011 |
| | 10 | 19,680 | 455 | 0.02 | 18,640 | 350 | 0.016 | 16,400 | 260 | 0.011 |
| 1 | 2 | 24,600 | 1,045 | 0.09 | 23,300 | 890 | 0.07 | 20,500 | 665 | 0.05 |
| | 3 | 24,600 | 1,045 | 0.09 | 23,300 | 890 | 0.07 | 20,500 | 665 | 0.05 |
| | 4 | 24,600 | 1,045 | 0.063 | 23,300 | 890 | 0.049 | 20,500 | 665 | 0.035 |
| | 5 | 24,600 | 1,045 | 0.063 | 23,300 | 890 | 0.049 | 20,500 | 665 | 0.035 |
| | 6 | 22,140 | 845 | 0.036 | 20,970 | 720 | 0.028 | 18,450 | 540 | 0.02 |
| | 7 | 22,140 | 845 | 0.036 | 20,970 | 720 | 0.028 | 18,450 | 540 | 0.02 |
| | 8 | 22,140 | 845 | 0.036 | 20,970 | 720 | 0.028 | 18,450 | 540 | 0.02 |
| | 10 | 22,140 | 845 | 0.023 | 20,970 | 720 | 0.018 | 18,450 | 540 | 0.013 |
| | 12 | 19,680 | 670 | 0.023 | 18,640 | 570 | 0.018 | 16,400 | 425 | 0.013 |
| | 14 | 19,680 | 670 | 0.014 | 18,640 | 570 | 0.011 | 16,400 | 425 | 0.008 |
| | 16 | 14,760 | 440 | 0.014 | 13,980 | 375 | 0.011 | 12,300 | 280 | 0.008 |
| | 18 | 14,760 | 440 | 0.009 | 13,980 | 375 | 0.007 | 12,300 | 280 | 0.005 |
| | 20 | 14,760 | 440 | 0.009 | 13,980 | 375 | 0.007 | 12,300 | 280 | 0.005 |
| | 22 | 7,380 | 190 | 0.009 | 6,990 | 160 | 0.007 | 6,150 | 120 | 0.005 |
| | 26 | 7,380 | 190 | 0.009 | 6,990 | 160 | 0.007 | 6,150 | 120 | 0.005 |
| | 30 | 7,380 | 190 | 0.009 | 6,990 | 160 | 0.007 | 6,150 | 120 | 0.005 |
| | 40 | 2,460 | 50 | 0.009 | 2,330 | 45 | 0.007 | 2,050 | 35 | 0.005 |
| | 50 | 2,460 | 50 | 0.006 | 2,330 | 45 | 0.005 | 2,050 | 35 | 0.003 |
| 1.2 | 4 | 21,900 | 930 | 0.076 | 20,700 | 720 | 0.059 | 18,200 | 485 | 0.042 |

## ESRE712 SERIES ▶ Side Cutting

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 1.2 | 6 | 21,900 | 930 | 0.076 | 20,700 | 720 | 0.059 | 18,200 | 485 | 0.042 |
| | 8 | 19,710 | 755 | 0.043 | 18,630 | 585 | 0.034 | 16,380 | 395 | 0.024 |
| | 10 | 19,710 | 755 | 0.027 | 18,630 | 585 | 0.021 | 16,380 | 395 | 0.015 |
| | 12 | 19,710 | 755 | 0.027 | 18,630 | 585 | 0.021 | 16,380 | 395 | 0.015 |
| | 14 | 17,520 | 595 | 0.027 | 16,560 | 460 | 0.021 | 14,560 | 310 | 0.015 |
| | 16 | 17,520 | 595 | 0.016 | 16,560 | 460 | 0.013 | 14,560 | 310 | 0.009 |
| | 20 | 13,140 | 390 | 0.011 | 12,420 | 300 | 0.008 | 10,920 | 205 | 0.006 |
| | 26 | 6,570 | 165 | 0.011 | 6,210 | 130 | 0.008 | 5,460 | 85 | 0.006 |
| | 30 | 6,570 | 165 | 0.011 | 6,210 | 130 | 0.008 | 5,460 | 85 | 0.006 |
| 1.4 | 6 | 19,200 | 815 | 0.088 | 18,100 | 570 | 0.069 | 16,000 | 425 | 0.049 |
| | 8 | 17,280 | 660 | 0.05 | 16,290 | 460 | 0.039 | 14,400 | 345 | 0.028 |
| | 10 | 17,280 | 660 | 0.05 | 16,290 | 460 | 0.039 | 14,400 | 345 | 0.028 |
| | 14 | 17,280 | 660 | 0.032 | 16,290 | 460 | 0.025 | 14,400 | 345 | 0.018 |
| | 16 | 15,360 | 520 | 0.032 | 14,480 | 365 | 0.025 | 12,800 | 270 | 0.018 |
| | 20 | 15,360 | 520 | 0.019 | 14,480 | 365 | 0.015 | 12,800 | 270 | 0.011 |
| 1.5 | 4 | 19,200 | 905 | 0.135 | 18,100 | 635 | 0.105 | 16,000 | 475 | 0.075 |
| | 5 | 19,200 | 905 | 0.095 | 18,100 | 635 | 0.074 | 16,000 | 475 | 0.053 |
| | 6 | 19,200 | 905 | 0.095 | 18,100 | 635 | 0.074 | 16,000 | 475 | 0.053 |
| | 7 | 19,200 | 905 | 0.095 | 18,100 | 635 | 0.074 | 16,000 | 475 | 0.053 |
| | 8 | 17,280 | 735 | 0.054 | 16,290 | 515 | 0.042 | 14,400 | 385 | 0.03 |
| | 10 | 17,280 | 735 | 0.054 | 16,290 | 515 | 0.042 | 14,400 | 385 | 0.03 |
| | 12 | 17,280 | 735 | 0.054 | 16,290 | 515 | 0.042 | 14,400 | 385 | 0.03 |
| | 14 | 17,280 | 735 | 0.034 | 16,290 | 515 | 0.026 | 14,400 | 385 | 0.019 |
| | 16 | 15,360 | 580 | 0.034 | 14,480 | 405 | 0.026 | 12,800 | 305 | 0.019 |
| | 18 | 15,360 | 580 | 0.034 | 14,480 | 405 | 0.026 | 12,800 | 305 | 0.019 |
| | 20 | 15,360 | 580 | 0.02 | 14,480 | 405 | 0.016 | 12,800 | 305 | 0.011 |
| | 22 | 15,360 | 580 | 0.02 | 14,480 | 405 | 0.016 | 12,800 | 305 | 0.011 |
| | 26 | 11,520 | 380 | 0.014 | 10,860 | 265 | 0.011 | 9,600 | 200 | 0.008 |
| | 30 | 11,520 | 380 | 0.014 | 10,860 | 265 | 0.011 | 9,600 | 200 | 0.008 |
| 1.6 | 8 | 17,800 | 840 | 0.101 | 16,800 | 655 | 0.078 | 14,800 | 490 | 0.056 |
| | 10 | 16,020 | 680 | 0.058 | 15,120 | 530 | 0.045 | 13,320 | 395 | 0.032 |
| | 12 | 16,020 | 680 | 0.058 | 15,120 | 530 | 0.045 | 13,320 | 395 | 0.032 |
| | 16 | 16,020 | 680 | 0.036 | 15,120 | 530 | 0.028 | 13,320 | 395 | 0.02 |
| | 20 | 14,240 | 540 | 0.036 | 13,440 | 420 | 0.028 | 11,840 | 315 | 0.02 |
| 1.8 | 8 | 17,800 | 840 | 0.113 | 16,800 | 655 | 0.088 | 14,800 | 490 | 0.063 |
| | 10 | 16,020 | 680 | 0.065 | 15,120 | 530 | 0.05 | 13,320 | 395 | 0.036 |
| | 12 | 16,020 | 680 | 0.065 | 15,120 | 530 | 0.05 | 13,320 | 395 | 0.036 |
| | 16 | 16,020 | 680 | 0.041 | 15,120 | 530 | 0.032 | 13,320 | 395 | 0.023 |
| | 20 | 14,240 | 540 | 0.041 | 13,440 | 420 | 0.032 | 11,840 | 315 | 0.023 |
| 2 | 6 | 14,400 | 820 | 0.18 | 13,600 | 620 | 0.14 | 12,000 | 475 | 0.1 |
| | 8 | 14,400 | 820 | 0.126 | 13,600 | 620 | 0.098 | 12,000 | 475 | 0.07 |
| | 10 | 14,400 | 820 | 0.126 | 13,600 | 620 | 0.098 | 12,000 | 475 | 0.07 |
| | 12 | 12,960 | 665 | 0.072 | 12,240 | 500 | 0.056 | 10,800 | 385 | 0.04 |

# Recommended Cutting Condition

## ESRE712 SERIES ▶ Side Cutting

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 2 | 14 | 12,960 | 665 | 0.072 | 12,240 | 500 | 0.056 | 10,800 | 385 | 0.04 |
| | 16 | 12,960 | 665 | 0.072 | 12,240 | 500 | 0.056 | 10,800 | 385 | 0.04 |
| | 18 | 12,960 | 665 | 0.045 | 12,240 | 500 | 0.035 | 10,800 | 385 | 0.025 |
| | 20 | 12,960 | 665 | 0.045 | 12,240 | 500 | 0.035 | 10,800 | 385 | 0.025 |
| | 22 | 11,520 | 525 | 0.045 | 10,880 | 395 | 0.035 | 9,600 | 305 | 0.025 |
| | 26 | 11,520 | 525 | 0.045 | 10,880 | 395 | 0.035 | 9,600 | 305 | 0.025 |
| | 30 | 11,520 | 525 | 0.027 | 10,880 | 395 | 0.021 | 9,600 | 305 | 0.015 |
| | 35 | 8,640 | 345 | 0.018 | 8,160 | 260 | 0.014 | 7,200 | 200 | 0.01 |
| | 40 | 8,640 | 345 | 0.018 | 8,160 | 260 | 0.014 | 7,200 | 200 | 0.01 |
| | 45 | 4,320 | 150 | 0.018 | 4,080 | 110 | 0.014 | 3,600 | 85 | 0.01 |
| | 50 | 4,320 | 150 | 0.018 | 4,080 | 110 | 0.014 | 3,600 | 85 | 0.01 |
| | 60 | 4,320 | 150 | 0.018 | 4,080 | 110 | 0.014 | 3,600 | 85 | 0.01 |
| 2.5 | 8 | 12,300 | 970 | 0.158 | 11,600 | 680 | 0.123 | 10,300 | 510 | 0.088 |
| | 10 | 12,300 | 970 | 0.158 | 11,600 | 680 | 0.123 | 10,300 | 510 | 0.088 |
| | 12 | 12,300 | 970 | 0.158 | 11,600 | 680 | 0.123 | 10,300 | 510 | 0.088 |
| | 14 | 11,070 | 785 | 0.09 | 10,440 | 550 | 0.07 | 9,270 | 415 | 0.05 |
| | 16 | 11,070 | 785 | 0.09 | 10,440 | 550 | 0.07 | 9,270 | 415 | 0.05 |
| | 18 | 11,070 | 785 | 0.09 | 10,440 | 550 | 0.07 | 9,270 | 415 | 0.05 |
| | 20 | 11,070 | 785 | 0.09 | 10,440 | 550 | 0.07 | 9,270 | 415 | 0.05 |
| | 22 | 11,070 | 785 | 0.056 | 10,440 | 550 | 0.044 | 9,270 | 415 | 0.031 |
| | 26 | 9,840 | 620 | 0.056 | 9,280 | 435 | 0.044 | 8,240 | 325 | 0.031 |
| | 30 | 9,840 | 620 | 0.056 | 9,280 | 435 | 0.044 | 8,240 | 325 | 0.031 |
| | 35 | 9,840 | 620 | 0.034 | 9,280 | 435 | 0.026 | 8,240 | 325 | 0.019 |
| | 40 | 7,380 | 405 | 0.034 | 6,960 | 285 | 0.026 | 6,180 | 215 | 0.019 |
| | 45 | 7,380 | 405 | 0.023 | 6,960 | 285 | 0.018 | 6,180 | 215 | 0.013 |
| | 50 | 7,380 | 405 | 0.023 | 6,960 | 285 | 0.018 | 6,180 | 215 | 0.013 |
| 3 | 6 | 10,900 | 860 | 0.27 | 10,300 | 605 | 0.21 | 6,600 | 450 | 0.15 |
| | 8 | 10,900 | 860 | 0.27 | 10,300 | 605 | 0.21 | 6,600 | 450 | 0.15 |
| | 10 | 10,900 | 860 | 0.189 | 10,300 | 605 | 0.147 | 6,600 | 450 | 0.105 |
| | 12 | 10,900 | 860 | 0.189 | 10,300 | 605 | 0.147 | 6,600 | 450 | 0.105 |
| | 14 | 10,900 | 860 | 0.189 | 10,300 | 605 | 0.147 | 6,600 | 450 | 0.105 |
| | 16 | 9,810 | 695 | 0.108 | 9,270 | 490 | 0.084 | 5,940 | 365 | 0.06 |
| | 18 | 9,810 | 695 | 0.108 | 9,270 | 490 | 0.084 | 5,940 | 365 | 0.06 |
| | 20 | 9,810 | 695 | 0.108 | 9,270 | 490 | 0.084 | 5,940 | 365 | 0.06 |
| | 22 | 9,810 | 695 | 0.108 | 9,270 | 490 | 0.084 | 5,940 | 365 | 0.06 |
| | 26 | 9,810 | 695 | 0.068 | 9,270 | 490 | 0.053 | 5,940 | 365 | 0.038 |
| | 30 | 9,810 | 695 | 0.068 | 9,270 | 490 | 0.053 | 5,940 | 365 | 0.038 |
| | 35 | 8,720 | 550 | 0.068 | 8,240 | 385 | 0.053 | 5,280 | 290 | 0.038 |
| | 40 | 8,720 | 550 | 0.041 | 8,240 | 385 | 0.032 | 5,280 | 290 | 0.023 |
| | 45 | 8,720 | 550 | 0.041 | 8,240 | 385 | 0.032 | 5,280 | 290 | 0.023 |
| | 50 | 6,540 | 360 | 0.027 | 6,180 | 255 | 0.021 | 3,960 | 190 | 0.015 |
| | 60 | 6,540 | 360 | 0.027 | 6,180 | 255 | 0.021 | 3,960 | 190 | 0.015 |
| 4 | 8 | 8,000 | 1,300 | 0.36 | 7,600 | 1,160 | 0.28 | 6,700 | 770 | 0.2 |

## ESRE712 SERIES ▶ Side Cutting

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 4 | 10 | 8,000 | 1,300 | 0.36 | 7,600 | 1,160 | 0.28 | 6,700 | 770 | 0.2 |
| | 12 | 8,000 | 1,300 | 0.36 | 7,600 | 1,160 | 0.28 | 6,700 | 770 | 0.2 |
| | 14 | 8,000 | 1,300 | 0.252 | 7,600 | 1,160 | 0.196 | 6,700 | 770 | 0.14 |
| | 16 | 8,000 | 1,300 | 0.252 | 7,600 | 1,160 | 0.196 | 6,700 | 770 | 0.14 |
| | 18 | 8,000 | 1,300 | 0.252 | 7,600 | 1,160 | 0.196 | 6,700 | 770 | 0.14 |
| | 20 | 8,000 | 1,300 | 0.252 | 7,600 | 1,160 | 0.196 | 6,700 | 770 | 0.14 |
| | 22 | 7,200 | 1,055 | 0.144 | 6,840 | 940 | 0.112 | 6,030 | 625 | 0.08 |
| | 26 | 7,200 | 1,055 | 0.144 | 6,840 | 940 | 0.112 | 6,030 | 625 | 0.08 |
| | 30 | 7,200 | 1,055 | 0.144 | 6,840 | 940 | 0.112 | 6,030 | 625 | 0.08 |
| | 35 | 7,200 | 1,055 | 0.09 | 6,840 | 940 | 0.07 | 6,030 | 625 | 0.05 |
| | 40 | 7,200 | 1,055 | 0.09 | 6,840 | 940 | 0.07 | 6,030 | 625 | 0.05 |
| | 45 | 6,400 | 830 | 0.09 | 6,080 | 740 | 0.07 | 5,360 | 495 | 0.05 |
| | 50 | 6,400 | 830 | 0.09 | 6,080 | 740 | 0.07 | 5,360 | 495 | 0.05 |
| | 60 | 6,400 | 830 | 0.054 | 6,080 | 740 | 0.042 | 5,360 | 495 | 0.03 |
| 5 | 16 | 6,400 | 1,155 | 0.315 | 6,100 | 900 | 0.245 | 5,400 | 605 | 0.175 |
| | 20 | 6,400 | 1,155 | 0.315 | 6,100 | 900 | 0.245 | 5,400 | 605 | 0.175 |
| | 26 | 5,760 | 935 | 0.18 | 5,490 | 730 | 0.14 | 4,860 | 490 | 0.1 |
| | 30 | 5,760 | 935 | 0.18 | 5,490 | 730 | 0.14 | 4,860 | 490 | 0.1 |
| | 35 | 5,760 | 935 | 0.18 | 5,490 | 730 | 0.14 | 4,860 | 490 | 0.1 |
| | 40 | 5,760 | 935 | 0.18 | 5,490 | 730 | 0.14 | 4,860 | 490 | 0.1 |
| | 50 | 5,760 | 935 | 0.113 | 5,490 | 730 | 0.088 | 4,860 | 490 | 0.063 |
| | 60 | 5,120 | 740 | 0.113 | 4,880 | 575 | 0.088 | 4,320 | 385 | 0.063 |
| 6 | 15 | 5,300 | 1,055 | 0.54 | 5,000 | 820 | 0.42 | 4,400 | 550 | 0.3 |
| | 20 | 5,300 | 1,055 | 0.378 | 5,000 | 820 | 0.294 | 4,400 | 550 | 0.21 |
| | 30 | 5,300 | 1,055 | 0.378 | 5,000 | 820 | 0.294 | 4,400 | 550 | 0.21 |
| | 32 | 4,770 | 855 | 0.216 | 4,500 | 665 | 0.168 | 3,960 | 445 | 0.12 |
| 8 | 25 | 4,000 | 950 | 0.504 | 3,800 | 750 | 0.392 | 3,300 | 500 | 0.28 |
| | 30 | 4,000 | 950 | 0.504 | 3,800 | 750 | 0.392 | 3,300 | 500 | 0.28 |
| | 42 | 3,600 | 770 | 0.288 | 3,400 | 605 | 0.224 | 2,950 | 405 | 0.16 |
| 10 | 30 | 3,200 | 900 | 0.9 | 3,050 | 680 | 0.7 | 2,630 | 400 | 0.5 |
| | 35 | 3,200 | 900 | 0.63 | 3,050 | 680 | 0.49 | 2,630 | 400 | 0.35 |
| | 45 | 3,200 | 900 | 0.63 | 3,050 | 680 | 0.49 | 2,630 | 400 | 0.35 |
| 12 | 35 | 2,650 | 800 | 1.08 | 2,520 | 600 | 0.84 | 2,180 | 350 | 0.6 |
| | 40 | 2,650 | 800 | 0.756 | 2,520 | 600 | 0.588 | 2,180 | 350 | 0.42 |
| | 50 | 2,650 | 800 | 0.756 | 2,520 | 600 | 0.588 | 2,180 | 350 | 0.42 |

RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## ESRE714 SERIES

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.5 | 1 | 27,400 | 756 | 0.045 | 25,800 | 595 | 0.035 | 22,800 | 399 | 0.025 |
| | 2 | 27,400 | 756 | 0.032 | 25,800 | 595 | 0.025 | 22,800 | 399 | 0.018 |
| | 3 | 24,660 | 609 | 0.018 | 23,220 | 483 | 0.014 | 20,520 | 322 | 0.01 |
| | 4 | 24,660 | 609 | 0.018 | 23,220 | 483 | 0.014 | 20,520 | 322 | 0.01 |
| | 5 | 24,660 | 609 | 0.011 | 23,220 | 483 | 0.009 | 20,520 | 322 | 0.006 |
| | 6 | 21,920 | 483 | 0.011 | 20,640 | 378 | 0.009 | 18,240 | 252 | 0.006 |
| | 8 | 16,440 | 315 | 0.007 | 15,480 | 252 | 0.005 | 13,680 | 168 | 0.004 |
| | 10 | 16,440 | 315 | 0.005 | 15,480 | 252 | 0.004 | 13,680 | 168 | 0.003 |
| 0.6 | 1 | 27,400 | 1085 | 0.038 | 25,800 | 763 | 0.029 | 22,800 | 567 | 0.021 |
| | 2 | 27,400 | 1085 | 0.038 | 25,800 | 763 | 0.029 | 22,800 | 567 | 0.021 |
| | 3 | 27,400 | 1085 | 0.038 | 25,800 | 763 | 0.029 | 22,800 | 567 | 0.021 |
| | 4 | 24,660 | 882 | 0.022 | 23,220 | 616 | 0.017 | 20,520 | 462 | 0.012 |
| | 5 | 24,660 | 882 | 0.014 | 23,220 | 616 | 0.011 | 20,520 | 462 | 0.008 |
| | 6 | 24,660 | 882 | 0.014 | 23,220 | 616 | 0.011 | 20,520 | 462 | 0.008 |
| | 8 | 21,920 | 693 | 0.008 | 20,640 | 490 | 0.006 | 18,240 | 364 | 0.005 |
| | 10 | 16,440 | 455 | 0.005 | 15,480 | 322 | 0.004 | 13,680 | 238 | 0.003 |
| | 12 | 16,440 | 455 | 0.005 | 15,480 | 322 | 0.004 | 13,680 | 238 | 0.003 |
| 0.7 | 2 | 27,400 | 1085 | 0.063 | 25,800 | 763 | 0.049 | 22,800 | 567 | 0.035 |
| | 4 | 24,660 | 882 | 0.025 | 23,220 | 616 | 0.02 | 20,520 | 462 | 0.014 |
| | 6 | 24,660 | 882 | 0.016 | 23,220 | 616 | 0.012 | 20,520 | 462 | 0.009 |
| | 8 | 21,920 | 693 | 0.016 | 20,640 | 490 | 0.012 | 18,240 | 364 | 0.009 |
| | 10 | 21,920 | 693 | 0.009 | 20,640 | 490 | 0.007 | 18,240 | 364 | 0.005 |
| 0.8 | 1 | 27,400 | 1085 | 0.072 | 25,800 | 847 | 0.056 | 22,800 | 630 | 0.04 |
| | 2 | 27,400 | 1085 | 0.072 | 25,800 | 847 | 0.056 | 22,800 | 630 | 0.04 |
| | 3 | 27,400 | 1085 | 0.05 | 25,800 | 847 | 0.039 | 22,800 | 630 | 0.028 |
| | 4 | 27,400 | 1085 | 0.05 | 25,800 | 847 | 0.039 | 22,800 | 630 | 0.028 |
| | 5 | 24,660 | 882 | 0.029 | 23,220 | 686 | 0.022 | 20,520 | 511 | 0.016 |
| | 6 | 24,660 | 882 | 0.029 | 23,220 | 686 | 0.022 | 20,520 | 511 | 0.016 |
| | 8 | 24,660 | 882 | 0.018 | 23,220 | 686 | 0.014 | 20,520 | 511 | 0.01 |
| | 10 | 21,920 | 693 | 0.018 | 20,640 | 539 | 0.014 | 18,240 | 406 | 0.01 |
| | 12 | 21,920 | 693 | 0.011 | 20,640 | 539 | 0.008 | 18,240 | 406 | 0.006 |
| | 16 | 16,440 | 455 | 0.007 | 15,480 | 357 | 0.006 | 13,680 | 266 | 0.004 |
| 1 | 2 | 24,600 | 1463 | 0.09 | 23,300 | 1246 | 0.07 | 20,500 | 931 | 0.05 |
| | 3 | 24,600 | 1463 | 0.09 | 23,300 | 1246 | 0.07 | 20,500 | 931 | 0.05 |
| | 4 | 24,600 | 1463 | 0.063 | 23,300 | 1246 | 0.049 | 20,500 | 931 | 0.035 |
| | 6 | 22,140 | 1183 | 0.036 | 20,970 | 1008 | 0.028 | 18,450 | 756 | 0.02 |
| | 8 | 22,140 | 1183 | 0.036 | 20,970 | 1008 | 0.028 | 18,450 | 756 | 0.02 |
| | 10 | 22,140 | 1183 | 0.023 | 20,970 | 1008 | 0.018 | 18,450 | 756 | 0.013 |
| | 12 | 19,680 | 938 | 0.023 | 18,640 | 798 | 0.018 | 16,400 | 595 | 0.013 |
| | 14 | 19,680 | 938 | 0.014 | 18,640 | 798 | 0.011 | 16,400 | 595 | 0.008 |
| | 16 | 14,760 | 616 | 0.014 | 13,980 | 525 | 0.011 | 12,300 | 392 | 0.008 |
| | 18 | 14,760 | 616 | 0.009 | 13,980 | 525 | 0.007 | 12,300 | 392 | 0.005 |
| | 20 | 14,760 | 616 | 0.009 | 13,980 | 525 | 0.007 | 12,300 | 392 | 0.005 |

## ESRE714 SERIES

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 1.2 | 4 | 21,900 | 1,302 | 0.076 | 20,700 | 1008 | 0.059 | 18,200 | 679 | 0.042 |
| | 6 | 21,900 | 1,302 | 0.076 | 20,700 | 1008 | 0.059 | 18,200 | 679 | 0.042 |
| | 8 | 19,710 | 1,057 | 0.043 | 18,630 | 819 | 0.034 | 16,380 | 553 | 0.024 |
| | 10 | 19,710 | 1,057 | 0.027 | 18,630 | 819 | 0.021 | 16,380 | 553 | 0.015 |
| | 12 | 19,710 | 1057 | 0.027 | 18,630 | 819 | 0.021 | 16,380 | 553 | 0.015 |
| | 16 | 17,520 | 833 | 0.016 | 16,560 | 644 | 0.013 | 14,560 | 434 | 0.009 |
| | 18 | 17,520 | 833 | 0.016 | 16,560 | 644 | 0.013 | 14,560 | 434 | 0.009 |
| | 20 | 13,140 | 546 | 0.011 | 12,420 | 420 | 0.008 | 10,920 | 287 | 0.006 |
| 1.4 | 6 | 19,200 | 1141 | 0.088 | 18,100 | 798 | 0.069 | 16,000 | 595 | 0.049 |
| | 8 | 17,280 | 924 | 0.05 | 16,290 | 644 | 0.039 | 14,400 | 483 | 0.028 |
| | 10 | 17,280 | 924 | 0.05 | 16,290 | 644 | 0.039 | 14,400 | 483 | 0.028 |
| | 12 | 17,280 | 924 | 0.05 | 16,290 | 644 | 0.039 | 14,400 | 483 | 0.028 |
| | 14 | 17,280 | 924 | 0.032 | 16,290 | 644 | 0.025 | 14,400 | 483 | 0.018 |
| | 16 | 15,360 | 728 | 0.032 | 14,480 | 511 | 0.025 | 12,800 | 378 | 0.018 |
| 1.5 | 4 | 19,200 | 1267 | 0.135 | 18,100 | 889 | 0.105 | 16,000 | 665 | 0.075 |
| | 6 | 19,200 | 1267 | 0.095 | 18,100 | 889 | 0.074 | 16,000 | 665 | 0.053 |
| | 8 | 17,280 | 1029 | 0.054 | 16,290 | 721 | 0.042 | 14,400 | 539 | 0.03 |
| | 10 | 17,280 | 1029 | 0.054 | 16,290 | 721 | 0.042 | 14,400 | 539 | 0.03 |
| | 12 | 17,280 | 1029 | 0.054 | 16,290 | 721 | 0.042 | 14,400 | 539 | 0.03 |
| | 16 | 15,360 | 812 | 0.034 | 14,480 | 567 | 0.026 | 12,800 | 427 | 0.019 |
| | 18 | 15,360 | 812 | 0.034 | 14,480 | 567 | 0.026 | 12,800 | 427 | 0.019 |
| | 20 | 15,360 | 812 | 0.02 | 14,480 | 567 | 0.016 | 12,800 | 427 | 0.011 |
| | 25 | 11,520 | 532 | 0.014 | 10,860 | 371 | 0.011 | 9,600 | 280 | 0.008 |
| | 30 | 11,520 | 532 | 0.014 | 10,860 | 371 | 0.011 | 9,600 | 280 | 0.008 |
| 1.6 | 6 | 17,800 | 1176 | 0.101 | 16,800 | 917 | 0.078 | 14,800 | 686 | 0.056 |
| | 8 | 17,800 | 1176 | 0.101 | 16,800 | 917 | 0.078 | 14,800 | 686 | 0.056 |
| | 10 | 16,020 | 952 | 0.058 | 15,120 | 742 | 0.045 | 13,320 | 553 | 0.032 |
| | 12 | 16,020 | 952 | 0.058 | 15,120 | 742 | 0.045 | 13,320 | 553 | 0.032 |
| | 14 | 16,020 | 952 | 0.058 | 15,120 | 742 | 0.045 | 13,320 | 553 | 0.032 |
| | 16 | 16,020 | 952 | 0.036 | 15,120 | 752 | 0.028 | 13,320 | 553 | 0.02 |
| | 18 | 16,020 | 952 | 0.036 | 15,120 | 752 | 0.028 | 13,320 | 553 | 0.02 |
| | 20 | 14,240 | 756 | 0.036 | 13,440 | 588 | 0.028 | 11,840 | 441 | 0.02 |
| | 25 | 14,240 | 756 | 0.036 | 13,440 | 588 | 0.028 | 11,840 | 441 | 0.02 |
| 1.8 | 6 | 17,800 | 1176 | 0.113 | 16,800 | 917 | 0.088 | 14,800 | 686 | 0.063 |
| | 8 | 17,800 | 1176 | 0.113 | 16,800 | 917 | 0.088 | 14,800 | 686 | 0.063 |
| | 10 | 16,020 | 952 | 0.065 | 15,120 | 742 | 0.05 | 13,320 | 553 | 0.036 |
| | 12 | 16,020 | 952 | 0.065 | 15,120 | 742 | 0.05 | 13,320 | 553 | 0.036 |
| | 16 | 16,020 | 952 | 0.041 | 15,120 | 742 | 0.032 | 13,320 | 553 | 0.023 |
| | 20 | 14,240 | 756 | 0.041 | 13,440 | 588 | 0.032 | 11,840 | 441 | 0.023 |
| | 25 | 14,240 | 756 | 0.041 | 13,440 | 588 | 0.032 | 11,840 | 441 | 0.023 |
| 2 | 4 | 14,400 | 1148 | 0.18 | 13,600 | 868 | 0.14 | 12,000 | 665 | 0.1 |
| | 6 | 14,400 | 1148 | 0.18 | 13,600 | 868 | 0.14 | 12,000 | 665 | 0.1 |
| | 8 | 14,400 | 1148 | 0.126 | 13,600 | 868 | 0.098 | 12,000 | 665 | 0.07 |

# Recommended Cutting Condition

## ESRE714 SERIES

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 2 | 10 | 14,400 | 1148 | 0.126 | 13,600 | 868 | 0.098 | 12,000 | 665 | 0.07 |
| | 12 | 12,960 | 931 | 0.072 | 12,240 | 700 | 0.056 | 10,800 | 539 | 0.04 |
| | 14 | 12,960 | 931 | 0.072 | 12,240 | 700 | 0.056 | 10,800 | 539 | 0.04 |
| | 16 | 12,960 | 931 | 0.072 | 12,240 | 700 | 0.056 | 10,800 | 539 | 0.04 |
| | 18 | 12,960 | 931 | 0.045 | 12,240 | 700 | 0.035 | 10,800 | 539 | 0.025 |
| | 20 | 12,960 | 931 | 0.045 | 12,240 | 700 | 0.035 | 10,800 | 539 | 0.025 |
| | 22 | 11,520 | 735 | 0.045 | 10,880 | 553 | 0.035 | 9,600 | 427 | 0.025 |
| | 25 | 11,520 | 735 | 0.045 | 10,880 | 553 | 0.035 | 9,600 | 427 | 0.025 |
| | 30 | 11,520 | 735 | 0.027 | 10,880 | 553 | 0.021 | 9,600 | 427 | 0.015 |
| 2.5 | 10 | 12,300 | 1358 | 0.158 | 11,600 | 952 | 0.123 | 10,300 | 714 | 0.088 |
| | 12 | 12,300 | 1358 | 0.158 | 11,600 | 952 | 0.123 | 10,300 | 714 | 0.088 |
| | 16 | 11,070 | 1099 | 0.09 | 10,440 | 770 | 0.07 | 9,270 | 581 | 0.05 |
| | 20 | 11,070 | 1099 | 0.09 | 10,440 | 770 | 0.07 | 9,270 | 581 | 0.05 |
| | 25 | 9,840 | 868 | 0.056 | 9,280 | 609 | 0.044 | 8,240 | 455 | 0.031 |
| | 30 | 9,840 | 868 | 0.056 | 9,280 | 609 | 0.044 | 8,240 | 455 | 0.031 |
| 3 | 6 | 10,900 | 1204 | 0.27 | 10,300 | 847 | 0.21 | 6,600 | 630 | 0.15 |
| | 8 | 10,900 | 1204 | 0.27 | 10,300 | 847 | 0.21 | 6,600 | 630 | 0.15 |
| | 10 | 10,900 | 1204 | 0.189 | 10,300 | 847 | 0.147 | 6,600 | 630 | 0.105 |
| | 12 | 10,900 | 1204 | 0.189 | 10,300 | 847 | 0.147 | 6,600 | 630 | 0.105 |
| | 16 | 9,810 | 973 | 0.108 | 9,270 | 686 | 0.084 | 5,940 | 511 | 0.06 |
| | 20 | 9,810 | 973 | 0.108 | 9,270 | 686 | 0.084 | 5,940 | 511 | 0.06 |
| | 25 | 9,810 | 973 | 0.068 | 9,270 | 686 | 0.053 | 5,940 | 511 | 0.038 |
| | 30 | 9,810 | 973 | 0.068 | 9,270 | 686 | 0.053 | 5,940 | 511 | 0.038 |
| | 35 | 8,720 | 770 | 0.068 | 8,240 | 539 | 0.053 | 5,280 | 406 | 0.038 |
| | 40 | 8,720 | 770 | 0.041 | 8,240 | 539 | 0.032 | 5,280 | 406 | 0.023 |
| | 45 | 8,720 | 770 | 0.041 | 8,240 | 539 | 0.032 | 5,280 | 406 | 0.023 |
| | 50 | 6,540 | 504 | 0.027 | 6,180 | 357 | 0.021 | 3,960 | 266 | 0.015 |
| | 60 | 6,540 | 504 | 0.027 | 6,180 | 357 | 0.021 | 3,960 | 266 | 0.015 |
| 3.5 | 12 | 9,310 | 1430 | 0.236 | 8,800 | 1008 | 0.183 | 5,640 | 750 | 0.131 |
| | 16 | 8,380 | 1158 | 0.135 | 7,920 | 816 | 0.105 | 5,070 | 608 | 0.075 |
| | 20 | 8,380 | 1158 | 0.135 | 7,920 | 816 | 0.105 | 5,070 | 608 | 0.047 |
| | 25 | 8,380 | 1158 | 0.085 | 7,920 | 816 | 0.066 | 5,070 | 608 | 0.047 |
| | 30 | 8,380 | 1158 | 0.085 | 7,920 | 816 | 0.066 | 5,070 | 608 | 0.047 |
| | 35 | 7,450 | 916 | 0.085 | 7,040 | 641 | 0.066 | 4,510 | 483 | 0.047 |
| | 40 | 7,450 | 916 | 0.051 | 7,040 | 641 | 0.04 | 4,510 | 483 | 0.028 |
| 4 | 6 | 8,000 | 1820 | 0.36 | 7,600 | 1624 | 0.28 | 6,700 | 1078 | 0.2 |
| | 8 | 8,000 | 1820 | 0.36 | 7,600 | 1624 | 0.28 | 6,700 | 1078 | 0.2 |
| | 10 | 8,000 | 1820 | 0.36 | 7,600 | 1624 | 0.28 | 6,700 | 1078 | 0.2 |
| | 12 | 8,000 | 1820 | 0.36 | 7,600 | 1624 | 0.28 | 6,700 | 1078 | 0.2 |
| | 16 | 8,000 | 1820 | 0.252 | 7,600 | 1624 | 0.196 | 6,700 | 1078 | 0.14 |
| | 20 | 8,000 | 1820 | 0.252 | 7,600 | 1624 | 0.196 | 6,700 | 1078 | 0.14 |
| | 25 | 7,200 | 1477 | 0.144 | 6,840 | 1316 | 0.112 | 6,030 | 875 | 0.08 |
| | 30 | 7,200 | 1477 | 0.144 | 6,840 | 1316 | 0.112 | 6,030 | 875 | 0.08 |

## ESRE714 SERIES

| Workpiece | | Carbon Steels, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 4 | 40 | 7,200 | 1477 | 0.09 | 6,840 | 1316 | 0.07 | 6,030 | 875 | 0.05 |
| | 45 | 6,400 | 1162 | 0.09 | 6,080 | 1036 | 0.07 | 5,360 | 693 | 0.05 |
| | 50 | 6,400 | 1162 | 0.09 | 6,080 | 1036 | 0.07 | 5,360 | 693 | 0.05 |
| | 60 | 6,400 | 1162 | 0.054 | 6,080 | 1036 | 0.042 | 5,360 | 693 | 0.03 |
| 4.5 | 12 | 6,830 | 2166 | 0.45 | 6,490 | 1933 | 0.35 | 5,720 | 1283 | 0.25 |
| | 16 | 6,830 | 2166 | 0.315 | 6,490 | 1933 | 0.245 | 5,720 | 1283 | 0.175 |
| | 20 | 6,830 | 2166 | 0.315 | 6,490 | 1933 | 0.245 | 5,720 | 1283 | 0.175 |
| | 25 | 6,150 | 1758 | 0.18 | 5,840 | 1566 | 0.14 | 5,150 | 1041 | 0.1 |
| | 30 | 6,150 | 1758 | 0.18 | 5,840 | 1566 | 0.14 | 5,150 | 1041 | 0.1 |
| | 40 | 6,150 | 1758 | 0.112 | 5,840 | 1566 | 0.087 | 5,150 | 1041 | 0.062 |
| 5 | 16 | 6,400 | 1617 | 0.315 | 6,100 | 1260 | 0.245 | 5,400 | 847 | 0.175 |
| | 20 | 6,400 | 1617 | 0.315 | 6,100 | 1260 | 0.245 | 5,400 | 847 | 0.175 |
| | 25 | 5,760 | 1309 | 0.18 | 5,490 | 1022 | 0.14 | 4,860 | 686 | 0.1 |
| | 30 | 5,760 | 1309 | 0.18 | 5,490 | 1022 | 0.14 | 4,860 | 686 | 0.1 |
| | 40 | 5,760 | 1309 | 0.18 | 5,490 | 1022 | 0.14 | 4,860 | 686 | 0.1 |
| | 50 | 5,760 | 1309 | 0.113 | 5,490 | 1022 | 0.088 | 4,860 | 686 | 0.063 |
| | 60 | 5,120 | 1036 | 0.113 | 4,880 | 805 | 0.088 | 4,320 | 539 | 0.063 |
| 6 | 20 | 5,300 | 1477 | 0.378 | 5,000 | 1148 | 0.294 | 4,400 | 770 | 0.21 |
| | 30 | 5,300 | 1,477 | 0.378 | 5,000 | 1,148 | 0.294 | 4,400 | 770 | 0.21 |
| | 40 | 4,770 | 1,197 | 0.216 | 4,500 | 931 | 0.168 | 3,960 | 623 | 0.12 |
| | 50 | 4,770 | 1,197 | 0.216 | 4,500 | 931 | 0.168 | 3,960 | 623 | 0.12 |
| | 60 | 4,370 | 958 | 0.141 | 4,171 | 931 | 0.11 | 3,690 | 623 | 0.078 |
| 8 | 25 | 4,000 | 1,330 | 0.504 | 3,800 | 1,050 | 0.392 | 3,300 | 700 | 0.28 |
| | 40 | 3,600 | 1,078 | 0.288 | 3,400 | 847 | 0.224 | 2,950 | 567 | 0.16 |
| | 50 | 3,600 | 1,078 | 0.288 | 3,400 | 847 | 0.224 | 2,950 | 567 | 0.16 |
| 10 | 30 | 3,200 | 1,260 | 0.9 | 3,050 | 952 | 0.7 | 2,630 | 560 | 0.5 |
| | 50 | 3,200 | 1,260 | 0.63 | 3,050 | 952 | 0.49 | 2,630 | 560 | 0.35 |
| | 60 | 3,200 | 1,260 | 0.63 | 3,050 | 952 | 0.49 | 2,630 | 560 | 0.35 |
| 12 | 40 | 2,650 | 1,120 | 0.756 | 2,520 | 840 | 0.588 | 2,180 | 490 | 0.42 |
| | 60 | 2,360 | 896 | 0.472 | 2,250 | 672 | 0.367 | 1,940 | 392 | 0.262 |
| | 70 | 2,360 | 896 | 0.472 | 2,250 | 672 | 0.367 | 1,940 | 392 | 0.262 |

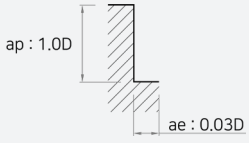
RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## ESXE704, ESXE714, ESXR704 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 4 | 17,200 | 1,690 | 11,440 | 1,140 | 9,360 | 700 | 7,280 | 430 | 6,170 | 310 |
| 6 | 13,450 | 1,820 | 8,970 | 1,230 | 6,890 | 720 | 5,460 | 450 | 4,810 | 330 |
| 8 | 9,100 | 1,750 | 6,760 | 1,170 | 5,200 | 670 | 4,160 | 420 | 3,640 | 310 |
| 10 | 8,000 | 1,630 | 5,330 | 1,090 | 4,160 | 620 | 3,320 | 400 | 2,860 | 280 |
| 12 | 6,830 | 1,630 | 4,550 | 1,010 | 3,450 | 580 | 2,730 | 370 | 2,420 | 260 |

RPM = rev / min
FEED = mm / min




## ESLNS20, ESLNS40 SERIES

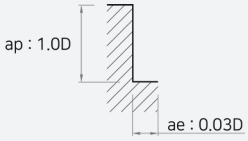
| Workpiece | Alloy Steels, Heat Resistant Steels | | | Herdened Steels | | | Herdened Steels | | | Copper, Copper alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30~HRc45 | | | HRc45~HRc55 | | | HRc55~HRc65 | | | | | |
| Diameter (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.4 | 34,100~50,000 | 350~590 | 0.005~0.028 | 30,500~35,200 | 295~340 | 0.003~0.020 | 18,300~24,600 | 120~200 | 0.002~0.012 | 48,000~50,000 | 790~920 | 0.008~0.048 |
| 0.5 | 25,650~33,000 | 370~470 | 0.006~0.035 | 23,750~26,000 | 285~315 | 0.004~0.025 | 14,200~18,000 | 115~130 | 0.003~0.015 | 44,000~50,000 | 800~1,150 | 0.010~0.060 |
| 0.6 | 20,900~35,200 | 330~560 | 0.007~0.030 | 19,900~22,000 | 260~290 | 0.005~0.021 | 11,900~15,500 | 100~120 | 0.003~0.013 | 37,500~50,000 | 770~1,250 | 0.011~0.051 |
| 0.8 | 16,150~26,400 | 360~590 | 0.009~0.040 | 15,200~16,700 | 280~310 | 0.006~0.028 | 9,000~11,700 | 110~125 | 0.004~0.017 | 28,500~47,000 | 770~1,300 | 0.015~0.068 |
| 1 | 12,300~18,700 | 350~540 | 0.011~0.028 | 10,500~11,500 | 250~280 | 0.008~0.020 | 6,300~8,050 | 100~115 | 0.005~0.012 | 22,500~34,000 | 810~1,300 | 0.018~0.048 |
| 1.2 | 10,450~17,600 | 350~590 | 0.025~0.070 | 9,100~10,000 | 250~280 | 0.015~0.042 | 5,400~7,000 | 100~115 | 0.009~0.026 | 22,500~31,500 | 950~1,350 | 0.036~0.101 |
| 1.5 | 9,100~17,600 | 430~830 | 0.017~0.077 | 7,000~8,000 | 250~280 | 0.012~0.055 | 4,300~5,500 | 100~115 | 0.007~0.033 | 14,500~25,000 | 770~1,320 | 0.028~0.132 |
| 2 | 6,350~10,550 | 340~570 | 0.021~0.140 | 6,100~6,700 | 270~300 | 0.015~0.100 | 3,600~4,700 | 100~120 | 0.009~0.060 | 11,500~18,500 | 770~1,250 | 0.036~0.240 |
| 3 | 4,300~7,050 | 550~900 | 0.056~0.210 | 3,990~4,600 | 445~515 | 0.040~0.150 | 2,400~3,200 | 105~310 | 0.024~0.090 | 9,000~13,000 | 1,400~2,110 | 0.096~0.360 |
| 4 | 3,200~5,300 | 400~675 | 0.074~0.280 | 3,000~3,400 | 335~380 | 0.053~0.200 | 1,800~2,400 | 75~230 | 0.032~0.120 | 6,750~9,750 | 1,050~1,575 | 0.128~0.480 |

RPM = rev / min
FEED = mm / min

## ESR702 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 33,300 | 960 | 26,000 | 776 | 17,500 | 480 | 14,500 | 296 | 11,000 | 184 | 9,500 | 132 |
| 3 | 21,800 | 960 | 17,300 | 776 | 11,500 | 480 | 9,500 | 296 | 7,500 | 184 | 6,400 | 132 |
| 4 | 16,700 | 1,000 | 13,200 | 800 | 8,800 | 500 | 7,200 | 308 | 5,600 | 192 | 4,750 | 136 |
| 5 | 15,700 | 1,160 | 12,500 | 920 | 8,300 | 568 | 6,400 | 328 | 5,100 | 208 | 4,450 | 152 |
| 6 | 13,100 | 1,080 | 10,350 | 880 | 6,900 | 552 | 5,300 | 320 | 4,200 | 204 | 3,700 | 148 |
| 8 | 9,880 | 1,056 | 7,800 | 824 | 5,200 | 508 | 4,000 | 292 | 3,200 | 188 | 2,800 | 136 |
| 10 | 7,800 | 960 | 6,150 | 776 | 4,100 | 472 | 3,200 | 272 | 2,550 | 176 | 2,200 | 128 |
| 12 | 6,650 | 960 | 5,250 | 776 | 3,500 | 472 | 2,650 | 272 | 2,100 | 176 | 1,860 | 128 |
| 16 | 4,900 | 840 | 3,900 | 672 | 2,600 | 416 | 2,000 | 240 | 1,600 | 152 | 1,400 | 112 |
| 20 | 3,900 | 760 | 3,100 | 600 | 2,050 | 380 | 1,600 | 220 | 1,300 | 140 | 1,100 | 100 |

RPM = rev / min
FEED = mm / min




## ESR702, ESR732 SERIES ▶ Slotting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 33,300 | 680 | 26,000 | 544 | 17,500 | 336 | 14,500 | 208 | 11,000 | 128 | 9,500 | 92 |
| 3 | 21,800 | 680 | 17,300 | 544 | 11,500 | 336 | 9,500 | 208 | 7,500 | 128 | 6,400 | 92 |
| 4 | 16,700 | 704 | 13,200 | 560 | 8,800 | 352 | 7,200 | 216 | 5,600 | 136 | 4,750 | 94 |
| 5 | 15,700 | 800 | 12,500 | 644 | 8,300 | 400 | 6,400 | 228 | 5,100 | 144 | 4,450 | 106 |
| 6 | 13,100 | 760 | 10,350 | 616 | 6,900 | 384 | 5,300 | 224 | 4,200 | 144 | 3,700 | 104 |
| 8 | 9,880 | 744 | 7,800 | 576 | 5,200 | 356 | 4,000 | 204 | 3,200 | 132 | 2,800 | 96 |
| 10 | 7,800 | 680 | 6,150 | 544 | 4,100 | 332 | 3,200 | 192 | 2,550 | 124 | 2,200 | 90 |
| 12 | 6,650 | 680 | 5,250 | 544 | 3,500 | 332 | 2,650 | 192 | 2,100 | 124 | 1,860 | 90 |
| 16 | 4,900 | 584 | 3,900 | 464 | 2,600 | 292 | 2,000 | 168 | 1,600 | 108 | 1,400 | 78 |
| 20 | 3,900 | 528 | 3,100 | 420 | 2,050 | 268 | 1,600 | 168 | 1,300 | 100 | 1,100 | 70 |

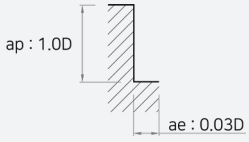
RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## ESR704, ESR714, ESR724, ESR734 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 21,800 | 1,400 | 17,300 | 1,000 | 11,500 | 672 | 9,500 | 416 | 7,500 | 256 | 6,400 | 184 |
| 4 | 16,700 | 1,440 | 13,200 | 1,040 | 8,800 | 704 | 7,200 | 432 | 5,600 | 268 | 4,750 | 192 |
| 5 | 15,700 | 1,600 | 12,500 | 1,200 | 8,300 | 800 | 6,400 | 464 | 5,100 | 296 | 4,450 | 216 |
| 6 | 13,100 | 1,560 | 10,350 | 1,120 | 6,900 | 760 | 5,300 | 448 | 4,200 | 280 | 3,700 | 208 |
| 8 | 9,880 | 1,504 | 7,800 | 1,080 | 5,200 | 720 | 4,000 | 416 | 3,200 | 264 | 2,800 | 192 |
| 10 | 7,800 | 1,400 | 6,150 | 1,008 | 4,100 | 672 | 3,200 | 384 | 2,550 | 248 | 2,200 | 176 |
| 12 | 6,650 | 1,400 | 5,250 | 1,008 | 3,500 | 672 | 2,650 | 384 | 2,100 | 240 | 1,860 | 176 |
| 16 | 4,900 | 1,200 | 3,900 | 880 | 2,600 | 584 | 2,000 | 336 | 1,600 | 216 | 1,400 | 160 |
| 20 | 3,900 | 1,040 | 3,100 | 776 | 2,050 | 520 | 1,600 | 304 | 1,300 | 200 | 1,100 | 144 |

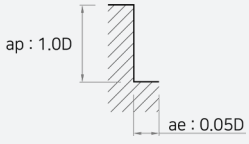
RPM = rev / min
FEED = mm / min

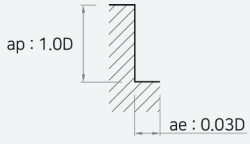



## ESR706 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 24,800 | 5,350 | 23,500 | 4,900 | 16,000 | 4,900 | 13,500 | 3,300 | 10,500 | 2,100 | 8,000 | 1,450 |
| 8 | 20,000 | 5,500 | 19,000 | 5,000 | 12,000 | 4,600 | 10,000 | 3,100 | 8,000 | 2,000 | 6,000 | 1,400 |
| 10 | 16,000 | 4,900 | 15,500 | 4,500 | 9,500 | 4,100 | 8,000 | 2,900 | 6,400 | 1,800 | 4,800 | 1,300 |
| 12 | 13,000 | 4,500 | 12,500 | 4,100 | 8,000 | 3,800 | 6,600 | 2,500 | 5,300 | 1,600 | 4,000 | 1,150 |
| 16 | 10,000 | 4,000 | 9,700 | 3,700 | 6,000 | 3,400 | 5,000 | 2,300 | 4,000 | 1,250 | 3,000 | 870 |
| 20 | 8,000 | 3,350 | 7,800 | 3,400 | 4,800 | 3,200 | 4,000 | 2,100 | 3,200 | 1,020 | 2,400 | 690 |

RPM = rev / min
FEED = mm / min



## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.2 | 0.02 | 0.5 | 0.016 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1 | 0.011 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1.5 | 0.007 | 42,000 | 202 | 36,700 | 176 | 36,700 | 162 | 36,700 | 147 |
| | 0.05 | 0.5 | 0.02 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1 | 0.014 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1.5 | 0.008 | 50,000 | 240 | 45,900 | 202 | 45,900 | 170 | 45,900 | 153 |
| 0.3 | 0.02 | 1 | 0.016 | 50,000 | 585 | 50,000 | 456 | 50,000 | 336 | 50,000 | 320 |
| | | 2 | 0.011 | 45,000 | 530 | 45,000 | 420 | 45,000 | 300 | 45,000 | 290 |
| | | 3 | 0.007 | 35,000 | 412 | 35,000 | 326 | 30,000 | 200 | 30,000 | 194 |
| | 0.05 | 1 | 0.021 | 50,000 | 585 | 50,000 | 456 | 50,000 | 336 | 50,000 | 320 |
| | | 2 | 0.012 | 45,000 | 530 | 45,000 | 420 | 45,000 | 300 | 45,000 | 290 |
| | | 3 | 0.008 | 35,000 | 412 | 35,000 | 326 | 30,000 | 200 | 30,000 | 194 |
| 0.4 | 0.02 | 1 | 0.016 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 2 | 0.013 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 3 | 0.01 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 4 | 0.007 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| | 0.05 | 1 | 0.025 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 2 | 0.016 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 3 | 0.014 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 4 | 0.008 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| | 0.1 | 1 | 0.033 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 1.5 | 0.03 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 2 | 0.028 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 3 | 0.016 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 4 | 0.01 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| 0.5 | 0.02 | 1 | 0.016 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 1.5 | 0.014 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.013 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2.5 | 0.011 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 3 | 0.01 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.008 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.007 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 6 | 0.006 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 8 | 0.005 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 10 | 0.004 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | 0.05 | 1 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 1.5 | 0.026 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.023 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2.5 | 0.02 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 3 | 0.017 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.017 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.011 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.008 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 8 | 0.007 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |

# Recommended Cutting Condition

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| | 0.05 | 10 | 0.006 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 1 | 0.035 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 1.5 | 0.032 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2.5 | 0.025 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| 0.5 | 0.1 | 3 | 0.02 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.02 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.013 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.013 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 8 | 0.01 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 10 | 0.08 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | | 2 | 0.016 | 50,000 | 1,159 | 37,830 | 600 | 28,200 | 390 | 23,000 | 320 |
| | | 3 | 0.014 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | | 4 | 0.013 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | 0.02 | 6 | 0.01 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.008 | 24,000 | 466 | 18,000 | 285 | 17,800 | 228 | 15,000 | 200 |
| | | 10 | 0.007 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 12 | 0.006 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 2 | 0.028 | 50,000 | 1,159 | 37,830 | 600 | 28,200 | 390 | 23,000 | 320 |
| | | 3 | 0.023 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | | 4 | 0.019 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| 0.6 | 0.05 | 6 | 0.012 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.01 | 24,000 | 466 | 18,000 | 285 | 17,800 | 228 | 15,000 | 200 |
| | | 10 | 0.007 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 12 | 0.006 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 2 | 0.035 | 50,000 | 1,159 | 37,830 | 600 | 28,200 | 390 | 23,000 | 320 |
| | | 3 | 0.03 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | | 4 | 0.024 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | 0.1 | 6 | 0.015 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.013 | 24,000 | 466 | 18,000 | 285 | 17,800 | 228 | 15,000 | 200 |
| | | 10 | 0.009 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 12 | 0.007 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| | | 2 | 0.042 | 49,200 | 1,054 | 34,190 | 558 | 29,030 | 355 | 25,830 | 292 |
| | | 4 | 0.029 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| 0.7 | 0.1 | 6 | 0.018 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.015 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 10 | 0.012 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 2 | 0.016 | 48,000 | 1,378 | 28,000 | 647 | 20,000 | 400 | 20,000 | 360 |
| | | 4 | 0.016 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | 0.02 | 6 | 0.013 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| 0.8 | | 8 | 0.011 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 10 | 0.01 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | | 12 | 0.09 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.05 | 2 | 0.038 | 48,000 | 1,378 | 28,000 | 647 | 20,000 | 400 | 20,000 | 360 |

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.8 | 0.05 | 4 | 0.026 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.015 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.012 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 10 | 0.011 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | | 12 | 0.01 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.1 | 2 | 0.047 | 48,000 | 1,378 | 28,000 | 647 | 20,000 | 400 | 20,000 | 360 |
| | | 4 | 0.032 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.019 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.015 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 10 | 0.013 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | | 12 | 0.012 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.2 | 2 | 0.081 | 48,000 | 1,378 | 28,000 | 647 | 20,000 | 400 | 20,000 | 360 |
| | | 4 | 0.056 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.032 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.018 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 10 | 0.016 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | | 12 | 0.015 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| 1 | 0.02 | 4 | 0.013 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.01 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.008 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.006 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.005 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 14 | 0.004 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.004 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.003 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.05 | 4 | 0.027 | 32,400 | 1,359 | 28,917 | 1,128 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.017 | 26,244 | 990 | 24,538 | 928 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.016 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.011 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.01 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 14 | 0.008 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.006 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.004 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.1 | 4 | 0.038 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.024 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.024 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.015 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.015 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 14 | 0.012 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.009 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.006 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.2 | 4 | 0.07 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.04 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |

# Recommended Cutting Condition

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 0.2 | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.025 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 14 | 0.02 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.3 | 4 | 0.07 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.04 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.025 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 14 | 0.02 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| 1.2 | 0.02 | 4 | 0.013 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 6 | 0.01 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 8 | 0.008 | 24,640 | 962 | 20,944 | 791 | 18,480 | 620 | 17,248 | 506 |
| | | 10 | 0.006 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.005 | 19,278 | 652 | 16,386 | 554 | 14,458 | 428 | 13,494 | 342 |
| | | 14 | 0.004 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.004 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.003 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.05 | 4 | 0.027 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 6 | 0.017 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 8 | 0.016 | 24,640 | 962 | 20,944 | 791 | 18,480 | 620 | 17,248 | 506 |
| | | 10 | 0.011 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.01 | 19,278 | 652 | 16,386 | 554 | 14,458 | 428 | 13,494 | 342 |
| | | 14 | 0.008 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.006 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.004 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.1 | 4 | 0.03 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 6 | 0.03 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 8 | 0.022 | 24,640 | 962 | 20,944 | 791 | 18,480 | 620 | 17,248 | 506 |
| | | 10 | 0.015 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.012 | 19,278 | 652 | 16,386 | 554 | 14,458 | 428 | 13,494 | 342 |
| | | 14 | 0.01 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.01 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.006 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.2 | 4 | 0.05 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 6 | 0.05 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 8 | 0.037 | 24,640 | 962 | 20,944 | 791 | 18,480 | 620 | 17,248 | 506 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.02 | 19,278 | 651 | 16,386 | 554 | 14,458 | 428 | 13,494 | 342 |
| | | 14 | 0.016 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.016 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.2 | 0.2 | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.3 | 4 | 0.05 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 6 | 0.05 | 28,868 | 1,154 | 24,538 | 928 | 21,651 | 727 | 20,208 | 594 |
| | | 8 | 0.037 | 24,640 | 962 | 20,944 | 791 | 18,480 | 620 | 17,248 | 506 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.02 | 19,278 | 651 | 16,386 | 554 | 14,458 | 428 | 13,494 | 342 |
| | | 14 | 0.016 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 16 | 0.016 | 18,144 | 533 | 15,422 | 453 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| 1.5 | 0.02 | 4 | 0.013 | 24,930 | 1,130 | 20,956 | 947 | 18,711 | 752 | 17,364 | 611 |
| | | 6 | 0.01 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.008 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 10 | 0.006 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.005 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.004 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.004 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.003 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.05 | 4 | 0.027 | 24,930 | 1,130 | 20,956 | 947 | 18,711 | 752 | 17,364 | 611 |
| | | 6 | 0.017 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.016 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 10 | 0.011 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.01 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.008 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.006 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.004 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.1 | 4 | 0.042 | 24,930 | 1,130 | 20,956 | 947 | 18,711 | 752 | 17,364 | 611 |
| | | 6 | 0.04 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.036 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 10 | 0.036 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.036 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.023 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.023 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.018 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.2 | 4 | 0.07 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 6 | 0.065 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 10 | 0.06 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.06 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.3 | 4 | 0.07 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 6 | 0.065 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |

# Recommended Cutting Condition

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.5 | 0.3 | 10 | 0.06 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.06 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.5 | 4 | 0.085 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 6 | 0.08 | 23,779 | 1,074 | 20,382 | 921 | 17,834 | 716 | 16,560 | 582 |
| | | 8 | 0.07 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 10 | 0.067 | 20,412 | 924 | 17,350 | 785 | 15,309 | 616 | 14,288 | 503 |
| | | 12 | 0.065 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 14 | 0.045 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 16 | 0.045 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.035 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| 2 | 0.02 | 6 | 0.013 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.01 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.008 | 17104 | 1284 | 14539 | 1092 | 12828 | 807 | 11973 | 659 |
| | | 12 | 0.006 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.005 | 14,458 | 1023 | 12,290 | 869 | 10,844 | 682 | 10,121 | 557 |
| | | 16 | 0.004 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.004 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.003 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | 0.05 | 6 | 0.027 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.017 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.016 | 17104 | 1284 | 14539 | 1092 | 12828 | 807 | 11973 | 659 |
| | | 12 | 0.011 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.01 | 14,458 | 1023 | 12,290 | 869 | 10,844 | 682 | 10,121 | 557 |
| | | 16 | 0.008 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.006 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.004 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | 0.1 | 6 | 0.07 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.055 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.042 | 17104 | 1284 | 14539 | 1092 | 12828 | 807 | 11973 | 659 |
| | | 12 | 0.03 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.03 | 14,458 | 1023 | 12,290 | 869 | 10,844 | 682 | 10,121 | 557 |
| | | 16 | 0.03 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.025 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.015 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | | 30 | 0.01 | 11,312 | 719 | 9,615 | 611 | 8,484 | 480 | 7,918 | 391 |
| | 0.2 | 6 | 0.08 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.07 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.055 | 17,104 | 1,284 | 14,539 | 1,092 | 12,828 | 807 | 11,973 | 659 |
| | | 12 | 0.04 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.04 | 14,458 | 1,023 | 12,290 | 869 | 10,844 | 682 | 10,121 | 557 |
| | | 16 | 0.04 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 0.2 | 20 | 0.035 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.025 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | | 30 | 0.017 | 11,312 | 719 | 9,615 | 611 | 8,484 | 480 | 7,918 | 391 |
| | 0.3 | 6 | 0.11 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.09 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.075 | 17,104 | 1,284 | 14,539 | 1,092 | 12,828 | 807 | 11,973 | 659 |
| | | 12 | 0.06 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.06 | 14,458 | 1023 | 12,290 | 869 | 10,844 | 682 | 10,121 | 557 |
| | | 16 | 0.06 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.037 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.03 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | | 30 | 0.021 | 11,312 | 719 | 9,615 | 611 | 8,484 | 480 | 7,918 | 391 |
| | 0.5 | 6 | 0.17 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.14 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 10 | 0.11 | 17,104 | 1284 | 14,539 | 1143 | 12,828 | 807 | 11,973 | 659 |
| | | 12 | 0.08 | 15,309 | 1,083 | 13,013 | 1,023 | 11,482 | 722 | 10,716 | 590 |
| | | 14 | 0.08 | 14,458 | 1023 | 12,290 | 920 | 1,084 | 682 | 10,121 | 557 |
| | | 16 | 0.08 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.05 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.05 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | | 30 | 0.03 | 11,312 | 719 | 9,615 | 611 | 8,484 | 480 | 7,918 | 391 |
| 2.5 | 0.1 | 10 | 0.055 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 16 | 0.042 | 16,254 | 1224 | 13,816 | 1040 | 12,190 | 767 | 11,378 | 626 |
| | | 20 | 0.03 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 25 | 0.022 | 12,757 | 860 | 10,844 | 730 | 9,568 | 573 | 8,930 | 467 |
| | | 30 | 0.015 | 11,907 | 757 | 10,121 | 643 | 8,930 | 505 | 8,335 | 411 |
| | 0.2 | 10 | 0.07 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 16 | 0.055 | 16,254 | 1,224 | 1,386 | 1040 | 12,190 | 767 | 11,378 | 626 |
| | | 20 | 0.04 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | 0.3 | 10 | 0.09 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 16 | 0.075 | 16,254 | 1,224 | 1,386 | 1040 | 12,190 | 767 | 11,378 | 626 |
| | | 20 | 0.06 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | 0.5 | 10 | 0.14 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 16 | 0.11 | 16,254 | 1,224 | 1,386 | 1040 | 12,190 | 767 | 11,378 | 626 |
| | | 20 | 0.08 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| 3 | 0.1 | 10 | 0.06 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.05 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.035 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.035 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 687 | 8,165 | 561 |
| | | 25 | 0.031 | 10,368 | 973 | 8,812 | 827 | 7,776 | 583 | 7,257 | 477 |
| | | 30 | 0.027 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 35 | 0.02 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 40 | 0.015 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | 0.2 | 10 | 0.08 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |

# Recommended Cutting Condition

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 3 | 0.2 | 12 | 0.07 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.05 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.05 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 687 | 8,165 | 561 |
| | | 25 | 0.045 | 10,368 | 973 | 8,812 | 827 | 7,776 | 583 | 7,257 | 477 |
| | | 30 | 0.04 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 35 | 0.035 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 40 | 0.03 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | 0.3 | 10 | 0.115 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.1 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.075 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.075 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 687 | 8,165 | 561 |
| | | 25 | 0.067 | 10,368 | 973 | 8,812 | 827 | 7,776 | 583 | 7,257 | 477 |
| | | 30 | 0.06 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 35 | 0.05 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 40 | 0.04 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | 0.5 | 10 | 0.155 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.13 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.1 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.1 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 687 | 8,165 | 561 |
| | | 25 | 0.09 | 10,368 | 973 | 8,812 | 827 | 7,776 | 583 | 7,257 | 477 |
| | | 30 | 0.08 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 35 | 0.065 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 40 | 0.05 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | 1 | 10 | 0.175 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.15 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.12 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.11 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 687 | 8,165 | 561 |
| | | 25 | 0.1 | 10,368 | 973 | 8,812 | 827 | 7,776 | 583 | 7,257 | 477 |
| | | 30 | 0.09 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 35 | 0.075 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| | | 40 | 0.06 | 9,072 | 801 | 7,711 | 681 | 6,804 | 480 | 6,350 | 393 |
| 4 | 0.1 | 12 | 0.065 | 11,213 | 1,950 | 9,531 | 1,658 | 8,410 | 1,170 | 7,849 | 956 |
| | | 16 | 0.06 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 20 | 0.055 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 25 | 0.05 | 10,255 | 1,783 | 7,782 | 1293 | 6,545 | 872 | 5,904 | 687 |
| | | 30 | 0.045 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 35 | 0.04 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 40 | 0.035 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | 0.2 | 12 | 0.14 | 11,213 | 1,950 | 9,531 | 1,658 | 8,410 | 1,170 | 7,849 | 956 |
| | | 16 | 0.13 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 20 | 0.11 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 25 | 0.105 | 10,255 | 1,783 | 7,782 | 1293 | 6,545 | 872 | 5,904 | 687 |
| | | 30 | 0.1 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 35 | 0.08 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 4 | 0.2 | 40 | 0.07 | 9,247 | 1,429 | 6,225 | 901 | 5,217 | 602 | 4,621 | 459 |
| | 0.3 | 12 | 0.22 | 11,213 | 1,950 | 9,531 | 1,658 | 8,410 | 1,170 | 7,849 | 956 |
| | | 16 | 0.2 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 20 | 0.18 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 25 | 0.17 | 10,255 | 1,783 | 7,782 | 1293 | 6,545 | 872 | 5,904 | 687 |
| | | 30 | 0.16 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 35 | 0.14 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 40 | 0.13 | 9,247 | 1,429 | 6,225 | 901 | 5,217 | 602 | 4,621 | 459 |
| | 0.5 | 12 | 0.35 | 11,213 | 1,950 | 9,531 | 1,658 | 8,410 | 1,170 | 7,849 | 956 |
| | | 16 | 0.25 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 20 | 0.2 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 25 | 0.175 | 10,255 | 1,783 | 7,782 | 1293 | 6,545 | 872 | 5,904 | 687 |
| | | 30 | 0.15 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 5 |
| | | 35 | 0.1 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 40 | 0.075 | 9,247 | 1,429 | 6,225 | 901 | 5,217 | 602 | 4,621 | 459 |
| | 1 | 12 | 0.4 | 11,213 | 1,950 | 9,531 | 1,658 | 8,410 | 1,170 | 7,849 | 956 |
| | | 16 | 0.29 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 20 | 0.23 | 10,255 | 1,783 | 8,697 | 1,512 | 7,599 | 1,057 | 6,684 | 814 |
| | | 25 | 0.2 | 10,255 | 1,783 | 7,782 | 1293 | 6,545 | 872 | 5,904 | 687 |
| | | 30 | 0.17 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 35 | 0.12 | 10,255 | 1,783 | 6,867 | 1,075 | 5,491 | 688 | 5,124 | 561 |
| | | 40 | 0.09 | 9,247 | 1,429 | 6,225 | 901 | 5,217 | 602 | 4,621 | 459 |
| 5 | 0.2 | 15 | 0.16 | 9,154 | 1,990 | 7,781 | 1,692 | 6,866 | 1,194 | 6,408 | 975 |
| | | 25 | 0.152 | 8,513 | 1813 | 7,236 | 1541 | 6,385 | 1088 | 5,959 | 888 |
| | | 30 | 0.145 | 7,872 | 1637 | 6,691 | 1391 | 5,904 | 982 | 5,510 | 802 |
| | | 40 | 0.13 | 6,590 | 1,284 | 5,602 | 1,091 | 4,943 | 770 | 4,613 | 629 |
| | 0.5 | 15 | 0.35 | 9,154 | 1,990 | 7,781 | 1,692 | 6,866 | 1,194 | 6,408 | 975 |
| | | 25 | 0.296 | 8,513 | 1813 | 7,236 | 1541 | 6,385 | 1088 | 5,959 | 888 |
| | | 30 | 0.24 | 7,872 | 1637 | 6,691 | 1391 | 5,904 | 982 | 5,510 | 802 |
| | | 40 | 0.135 | 6,590 | 1,284 | 5,602 | 1,091 | 4,943 | 770 | 4,613 | 629 |
| | 1 | 15 | 0.4 | 9,154 | 1,990 | 7,781 | 1,692 | 6,866 | 1,194 | 6,408 | 975 |
| | | 25 | 0.337 | 8,513 | 1813 | 7,236 | 1541 | 6,385 | 1088 | 5,959 | 888 |
| | | 30 | 0.275 | 7,872 | 1637 | 6,691 | 1391 | 5,904 | 982 | 5,510 | 802 |
| | | 40 | 0.15 | 6,590 | 1,284 | 5,602 | 1,091 | 4,943 | 770 | 4,613 | 629 |
| 6 | 0.1 | 20 | 0.065 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.05 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |
| | 0.2 | 20 | 0.14 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.11 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |
| | 0.3 | 20 | 0.22 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.18 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |
| | 0.5 | 20 | 0.35 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.24 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |
| | 1 | 20 | 0.4 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.28 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |

# Recommended Cutting Condition

## ESRR712 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 6 | 1.5 | 20 | 0.45 | 7,630 | 1,991 | 6,486 | 1,692 | 5,722 | 1,194 | 5,342 | 975 |
| | | 40 | 0.3 | 6,486 | 1,523 | 5,513 | 1,294 | 4,865 | 914 | 4,540 | 746 |
| 8 | 0.2 | 22 | 0.35 | 5,730 | 1900 | 4,524 | 1483 | 3,016 | 914 | 2,320 | 584 |
| | 0.3 | 22 | 0.5 | 5,730 | 1900 | 4,524 | 1483 | 3,016 | 914 | 2,320 | 584 |
| | 0.5 | 22 | 0.6 | 5,730 | 1900 | 4,524 | 1483 | 3,016 | 914 | 2,320 | 584 |
| | 1 | 22 | 0.7 | 5,730 | 1900 | 4,524 | 1483 | 3,016 | 914 | 2,320 | 584 |
| | 1.5 | 22 | 0.8 | 5,730 | 1900 | 4,524 | 1483 | 3,016 | 914 | 2,320 | 584 |
| 10 | 0.2 | 24 | 0.4 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| | 0.3 | 24 | 0.5 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| | 0.5 | 24 | 0.6 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| | 1 | 24 | 0.7 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| | 1.5 | 24 | 0.8 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| | 2 | 24 | 0.9 | 4,524 | 1728 | 3,567 | 1396 | 2,378 | 849 | 1,856 | 544 |
| 12 | 0.2 | 26 | 0.5 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 0.3 | 26 | 0.6 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 0.5 | 26 | 0.7 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 1 | 26 | 0.8 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 1.5 | 26 | 0.9 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 2 | 26 | 1 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| | 3 | 26 | 1 | 3,857 | 1728 | 3,045 | 1396 | 2,030 | 849 | 1,537 | 544 |
| 16 | 0.5 | 35 | 2 | 2,842 | 1,512 | 2,262 | 1209 | 1,508 | 748 | 1,160 | 480 |
| | 1 | 35 | 2 | 2,842 | 453 | 2,262 | 362 | 1,508 | 224 | 1,160 | 480 |

· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.

· In the case of low RPM, reduce the feed rate at the same rate.

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.5 | 0.05 | 2 | 0.023 | 50,000 | 1257 | 40,000 | 649 | 30,000 | 529 | 28,000 | 441 |
| | | 4 | 0.017 | 40,000 | 1008 | 32,000 | 529 | 24,000 | 390 | 20,000 | 327 |
| | | 6 | 0.008 | 28,800 | 672 | 19,400 | 364 | 18,000 | 350 | 15,000 | 280 |
| | | 8 | 0.007 | 28,800 | 672 | 19,400 | 364 | 18,000 | 350 | 15,000 | 280 |
| | 0.1 | 2 | 0.03 | 50,000 | 1257 | 40,000 | 649 | 30,000 | 529 | 28,000 | 441 |
| | | 4 | 0.02 | 40,000 | 1008 | 32,000 | 529 | 24,000 | 390 | 20,000 | 327 |
| | | 6 | 0.013 | 28,800 | 672 | 19,400 | 364 | 18,000 | 350 | 15,000 | 280 |
| | | 8 | 0.01 | 28,800 | 672 | 19,400 | 364 | 18,000 | 350 | 15,000 | 280 |
| 0.6 | 0.05 | 2 | 0.028 | 50,000 | 1622 | 37,830 | 840 | 28,200 | 546 | 23,000 | 448 |
| | | 4 | 0.019 | 40,000 | 1,162 | 27,800 | 616 | 23,600 | 392 | 21,000 | 322 |
| | | 6 | 0.012 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| | | 8 | 0.01 | 24,000 | 652 | 18,000 | 399 | 17,800 | 319 | 15,000 | 280 |
| | 0.1 | 2 | 0.035 | 50,000 | 1622 | 37,830 | 840 | 28,200 | 546 | 23,000 | 448 |
| | | 4 | 0.024 | 40,000 | 1,162 | 27,800 | 616 | 23,600 | 392 | 21,000 | 322 |
| | | 6 | 0.015 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| | | 8 | 0.013 | 24,000 | 652 | 18,000 | 399 | 17,800 | 319 | 15,000 | 280 |
| 0.7 | 0.05 | 2 | 0.028 | 49,200 | 1,475 | 34,190 | 781 | 29,030 | 497 | 25,830 | 408 |
| | | 4 | 0.019 | 40,000 | 1,162 | 27,800 | 616 | 23,600 | 392 | 21,000 | 322 |
| | | 6 | 0.012 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| | | 8 | 0.01 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| | 0.1 | 2 | 0.042 | 49,200 | 1,475 | 34,190 | 781 | 29,030 | 497 | 25,830 | 408 |
| | | 4 | 0.029 | 40,000 | 1,162 | 27,800 | 616 | 23,600 | 392 | 21,000 | 322 |
| | | 6 | 0.018 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| | | 8 | 0.015 | 24,000 | 686 | 18,000 | 420 | 17,800 | 336 | 15,000 | 294 |
| 0.8 | 0.02 | 2 | 0.016 | 48,000 | 1929 | 28,000 | 905 | 20,000 | 560 | 360 | 504 |
| | | 4 | 0.016 | 48,000 | 1,542 | 28,000 | 725 | 20,000 | 448 | 288 | 403 |
| | | 6 | 0.013 | 38,700 | 1,120 | 25,000 | 645 | 18,000 | 403 | 256 | 358 |
| | | 8 | 0.011 | 29,025 | 840 | 20,000 | 516 | 16,200 | 362 | 230 | 322 |
| | | 10 | 0.01 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| | | 12 | 0.09 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| | 0.05 | 2 | 0.038 | 48,000 | 1929 | 28,000 | 905 | 20,000 | 560 | 360 | 504 |
| | | 4 | 0.026 | 48,000 | 1,542 | 28,000 | 725 | 20,000 | 448 | 288 | 403 |
| | | 6 | 0.015 | 38,700 | 1,120 | 25,000 | 645 | 18,000 | 403 | 256 | 358 |
| | | 8 | 0.012 | 29,025 | 840 | 20,000 | 516 | 16,200 | 362 | 230 | 322 |
| | | 10 | 0.011 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| | | 12 | 0.01 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| | 0.1 | 2 | 0.047 | 48,000 | 1929 | 28,000 | 905 | 20,000 | 560 | 360 | 504 |
| | | 4 | 0.032 | 48,000 | 1,542 | 28,000 | 725 | 20,000 | 448 | 288 | 403 |
| | | 6 | 0.019 | 38,700 | 1,120 | 25,000 | 645 | 18,000 | 403 | 256 | 358 |
| | | 8 | 0.015 | 29,025 | 840 | 20,000 | 516 | 16,200 | 362 | 230 | 322 |
| | | 10 | 0.013 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| | | 12 | 0.012 | 29,025 | 798 | 20,000 | 490 | 16,200 | 344 | 219 | 306 |
| 1 | 0.02 | 4 | 0.013 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 6 | 0.01 | 26,244 | 1386 | 22,307 | 1178 | 19,683 | 924 | 18,371 | 754 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 0.02 | 8 | 0.008 | 23,328 | 1232 | 19,829 | 1047 | 17,496 | 821 | 16,330 | 670 |
| | | 10 | 0.006 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.005 | 18,144 | 852 | 15,422 | 634 | 13,608 | 558 | 12,701 | 448 |
| | | 14 | 0.004 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.004 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.003 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.05 | 3 | 0.027 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 4 | 0.027 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 6 | 0.017 | 26,244 | 1386 | 22,307 | 1178 | 19,683 | 924 | 18,371 | 754 |
| | | 8 | 0.016 | 23,328 | 1232 | 19,829 | 1047 | 17,496 | 821 | 16,330 | 670 |
| | | 10 | 0.011 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.01 | 18,144 | 852 | 15,422 | 634 | 13,608 | 558 | 12,701 | 448 |
| | | 14 | 0.008 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.006 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.004 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.1 | 3 | 0.038 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 4 | 0.038 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 6 | 0.024 | 26,244 | 1386 | 22,307 | 1178 | 19,683 | 924 | 18,371 | 754 |
| | | 8 | 0.024 | 23,328 | 1232 | 19,829 | 1047 | 17,496 | 821 | 16,330 | 670 |
| | | 10 | 0.015 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.015 | 18,144 | 852 | 15,422 | 634 | 13,608 | 558 | 12,701 | 448 |
| | | 14 | 0.012 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.009 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.006 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.2 | 3 | 0.07 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 4 | 0.07 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 6 | 0.04 | 26,244 | 1386 | 22,307 | 1178 | 19,683 | 924 | 18,371 | 754 |
| | | 8 | 0.04 | 23,328 | 1232 | 19,829 | 1047 | 17,496 | 821 | 16,330 | 670 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.025 | 18,144 | 852 | 15,422 | 634 | 13,608 | 558 | 12,701 | 448 |
| | | 14 | 0.02 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.015 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.3 | 3 | 0.07 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 4 | 0.07 | 32,400 | 1902 | 27,540 | 1454 | 24,300 | 1141 | 22,680 | 932 |
| | | 6 | 0.04 | 26,244 | 1386 | 22,307 | 1178 | 19,683 | 924 | 18,371 | 754 |
| | | 8 | 0.04 | 23,328 | 1232 | 19,829 | 1047 | 17,496 | 821 | 16,330 | 670 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.025 | 18,144 | 852 | 15,422 | 634 | 13,608 | 558 | 12,701 | 448 |
| | | 14 | 0.02 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.015 | 18,144 | 746 | 15,422 | 588 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| 1.2 | 0.02 | 4 | 0.013 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.01 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.2 | 0.02 | 8 | 0.008 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.006 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.005 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.004 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.004 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.003 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.05 | 3 | 0.027 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.027 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.017 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.016 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.011 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.01 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.008 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.006 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.004 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.1 | 3 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.022 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.015 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.012 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.01 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.01 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.006 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.2 | 3 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.037 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.02 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.3 | 3 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.037 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.02 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 16 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| 1.5 | 0.02 | 6 | 0.01 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.008 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.006 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.5 | 0.02 | 8 | 0.008 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.006 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.005 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.004 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.004 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.003 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.05 | 3 | 0.027 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.027 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.017 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.016 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.011 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.01 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.008 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.006 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.004 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.1 | 3 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.03 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.022 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.015 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.012 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.01 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.01 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.006 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.2 | 3 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.037 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.02 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 14 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 16 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| | 0.3 | 3 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 4 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1017 | 20,208 | 831 |
| | | 6 | 0.05 | 28,868 | 1,615 | 24,538 | 1,299 | 21,651 | 1,017 | 20,208 | 831 |
| | | 8 | 0.037 | 24,640 | 1,346 | 20,944 | 1,107 | 18,480 | 868 | 17,248 | 708 |
| | | 10 | 0.025 | 20,412 | 1,078 | 17,350 | 917 | 15,309 | 719 | 14,288 | 586 |
| | | 12 | 0.02 | 19,278 | 912 | 16,386 | 775 | 14,458 | 599 | 13,494 | 478 |
| | | 16 | 0.016 | 18,144 | 746 | 15,422 | 634 | 13,608 | 478 | 12,701 | 372 |
| | | 20 | 0.01 | 13,608 | 558 | 11,567 | 441 | 10,206 | 359 | 9,526 | 280 |
| 1.5 | 0.02 | 6 | 0.01 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.008 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.006 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.5 | 0.02 | 12 | 0.005 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.004 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.004 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.003 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.003 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | 0.05 | 4 | 0.027 | 24,930 | 1,582 | 20,956 | 1325 | 18,711 | 1052 | 17,364 | 855 |
| | | 6 | 0.017 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.016 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.011 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |
| | | 12 | 0.01 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.008 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.006 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.004 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.004 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 26 | 0.003 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | 0.1 | 4 | 0.042 | 24,930 | 1,582 | 20,956 | 1325 | 18,711 | 1052 | 17,364 | 855 |
| | | 6 | 0.04 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.036 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.036 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |
| | | 12 | 0.036 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.023 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.023 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.018 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.015 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 26 | 0.01 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | 0.2 | 4 | 0.07 | 24,930 | 1,582 | 20,956 | 1325 | 18,711 | 1052 | 17,364 | 855 |
| | | 6 | 0.065 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.06 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.06 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |
| | | 12 | 0.06 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.038 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.038 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.03 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.025 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 25 | 0.02 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | 0.3 | 4 | 0.07 | 24,930 | 1,582 | 20,956 | 1325 | 18,711 | 1052 | 17,364 | 855 |
| | | 6 | 0.065 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.06 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.06 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |
| | | 12 | 0.06 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.038 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.038 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.03 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.025 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1.5 | 0.3 | 25 | 0.02 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | 0.5 | 4 | 0.085 | 24,930 | 1,582 | 20,956 | 1325 | 18,711 | 1052 | 17,364 | 855 |
| | | 6 | 0.08 | 23,779 | 1,503 | 20,382 | 1,325 | 17,834 | 1,052 | 16,560 | 855 |
| | | 8 | 0.07 | 22,680 | 1,437 | 19,278 | 1,289 | 17,010 | 1,002 | 15,876 | 814 |
| | | 10 | 0.067 | 20,412 | 1,293 | 17,350 | 1,222 | 15,309 | 959 | 14,288 | 782 |
| | | 12 | 0.065 | 18,144 | 1,150 | 15,422 | 1,099 | 13,608 | 862 | 12,701 | 704 |
| | | 14 | 0.045 | 14,112 | 795 | 11,995 | 977 | 10,584 | 767 | 9,878 | 625 |
| | | 16 | 0.045 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 20 | 0.035 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 22 | 0.03 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| | | 25 | 0.025 | 14,112 | 795 | 11,995 | 592 | 10,584 | 522 | 9,878 | 417 |
| 2 | 0.02 | 6 | 0.013 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.01 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.008 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.006 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.005 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |
| | | 16 | 0.004 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.004 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 25 | 0.003 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.003 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| | 0.05 | 6 | 0.027 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.017 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.016 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.011 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.01 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |
| | | 16 | 0.008 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.006 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 25 | 0.004 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.003 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| | 0.1 | 6 | 0.07 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.055 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.042 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.03 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.03 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |
| | | 16 | 0.03 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.025 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 22 | 0.02 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 25 | 0.015 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.01 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| | 0.2 | 6 | 0.08 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.07 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.055 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.04 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.04 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 0.2 | 16 | 0.04 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.035 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 22 | 0.03 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 25 | 0.025 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.017 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| | 0.3 | 6 | 0.11 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.09 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.075 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.06 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.06 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |
| | | 16 | 0.06 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.037 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 22 | 0.033 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 25 | 0.03 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.021 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| | 0.5 | 6 | 0.17 | 20,790 | 2289 | 17,672 | 1944 | 15,593 | 1373 | 14,553 | 1121 |
| | | 8 | 0.14 | 18,900 | 2080 | 16,065 | 1768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.11 | 17104 | 1797 | 14539 | 1528 | 12828 | 1129 | 11973 | 922 |
| | | 12 | 0.08 | 15,309 | 1516 | 13,013 | 1289 | 11,482 | 1010 | 10,716 | 826 |
| | | 14 | 0.08 | 14,458 | 1432 | 12,290 | 1216 | 10,844 | 954 | 10,121 | 779 |
| | | 16 | 0.08 | 13,608 | 1,348 | 11,567 | 1145 | 10,206 | 898 | 9,526 | 733 |
| | | 20 | 0.05 | 11,907 | 1180 | 10,121 | 1002 | 8,930 | 786 | 8,335 | 642 |
| | | 22 | 0.05 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 25 | 0.05 | 11,907 | 1059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | | 30 | 0.03 | 11,312 | 1006 | 9,615 | 855 | 8,484 | 672 | 7,918 | 547 |
| 2.5 | 0.1 | 8 | 0.06 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.055 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 12 | 0.051 | 18,018 | 1,958 | 15,315 | 1664 | 13,513 | 1190 | 12,613 | 1019 |
| | | 14 | 0.046 | 17,136 | 1835 | 14,566 | 1560 | 12,852 | 1132 | 11,995 | 971 |
| | | 16 | 0.042 | 16,254 | 1,713 | 13,816 | 1,456 | 12,190 | 1,073 | 11,378 | 876 |
| | | 20 | 0.03 | 13,608 | 1,348 | 11,567 | 1,145 | 10,206 | 898 | 9,526 | 733 |
| | | 25 | 0.022 | 12,757 | 1204 | 10,844 | 1022 | 9,568 | 802 | 8,930 | 653 |
| | | 30 | 0.015 | 11,907 | 1,059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | 0.2 | 8 | 0.08 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.07 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 12 | 0.06 | 18,018 | 1,958 | 15,315 | 1664 | 13,513 | 1190 | 12,613 | 1019 |
| | | 14 | 0.05 | 17,136 | 1835 | 14,566 | 1560 | 12,852 | 1132 | 11,995 | 971 |
| | | 16 | 0.055 | 16,254 | 1,713 | 13,816 | 1,456 | 12,190 | 1,073 | 11,378 | 876 |
| | | 20 | 0.04 | 13,608 | 1,348 | 11,567 | 1,145 | 10,206 | 898 | 9,526 | 733 |
| | | 25 | 0.03 | 12,757 | 1204 | 10,844 | 1022 | 9,568 | 802 | 8,930 | 653 |
| | | 30 | 0.02 | 11,907 | 1,059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | 0.3 | 8 | 0.1 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.09 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 12 | 0.085 | 18,018 | 1,958 | 15,315 | 1664 | 13,513 | 1190 | 12,613 | 1019 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2.5 | 0.3 | 14 | 0.08 | 17,136 | 1835 | 14,566 | 1560 | 12,852 | 1132 | 11,995 | 971 |
| | | 16 | 0.075 | 16,254 | 1,713 | 13,816 | 1,456 | 12,190 | 1,073 | 11,378 | 876 |
| | | 20 | 0.06 | 13,608 | 1,348 | 11,567 | 1,145 | 10,206 | 898 | 9,526 | 733 |
| | | 25 | 0.065 | 12,757 | 1204 | 10,844 | 1022 | 9,568 | 802 | 8,930 | 653 |
| | | 30 | 0.06 | 11,907 | 1,059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| | 0.5 | 8 | 0.15 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 10 | 0.14 | 18,900 | 2,080 | 16,065 | 1,768 | 14,175 | 1248 | 13,230 | 1019 |
| | | 12 | 0.13 | 18,018 | 1,958 | 15,315 | 1664 | 13,513 | 1190 | 12,613 | 1019 |
| | | 14 | 0.12 | 17,136 | 1835 | 14,566 | 1560 | 12,852 | 1132 | 11,995 | 971 |
| | | 16 | 0.11 | 16,254 | 1,713 | 13,816 | 1,456 | 12,190 | 1,073 | 11,378 | 876 |
| | | 20 | 0.08 | 13,608 | 1,348 | 11,567 | 1,145 | 10,206 | 898 | 9,526 | 733 |
| | | 25 | 0.07 | 12,757 | 1204 | 10,844 | 1022 | 9,568 | 802 | 8,930 | 653 |
| | | 30 | 0.05 | 11,907 | 1,059 | 10,121 | 900 | 8,930 | 707 | 8,335 | 575 |
| 3 | 0.1 | 8 | 0.07 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 10 | 0.06 | 14400 | 1,981 | 12240 | 1,684 | 10800 | 1188 | 10080 | 970 |
| | | 12 | 0.05 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 14 | 0.047 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 16 | 0.035 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 20 | 0.035 | 11,664 | 1,604 | 9,914 | 1,363 | 8,748 | 961 | 8,165 | 785 |
| | | 25 | 0.031 | 10368 | 1,362 | 8812.5 | 1,158 | 7776 | 816 | 7257.5 | 667 |
| | | 30 | 0.027 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 35 | 0.02 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 40 | 0.015 | 8,164 | 897 | 6,939 | 762 | 6,123 | 537 | 5,715 | 440 |
| | | 45 | 0.01 | 7,258 | 672 | 6,169 | 572 | 5,443 | 403 | 5,080 | 330 |
| | 0.2 | 8 | 0.09 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 10 | 0.08 | 14400 | 1,981 | 12240 | 1,684 | 10800 | 1188 | 10080 | 970 |
| | | 12 | 0.07 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 14 | 0.06 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 16 | 0.05 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 20 | 0.05 | 11,664 | 1,604 | 9,914 | 1,363 | 8,748 | 961 | 8,165 | 785 |
| | | 25 | 0.045 | 10368 | 1,362 | 8812.5 | 1,158 | 7776 | 816 | 7257.5 | 667 |
| | | 30 | 0.04 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 35 | 0.035 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 40 | 0.03 | 8,164 | 897 | 6,939 | 762 | 6,123 | 537 | 5,715 | 440 |
| | | 45 | 0.025 | 7,258 | 672 | 6,169 | 572 | 5,443 | 403 | 5,080 | 330 |
| | 0.3 | 8 | 0.13 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 10 | 0.115 | 14400 | 1,981 | 12240 | 1,684 | 10800 | 1188 | 10080 | 970 |
| | | 12 | 0.1 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 14 | 0.085 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 16 | 0.075 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 20 | 0.075 | 11,664 | 1,604 | 9,914 | 1,363 | 8,748 | 961 | 8,165 | 785 |
| | | 25 | 0.0675 | 10368 | 1,362 | 8812.5 | 1,158 | 7776 | 816 | 7257.5 | 667 |
| | | 30 | 0.06 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 35 | 0.05 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 3 | 0.3 | 40 | 0.04 | 8,164 | 897 | 6,939 | 762 | 6,123 | 537 | 5,715 | 440 |
| | | 45 | 0.03 | 7,258 | 672 | 6,169 | 572 | 5,443 | 403 | 5,080 | 330 |
| | 0.5 | 8 | 0.18 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 10 | 0.155 | 14400 | 1,981 | 12240 | 1,684 | 10800 | 1188 | 10080 | 970 |
| | | 12 | 0.13 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 14 | 0.12 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 16 | 0.1 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 20 | 0.1 | 11,664 | 1,604 | 9,914 | 1,363 | 8,748 | 961 | 8,165 | 785 |
| | | 25 | 0.09 | 10368 | 1,362 | 8812.5 | 1,158 | 7776 | 816 | 7257.5 | 667 |
| | | 30 | 0.08 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 35 | 0.065 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 40 | 0.05 | 8,164 | 897 | 6,939 | 762 | 6,123 | 537 | 5,715 | 440 |
| | | 45 | 0.04 | 7,258 | 672 | 6,169 | 572 | 5,443 | 403 | 5,080 | 330 |
| | | 50 | 0.03 | 6,532 | 538 | 5,552 | 457 | 4,899 | 322 | 4,572 | 264 |
| | 1 | 8 | 0.2 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 10 | 0.175 | 14400 | 1,981 | 12240 | 1,684 | 10800 | 1188 | 10080 | 970 |
| | | 12 | 0.15 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 14 | 0.13 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 16 | 0.12 | 14,400 | 1,981 | 12,240 | 1,684 | 10,800 | 1188 | 10,080 | 970 |
| | | 20 | 0.11 | 11,664 | 1,604 | 9,914 | 1,363 | 8,748 | 961 | 8,165 | 785 |
| | | 25 | 0.1 | 10368 | 1,362 | 8812.5 | 1,158 | 7776 | 816 | 7257.5 | 667 |
| | | 30 | 0.09 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 35 | 0.075 | 9,072 | 1,121 | 7,711 | 953 | 6,804 | 672 | 6,350 | 550 |
| | | 40 | 0.06 | 8,164 | 897 | 6,939 | 762 | 6,123 | 537 | 5,715 | 440 |
| | | 45 | 0.045 | 7,258 | 672 | 6,169 | 572 | 5,443 | 403 | 5,080 | 330 |
| | | 50 | 0.03 | 6,532 | 538 | 5,552 | 457 | 4,899 | 322 | 4,572 | 264 |
| 4 | 0.1 | 10 | 0.072 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1,638 | 7,849 | 1338 |
| | | 12 | 0.065 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1638 | 7,849 | 1338 |
| | | 13 | 0.062 | 10,734 | 2,613 | 9,114 | 2,219 | 8,004 | 1558 | 7,266 | 1239 |
| | | 16 | 0.06 | 10,255 | 2,496 | 8,697 | 2116 | 7,599 | 1479 | 6,684 | 1139 |
| | | 20 | 0.055 | 10,255 | 2496 | 8,697 | 2,116 | 7,599 | 1479 | 6,884 | 1139 |
| | | 25 | 0.05 | 10,255 | 2,496 | 7,782 | 1,810 | 6,545 | 1,221 | 5,904 | 962 |
| | | 30 | 0.045 | 10,255 | 2,496 | 6,867 | 1,505 | 5,491 | 963 | 5,124 | 785 |
| | | 35 | 0.04 | 10,255 | 2,496 | 6,867 | 1505 | 5,491 | 963 | 5,124 | 785 |
| | | 40 | 0.035 | 9,247 | 2,000 | 6,225 | 1,262 | 5,217 | 842 | 4,621 | 643 |
| | | 45 | 0.03 | 8,240 | 1,505 | 5,584 | 1,019 | 4,944 | 722 | 4,119 | 501 |
| | | 50 | 0.02 | 7,398 | 1,200 | 4,980 | 757 | 4,174 | 505 | 3,697 | 385 |
| | 0.2 | 10 | 0.15 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1,638 | 7,849 | 1338 |
| | | 12 | 0.14 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1638 | 7,849 | 1338 |
| | | 13 | 0.135 | 10,734 | 2,613 | 9,114 | 2,219 | 8,004 | 1558 | 7,266 | 1239 |
| | | 16 | 0.13 | 10,255 | 2,496 | 8,697 | 2116 | 7,599 | 1479 | 6,684 | 1139 |
| | | 20 | 0.11 | 10,255 | 2496 | 8,697 | 2,116 | 7,599 | 1479 | 6,884 | 1139 |
| | | 25 | 0.105 | 10,255 | 2,496 | 7,782 | 1,810 | 6,545 | 1,221 | 5,904 | 962 |
| | | 30 | 0.1 | 10,255 | 2,496 | 6,867 | 1,505 | 5,491 | 963 | 5,124 | 785 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 4 | 0.2 | 35 | 0.08 | 10,255 | 2,496 | 6,867 | 1505 | 5,491 | 963 | 5,124 | 785 |
| | | 40 | 0.07 | 9,247 | 2,000 | 6,225 | 1,262 | 5,217 | 842 | 4,621 | 643 |
| | | 45 | 0.06 | 8,240 | 1,505 | 5,584 | 1,019 | 4,944 | 722 | 4,119 | 501 |
| | | 50 | 0.05 | 7,398 | 1,200 | 4,980 | 757 | 4,174 | 505 | 3,697 | 385 |
| | 0.3 | 10 | 0.23 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1,638 | 7,849 | 1338 |
| | | 12 | 0.22 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1638 | 7,849 | 1338 |
| | | 13 | 0.21 | 10,734 | 2,613 | 9,114 | 2,219 | 8,004 | 1558 | 7,266 | 1239 |
| | | 16 | 0.2 | 10,255 | 2,496 | 8,697 | 2116 | 7,599 | 1479 | 6,684 | 1139 |
| | | 20 | 0.18 | 10,255 | 2496 | 8,697 | 2,116 | 7,599 | 1479 | 6,884 | 1139 |
| | | 25 | 0.17 | 10,255 | 2,496 | 7,782 | 1,810 | 6,545 | 1,221 | 5,904 | 962 |
| | | 30 | 0.16 | 10,255 | 2,496 | 6,867 | 1,505 | 5,491 | 963 | 5,124 | 785 |
| | | 35 | 0.14 | 10,255 | 2,496 | 6,867 | 1505 | 5,491 | 963 | 5,124 | 785 |
| | | 40 | 0.13 | 9,247 | 2,000 | 6,225 | 1,262 | 5,217 | 842 | 4,621 | 643 |
| | | 45 | 0.12 | 8,240 | 1,505 | 5,584 | 1,019 | 4,944 | 722 | 4,119 | 501 |
| | | 50 | 0.11 | 7,398 | 1,200 | 4,980 | 757 | 4,174 | 505 | 3,697 | 385 |
| | 0.5 | 10 | 0.4 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1,638 | 7,849 | 1338 |
| | | 12 | 0.35 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1638 | 7,849 | 1338 |
| | | 13 | 0.3 | 10,734 | 2,613 | 9,114 | 2,219 | 8,004 | 1558 | 7,266 | 1239 |
| | | 16 | 0.25 | 10,255 | 2,496 | 8,697 | 2116 | 7,599 | 1479 | 6,684 | 1139 |
| | | 20 | 0.2 | 10,255 | 2496 | 8,697 | 2,116 | 7,599 | 1479 | 6,884 | 1139 |
| | | 25 | 0.175 | 10,255 | 2,496 | 7,782 | 1,810 | 6,545 | 1,221 | 5,904 | 962 |
| | | 30 | 0.15 | 10,255 | 2,496 | 6,867 | 1,505 | 5,491 | 963 | 5,124 | 785 |
| | | 35 | 0.1 | 10,255 | 2,496 | 6,867 | 1505 | 5,491 | 963 | 5,124 | 785 |
| | | 40 | 0.075 | 9,247 | 2,000 | 6,225 | 1,262 | 5,217 | 842 | 4,621 | 643 |
| | | 45 | 0.05 | 8,240 | 1,505 | 5,584 | 1,019 | 4,944 | 722 | 4,119 | 501 |
| | | 50 | 0.04 | 7,398 | 1,200 | 4,980 | 757 | 4,174 | 505 | 3,697 | 385 |
| | | 55 | 0.03 | 6,592 | 9903 | 4,467 | 611 | 3,955 | 433 | 3,295 | 300 |
| | 1 | 10 | 0.5 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1,638 | 7,849 | 1338 |
| | | 12 | 0.4 | 11,213 | 2,730 | 9,531 | 2,321 | 8,410 | 1638 | 7,849 | 1338 |
| | | 13 | 0.35 | 10,734 | 2,613 | 9,114 | 2,219 | 8,004 | 1558 | 7,266 | 1239 |
| | | 16 | 0.29 | 10,255 | 2,496 | 8,697 | 2116 | 7,599 | 1479 | 6,684 | 1139 |
| | | 20 | 0.23 | 10,255 | 2496 | 8,697 | 2,116 | 7,599 | 1479 | 6,884 | 1139 |
| | | 25 | 0.2 | 10,255 | 2,496 | 7,782 | 1,810 | 6,545 | 1,221 | 5,904 | 962 |
| | | 30 | 0.17 | 10,255 | 2,496 | 6,867 | 1,505 | 5,491 | 963 | 5,124 | 785 |
| | | 35 | 0.12 | 10,255 | 2,496 | 6,867 | 1505 | 5,491 | 963 | 5,124 | 785 |
| | | 40 | 0.09 | 9,247 | 2,000 | 6,225 | 1,262 | 5,217 | 842 | 4,621 | 643 |
| | | 45 | 0.06 | 8,240 | 1,505 | 5,584 | 1,019 | 4,944 | 722 | 4,119 | 501 |
| | | 50 | 0.05 | 7,398 | 1,200 | 4,980 | 757 | 4,174 | 505 | 3,697 | 385 |
| | | 55 | 0.04 | 6,592 | 9903 | 4,467 | 611 | 3,955 | 433 | 3,295 | 300 |
| 5 | 0.1 | 16 | 0.08 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | | 30 | 0.07 | 7,872 | 2291 | 6,691 | 1948 | 5,904 | 1374 | 5,510 | 1122 |
| | | 40 | 0.06 | 6,590 | 1797 | 5,602 | 1527 | 4,943 | 1078 | 4,613 | 880 |
| | 0.2 | 16 | 0.16 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | | 30 | 0.145 | 7,872 | 2291 | 6,691 | 1948 | 5,904 | 1374 | 5,510 | 1122 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 5 | 0.2 | 40 | 0.13 | 6,590 | 1797 | 5,602 | 1527 | 4,943 | 1078 | 4,613 | 880 |
| | 0.3 | 16 | 0.24 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | | 30 | 0.22 | 7,872 | 2291 | 6,691 | 1948 | 5,904 | 1374 | 5,510 | 1122 |
| | | 40 | 0.2 | 6,590 | 1797 | 5,602 | 1527 | 4,943 | 1078 | 4,613 | 880 |
| | 0.5 | 16 | 0.35 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | | 30 | 0.296 | 7,872 | 2291 | 6,691 | 1948 | 5,904 | 1374 | 5,510 | 1122 |
| | | 40 | 0.135 | 6,590 | 1797 | 5,602 | 1527 | 4,943 | 1078 | 4,613 | 880 |
| | | 50 | 0.12 | 5,272 | 1078 | 4,482 | 916 | 3,954 | 646 | 3,690 | 528 |
| | | 60 | 0.1 | 4,218 | 647 | 3,585 | 549 | 3,164 | 388 | 2,952 | 317 |
| | 1 | 16 | 0.4 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | | 30 | 0.275 | 7,872 | 2291 | 6,691 | 1948 | 5,904 | 1374 | 5,510 | 1122 |
| | | 40 | 0.15 | 6,590 | 1797 | 5,602 | 1527 | 4,943 | 1078 | 4,613 | 880 |
| | | 50 | 0.13 | 5,272 | 1078 | 4,482 | 916 | 3,954 | 646 | 3,690 | 528 |
| | | 60 | 0.11 | 4,218 | 647 | 3,585 | 549 | 3,164 | 388 | 2,952 | 317 |
| | 1.5 | 15 | 0.45 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| | 2 | 15 | 0.5 | 9,154 | 2786 | 7,781 | 2368 | 6,866 | 1671 | 6,408 | 1365 |
| 6 | 0.1 | 20 | 0.065 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.05 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.04 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 0.2 | 20 | 0.14 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.11 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.08 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 0.3 | 20 | 0.22 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 30 | 0.2 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.18 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.14 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 0.5 | 20 | 0.35 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 30 | 0.29 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.24 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.165 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | | 60 | 0.1 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 1 | 20 | 0.4 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 30 | 0.35 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.28 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.2 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | | 60 | 0.15 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 1.5 | 20 | 0.45 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.4 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.3 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| | 2 | 20 | 0.5 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 30 | 0.4 | 7,630 | 2787 | 6,486 | 2368 | 5,722 | 1671 | 5,432 | 1365 |
| | | 40 | 0.3 | 6,486 | 2132 | 5,513 | 1811 | 4,865 | 1279 | 4,540 | 1044 |
| | | 50 | 0.2 | 5,491 | 1,470 | 4,668 | 1,248 | 4,118 | 872 | 3,844 | 711 |
| 8 | 0.1 | 25 | 0.35 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |

# Recommended Cutting Condition

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 8 | 0.2 | 22 | 0.5 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.25 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | 0.3 | 22 | 0.6 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.3 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | 0.5 | 22 | 0.7 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 35 | 0.5 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.35 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 50 | 0.3 | 4,584 | 1596 | 3,619 | 1245 | 2,413 | 767 | 1,856 | 490 |
| | | 60 | 0.25 | 4,584 | 1596 | 3,619 | 1245 | 2,413 | 767 | 1,856 | 490 |
| | 1 | 22 | 0.8 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 35 | 0.6 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.4 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 50 | 0.4 | 4,584 | 1596 | 3,619 | 1245 | 2,413 | 767 | 1,856 | 490 |
| | | 60 | 0.3 | 4,584 | 1596 | 3,619 | 1245 | 2,413 | 767 | 1,856 | 490 |
| | 1.2 | 22 | 0.9 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.45 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | 2 | 22 | 1 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 40 | 0.5 | 5,730 | 2660 | 4,524 | 2076 | 3,016 | 1279 | 2,320 | 817 |
| | | 50 | 0.4 | 4,584 | 1596 | 3,619 | 1245 | 2,413 | 767 | 1,856 | 490 |
| 10 | 0.1 | 30 | 0.4 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | 0.2 | 24 | 0.5 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.25 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | 0.3 | 24 | 0.6 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.3 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | 0.5 | 24 | 0.7 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.4 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 50 | 0.3 | 3,619 | 1451 | 2,854 | 1172 | 1,902 | 713 | 1,485 | 456 |
| | | 60 | 0.2 | 3,619 | 1451 | 2,854 | 1172 | 1,902 | 713 | 1,485 | 456 |
| | 1 | 24 | 0.8 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.5 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 50 | 0.4 | 3,619 | 1451 | 2,854 | 1172 | 1,902 | 713 | 1,485 | 456 |
| | | 60 | 0.3 | 3,619 | 1451 | 2,854 | 1172 | 1,902 | 713 | 1,485 | 456 |
| | 1.5 | 24 | 0.9 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.55 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | 2 | 24 | 1 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| | | 40 | 0.5 | 3,619 | 1451 | 2,854 | 1172 | 1,902 | 713 | 1,485 | 456 |
| | | 50 | 0.4 | 2,895 | 870 | 2,283 | 703 | 1,522 | 427 | 1,188 | 274 |
| | 2.5 | 24 | 1.1 | 4,524 | 2419 | 3,567 | 1954 | 2,378 | 1188 | 1,856 | 761 |
| 12 | 0.2 | 32 | 0.5 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | 0.3 | 26 | 0.6 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 45 | 0.3 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | 0.5 | 26 | 0.7 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 40 | 0.4 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 60 | 0.3 | 3,086 | 1451 | 2,436 | 1172 | 1,624 | 713 | 1,230 | 456 |

## ESRR714 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 12 | 1 | 26 | 0.8 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 40 | 0.5 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 60 | 0.3 | 3,086 | 1451 | 2,436 | 1172 | 1,624 | 713 | 1,230 | 456 |
| | 1.5 | 26 | 0.9 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | 2 | 26 | 1 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | | 40 | 0.5 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| | 3 | 26 | 1 | 3,857 | 2419 | 3,045 | 1954 | 2,030 | 1188 | 1,537 | 761 |
| 16 | 0.5 | 35 | 2 | 2,842 | 2116 | 2,262 | 1692 | 1,508 | 1047 | 1,160 | 672 |
| | | 50 | 1 | 2,842 | 2116 | 2,262 | 1692 | 1,508 | 1047 | 1,160 | 672 |
| | 1 | 35 | 2 | 2,842 | 2116 | 2,262 | 1692 | 1,508 | 1047 | 1,160 | 672 |
| | | 50 | 1 | 2,842 | 2116 | 2,262 | 1692 | 1,508 | 1047 | 1,160 | 672 |
| 20 | 0.5 | 40 | 2 | 2,262 | 1915 | 1,798 | 1512 | 1,189 | 957 | 928 | 616 |
| | | 55 | 1 | 2,262 | 1915 | 1,798 | 1512 | 1,189 | 957 | 928 | 616 |
| | 1 | 40 | 2 | 2,262 | 1915 | 1,798 | 1512 | 1,189 | 957 | 928 | 616 |
| | | 55 | 1 | 2,262 | 1915 | 1,798 | 1512 | 1,189 | 957 | 928 | 616 |

· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.

· In the case of low RPM, reduce the feed rate at the same rate.

# Recommended Cutting Condition

## ESLNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.2 | 0.05 | 0.5 | 0.02 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1 | 0.014 | 50,000 | 258 | 50,000 | 205 | 50,000 | 180 | 50,000 | 160 |
| | | 1.5 | 0.008 | 50,000 | 240 | 45,900 | 202 | 45,900 | 170 | 45,900 | 153 |
| | | 2 | 0.008 | 42,000 | 202 | 36,700 | 176 | 36,700 | 162 | 36,700 | 147 |
| 0.3 | 0.05 | 1 | 0.021 | 50,000 | 585 | 50,000 | 456 | 50,000 | 336 | 50,000 | 320 |
| | | 1.5 | 0.016 | 50,000 | 585 | 45,000 | 456 | 45,000 | 336 | 45,000 | 320 |
| | | 2 | 0.012 | 45,000 | 530 | 45,000 | 420 | 45,000 | 300 | 45,000 | 290 |
| | | 2.5 | 0.01 | 40,000 | 471 | 40,000 | 373 | 40,000 | 267 | 40,000 | 258 |
| | | 3 | 0.008 | 35,000 | 412 | 35,000 | 326 | 30,000 | 200 | 30,000 | 194 |
| 0.4 | 0.05 | 1 | 0.025 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 1.5 | 0.02 | 50,000 | 580 | 50,000 | 461 | 40,000 | 320 | 36,000 | 270 |
| | | 2 | 0.016 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 2.5 | 0.015 | 40,500 | 480 | 40,500 | 370 | 33,400 | 270 | 30,600 | 220 |
| | | 3 | 0.014 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 3.5 | 0.012 | 36,000 | 380 | 36,000 | 300 | 29,400 | 200 | 22,920 | 180 |
| | | 4 | 0.008 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| | 0.1 | 2 | 0.028 | 45,000 | 520 | 45,000 | 410 | 36,000 | 290 | 34,000 | 240 |
| | | 3 | 0.016 | 40,000 | 410 | 40,000 | 330 | 32,800 | 240 | 25,600 | 200 |
| | | 4 | 0.01 | 30,000 | 320 | 30,000 | 250 | 21,600 | 160 | 19,200 | 150 |
| 0.5 | 0.05 | 1 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.023 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 3 | 0.017 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.017 | 40,000 | 820 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.011 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.008 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| | 0.1 | 1 | 0.035 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 2 | 0.03 | 50,000 | 898 | 40,000 | 464 | 30,000 | 378 | 28,000 | 315 |
| | | 3 | 0.02 | 45,000 | 810 | 36,000 | 414 | 27,000 | 315 | 24,500 | 261 |
| | | 4 | 0.02 | 40,000 | 720 | 32,000 | 378 | 24,000 | 279 | 20,000 | 234 |
| | | 5 | 0.013 | 28,800 | 540 | 19,400 | 280 | 18,000 | 250 | 15,000 | 200 |
| | | 6 | 0.013 | 28,800 | 480 | 19,400 | 260 | 18,000 | 250 | 15,000 | 200 |
| 0.6 | 0.1 | 2 | 0.035 | 50,000 | 1,159 | 37,830 | 600 | 28,200 | 390 | 23,000 | 320 |
| | | 4 | 0.024 | 40,000 | 830 | 27,800 | 440 | 23,600 | 280 | 21,000 | 230 |
| | | 6 | 0.015 | 24,000 | 490 | 18,000 | 300 | 17,800 | 240 | 15,000 | 210 |
| | | 8 | 0.013 | 24,000 | 466 | 18,000 | 285 | 17,800 | 228 | 15,000 | 200 |
| | | 10 | 0.009 | 24,000 | 451 | 18,000 | 276 | 17,800 | 221 | 15,000 | 193 |
| 2 | 0.2 | 6 | 0.08 | 20,790 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.07 | 18,900 | 1,486 | 16,065 | 1,263 | 14,175 | 892 | 13,230 | 728 |
| | | 12 | 0.04 | 15,309 | 1,083 | 13,013 | 921 | 11,482 | 722 | 10,716 | 590 |
| | | 16 | 0.04 | 13,608 | 963 | 11,567 | 818 | 10,206 | 642 | 9,526 | 524 |
| | | 20 | 0.035 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 25 | 0.025 | 11,907 | 843 | 10,121 | 716 | 8,930 | 562 | 8,335 | 459 |
| | | 30 | 0.017 | 11,312 | 800 | 9,615 | 680 | 8,484 | 534 | 7,918 | 436 |
| | 0.3 | 8 | 0.09 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |

## ESLNR20 SERIES

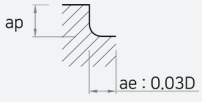
| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 0.3 | 16 | 0.06 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.037 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | 0.5 | 6 | 0.017 | 20,709 | 1,635 | 17,672 | 1,389 | 15,593 | 981 | 14,553 | 801 |
| | | 8 | 0.014 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |
| | | 12 | 0.08 | 15,309 | 1,204 | 13,013 | 1,023 | 11,482 | 802 | 10,716 | 655 |
| | | 16 | 0.08 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.05 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | | 25 | 0.05 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| | | 30 | 0.03 | 11,312 | 889 | 9,615 | 756 | 8,484 | 593 | 7,918 | 484 |
| | 0.8 | 8 | 0.2 | 18,900 | 1,651 | 16,065 | 1,403 | 14,175 | 991 | 13,230 | 809 |
| | | 16 | 0.1 | 13,608 | 1,070 | 11,567 | 909 | 10,206 | 713 | 9,526 | 583 |
| | | 20 | 0.06 | 11,907 | 936 | 10,121 | 796 | 8,930 | 624 | 8,335 | 510 |
| 3 | 0.2 | 8 | 0.09 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 12 | 0.07 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 16 | 0.05 | 14,400 | 1,415 | 12,240 | 1,203 | 10,800 | 849 | 10,080 | 693 |
| | | 20 | 0.05 | 11,664 | 1,146 | 9,914 | 974 | 8,748 | 764 | 8,165 | 624 |
| | | 30 | 0.04 | 9,072 | 1,146 | 7,711 | 974 | 6,804 | 764 | 6,350 | 624 |
| | | 35 | 0.035 | 9,072 | 1,146 | 7,711 | 974 | 6,804 | 764 | 6,350 | 624 |
| | 0.3 | 8 | 0.13 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 16 | 0.075 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 20 | 0.075 | 11,664 | 1,274 | 9,914 | 1,083 | 8,748 | 849 | 8,165 | 693 |
| | | 30 | 0.06 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |
| | 0.5 | 8 | 0.18 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 12 | 0.13 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 16 | 0.1 | 14,400 | 1,572 | 12,240 | 1,337 | 10,800 | 943 | 10,080 | 771 |
| | | 20 | 0.1 | 11,664 | 1,274 | 9,914 | 1,083 | 8,748 | 849 | 8,165 | 693 |
| | | 30 | 0.08 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |
| | | 35 | 0.065 | 9,072 | 1,274 | 7,711 | 1,083 | 6,804 | 849 | 6,350 | 693 |
| 0.8 | 0.1 | 4 | 0.032 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.019 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| | | 8 | 0.015 | 29,025 | 600 | 20,000 | 369 | 16,200 | 259 | 16,200 | 230 |
| | | 12 | 0.012 | 29,025 | 570 | 20,000 | 350 | 16,200 | 246 | 16,200 | 219 |
| | 0.2 | 4 | 0.056 | 48,000 | 1,102 | 28,000 | 518 | 20,000 | 320 | 20,000 | 288 |
| | | 6 | 0.032 | 38,700 | 800 | 25,000 | 461 | 18,000 | 288 | 18,000 | 256 |
| 1 | 0.1 | 4 | 0.038 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.024 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.024 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |
| | | 10 | 0.015 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.015 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 16 | 0.009 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.006 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.2 | 4 | 0.07 | 32,400 | 1,359 | 27,540 | 1,039 | 24,300 | 815 | 22,680 | 666 |
| | | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 8 | 0.04 | 23,328 | 880 | 19,829 | 748 | 17,496 | 587 | 16,330 | 479 |

# Recommended Cutting Condition

## ESLNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 0.2 | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 12 | 0.025 | 18,144 | 609 | 15,422 | 453 | 13,608 | 399 | 12,701 | 320 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| | 0.3 | 6 | 0.04 | 26,244 | 990 | 22,307 | 842 | 19,683 | 660 | 18,371 | 539 |
| | | 10 | 0.025 | 20,412 | 770 | 17,350 | 655 | 15,309 | 514 | 14,288 | 419 |
| | | 16 | 0.015 | 18,144 | 533 | 15,422 | 420 | 13,608 | 342 | 12,701 | 266 |
| | | 20 | 0.01 | 13,608 | 399 | 11,567 | 315 | 10,206 | 257 | 9,526 | 200 |
| 1.5 | 0.1 | 4 | 0.042 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 8 | 0.036 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 12 | 0.036 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 15 | 0.023 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.018 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.2 | 4 | 0.07 | 24,930 | 1,130 | 20,956 | 868 | 18,711 | 678 | 17,364 | 556 |
| | | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 12 | 0.06 | 18,144 | 822 | 15,422 | 698 | 13,608 | 548 | 12,701 | 447 |
| | | 15 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | 0.3 | 8 | 0.06 | 22,680 | 1,027 | 19,278 | 873 | 17,010 | 685 | 15,876 | 559 |
| | | 15 | 0.038 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |
| | | 20 | 0.03 | 14,112 | 568 | 11,995 | 423 | 10,584 | 373 | 9,878 | 298 |

RPM = rev / min
FEED = mm / min




· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

## ESTNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.2 | 0.05 | 2 | 0.007 | 39,660 | 887 | 33,660 | 754 | 29,700 | 591 | 27,720 | 483 |
| 0.4 | 0.05 | 4 | 0.009 | 30,096 | 899 | 25,582 | 764 | 22,572 | 599 | 21,067 | 489 |
| | | 5 | 0.007 | 26,752 | 710 | 22,739 | 528 | 20,064 | 466 | 18,726 | 373 |
| | 0.1 | 4 | 0.009 | 31,680 | 946 | 26,928 | 804 | 23,760 | 631 | 22,176 | 515 |
| | | 5 | 0.007 | 28,160 | 747 | 23,936 | 556 | 21,120 | 490 | 19,712 | 392 |
| 0.5 | 0.1 | 5 | 0.013 | 30,413 | 1,090 | 25,851 | 753 | 22,810 | 562 | 21,289 | 453 |
| | | 8 | 0.008 | 24,330 | 678 | 20,681 | 468 | 18,248 | 350 | 17,031 | 282 |
| | | 10 | 0.007 | 18,248 | 509 | 15,511 | 351 | 13,686 | 262 | 12,773 | 211 |
| 0.6 | 0.1 | 12 | 0.01 | 20,377 | 791 | 17,320 | 546 | 15,282 | 408 | 14,264 | 329 |
| | | 15 | 0.006 | 16,727 | 649 | 14,218 | 448 | 12,545 | 335 | 11,709 | 270 |
| 0.8 | 0.2 | 6 | 0.045 | 31,680 | 1,084 | 26,928 | 921 | 23,760 | 723 | 22,176 | 590 |
| | | 12 | 0.02 | 28,160 | 943 | 23,936 | 695 | 21,120 | 613 | 19,712 | 490 |
| 1 | 0.2 | 8 | 0.04 | 28,512 | 1,463 | 24,235 | 1,244 | 21,384 | 976 | 19,958 | 797 |
| | | 10 | 0.035 | 28,512 | 1,596 | 24,235 | 1,357 | 21,384 | 1,064 | 19,958 | 869 |
| | | 15 | 0.028 | 25,344 | 1,261 | 21,542 | 938 | 19,008 | 828 | 17,741 | 662 |
| | | 20 | 0.02 | 19,008 | 828 | 16,157 | 653 | 14,256 | 532 | 13,306 | 414 |
| | | 25 | 0.017 | 15,840 | 690 | 13,464 | 544 | 11,880 | 443 | 11,088 | 345 |
| | | 30 | 0.017 | 15,840 | 690 | 13,464 | 544 | 11,880 | 443 | 11,088 | 345 |
| | | 35 | 0.01 | 15,840 | 690 | 13,464 | 544 | 11,880 | 443 | 11,088 | 345 |
| | 0.3 | 8 | 0.04 | 28,512 | 1,463 | 24,235 | 1,244 | 21,384 | 976 | 19,958 | 797 |
| | | 15 | 0.028 | 25,344 | 1,261 | 21,542 | 938 | 19,008 | 828 | 17,741 | 662 |
| | | 25 | 0.017 | 15,840 | 690 | 13,464 | 544 | 11,880 | 443 | 11,088 | 345 |
| | | 30 | 0.017 | 15,840 | 690 | 13,464 | 544 | 11,880 | 443 | 11,088 | 345 |
| 1.5 | 0.2 | 10 | 0.05 | 21,683 | 1,079 | 18,431 | 803 | 16,262 | 708 | 15,178 | 567 |
| | | 15 | 0.045 | 19,712 | 981 | 16,755 | 730 | 14,784 | 644 | 13,798 | 515 |
| | | 20 | 0.042 | 17,347 | 863 | 14,745 | 642 | 13,010 | 567 | 12,143 | 453 |
| | | 25 | 0.032 | 14,784 | 644 | 12,566 | 508 | 11,088 | 414 | 10,349 | 322 |
| | | 30 | 0.028 | 12,320 | 536 | 10,472 | 423 | 9,240 | 345 | 8,624 | 268 |
| | 0.3 | 10 | 0.05 | 21,683 | 1,079 | 18,431 | 803 | 16,262 | 708 | 15,178 | 567 |
| | | 20 | 0.042 | 17,347 | 863 | 14,745 | 642 | 13,010 | 567 | 12,143 | 453 |
| | | 25 | 0.032 | 14,784 | 644 | 12,566 | 508 | 11,088 | 414 | 10,349 | 322 |
| | | 30 | 0.028 | 12,320 | 536 | 10,472 | 423 | 9,240 | 345 | 8,624 | 268 |
| 2 | 0.2 | 30 | 0.045 | 13,440 | 1,254 | 11,424 | 933 | 10,080 | 823 | 9,408 | 658 |
| | | 40 | 0.035 | 10,080 | 823 | 8,568 | 650 | 7,560 | 529 | 7,056 | 412 |
| | | 50 | 0.017 | 8,400 | 686 | 7,140 | 541 | 6,300 | 441 | 5,880 | 343 |
| | 0.3 | 12 | 0.088 | 22,680 | 1,814 | 19,278 | 1,427 | 17,010 | 1,191 | 15,876 | 1,048 |
| | | 20 | 0.054 | 18,144 | 1,452 | 15,422 | 1,141 | 13,608 | 953 | 12,701 | 838 |
| | | 30 | 0.045 | 13,440 | 1,393 | 11,424 | 1,036 | 10,080 | 914 | 9,408 | 732 |
| | | 40 | 0.035 | 10,080 | 914 | 8,568 | 722 | 7,560 | 588 | 7,056 | 457 |
| | | 50 | 0.017 | 8,400 | 762 | 7,140 | 601 | 6,300 | 490 | 5,880 | 381 |
| | 0.5 | 8 | 0.17 | 22,680 | 1,814 | 19,278 | 1,427 | 17,010 | 1,191 | 15,876 | 1,048 |
| | | 12 | 0.088 | 22,680 | 1,814 | 19,278 | 1,427 | 17,010 | 1,191 | 15,876 | 1,048 |
| | | 16 | 0.088 | 19,278 | 1,542 | 16,386 | 1,213 | 14,459 | 1,012 | 13,495 | 891 |
| | | 20 | 0.054 | 18,114 | 1,452 | 15,422 | 1,141 | 13,608 | 953 | 12,701 | 838 |

# Recommended Cutting Condition

## ESTNR20 SERIES

| Workpiece | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 0.5 | 25 | 0.054 | 15,876 | 1,270 | 13,495 | 999 | 11,907 | 833 | 11,113 | 733 |
| | | 30 | 0.045 | 13,440 | 1,393 | 11,424 | 1,036 | 10,080 | 914 | 9,408 | 732 |
| | | 40 | 0.035 | 10,080 | 914 | 8,568 | 722 | 7,560 | 588 | 7,056 | 457 |
| | | 50 | 0.017 | 8,400 | 762 | 7,140 | 601 | 6,300 | 490 | 5,880 | 381 |
| 3 | 0.2 | 40 | 0.07 | 10,240 | 956 | 8,704 | 711 | 7,680 | 627 | 7,168 | 502 |
| | | 50 | 0.05 | 7,680 | 627 | 6,528 | 495 | 5,760 | 403 | 5,376 | 314 |
| | | 60 | 0.03 | 6,400 | 523 | 5,440 | 412 | 4,800 | 336 | 4,480 | 261 |
| | 0.3 | 40 | 0.07 | 10,240 | 1,062 | 8,704 | 790 | 7,680 | 697 | 7,168 | 557 |
| | | 50 | 0.05 | 7,680 | 697 | 6,528 | 550 | 5,760 | 448 | 5,376 | 348 |
| | | 60 | 0.03 | 6,400 | 581 | 5,440 | 458 | 4,800 | 373 | 4,480 | 290 |
| | 0.5 | 40 | 0.07 | 10,240 | 1,062 | 8,704 | 790 | 7,680 | 697 | 7,168 | 557 |
| | | 50 | 0.05 | 7,680 | 697 | 6,528 | 550 | 5,760 | 448 | 5,376 | 348 |
| | | 60 | 0.03 | 6,400 | 581 | 5,440 | 458 | 4,800 | 373 | 4,480 | 290 |

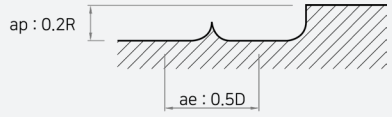
RPM = rev / min
FEED = mm / min

· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

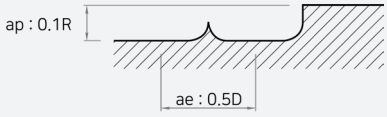
## ESPM4 SERIES ▶ Side Cutting

| Workpiece | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| D X R (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 X R0.5 | 9,550 | 6,500 | 6,900 | 4,150 | 4,550 | 2,750 | 2,850 | 1,150 | 1,900 | 610 |
| 4 X R0.5 | 7,950 | 7,000 | 5,750 | 4,600 | 4,000 | 3,200 | 2,550 | 1,350 | 1,750 | 700 |
| 6 X R0.5 | 5,800 | 7,650 | 4,100 | 4,900 | 2,900 | 3,500 | 1,850 | 1,850 | 1,350 | 795 |
| 6 X R1.0 | 5,800 | 7,650 | 4,100 | 4,900 | 2,900 | 3,500 | 1,850 | 1,850 | 1,350 | 795 |
| 8 X R1.0 | 4,350 | 7,650 | 3,050 | 4,900 | 2,200 | 3,500 | 1,400 | 1,850 | 995 | 795 |
| 8 X R2.0 | 4,350 | 7,650 | 3,050 | 4,900 | 2,200 | 3,500 | 1,400 | 1,850 | 995 | 795 |
| 10 X R1.0 | 3,500 | 7,650 | 2,450 | 4,900 | 1,750 | 3,500 | 1,100 | 1,850 | 795 | 795 |
| 10 X R2.0 | 3,500 | 7,650 | 2,450 | 4,900 | 1,750 | 3,500 | 1,100 | 1,850 | 795 | 795 |
| 12 X R2.0 | 2,900 | 7,650 | 2,050 | 4,900 | 1,450 | 3,500 | 925 | 1,850 | 665 | 795 |
| 12 X R3.0 | 2,900 | 7,650 | 2,050 | 4,900 | 1,450 | 3,500 | 925 | 1,850 | 665 | 795 |

RPM = rev / min
FEED = mm / min




*ae shouldn't be over max. 0.5D

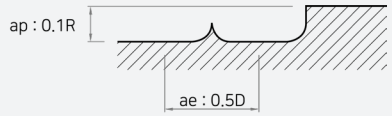



*ae shouldn't be over max. 0.5D

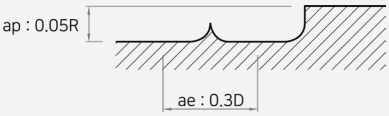
## ESPM4 SERIES ▶ High Speed Cutting

| Workpiece | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| D X R (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 X R0.5 | 22,000 | 16,000 | 17,000 | 10,000 | 12,500 | 8,000 | 9,500 | 4,600 | 6,900 | 2,500 |
| 4 X R0.5 | 17,000 | 17,500 | 13,000 | 12,000 | 11,000 | 9,200 | 8,000 | 5,500 | 5,600 | 2,900 |
| 6 X R0.5 | 13,500 | 18,500 | 10,500 | 13,800 | 9,000 | 11,000 | 6,400 | 6,400 | 4,500 | 3,600 |
| 6 X R1.0 | 13,500 | 18,500 | 10,500 | 13,800 | 9,000 | 11,000 | 6,400 | 6,400 | 4,500 | 3,600 |
| 8 X R1.0 | 10,000 | 18,500 | 8,000 | 14,000 | 6,800 | 11,000 | 4,800 | 6,700 | 3,400 | 4,100 |
| 8 X R2.0 | 10,000 | 18,500 | 8,000 | 14,000 | 6,800 | 11,000 | 4,800 | 6,700 | 3,400 | 4,100 |
| 10 X R1.0 | 8,000 | 18,500 | 6,400 | 14,000 | 5,400 | 11,000 | 3,800 | 6,800 | 2,700 | 3,800 |
| 10 X R2.0 | 8,000 | 18,500 | 6,400 | 14,000 | 5,400 | 11,000 | 3,800 | 6,800 | 2,700 | 3,800 |
| 12 X R2.0 | 6,600 | 18,500 | 5,300 | 14,000 | 4,500 | 11,000 | 3,200 | 7,000 | 2,250 | 3,600 |
| 12 X R3.0 | 6,600 | 18,500 | 5,300 | 14,000 | 4,500 | 11,000 | 3,200 | 7,000 | 2,250 | 3,600 |

RPM = rev / min
FEED = mm / min




*ae shouldn't be over max. 0.5D



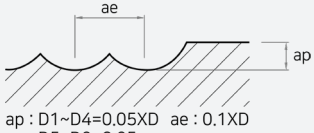

*ae shouldn't be over max. 0.3D

# Recommended Cutting Condition

## ESB702, ESB712 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| ~0.2 | 50,000 | 1,200 | 50,000 | 1,050 | 45,000 | 960 | 40,000 | 770 | 35,000 | 674 | 31,500 | 570 |
| 0.3 | 50,000 | 1,500 | 50,000 | 1,350 | 45,000 | 1,200 | 40,000 | 765 | 35,000 | 840 | 31,500 | 700 |
| 0.4 | 50,000 | 1,900 | 50,000 | 1,700 | 45,000 | 1,500 | 40,000 | 1,200 | 35,000 | 1,050 | 31,500 | 1,100 |
| 0.5 | 50,000 | 2,400 | 50,000 | 2,100 | 45,000 | 1,900 | 40,000 | 1,500 | 35,000 | 1,300 | 31,500 | 1,100 |
| 0.6 | 50,000 | 2,900 | 50,000 | 2,500 | 45,000 | 2,200 | 40,000 | 1,800 | 35,000 | 1,600 | 31,500 | 1,400 |
| 0.8 | 50,000 | 3,900 | 50,000 | 3,300 | 45,000 | 3,000 | 40,000 | 2,400 | 35,000 | 1,600 | 31,500 | 1,800 |
| 1 | 50,000 | 4,800 | 50,000 | 4,200 | 45,000 | 3,800 | 40,000 | 3,000 | 35,000 | 2,600 | 35,000 | 2,300 |
| 1.5 | 50,000 | 5,400 | 48,000 | 4,500 | 43,000 | 4,000 | 23,000 | 3,100 | 33,000 | 2,700 | 29,700 | 2,300 |
| 2 | 49,700 | 5,700 | 47,800 | 4,800 | 40,000 | 4,000 | 35,000 | 3,150 | 32,000 | 2,800 | 28,500 | 2,300 |
| 3 | 33,100 | 6,000 | 31,800 | 5,300 | 26,500 | 4,000 | 23,500 | 3,150 | 21,000 | 28,00 | 19,000 | 2,300 |
| 4 | 24,900 | 6,000 | 23,900 | 5,300 | 20,000 | 4,000 | 17,500 | 3,150 | 16,000 | 2,800 | 14,500 | 2,300 |
| 5 | 18.6 | 5,800 | 17,800 | 4,900 | 15,000 | 3,750 | 13,500 | 3,050 | 11,500 | 2,550 | 10,500 | 2,100 |
| 6 | 13,900 | 4,850 | 13,400 | 4,100 | 11,000 | 3,100 | 10,000 | 2,500 | 8,800 | 2,150 | 8,000 | 1,750 |
| 8 | 11,100 | 4,200 | 10,700 | 3,500 | 9,000 | 2,700 | 8,000 | 2,150 | 7,000 | 1,850 | 6,500 | 1,550 |
| 10 | 9,300 | 3,700 | 8,900 | 3,100 | 7,500 | 2,400 | 6,600 | 1,900 | 5,800 | 1,650 | 5,300 | 1,380 |
| 12 | 6,950 | 2,950 | 6,680 | 2,500 | 5,600 | 1,900 | 5,000 | 1,550 | 4,400 | 1,250 | 4,000 | 1,050 |

RPM = rev / min
FEED = mm / min

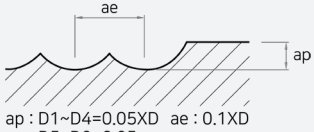



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

## ESB703 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 57,000 | 7,100 | 55,000 | 6,000 | 46,000 | 5,000 | 40,300 | 3,900 | 36,800 | 3,500 | 32,800 | 2,900 |
| 2.5 | 57,000 | 7,100 | 55,000 | 6,000 | 46,000 | 5,000 | 40,300 | 3,900 | 36,800 | 3,500 | 32,800 | 2,900 |
| 3 | 38,000 | 7,500 | 36,600 | 6,600 | 30,500 | 5,000 | 27,000 | 3,900 | 24,200 | 3,500 | 21,900 | 2,900 |
| 4 | 28,500 | 7,500 | 27,500 | 6,600 | 23,000 | 5,000 | 20,100 | 3,900 | 18,400 | 3,500 | 16,700 | 2,900 |
| 5 | 21,500 | 7,300 | 20,500 | 6,100 | 17,300 | 4,700 | 15,500 | 3,800 | 13,200 | 3,200 | 12,100 | 2,600 |
| 6 | 16,000 | 6,100 | 15,400 | 5,100 | 12,700 | 3,900 | 11,500 | 3,100 | 10,100 | 2,700 | 9,200 | 2,200 |
| 8 | 12,700 | 5,300 | 12,300 | 4,400 | 10,400 | 3,400 | 9,200 | 2,700 | 8,100 | 2,300 | 7,500 | 1,900 |
| 10 | 10,700 | 4,600 | 10,200 | 3,900 | 8,600 | 3,000 | 7,600 | 2,400 | 6,700 | 2,100 | 6,100 | 1,700 |
| 12 | 8,000 | 3,700 | 7,700 | 3,100 | 6,400 | 2,400 | 5,800 | 1,900 | 5,100 | 1,600 | 4,600 | 1,300 |

RPM = rev / min
FEED = mm / min

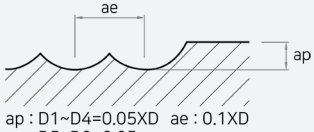



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

## ESB734 SERIES

| Workpiece | Herdened Steels Heat Resistant Steels | | Herdened Steels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc 65 ~ HRc70 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 62,100 | 8,600 | 59,800 | 7,200 | 50,000 | 6,000 | 43,800 | 4,700 | 40,000 | 4,200 | 35,600 | 3,500 |
| 2.5 | 62,100 | 8,600 | 59,800 | 7,200 | 50,000 | 6,000 | 43,800 | 4,700 | 40,000 | 4,200 | 35,600 | 3,500 |
| 3 | 41,400 | 9,000 | 39,800 | 8,000 | 33,100 | 6,000 | 29,400 | 4,700 | 26,300 | 4,200 | 23,800 | 3,500 |
| 4 | 31,100 | 9,000 | 29,900 | 8,000 | 25,000 | 6,000 | 21,900 | 4,700 | 20,000 | 4,200 | 18,100 | 3,500 |
| 5 | 23,300 | 8,700 | 22,300 | 7,400 | 18,800 | 5,600 | 16,900 | 4,600 | 14,400 | 3,800 | 13,100 | 3,200 |
| 6 | 17,400 | 7,300 | 16,800 | 6,200 | 13,800 | 4,700 | 12,500 | 3,800 | 11,000 | 3,200 | 10,000 | 2,600 |
| 8 | 13,900 | 6,300 | 13,400 | 5,300 | 11,300 | 4,100 | 10,000 | 3,200 | 8,800 | 2,800 | 8,100 | 2,300 |
| 10 | 11,600 | 5,600 | 11,100 | 4,700 | 9,400 | 3,600 | 8,300 | 2,900 | 7,300 | 2,500 | 6,600 | 2,100 |

RPM = rev / min
FEED = mm / min




ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

# Recommended Cutting Condition

## ESRB712 SERIES

| Workpiece | | CARBON STEEL, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.1 | 0.3 | 50,000 | 240 | 0.009 | 50,000 | 215 | 0.007 | 50,000 | 190 | 0.005 |
| | 0.5 | 50,000 | 240 | 0.006 | 50,000 | 215 | 0.005 | 50,000 | 190 | 0.004 |
| | 1 | 45,000 | 195 | 0.002 | 45,000 | 175 | 0.002 | 45,000 | 155 | 0.001 |
| 0.2 | 0.5 | 50,000 | 335 | 0.018 | 50,000 | 310 | 0.014 | 43,200 | 260 | 0.01 |
| | 1 | 50,000 | 335 | 0.013 | 50,000 | 310 | 0.01 | 43,200 | 260 | 0.007 |
| | 1.5 | 45,000 | 270 | 0.007 | 45,000 | 250 | 0.006 | 38,880 | 210 | 0.004 |
| | 2 | 45,000 | 270 | 0.005 | 45,000 | 250 | 0.004 | 38,880 | 210 | 0.003 |
| | 3 | 45,000 | 270 | 0.003 | 45,000 | 250 | 0.003 | 38,880 | 210 | 0.002 |
| 0.3 | 1 | 50,000 | 475 | 0.019 | 50,000 | 430 | 0.015 | 42,800 | 365 | 0.011 |
| | 1.5 | 50,000 | 475 | 0.019 | 50,000 | 430 | 0.015 | 42,800 | 365 | 0.011 |
| | 2 | 45,000 | 385 | 0.011 | 45,000 | 350 | 0.008 | 38,520 | 295 | 0.006 |
| | 2.5 | 45,000 | 385 | 0.007 | 45,000 | 350 | 0.005 | 38,520 | 295 | 0.004 |
| | 3 | 45,000 | 385 | 0.007 | 45,000 | 350 | 0.005 | 38,520 | 295 | 0.004 |
| | 4 | 40,000 | 305 | 0.004 | 40,000 | 275 | 0.003 | 34,240 | 235 | 0.002 |
| | 5 | 30,000 | 200 | 0.003 | 30,000 | 180 | 0.002 | 25,680 | 155 | 0.002 |
| 0.4 | 1 | 41,000 | 490 | 0.036 | 38,800 | 425 | 0.028 | 34,200 | 340 | 0.02 |
| | 1.5 | 41,000 | 490 | 0.025 | 38,800 | 425 | 0.02 | 34,200 | 340 | 0.014 |
| | 2 | 41,000 | 490 | 0.025 | 38,800 | 425 | 0.02 | 34,200 | 340 | 0.014 |
| | 2.5 | 36,900 | 395 | 0.014 | 34,920 | 345 | 0.011 | 30,780 | 275 | 0.008 |
| | 3 | 36,900 | 395 | 0.014 | 34,920 | 345 | 0.011 | 30,780 | 275 | 0.008 |
| | 4 | 36,900 | 395 | 0.009 | 34,920 | 345 | 0.007 | 30,780 | 275 | 0.005 |
| | 5 | 32,800 | 315 | 0.009 | 31,040 | 270 | 0.007 | 27,360 | 220 | 0.005 |
| | 6 | 32,800 | 315 | 0.005 | 31,040 | 270 | 0.004 | 27,360 | 220 | 0.003 |
| | 8 | 24,600 | 205 | 0.004 | 23,280 | 180 | 0.003 | 20,520 | 145 | 0.002 |
| | 10 | 12,300 | 90 | 0.004 | 11,640 | 75 | 0.003 | 10,260 | 60 | 0.002 |
| 0.5 | 1 | 34,200 | 685 | 0.045 | 32,300 | 580 | 0.035 | 28,500 | 515 | 0.025 |
| | 1.5 | 34,200 | 685 | 0.045 | 32,300 | 580 | 0.035 | 28,500 | 515 | 0.025 |
| | 2 | 34,200 | 685 | 0.032 | 32,300 | 580 | 0.025 | 28,500 | 515 | 0.018 |
| | 2.5 | 34,200 | 685 | 0.032 | 32,300 | 580 | 0.025 | 28,500 | 515 | 0.018 |
| | 3 | 30,780 | 555 | 0.018 | 29,070 | 470 | 0.014 | 25,650 | 415 | 0.01 |
| | 4 | 30,780 | 555 | 0.018 | 29,070 | 470 | 0.014 | 25,650 | 415 | 0.01 |
| | 5 | 30,780 | 555 | 0.011 | 29,070 | 470 | 0.009 | 25,650 | 415 | 0.006 |
| | 6 | 27,360 | 440 | 0.011 | 25,840 | 370 | 0.009 | 22,800 | 330 | 0.006 |
| | 8 | 20,520 | 290 | 0.007 | 19,380 | 245 | 0.005 | 17,100 | 215 | 0.004 |
| | 10 | 20,520 | 290 | 0.005 | 19,380 | 245 | 0.004 | 17,100 | 215 | 0.003 |
| | 12 | 10,260 | 125 | 0.005 | 9,690 | 105 | 0.004 | 8,550 | 95 | 0.003 |
| | 14 | 10,260 | 125 | 0.005 | 9,690 | 105 | 0.004 | 8,550 | 95 | 0.003 |
| | 16 | 3,420 | 35 | 0.005 | 3,230 | 30 | 0.004 | 2,850 | 25 | 0.003 |
| 0.6 | 1 | 34,200 | 1,025 | 0.038 | 32,300 | 840 | 0.029 | 28,500 | 685 | 0.021 |
| | 2 | 34,200 | 1,025 | 0.038 | 32,300 | 840 | 0.029 | 28,500 | 685 | 0.021 |
| | 3 | 34,200 | 1,025 | 0.038 | 32,300 | 840 | 0.029 | 28,500 | 685 | 0.021 |
| | 4 | 30,780 | 830 | 0.022 | 29,070 | 680 | 0.017 | 25,650 | 555 | 0.012 |
| | 5 | 30,780 | 830 | 0.014 | 29,070 | 680 | 0.011 | 25,650 | 555 | 0.008 |

## ESRB712 SERIES

| Workpiece | | CARBON STEEL, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.6 | 6 | 30,780 | 830 | 0.014 | 29,070 | 680 | 0.011 | 25,650 | 555 | 0.008 |
| | 8 | 27,360 | 655 | 0.008 | 25,840 | 540 | 0.006 | 22,800 | 440 | 0.005 |
| | 10 | 20,520 | 430 | 0.005 | 19,380 | 355 | 0.004 | 17,100 | 290 | 0.003 |
| | 12 | 20,520 | 430 | 0.005 | 19,380 | 355 | 0.004 | 17,100 | 290 | 0.003 |
| | 14 | 10,260 | 185 | 0.005 | 9,690 | 150 | 0.004 | 8,550 | 125 | 0.003 |
| | 16 | 10,260 | 185 | 0.005 | 9,690 | 150 | 0.004 | 8,550 | 125 | 0.003 |
| 0.7 | 2 | 34,200 | 1,130 | 0.063 | 32,300 | 930 | 0.049 | 28,500 | 765 | 0.035 |
| | 4 | 30,780 | 915 | 0.025 | 29,070 | 755 | 0.02 | 25,650 | 620 | 0.014 |
| | 6 | 30,780 | 915 | 0.016 | 29,070 | 755 | 0.012 | 25,650 | 620 | 0.009 |
| | 8 | 27,360 | 725 | 0.016 | 25,840 | 595 | 0.012 | 22,800 | 490 | 0.009 |
| | 10 | 27,360 | 725 | 0.009 | 25,840 | 595 | 0.007 | 22,800 | 490 | 0.005 |
| | 12 | 20,520 | 475 | 0.006 | 19,380 | 390 | 0.005 | 17,100 | 320 | 0.004 |
| 0.8 | 2 | 34,200 | 1,230 | 0.072 | 32,300 | 1,035 | 0.056 | 28,500 | 855 | 0.04 |
| | 3 | 34,200 | 1,230 | 0.05 | 32,300 | 1,035 | 0.039 | 28,500 | 855 | 0.028 |
| | 4 | 34,200 | 1,230 | 0.05 | 32,300 | 1,035 | 0.039 | 28,500 | 855 | 0.028 |
| | 5 | 30,780 | 995 | 0.029 | 29,070 | 840 | 0.022 | 25,650 | 695 | 0.016 |
| | 6 | 30,780 | 995 | 0.029 | 29,070 | 840 | 0.022 | 25,650 | 695 | 0.016 |
| | 8 | 30,780 | 995 | 0.018 | 29,070 | 840 | 0.014 | 25,650 | 695 | 0.01 |
| | 10 | 27,360 | 785 | 0.018 | 25,840 | 660 | 0.014 | 22,800 | 545 | 0.01 |
| | 12 | 27,360 | 785 | 0.011 | 25,840 | 660 | 0.008 | 22,800 | 545 | 0.006 |
| | 14 | 20,520 | 515 | 0.007 | 19,380 | 435 | 0.006 | 17,100 | 360 | 0.004 |
| | 16 | 20,520 | 515 | 0.007 | 19,380 | 435 | 0.006 | 17,100 | 360 | 0.004 |
| | 20 | 10,260 | 220 | 0.007 | 9,690 | 185 | 0.006 | 8,550 | 155 | 0.004 |
| 0.9 | 4 | 29,250 | 1,120 | 0.032 | 27,630 | 935 | 0.025 | 24,390 | 775 | 0.018 |
| | 6 | 29,250 | 1,120 | 0.032 | 27,630 | 935 | 0.025 | 24,390 | 775 | 0.018 |
| | 8 | 29,250 | 1,120 | 0.02 | 27,630 | 935 | 0.016 | 24,390 | 775 | 0.011 |
| | 10 | 26,000 | 885 | 0.02 | 24,560 | 740 | 0.016 | 21,680 | 610 | 0.011 |
| 1 | 2 | 30,800 | 1,540 | 0.09 | 29,100 | 1,310 | 0.07 | 25,700 | 1,075 | 0.05 |
| | 3 | 30,800 | 1,540 | 0.09 | 29,100 | 1,310 | 0.07 | 25,700 | 1,075 | 0.05 |
| | 4 | 30,800 | 1,540 | 0.063 | 29,100 | 1,310 | 0.049 | 25,700 | 1,075 | 0.035 |
| | 5 | 30,800 | 1,540 | 0.063 | 29,100 | 1,310 | 0.049 | 25,700 | 1,075 | 0.035 |
| | 6 | 27,720 | 1,245 | 0.036 | 26,190 | 1,060 | 0.028 | 23,130 | 870 | 0.02 |
| | 7 | 27,720 | 1,245 | 0.036 | 26,190 | 1,060 | 0.028 | 23,130 | 870 | 0.02 |
| | 8 | 27,720 | 1,245 | 0.036 | 26,190 | 1,060 | 0.028 | 23,130 | 870 | 0.02 |
| | 10 | 27,720 | 1,245 | 0.023 | 26,190 | 1,060 | 0.018 | 23,130 | 870 | 0.013 |
| | 12 | 24,640 | 985 | 0.023 | 23,280 | 840 | 0.018 | 20,560 | 690 | 0.013 |
| | 14 | 24,640 | 985 | 0.014 | 23,280 | 840 | 0.011 | 20,560 | 690 | 0.008 |
| | 16 | 18,480 | 645 | 0.014 | 17,460 | 550 | 0.011 | 15,420 | 450 | 0.008 |
| | 18 | 18,480 | 645 | 0.009 | 17,460 | 550 | 0.007 | 15,420 | 450 | 0.005 |
| | 20 | 18,480 | 645 | 0.009 | 17,460 | 550 | 0.007 | 15,420 | 450 | 0.005 |
| | 22 | 9,240 | 275 | 0.009 | 8,730 | 235 | 0.007 | 7,710 | 195 | 0.005 |
| | 26 | 9,240 | 275 | 0.009 | 8,730 | 235 | 0.007 | 7,710 | 195 | 0.005 |
| | 30 | 9,240 | 275 | 0.009 | 8,730 | 235 | 0.007 | 7,710 | 195 | 0.005 |

# Recommended Cutting Condition

## ESRB712 SERIES

| Workpiece | | CARBON STEEL, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 1 | 40 | 3,080 | 75 | 0.009 | 2,910 | 65 | 0.007 | 2,570 | 55 | 0.005 |
| | 50 | 3,080 | 75 | 0.006 | 2,910 | 65 | 0.005 | 2,570 | 55 | 0.003 |
| 1.2 | 4 | 26,300 | 1,375 | 0.076 | 24,800 | 1,150 | 0.059 | 21,900 | 950 | 0.042 |
| | 6 | 26,300 | 1,375 | 0.076 | 24,800 | 1,150 | 0.059 | 21,900 | 950 | 0.042 |
| | 8 | 23,670 | 1,115 | 0.043 | 22,320 | 930 | 0.034 | 19,710 | 770 | 0.024 |
| | 10 | 23,670 | 1,115 | 0.027 | 22,320 | 930 | 0.021 | 19,710 | 770 | 0.015 |
| | 12 | 23,670 | 1,115 | 0.027 | 22,320 | 930 | 0.021 | 19,710 | 770 | 0.015 |
| | 16 | 21,040 | 880 | 0.016 | 19,840 | 735 | 0.013 | 17,520 | 610 | 0.009 |
| | 20 | 15,780 | 580 | 0.011 | 14,880 | 485 | 0.008 | 13,140 | 400 | 0.006 |
| | 26 | 7,890 | 245 | 0.011 | 7,440 | 205 | 0.008 | 6,570 | 170 | 0.006 |
| 1.4 | 6 | 21,500 | 1,295 | 0.088 | 20,300 | 1,100 | 0.069 | 18,000 | 935 | 0.049 |
| | 8 | 19,350 | 1,050 | 0.05 | 18,270 | 890 | 0.039 | 16,200 | 755 | 0.028 |
| | 10 | 19,350 | 1,050 | 0.05 | 18,270 | 890 | 0.039 | 16,200 | 755 | 0.028 |
| | 16 | 17,200 | 830 | 0.032 | 16,240 | 705 | 0.025 | 14,400 | 600 | 0.018 |
| 1.5 | 4 | 23,900 | 1,580 | 0.135 | 22,600 | 1,355 | 0.105 | 20,000 | 1,075 | 0.075 |
| | 5 | 23,900 | 1,580 | 0.095 | 22,600 | 1,355 | 0.074 | 20,000 | 1,075 | 0.053 |
| | 6 | 23,900 | 1,580 | 0.095 | 22,600 | 1,355 | 0.074 | 20,000 | 1,075 | 0.053 |
| | 7 | 23,900 | 1,580 | 0.095 | 22,600 | 1,355 | 0.074 | 20,000 | 1,075 | 0.053 |
| | 8 | 21,510 | 1,280 | 0.054 | 20,340 | 1,100 | 0.042 | 18,000 | 870 | 0.03 |
| | 10 | 21,510 | 1,280 | 0.054 | 20,340 | 1,100 | 0.042 | 18,000 | 870 | 0.03 |
| | 12 | 21,510 | 1,280 | 0.054 | 20,340 | 1,100 | 0.042 | 18,000 | 870 | 0.03 |
| | 14 | 21,510 | 1,280 | 0.034 | 20,340 | 1,100 | 0.026 | 18,000 | 870 | 0.019 |
| | 16 | 19,120 | 1,010 | 0.034 | 18,080 | 865 | 0.026 | 16,000 | 690 | 0.019 |
| | 18 | 19,120 | 1,010 | 0.034 | 18,080 | 865 | 0.026 | 16,000 | 690 | 0.019 |
| | 20 | 19,120 | 1,010 | 0.02 | 18,080 | 865 | 0.016 | 16,000 | 690 | 0.011 |
| | 22 | 19,120 | 1,010 | 0.02 | 18,080 | 865 | 0.016 | 16,000 | 690 | 0.011 |
| | 26 | 14,340 | 665 | 0.014 | 13,560 | 570 | 0.011 | 12,000 | 450 | 0.008 |
| | 30 | 14,340 | 665 | 0.014 | 13,560 | 570 | 0.011 | 12,000 | 450 | 0.008 |
| | 35 | 7,170 | 285 | 0.01 | 6,780 | 245 | 0.008 | 6,000 | 195 | 0.005 |
| | 40 | 7,170 | 285 | 0.01 | 6,780 | 245 | 0.008 | 6,000 | 195 | 0.005 |
| 1.6 | 4 | 22,200 | 1,555 | 0.101 | 21,000 | 1,300 | 0.078 | 18,500 | 1,110 | 0.056 |
| | 6 | 22,200 | 1,555 | 0.101 | 21,000 | 1,300 | 0.078 | 18,500 | 1,110 | 0.056 |
| | 8 | 22,200 | 1,555 | 0.101 | 21,000 | 1,300 | 0.078 | 18,500 | 1,110 | 0.056 |
| | 10 | 19,980 | 1,260 | 0.058 | 18,900 | 1,055 | 0.045 | 16,650 | 900 | 0.032 |
| | 12 | 19,980 | 1,260 | 0.058 | 18,900 | 1,055 | 0.045 | 16,650 | 900 | 0.032 |
| | 16 | 19,980 | 1,260 | 0.036 | 18,900 | 1,055 | 0.028 | 16,650 | 900 | 0.02 |
| | 20 | 17,760 | 995 | 0.036 | 16,800 | 830 | 0.028 | 14,800 | 710 | 0.02 |
| 1.8 | 4 | 22,200 | 1,780 | 0.113 | 21,000 | 1,470 | 0.088 | 18,500 | 1,225 | 0.063 |
| | 6 | 22,200 | 1,780 | 0.113 | 21,000 | 1,470 | 0.088 | 18,500 | 1,225 | 0.063 |
| | 8 | 22,200 | 1,780 | 0.113 | 21,000 | 1,470 | 0.088 | 18,500 | 1,225 | 0.063 |
| | 10 | 19,980 | 1,440 | 0.065 | 18,900 | 1,190 | 0.05 | 16,650 | 990 | 0.036 |
| | 12 | 19,980 | 1,440 | 0.065 | 18,900 | 1,190 | 0.05 | 16,650 | 990 | 0.036 |
| | 16 | 19,980 | 1,440 | 0.041 | 18,900 | 1,190 | 0.032 | 16,650 | 990 | 0.023 |

## ESRB712 SERIES

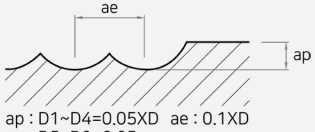
| Workpiece | | CARBON STEEL, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 1.8 | 20 | 17,760 | 1,140 | 0.041 | 16,800 | 940 | 0.032 | 14,800 | 785 | 0.023 |
| 2 | 6 | 18,000 | 1,795 | 0.18 | 17,000 | 1,525 | 0.14 | 15,000 | 1,285 | 0.1 |
| | 8 | 18,000 | 1,795 | 0.126 | 17,000 | 1,525 | 0.098 | 15,000 | 1,285 | 0.07 |
| | 10 | 18,000 | 1,795 | 0.126 | 17,000 | 1,525 | 0.098 | 15,000 | 1,285 | 0.07 |
| | 12 | 16,200 | 1,455 | 0.072 | 15,300 | 1,235 | 0.056 | 13,500 | 1,040 | 0.04 |
| | 14 | 16,200 | 1,455 | 0.072 | 15,300 | 1,235 | 0.056 | 13,500 | 1,040 | 0.04 |
| | 16 | 16,200 | 1,455 | 0.072 | 15,300 | 1,235 | 0.056 | 13,500 | 1,040 | 0.04 |
| | 18 | 16,200 | 1,455 | 0.045 | 15,300 | 1,235 | 0.035 | 13,500 | 1,040 | 0.025 |
| | 20 | 16,200 | 1,455 | 0.045 | 15,300 | 1,235 | 0.035 | 13,500 | 1,040 | 0.025 |
| | 22 | 14,400 | 1,150 | 0.045 | 13,600 | 975 | 0.035 | 12,000 | 820 | 0.025 |
| | 26 | 14,400 | 1,150 | 0.045 | 13,600 | 975 | 0.035 | 12,000 | 820 | 0.025 |
| | 30 | 14,400 | 1,150 | 0.027 | 13,600 | 975 | 0.021 | 12,000 | 820 | 0.015 |
| | 35 | 10,800 | 755 | 0.018 | 10,200 | 640 | 0.014 | 9,000 | 540 | 0.01 |
| | 40 | 10,800 | 755 | 0.018 | 10,200 | 640 | 0.014 | 9,000 | 540 | 0.01 |
| | 45 | 5,400 | 325 | 0.018 | 5,100 | 275 | 0.014 | 4,500 | 230 | 0.01 |
| | 50 | 5,400 | 325 | 0.018 | 5,100 | 275 | 0.014 | 4,500 | 230 | 0.01 |
| | 60 | 5,400 | 325 | 0.018 | 5,100 | 275 | 0.014 | 4,500 | 230 | 0.01 |
| 2.5 | 8 | 15,800 | 1,925 | 0.158 | 14,900 | 1,605 | 0.123 | 13,200 | 1,305 | 0.088 |
| | 10 | 15,800 | 1,925 | 0.158 | 14,900 | 1,605 | 0.123 | 13,200 | 1,305 | 0.088 |
| | 12 | 15,800 | 1,925 | 0.158 | 14,900 | 1,605 | 0.123 | 13,200 | 1,305 | 0.088 |
| | 16 | 14,220 | 1,560 | 0.09 | 13,410 | 1,300 | 0.07 | 11,880 | 1,055 | 0.05 |
| | 20 | 14,220 | 1,560 | 0.09 | 13,410 | 1,300 | 0.07 | 11,880 | 1,055 | 0.05 |
| | 22 | 14,220 | 1,560 | 0.056 | 13,410 | 1,300 | 0.044 | 11,880 | 1,055 | 0.031 |
| | 26 | 12,640 | 1,230 | 0.056 | 11,920 | 1,025 | 0.044 | 10,560 | 835 | 0.031 |
| | 30 | 12,640 | 1,230 | 0.056 | 11,920 | 1,025 | 0.044 | 10,560 | 835 | 0.031 |
| | 35 | 12,640 | 1,230 | 0.034 | 11,920 | 1,025 | 0.026 | 10,560 | 835 | 0.019 |
| | 40 | 9,480 | 810 | 0.034 | 8,940 | 675 | 0.026 | 7,920 | 550 | 0.019 |
| | 45 | 9,480 | 810 | 0.023 | 8,940 | 675 | 0.018 | 7,920 | 550 | 0.013 |
| | 50 | 9,480 | 810 | 0.023 | 8,940 | 675 | 0.018 | 7,920 | 550 | 0.013 |
| 3 | 6 | 13,700 | 2,050 | 0.27 | 12,900 | 1,730 | 0.21 | 11,400 | 1,435 | 0.15 |
| | 8 | 13,700 | 2,050 | 0.27 | 12,900 | 1,730 | 0.21 | 11,400 | 1,435 | 0.15 |
| | 10 | 13,700 | 2,050 | 0.189 | 12,900 | 1,730 | 0.147 | 11,400 | 1,435 | 0.105 |
| | 12 | 13,700 | 2,050 | 0.189 | 12,900 | 1,730 | 0.147 | 11,400 | 1,435 | 0.105 |
| | 14 | 13,700 | 2,050 | 0.189 | 12,900 | 1,730 | 0.147 | 11,400 | 1,435 | 0.105 |
| | 16 | 12,330 | 1,660 | 0.108 | 11,610 | 1,400 | 0.084 | 10,260 | 1,160 | 0.06 |
| | 18 | 12,330 | 1,660 | 0.108 | 11,610 | 1,400 | 0.084 | 10,260 | 1,160 | 0.06 |
| | 20 | 12,330 | 1,660 | 0.108 | 11,610 | 1,400 | 0.084 | 10,260 | 1,160 | 0.06 |
| | 22 | 12,330 | 1,660 | 0.108 | 11,610 | 1,400 | 0.084 | 10,260 | 1,160 | 0.06 |
| | 26 | 12,330 | 1,660 | 0.068 | 11,610 | 1,400 | 0.053 | 10,260 | 1,160 | 0.038 |
| | 30 | 12,330 | 1,660 | 0.068 | 11,610 | 1,400 | 0.053 | 10,260 | 1,160 | 0.038 |
| | 35 | 10,960 | 1,310 | 0.068 | 10,320 | 1,105 | 0.053 | 9,120 | 920 | 0.038 |
| | 40 | 10,960 | 1,310 | 0.041 | 10,320 | 1,105 | 0.032 | 9,120 | 920 | 0.023 |
| | 45 | 10,960 | 1,310 | 0.041 | 10,320 | 1,105 | 0.032 | 9,120 | 920 | 0.023 |

# Recommended Cutting Condition

## ESRB712 SERIES

| Workpiece | | CARBON STEEL, Alloy Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 3 | 50 | 8,220 | 860 | 0.027 | 7,740 | 725 | 0.021 | 6,840 | 605 | 0.015 |
| | 60 | 8,220 | 860 | 0.027 | 7,740 | 725 | 0.021 | 6,840 | 605 | 0.015 |
| 4 | 8 | 9,800 | 1,965 | 0.36 | 9,300 | 1,670 | 0.28 | 8,200 | 1,395 | 0.2 |
| | 10 | 9,800 | 1,965 | 0.36 | 9,300 | 1,670 | 0.28 | 8,200 | 1,395 | 0.2 |
| | 12 | 9,800 | 1,965 | 0.36 | 9,300 | 1,670 | 0.28 | 8,200 | 1,395 | 0.2 |
| | 14 | 9,800 | 1,965 | 0.252 | 9,300 | 1,670 | 0.196 | 8,200 | 1,395 | 0.14 |
| | 16 | 9,800 | 1,965 | 0.252 | 9,300 | 1,670 | 0.196 | 8,200 | 1,395 | 0.14 |
| | 18 | 9,800 | 1,965 | 0.252 | 9,300 | 1,670 | 0.196 | 8,200 | 1,395 | 0.14 |
| | 20 | 9,800 | 1,965 | 0.252 | 9,300 | 1,670 | 0.196 | 8,200 | 1,395 | 0.14 |
| | 22 | 8,820 | 1,590 | 0.144 | 8,370 | 1,355 | 0.112 | 7,380 | 1,130 | 0.08 |
| | 26 | 8,820 | 1,590 | 0.144 | 8,370 | 1,355 | 0.112 | 7,380 | 1,130 | 0.08 |
| | 30 | 8,820 | 1,590 | 0.144 | 8,370 | 1,355 | 0.112 | 7,380 | 1,130 | 0.08 |
| | 35 | 8,820 | 1,590 | 0.09 | 8,370 | 1,355 | 0.07 | 7,380 | 1,130 | 0.05 |
| | 40 | 8,820 | 1,590 | 0.09 | 8,370 | 1,355 | 0.07 | 7,380 | 1,130 | 0.05 |
| | 45 | 7,840 | 1,260 | 0.09 | 7,440 | 1,070 | 0.07 | 6,560 | 895 | 0.05 |
| | 50 | 7,840 | 1,260 | 0.09 | 7,440 | 1,070 | 0.07 | 6,560 | 895 | 0.05 |
| | 60 | 7,840 | 1,260 | 0.054 | 7,440 | 1,070 | 0.042 | 6,560 | 895 | 0.03 |
| 5 | 15 | 7,700 | 1,845 | 0.315 | 7,300 | 1,455 | 0.245 | 6,400 | 1,285 | 0.175 |
| | 20 | 7,700 | 1,845 | 0.315 | 7,300 | 1,455 | 0.245 | 6,400 | 1,285 | 0.175 |
| | 26 | 6,930 | 1,495 | 0.18 | 6,570 | 1,180 | 0.14 | 5,760 | 1,040 | 0.1 |
| | 30 | 6,930 | 1,495 | 0.18 | 6,570 | 1,180 | 0.14 | 5,760 | 1,040 | 0.1 |
| | 35 | 6,930 | 1,495 | 0.18 | 6,570 | 1,180 | 0.14 | 5,760 | 1,040 | 0.1 |
| | 40 | 6,930 | 1,495 | 0.18 | 6,570 | 1,180 | 0.14 | 5,760 | 1,040 | 0.1 |
| | 50 | 6,930 | 1,495 | 0.113 | 6,570 | 1,180 | 0.088 | 5,760 | 1,040 | 0.063 |
| | 60 | 6,160 | 1,180 | 0.113 | 5,840 | 930 | 0.088 | 5,120 | 820 | 0.063 |
| 6 | 20 | 6,500 | 1,900 | 0.378 | 6,200 | 1,600 | 0.294 | 5,500 | 1,330 | 0.21 |
| | 30 | 6,500 | 1,900 | 0.378 | 6,200 | 1,600 | 0.294 | 5,500 | 1,330 | 0.21 |
| 8 | 25 | 4,850 | 1,800 | 0.504 | 4,600 | 1,500 | 0.392 | 4,000 | 1,280 | 0.28 |
| | 30 | 4,850 | 1,800 | 0.504 | 4,600 | 1,500 | 0.392 | 4,000 | 1,280 | 0.28 |
| 10 | 30 | 3,850 | 1,650 | 0.9 | 3,680 | 1,400 | 0.7 | 3,200 | 1,200 | 0.5 |
| | 40 | 3,850 | 1,650 | 0.63 | 3,680 | 1,400 | 0.49 | 3,200 | 1,200 | 0.35 |
| 12 | 32 | 3,200 | 1,520 | 1.08 | 3,050 | 1,300 | 0.84 | 2,650 | 1,100 | 0.6 |
| | 45 | 3,200 | 1,520 | 0.756 | 3,050 | 1,300 | 0.588 | 2,650 | 1,100 | 0.42 |

RPM = rev / min
FEED = mm / min

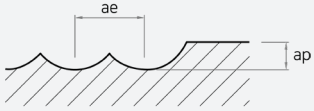



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

## ESLNB20 SERIES

| Work-piece | Alloy Steels, Heat Resistant Steels | | | Herdened Steels | | | Herdened Steels | | | Copper, Copper alloy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30~HRc45 | | | HRc45~HRc55 | | | HRc55~HRc65 | | | - | | |
| Diameter (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) | RPM | FEED | Ap (mm) |
| 0.5 | 34,100~49,500 | 600~870 | 0.007~0.028 | 31,900~35,200 | 490~540 | 0.005~0.023 | 31,900~35,200 | 440~480 | 0.005~0.021 | 49,000~50,000 | 1,100~1,400 | 0.010~0.042 |
| 0.6 | 28,600~40,700 | 590~850 | 0.007~0.034 | 26,400~29,700 | 480~540 | 0.006~0.028 | 26,400~29,700 | 400~480 | 0.006~0.025 | 42,000~50,000 | 1,100~1,700 | 0.011~0.050 |
| 0.8 | 22,000~30,800 | 640~890 | 0.016~0.064 | 19,800~22,000 | 490~550 | 0.013~0.052 | 19,800~22,000 | 440~500 | 0.012~0.048 | 31,000~50,000 | 1,100~2,250 | 0.024~0.096 |
| 1 | 17,600~24,200 | 600~850 | 0.008~0.080 | 15,400~17,600 | 470~540 | 0.007~0.065 | 15,400~17,600 | 440~500 | 0.006~0.060 | 24,000~49,500 | 1,100~2,200 | 0.012~0.120 |
| 1.2 | 14,300~18,700 | 590~780 | 0.024~0.032 | 12,000~14,000 | 480~540 | 0.020~0.026 | 12,000~14,000 | 420~480 | 0.018~0.024 | 28,500~38,500 | 1,480~1,950 | 0.036~0.048 |
| 1.5 | 11,000~14,300 | 580~760 | 0.031~0.048 | 10,000~11,500 | 480~540 | 0.025~0.039 | 10,000~11,500 | 420~480 | 0.023~0.036 | 17,000~28,500 | 1,100~1,950 | 0.046~0.072 |
| 2 | 8,500~11,000 | 590~800 | 0.024~0.160 | 7,900~8,800 | 470~530 | 0.020~0.130 | 7,900~8,800 | 440~480 | 0.018~0.120 | 12,600~24,000 | 1,100~2,150 | 0.036~0.240 |
| 3 | 5,700~8,200 | 730~1,000 | 0.064~0.24 | 5,300~5,800 | 590~650 | 0.052~0.195 | 5,300~5,800 | 550~620 | 0.048~0.120 | 11,900~17,000 | 1,850~2,700 | 0.096~0.360 |
| 4 | 4,300~6,200 | 680~990 | 0.080~0.320 | 3,950~4,400 | 550~620 | 0.065~0.260 | 3,850~4,400 | 530~570 | 0.060~0.240 | 6,600~12,500 | 1,260~2,500 | 0.120~0.480 |

RPM = rev / min
FEED = mm / min




ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

# Recommended Cutting Condition

## ESTNB20 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.4 | 0.8 | 4 | 0.4 | 0.062 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 6 | 0.4 | 0.045 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 8 | 0.9 | 0.026 | 25,600 | 1,475 | 17,920 | 1,032 | 16,640 | 852 | 16,640 | 745 |
| | | 12 | 0.9 | 0.02 | 20,800 | 1,065 | 14,560 | 699 | 13,520 | 606 | 13,520 | 519 |
| | | 16 | 0.9 | 0.018 | 20,800 | 932 | 14,560 | 612 | 13,520 | 530 | 13,520 | 454 |
| 0.45 | 0.9 | 4 | 0.4 | 0.063 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 8 | 0.4 | 0.05 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 12 | 0.4 | 0.037 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 16 | 0.4 | 0.024 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 18 | 0.4 | 0.018 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 20 | 0.4 | 0.015 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |
| | | 22 | 0.4 | 0.012 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |
| | | 24 | 0.4 | 0.009 | 14,150 | 1,019 | 9,905 | 624 | 9,198 | 579 | 9,198 | 497 |
| 0.5 | 1 | 6 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 8 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 10 | 0.4 | 0.032 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 10 | 0.9 | 0.035 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 15 | 0.9 | 0.028 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.4 | 0.018 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.9 | 0.02 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 25 | 0.9 | 0.017 | 14,560 | 1,165 | 10,192 | 764 | 9,464 | 662 | 9,464 | 568 |
| | | 30 | 0.4 | 0.015 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 30 | 0.9 | 0.017 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 35 | 0.9 | 0.01 | 10,400 | 728 | 7,280 | 473 | 6,760 | 406 | 6,760 | 338 |
| | | 40 | 0.9 | 0.009 | 10,000 | 700 | 7,000 | 455 | 6,500 | 390 | 6,500 | 325 |
| | | 50 | 0.9 | 0.007 | 9,500 | 665 | 6,650 | 432 | 6,175 | 371 | 6,175 | 309 |
| | | 60 | 0.9 | 0.005 | 9,000 | 630 | 6,300 | 410 | 5,850 | 351 | 5,850 | 293 |
| | | 70 | 0.9 | 0.003 | 8,500 | 595 | 5,950 | 387 | 5,525 | 332 | 5,525 | 276 |
| 0.75 | 1.5 | 8 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 10 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 12 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 15 | 0.9 | 0.045 | 13,568 | 1,832 | 9,498 | 1,282 | 8,819 | 1,058 | 8,819 | 926 |
| | | 20 | 0.9 | 0.04 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| | | 30 | 0.9 | 0.028 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| 0.9 | 1.8 | 4 | 0.4 | 0.12 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 8 | 0.4 | 0.1 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 12 | 0.4 | 0.08 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 16 | 0.4 | 0.071 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 20 | 0.4 | 0.062 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 24 | 0.4 | 0.053 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 28 | 0.4 | 0.044 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 32 | 0.4 | 0.036 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 36 | 0.4 | 0.028 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 38 | 0.4 | 0.02 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |

## ESTNB20 SERIES

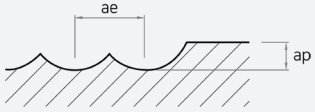
| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.9 | 1.8 | 40 | 0.4 | 0.015 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |
| 1 | 2 | 8 | 0.4 | 0.15 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 12 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 16 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 20 | 0.4 | 0.06 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 20 | 0.9 | 0.07 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 25 | 0.9 | 0.07 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.4 | 0.04 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 35 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.4 | 0.03 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.9 | 0.035 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 50 | 0.9 | 0.17 | 8,512 | 1,192 | 5,958 | 775 | 5,533 | 664 | 5,533 | 553 |
| | | 60 | 0.9 | 0.009 | 7,235 | 1,013 | 5,065 | 658 | 4,703 | 564 | 4,703 | 470 |
| | | 70 | 0.9 | 0.005 | 6,150 | 861 | 4,305 | 560 | 3,997 | 480 | 3,997 | 400 |
| 1.5 | 3 | 8 | 0.4 | 0.32 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 16 | 0.4 | 0.22 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 20 | 0.4 | 0.15 | 12,720 | 3,434 | 8,904 | 2,137 | 8,268 | 1,736 | 8,268 | 1,488 |
| | | 30 | 0.4 | 0.08 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 30 | 0.9 | 0.09 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 40 | 0.4 | 0.06 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 40 | 0.9 | 0.07 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 50 | 0.9 | 0.05 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 60 | 0.9 | 0.03 | 7,123 | 1,710 | 4,986 | 1,047 | 4,630 | 972 | 4,630 | 833 |
| | | 70 | 0.9 | 0.02 | 6,233 | 1,496 | 4,363 | 916 | 4,051 | 851 | 4,051 | 729 |
| 2 | 4 | 20 | 1 | 0.32 | 11,900 | 2,860 | 9,000 | 2,050 | 7,800 | 1,680 | 7,800 | 1,590 |
| | | 30 | 1 | 0.23 | 11,900 | 2,570 | 9,000 | 1,850 | 7,800 | 1,520 | 7,800 | 1,430 |
| | | 40 | 1 | 0.14 | 9,500 | 1,940 | 7,200 | 1,400 | 6,200 | 1,140 | 6,200 | 1,080 |
| | | 50 | 1 | 0.11 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| | | 60 | 1 | 0.07 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| 2.5 | 5 | 30 | 1 | 0.34 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 40 | 1 | 0.25 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 60 | 1 | 0.15 | 6,200 | 1,320 | 4,700 | 950 | 4,000 | 770 | 4,000 | 720 |
| 3 | 6 | 30 | 1 | 0.45 | 8,000 | 2,000 | 6,000 | 1,430 | 5,200 | 1,170 | 5,200 | 1,110 |
| | | 40 | 1 | 0.4 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 50 | 1 | 0.32 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 60 | 1 | 0.22 | 6,400 | 1,360 | 4,800 | 970 | 4,100 | 780 | 4,100 | 740 |
| | | 70 | 1 | 0.18 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| | | 80 | 1 | 0.14 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| 4 | 8 | 50 | 1 | 0.5 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 60 | 1 | 0.43 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 70 | 1 | 0.33 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 80 | 1 | 0.25 | 4,800 | 1,100 | 3,600 | 780 | 3,100 | 640 | 3,100 | 600 |
| 5 | 10 | 60 | 1 | 0.7 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |

# Recommended Cutting Condition

## ESTNB20 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 5 | 10 | 75 | 1 | 0.5 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |

RPM = rev / min
FEED = mm / min




ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

· Please try to use 20-30% slow down than recommendation when chips are not evacuated well -Rib machining, slotting, etc.
ex)ESTNB2040-20-10, HRc 55, Rib machining
ap : 0.32(ap from chart) X 0.65(constant value) X 0.8 = 0.17mm
· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

## ESTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.1 | 0.2 | 1 | 0.4 | 0.017 | 40,000 | 800 | 28,000 | 504 | 26,000 | 416 | 26,000 | 364 |
| | | 1.5 | 0.4 | 0.009 | 40,000 | 800 | 28,000 | 504 | 26,000 | 416 | 26,000 | 364 |
| | | 2 | 0.9 | 0.007 | 32,000 | 461 | 22,400 | 323 | 20,800 | 266 | 20,800 | 233 |
| | | 2.5 | 0.9 | 0.004 | 26,000 | 333 | 18,200 | 204 | 16,900 | 189 | 16,900 | 162 |
| 0.15 | 0.3 | 2 | 0.4 | 0.025 | 40,000 | 1,200 | 28,000 | 756 | 26,000 | 624 | 26,000 | 546 |
| | | 3 | 0.9 | 0.013 | 32,000 | 691 | 22,400 | 484 | 20,800 | 399 | 20,800 | 349 |
| | | 4 | 0.9 | 0.01 | 26,000 | 499 | 18,200 | 306 | 16,900 | 284 | 16,900 | 243 |
| 0.2 | 0.4 | 2 | 0.4 | 0.035 | 40,000 | 1,600 | 28,000 | 1,008 | 26,000 | 832 | 26,000 | 728 |
| | | 3 | 0.4 | 0.02 | 40,000 | 1,600 | 28,000 | 1,008 | 26,000 | 832 | 26,000 | 728 |
| | | 4 | 0.4 | 0.007 | 32,000 | 922 | 22,400 | 645 | 20,800 | 532 | 20,800 | 466 |
| | | 4 | 0.9 | 0.009 | 32,000 | 922 | 22,400 | 645 | 20,800 | 532 | 20,800 | 466 |
| | | 5 | 0.4 | 0.006 | 26,000 | 666 | 18,200 | 408 | 16,900 | 379 | 16,900 | 324 |
| | | 5 | 0.9 | 0.007 | 26,000 | 666 | 18,200 | 408 | 16,900 | 379 | 16,900 | 324 |
| 0.25 | 0.5 | 4 | 0.4 | 0.04 | 40,000 | 2,000 | 28,000 | 1,260 | 26,000 | 1,040 | 26,000 | 910 |
| | | 8 | 0.9 | 0.01 | 26,000 | 728 | 18,200 | 446 | 16,900 | 414 | 16,900 | 355 |
| | | 12 | 0.9 | 0.005 | 22,400 | 627 | 15,680 | 384 | 14,560 | 357 | 14,560 | 306 |
| 0.27 | 0.54 | 2 | 0.4 | 0.05 | 40,000 | 2,160 | 28,000 | 1,361 | 26,000 | 1,123 | 26,000 | 983 |
| | | 4 | 0.4 | 0.037 | 40,000 | 2,160 | 28,000 | 1,361 | 26,000 | 1,123 | 26,000 | 983 |
| | | 5 | 0.4 | 0.031 | 40,000 | 1,512 | 28,000 | 1,176 | 26,000 | 1,040 | 26,000 | 832 |
| | | 6 | 0.4 | 0.025 | 26,000 | 1,244 | 18,200 | 871 | 16,900 | 676 | 16,900 | 629 |
| | | 6.5 | 0.4 | 0.02 | 26,000 | 1,011 | 18,200 | 619 | 16,900 | 575 | 16,900 | 493 |
| | | 7 | 0.4 | 0.015 | 26,000 | 899 | 18,200 | 585 | 16,900 | 543 | 16,900 | 465 |
| 0.3 | 0.6 | 2 | 0.4 | 0.055 | 40,000 | 2,400 | 28,000 | 1,512 | 26,000 | 1,248 | 26,000 | 1,092 |
| | | 4 | 0.4 | 0.035 | 40,000 | 2,400 | 28,000 | 1,512 | 26,000 | 1,248 | 26,000 | 1,092 |
| | | 6 | 0.4 | 0.018 | 32,000 | 1,382 | 22,400 | 968 | 20,800 | 799 | 20,800 | 699 |
| | | 6 | 0.9 | 0.02 | 32,000 | 1,382 | 22,400 | 968 | 20,800 | 799 | 20,800 | 699 |
| | | 8 | 0.9 | 0.02 | 26,000 | 998 | 18,200 | 612 | 16,900 | 568 | 16,900 | 487 |
| | | 10 | 0.4 | 0.013 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 10 | 0.9 | 0.015 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 12 | 0.9 | 0.01 | 26,000 | 874 | 18,200 | 535 | 16,900 | 497 | 16,900 | 426 |
| | | 15 | 0.4 | 0.005 | 22,400 | 753 | 15,680 | 461 | 14,560 | 367 | 14,560 | 367 |
| | | 15 | 0.9 | 0.006 | 22,400 | 753 | 15,680 | 461 | 14,560 | 367 | 14,560 | 367 |
| 0.4 | 0.8 | 4 | 0.4 | 0.062 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 6 | 0.4 | 0.045 | 32,000 | 2,560 | 22,400 | 1,613 | 20,800 | 1,331 | 20,800 | 1,165 |
| | | 8 | 0.9 | 0.026 | 25,600 | 1,475 | 17,920 | 1,032 | 16,640 | 852 | 16,640 | 745 |
| | | 12 | 0.9 | 0.02 | 20,800 | 1,065 | 14,560 | 699 | 13,520 | 606 | 13,520 | 519 |
| | | 16 | 0.9 | 0.018 | 20,800 | 932 | 14,560 | 612 | 13,520 | 530 | 13,520 | 454 |
| 0.45 | 0.9 | 4 | 0.4 | 0.063 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 8 | 0.4 | 0.05 | 28,300 | 2,547 | 19,810 | 1,605 | 18,395 | 1,324 | 18,395 | 1,159 |
| | | 12 | 0.4 | 0.037 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 16 | 0.4 | 0.024 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 18 | 0.4 | 0.018 | 18,400 | 1,325 | 12,880 | 811 | 11,960 | 753 | 11,960 | 646 |
| | | 20 | 0.4 | 0.015 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |
| | | 22 | 0.4 | 0.012 | 15,850 | 1,141 | 11,095 | 699 | 10,303 | 649 | 10,303 | 556 |

# Recommended Cutting Condition

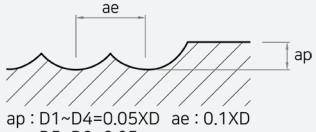
## ESTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 0.45 | 0.9 | 24 | 0.4 | 0.009 | 14,150 | 1,019 | 9,905 | 624 | 9,198 | 579 | 9,198 | 497 |
| 0.5 | 1 | 6 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 8 | 0.4 | 0.055 | 25,600 | 2,560 | 17,920 | 1,613 | 16,640 | 1,331 | 16,640 | 1,165 |
| | | 10 | 0.4 | 0.032 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 10 | 0.9 | 0.035 | 20,800 | 1,872 | 14,560 | 1,310 | 13,520 | 1,082 | 13,520 | 946 |
| | | 15 | 0.9 | 0.028 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.4 | 0.018 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 20 | 0.9 | 0.02 | 16,640 | 1,331 | 11,648 | 874 | 10,816 | 757 | 10,816 | 649 |
| | | 25 | 0.9 | 0.017 | 14,560 | 1,165 | 10,192 | 764 | 9,464 | 662 | 9,464 | 568 |
| | | 30 | 0.4 | 0.015 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 30 | 0.9 | 0.017 | 12,480 | 874 | 8,736 | 568 | 8,112 | 487 | 8,112 | 406 |
| | | 35 | 0.9 | 0.01 | 10,400 | 728 | 7,280 | 473 | 6,760 | 406 | 6,760 | 338 |
| | | 40 | 0.9 | 0.009 | 10,000 | 700 | 7,000 | 455 | 6,500 | 390 | 6,500 | 325 |
| | | 50 | 0.9 | 0.007 | 9,500 | 665 | 6,650 | 432 | 6,175 | 371 | 6,175 | 309 |
| | | 60 | 0.9 | 0.005 | 9,000 | 630 | 6,300 | 410 | 5,850 | 351 | 5,850 | 293 |
| | | 70 | 0.9 | 0.003 | 8,500 | 595 | 5,950 | 387 | 5,525 | 332 | 5,525 | 276 |
| 0.75 | 1.5 | 8 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 10 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 12 | 0.4 | 0.07 | 16,960 | 2,544 | 11,872 | 1,603 | 11,024 | 1,323 | 11,024 | 1,158 |
| | | 15 | 0.9 | 0.045 | 13,568 | 1,832 | 9,498 | 1,282 | 8,819 | 1,058 | 8,819 | 926 |
| | | 20 | 0.9 | 0.04 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| | | 30 | 0.9 | 0.028 | 11,024 | 1,323 | 7,717 | 810 | 7,166 | 752 | 7,166 | 645 |
| 0.9 | 1.8 | 4 | 0.4 | 0.12 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 8 | 0.4 | 0.1 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 12 | 0.4 | 0.08 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 16 | 0.4 | 0.071 | 14,200 | 2,556 | 9,940 | 1,610 | 9,230 | 1,329 | 9,230 | 1,163 |
| | | 20 | 0.4 | 0.062 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 24 | 0.4 | 0.053 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 28 | 0.4 | 0.044 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 32 | 0.4 | 0.036 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 36 | 0.4 | 0.028 | 9,230 | 1,329 | 6,461 | 814 | 6,000 | 756 | 6,000 | 648 |
| | | 38 | 0.4 | 0.02 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |
| | | 40 | 0.4 | 0.015 | 8,000 | 1,152 | 5,600 | 706 | 5,200 | 655 | 5,200 | 562 |
| 1 | 2 | 8 | 0.4 | 0.15 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 12 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 16 | 0.4 | 0.09 | 15,200 | 3,040 | 10,640 | 1,915 | 9,880 | 1,581 | 9,880 | 1,383 |
| | | 20 | 0.4 | 0.06 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 20 | 0.9 | 0.07 | 12,160 | 2,189 | 8,512 | 1,532 | 7,904 | 1,265 | 7,904 | 1,107 |
| | | 25 | 0.9 | 0.07 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.4 | 0.04 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 30 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 35 | 0.9 | 0.045 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.4 | 0.03 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |
| | | 40 | 0.9 | 0.035 | 9,880 | 1,581 | 6,916 | 968 | 6,442 | 899 | 6,422 | 771 |

## ESTNB30 SERIES

| Workpiece | | | | | Carbon Steels, Alloy Steels (180~250HB) | | Prehardened Steels (HRc35~45) | | Herdened Steels (HRc45~55) | | Herdened Steels (HRc55~65) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio to standard depth of cut | | | | | Depth of Cut X 100% | | Depth of Cut X 80% | | Depth of Cut X 65% | | Depth of Cut X 60% | |
| Mill Dia (mm) | Diameter (mm) | Neck Length (mm) | Neck Angle (˚) | Depth of Cut (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 1 | 2 | 50 | 0.9 | 0.17 | 8,512 | 1,192 | 5,958 | 775 | 5,533 | 664 | 5,533 | 553 |
| | | 60 | 0.9 | 0.009 | 7,235 | 1,013 | 5,065 | 658 | 4,703 | 564 | 4,703 | 470 |
| | | 70 | 0.9 | 0.005 | 6,150 | 861 | 4,305 | 560 | 3,997 | 480 | 3,997 | 400 |
| 1.5 | 3 | 8 | 0.4 | 0.32 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 16 | 0.4 | 0.22 | 12,720 | 3,816 | 8,904 | 2,404 | 8,268 | 1,984 | 8,268 | 1,736 |
| | | 20 | 0.4 | 0.15 | 12,720 | 3,434 | 8,904 | 2,137 | 8,268 | 1,736 | 8,268 | 1,488 |
| | | 30 | 0.4 | 0.08 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 30 | 0.9 | 0.09 | 10,176 | 2,748 | 7,123 | 1,496 | 6,614 | 1,389 | 6,614 | 1,191 |
| | | 40 | 0.4 | 0.06 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 40 | 0.9 | 0.07 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 50 | 0.9 | 0.05 | 8,268 | 1,984 | 5,788 | 1,215 | 5,374 | 1,129 | 5,374 | 967 |
| | | 60 | 0.9 | 0.03 | 7,123 | 1,710 | 4,986 | 1,047 | 4,630 | 972 | 4,630 | 833 |
| | | 70 | 0.9 | 0.02 | 6,233 | 1,496 | 4,363 | 916 | 4,051 | 851 | 4,051 | 729 |
| 2 | 4 | 20 | 1 | 0.32 | 11,900 | 2,860 | 9,000 | 2,050 | 7,800 | 1,680 | 7,800 | 1,590 |
| | | 30 | 1 | 0.23 | 11,900 | 2,570 | 9,000 | 1,850 | 7,800 | 1,520 | 7,800 | 1,430 |
| | | 40 | 1 | 0.14 | 9,500 | 1,940 | 7,200 | 1,400 | 6,200 | 1,140 | 6,200 | 1,080 |
| | | 50 | 1 | 0.11 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| | | 60 | 1 | 0.07 | 7,800 | 1,590 | 5,800 | 1,120 | 5,000 | 920 | 5,000 | 870 |
| 2.5 | 5 | 30 | 1 | 0.34 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 40 | 1 | 0.25 | 9,500 | 2,140 | 7,200 | 1,540 | 6,200 | 1,260 | 6,200 | 1,190 |
| | | 60 | 1 | 0.15 | 6,200 | 1,320 | 4,700 | 950 | 4,000 | 770 | 4,000 | 720 |
| 3 | 6 | 30 | 1 | 0.45 | 8,000 | 2,000 | 6,000 | 1,430 | 5,200 | 1,170 | 5,200 | 1,110 |
| | | 40 | 1 | 0.4 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 50 | 1 | 0.32 | 8,000 | 1,800 | 6,000 | 1,280 | 5,200 | 1,050 | 5,200 | 990 |
| | | 60 | 1 | 0.22 | 6,400 | 1,360 | 4,800 | 970 | 4,100 | 780 | 4,100 | 740 |
| | | 70 | 1 | 0.18 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| | | 80 | 1 | 0.14 | 5,200 | 1,110 | 3,900 | 790 | 3,400 | 650 | 3,400 | 610 |
| 4 | 8 | 50 | 1 | 0.5 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 60 | 1 | 0.43 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 70 | 1 | 0.33 | 6,000 | 1,460 | 4,500 | 1,040 | 3,900 | 850 | 3,900 | 810 |
| | | 80 | 1 | 0.25 | 4,800 | 1,100 | 3,600 | 780 | 3,100 | 640 | 3,100 | 600 |
| 5 | 10 | 60 | 1 | 0.7 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |
| | | 75 | 1 | 0.5 | 4,800 | 1,300 | 3,600 | 920 | 3,100 | 750 | 3,100 | 710 |

RPM = rev / min
FEED = mm / min




ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

· Please try to use 20-30% slow down than recommendation when chips are not evacuated well -Rib machining, slotting, etc.
ex)ESTNB3040-20-10, HRc 55, Rib machining
ap : 0.32(ap from chart) X 0.65(constant value) X 0.8 = 0.17mm
· The above recommendation table may differ from the actual situation, adjust it according to the machine condition, processing type and purpose.
· In the case of low RPM, reduce the feed rate at the same rate.

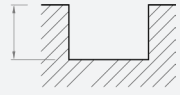
# Recommended Cutting Condition

## UE502, UXE502 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Stainless Steels (SUS) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | - | | HRc45 ~ HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | - | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) | n (min-1) | Vf (mm/min) |
| 2 | 11,560 | 190 | 7,560 | 120 | 6,300 | 90 | 5,040 | 35 |
| 3 | 8,920 | 210 | 5,560 | 140 | 4,620 | 120 | 3,360 | 40 |
| 4 | 7,560 | 300 | 4,620 | 180 | 3,880 | 150 | 2,940 | 40 |
| 5 | 6,300 | 320 | 3,780 | 190 | 3,160 | 160 | 2,320 | 50 |
| 6 | 5,560 | 350 | 3,360 | 220 | 2,840 | 180 | 2,000 | 55 |
| 8 | 4,200 | 380 | 2,520 | 200 | 2,100 | 180 | 1,680 | 75 |
| 10 | 3,260 | 330 | 2,000 | 160 | 1,680 | 160 | 1,360 | 60 |
| 12 | 2,740 | 280 | 1,680 | 130 | 1,360 | 130 | 1,160 | 55 |
| 16 | 2,200 | 220 | 1,360 | 110 | 1,060 | 110 | 900 | 40 |
| 20 | 1,680 | 170 | 1,060 | 80 | 840 | 80 | 680 | 30 |
| 25 | 1,360 | 130 | 840 | 70 | 680 | 60 | 540 | 20 |

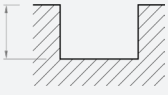
RPM = rev / min
FEED = mm / min

ap : 0.5D



(ap : UP TO Ø 3.0 : 0.2D)

ap : 0.05D



## UE512 SERIES

| Workpiece | | Alloy Steels, Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 0.1 | 0.3 | 50000 | 315 | 0.009 | 46200 | 230 | 0.007 | 40600 | 170 | 0.005 |
| | 0.5 | 50000 | 315 | 0.006 | 46200 | 230 | 0.005 | 40600 | 170 | 0.004 |
| | 1 | 45000 | 255 | 0.002 | 41580 | 185 | 0.002 | 36540 | 140 | 0.001 |
| 0.2 | 0.5 | 38500 | 380 | 0.018 | 36300 | 270 | 0.014 | 32100 | 200 | 0.01 |
| | 1 | 38500 | 380 | 0.013 | 36300 | 270 | 0.010 | 32100 | 200 | 0.007 |
| | 1.5 | 34650 | 310 | 0.007 | 32670 | 220 | 0.006 | 28890 | 160 | 0.004 |
| | 2 | 34650 | 310 | 0.005 | 32670 | 220 | 0.004 | 28890 | 160 | 0.003 |
| 0.3 | 1 | 34200 | 390 | 0.019 | 32300 | 270 | 0.015 | 28500 | 230 | 0.011 |
| | 1.5 | 34200 | 390 | 0.019 | 32300 | 270 | 0.015 | 25800 | 230 | 0.011 |
| | 2 | 30780 | 315 | 0.011 | 29070 | 220 | 0.008 | 25650 | 185 | 0.006 |
| | 2.5 | 30780 | 315 | 0.007 | 29070 | 220 | 0.005 | 25650 | 185 | 0.004 |
| | 3 | 30780 | 315 | 0.007 | 29070 | 220 | 0.005 | 25650 | 185 | 0.004 |
| | 4 | 27360 | 250 | 0.004 | 25840 | 175 | 0.003 | 22800 | 145 | 0.002 |
| | 5 | 20520 | 165 | 0.003 | 19380 | 115 | 0.002 | 17100 | 95 | 0.002 |
| 0.4 | 1 | 27400 | 540 | 0.036 | 25800 | 380 | 0.028 | 22800 | 280 | 0.02 |
| | 1.5 | 27400 | 540 | 0.025 | 25800 | 380 | 0.020 | 22800 | 280 | 0.014 |
| | 2 | 27400 | 540 | 0.025 | 25800 | 380 | 0.020 | 22800 | 280 | 0.014 |
| | 2.5 | 24660 | 435 | 0.014 | 23220 | 310 | 0.011 | 20520 | 225 | 0.008 |
| | 3 | 24660 | 435 | 0.014 | 23220 | 310 | 0.011 | 20520 | 225 | 0.008 |
| | 4 | 24660 | 435 | 0.009 | 23220 | 310 | 0.007 | 20520 | 225 | 0.005 |
| | 5 | 21920 | 345 | 0.009 | 20640 | 245 | 0.007 | 18240 | 180 | 0.005 |
| | 6 | 21920 | 345 | 0.005 | 20640 | 245 | 0.004 | 18240 | 180 | 0.003 |
| | 8 | 16440 | 225 | 0.004 | 15480 | 160 | 0.003 | 13680 | 120 | 0.002 |
| | 10 | 8220 | 95 | 0.004 | 7740 | 70 | 0.003 | 6840 | 50 | 0.002 |
| 0.5 | 1 | 27400 | 540 | 0.045 | 25800 | 425 | 0.035 | 22800 | 285 | 0.025 |
| | 1.5 | 27400 | 540 | 0.045 | 25800 | 425 | 0.035 | 22800 | 285 | 0.025 |
| | 2 | 27400 | 540 | 0.032 | 25800 | 425 | 0.025 | 22800 | 285 | 0.018 |
| | 2.5 | 27400 | 540 | 0.032 | 25800 | 425 | 0.025 | 22800 | 285 | 0.018 |
| | 3 | 24660 | 435 | 0.018 | 23220 | 345 | 0.014 | 20520 | 230 | 0.01 |
| | 4 | 24660 | 435 | 0.018 | 23220 | 345 | 0.014 | 20520 | 230 | 0.01 |
| | 5 | 24660 | 435 | 0.011 | 23220 | 345 | 0.009 | 20520 | 230 | 0.006 |
| | 6 | 21920 | 345 | 0.011 | 20640 | 270 | 0.009 | 18240 | 180 | 0.006 |
| | 8 | 16440 | 225 | 0.007 | 15480 | 180 | 0.005 | 13680 | 120 | 0.004 |
| | 10 | 16440 | 225 | 0.005 | 15480 | 180 | 0.004 | 13680 | 120 | 0.003 |
| | 12 | 8220 | 95 | 0.005 | 7740 | 75 | 0.004 | 6840 | 50 | 0.003 |
| | 14 | 8220 | 95 | 0.005 | 7740 | 75 | 0.004 | 6840 | 50 | 0.003 |
| | 16 | 2740 | 25 | 0.005 | 2580 | 20 | 0.004 | 2280 | 15 | 0.003 |
| 0.6 | 2 | 27400 | 775 | 0.038 | 25800 | 545 | 0.029 | 22800 | 405 | 0.021 |
| | 3 | 27400 | 775 | 0.038 | 25800 | 545 | 0.029 | 22800 | 405 | 0.021 |
| | 4 | 24660 | 630 | 0.022 | 23220 | 440 | 0.017 | 20520 | 330 | 0.012 |
| | 5 | 24660 | 630 | 0.014 | 23220 | 440 | 0.011 | 20520 | 330 | 0.008 |
| | 6 | 24660 | 630 | 0.014 | 23220 | 440 | 0.011 | 20520 | 330 | 0.008 |

# Recommended Cutting Condition

## UE512 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 0.6 | 8 | 21920 | 495 | 0.008 | 20640 | 350 | 0.006 | 18240 | 260 | 0.005 |
| | 10 | 16440 | 325 | 0.005 | 15480 | 230 | 0.004 | 13680 | 170 | 0.003 |
| | 12 | 16440 | 325 | 0.005 | 15480 | 230 | 0.004 | 13680 | 170 | 0.003 |
| | 14 | 8220 | 140 | 0.005 | 7740 | 100 | 0.004 | 6840 | 75 | 0.003 |
| | 16 | 8220 | 140 | 0.005 | 7740 | 100 | 0.004 | 6840 | 75 | 0.003 |
| 0.7 | 2 | 27400 | 775 | 0.063 | 25800 | 545 | 0.049 | 22800 | 405 | 0.035 |
| | 4 | 24660 | 630 | 0.025 | 23220 | 440 | 0.020 | 20520 | 330 | 0.014 |
| | 6 | 24660 | 630 | 0.016 | 23220 | 440 | 0.012 | 20520 | 330 | 0.009 |
| | 8 | 21920 | 495 | 0.016 | 20640 | 350 | 0.012 | 18240 | 260 | 0.009 |
| | 10 | 21920 | 495 | 0.009 | 20640 | 350 | 0.007 | 18240 | 260 | 0.005 |
| | 12 | 16440 | 325 | 0.009 | 15480 | 230 | 0.005 | 13680 | 170 | 0.004 |
| 0.8 | 2 | 27400 | 775 | 0.072 | 25800 | 605 | 0.056 | 22800 | 450 | 0.040 |
| | 3 | 27400 | 775 | 0.050 | 25800 | 605 | 0.039 | 22800 | 450 | 0.028 |
| | 4 | 27400 | 775 | 0.050 | 25800 | 605 | 0.039 | 22800 | 450 | 0.028 |
| | 5 | 24660 | 630 | 0.029 | 23220 | 490 | 0.022 | 20520 | 365 | 0.016 |
| | 6 | 24660 | 630 | 0.029 | 23220 | 490 | 0.022 | 20520 | 365 | 0.016 |
| | 8 | 24660 | 630 | 0.018 | 23220 | 490 | 0.014 | 20520 | 365 | 0.010 |
| | 10 | 21920 | 495 | 0.018 | 20640 | 385 | 0.014 | 18240 | 290 | 0.01 |
| | 12 | 21920 | 495 | 0.011 | 20640 | 385 | 0.008 | 18240 | 290 | 0.006 |
| | 14 | 16440 | 325 | 0.007 | 15480 | 255 | 0.006 | 13680 | 190 | 0.004 |
| | 16 | 16440 | 325 | 0.007 | 15480 | 255 | 0.006 | 13680 | 190 | 0.004 |
| | 20 | 8220 | 140 | 0.007 | 7740 | 110 | 0.006 | 6840 | 80 | 0.004 |
| 0.9 | 6 | 22140 | 575 | 0.032 | 20970 | 440 | 0.025 | 18450 | 330 | 0.018 |
| | 8 | 22140 | 575 | 0.020 | 20970 | 440 | 0.016 | 18450 | 330 | 0.011 |
| | 10 | 19680 | 455 | 0.020 | 18640 | 350 | 0.016 | 16400 | 260 | 0.011 |
| 1.0 | 2 | 24600 | 1045 | 0.090 | 23300 | 890 | 0.070 | 20500 | 665 | 0.050 |
| | 3 | 24600 | 1045 | 0.090 | 23300 | 890 | 0.070 | 20500 | 665 | 0.050 |
| | 4 | 24600 | 1045 | 0.063 | 23300 | 890 | 0.049 | 20500 | 665 | 0.035 |
| | 5 | 24600 | 1045 | 0.063 | 23300 | 890 | 0.049 | 20500 | 665 | 0.035 |
| | 6 | 22140 | 845 | 0.036 | 20970 | 720 | 0.028 | 18450 | 540 | 0.020 |
| | 7 | 22140 | 845 | 0.036 | 20970 | 720 | 0.028 | 18450 | 540 | 0.020 |
| | 8 | 22140 | 845 | 0.036 | 20970 | 720 | 0.028 | 18450 | 540 | 0.020 |
| | 10 | 22140 | 845 | 0.023 | 20970 | 720 | 0.018 | 18450 | 540 | 0.013 |
| | 12 | 19680 | 670 | 0.023 | 18640 | 570 | 0.018 | 16400 | 425 | 0.013 |
| | 14 | 19680 | 670 | 0.014 | 18640 | 570 | 0.011 | 16400 | 425 | 0.008 |
| | 16 | 14760 | 440 | 0.014 | 13980 | 375 | 0.011 | 12300 | 280 | 0.008 |
| | 18 | 14760 | 440 | 0.009 | 13980 | 375 | 0.007 | 12300 | 280 | 0.005 |
| | 20 | 14760 | 440 | 0.009 | 13980 | 375 | 0.007 | 12300 | 280 | 0.005 |
| | 22 | 7380 | 190 | 0.009 | 6990 | 160 | 0.007 | 6150 | 120 | 0.005 |
| | 26 | 7380 | 190 | 0.009 | 6990 | 160 | 0.007 | 6150 | 120 | 0.005 |
| | 30 | 7380 | 190 | 0.009 | 6990 | 160 | 0.007 | 6150 | 120 | 0.005 |
| | 40 | 2460 | 50 | 0.009 | 2330 | 45 | 0.007 | 2050 | 35 | 0.005 |

## UE512 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 1.0 | 50 | 2460 | 50 | 0.006 | 2330 | 45 | 0.005 | 2050 | 35 | 0.003 |
| 1.2 | 4 | 21900 | 930 | 0.076 | 20700 | 720 | 0.059 | 18200 | 485 | 0.042 |
| | 6 | 21900 | 930 | 0.076 | 20700 | 720 | 0.059 | 18200 | 485 | 0.042 |
| | 8 | 19710 | 755 | 0.043 | 18630 | 585 | 0.034 | 16380 | 395 | 0.024 |
| | 10 | 19710 | 755 | 0.027 | 18630 | 585 | 0.021 | 16380 | 395 | 0.015 |
| | 12 | 19710 | 755 | 0.027 | 18630 | 585 | 0.021 | 16380 | 395 | 0.015 |
| | 14 | 17520 | 595 | 0.027 | 16560 | 460 | 0.021 | 14560 | 310 | 0.015 |
| | 16 | 17520 | 595 | 0.016 | 16560 | 460 | 0.013 | 14560 | 310 | 0.009 |
| | 20 | 13140 | 390 | 0.011 | 12420 | 300 | 0.008 | 10920 | 205 | 0.006 |
| | 26 | 6570 | 165 | 0.011 | 6210 | 130 | 0.008 | 5460 | 85 | 0.006 |
| | 30 | 6570 | 165 | 0.011 | 6210 | 130 | 0.008 | 5460 | 85 | 0.006 |
| 1.4 | 6 | 19200 | 815 | 0.088 | 18100 | 570 | 0.069 | 16000 | 425 | 0.049 |
| | 8 | 17280 | 660 | 0.050 | 16290 | 460 | 0.039 | 14400 | 345 | 0.028 |
| | 10 | 17280 | 660 | 0.050 | 16290 | 460 | 0.039 | 14400 | 345 | 0.028 |
| | 14 | 17280 | 660 | 0.032 | 16290 | 460 | 0.025 | 14400 | 345 | 0.018 |
| | 16 | 15360 | 520 | 0.032 | 14480 | 365 | 0.025 | 12800 | 270 | 0.018 |
| | 20 | 15360 | 520 | 0.019 | 14480 | 365 | 0.015 | 12800 | 270 | 0.011 |
| 1.5 | 4 | 19200 | 905 | 0.135 | 18100 | 635 | 0.105 | 16000 | 475 | 0.075 |
| | 5 | 19200 | 905 | 0.095 | 18100 | 635 | 0.074 | 16000 | 475 | 0.053 |
| | 6 | 19200 | 905 | 0.095 | 18100 | 635 | 0.074 | 16000 | 475 | 0.053 |
| | 7 | 19200 | 905 | 0.095 | 18100 | 635 | 0.074 | 16000 | 475 | 0.053 |
| | 8 | 17280 | 735 | 0.054 | 16290 | 515 | 0.042 | 14400 | 385 | 0.030 |
| | 10 | 17280 | 735 | 0.054 | 16290 | 515 | 0.042 | 14400 | 385 | 0.03 |
| | 12 | 17280 | 735 | 0.054 | 16290 | 515 | 0.042 | 14400 | 385 | 0.030 |
| | 14 | 17280 | 735 | 0.034 | 16290 | 515 | 0.026 | 14400 | 385 | 0.019 |
| | 16 | 15360 | 580 | 0.034 | 14480 | 405 | 0.026 | 12800 | 305 | 0.019 |
| | 18 | 15360 | 580 | 0.034 | 14480 | 405 | 0.026 | 12800 | 305 | 0.019 |
| | 20 | 15360 | 580 | 0.020 | 14480 | 405 | 0.016 | 12800 | 305 | 0.011 |
| | 22 | 15360 | 580 | 0.020 | 14480 | 405 | 0.016 | 12800 | 305 | 0.011 |
| | 26 | 11520 | 380 | 0.014 | 10860 | 265 | 0.011 | 9600 | 200 | 0.008 |
| | 30 | 11520 | 380 | 0.014 | 10860 | 265 | 0.011 | 9600 | 200 | 0.008 |
| 1.6 | 8 | 17800 | 840 | 0.101 | 16800 | 655 | 0.078 | 14800 | 490 | 0.056 |
| | 10 | 16020 | 680 | 0.058 | 15120 | 530 | 0.045 | 13320 | 395 | 0.032 |
| | 12 | 16020 | 680 | 0.058 | 15120 | 530 | 0.045 | 13320 | 395 | 0.032 |
| | 16 | 16020 | 680 | 0.036 | 15120 | 530 | 0.028 | 13320 | 395 | 0.020 |
| | 20 | 14240 | 540 | 0.036 | 13440 | 420 | 0.028 | 11840 | 315 | 0.020 |
| 1.8 | 8 | 17800 | 840 | 0.113 | 16800 | 655 | 0.088 | 14800 | 490 | 0.063 |
| | 10 | 16020 | 680 | 0.065 | 15120 | 530 | 0.050 | 13320 | 395 | 0.036 |
| | 12 | 16020 | 680 | 0.065 | 15120 | 530 | 0.050 | 13320 | 395 | 0.036 |
| | 16 | 16020 | 680 | 0.041 | 15120 | 530 | 0.032 | 13320 | 395 | 0.023 |
| | 20 | 14240 | 540 | 0.041 | 13440 | 420 | 0.032 | 11840 | 315 | 0.023 |
| 2.0 | 6 | 14400 | 820 | 0.180 | 13600 | 620 | 0.140 | 12000 | 475 | 0.100 |

# Recommended Cutting Condition

## UE512 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~HRc35 | | | HRc35~HRc45 | | | HRc45~HRc55 | | |
| Strength | | ~1100N/mm2 | | | 1100~1500N/mm2 | | | 1500~2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 2.0 | 8 | 14400 | 820 | 0.126 | 13600 | 620 | 0.098 | 12000 | 475 | 0.070 |
| | 10 | 14400 | 820 | 0.126 | 13600 | 620 | 0.098 | 12000 | 475 | 0.070 |
| | 12 | 12960 | 665 | 0.072 | 12240 | 500 | 0.056 | 10800 | 385 | 0.040 |
| | 14 | 12960 | 665 | 0.072 | 12240 | 500 | 0.056 | 10800 | 385 | 0.040 |
| | 16 | 12960 | 665 | 0.072 | 12240 | 500 | 0.056 | 10800 | 385 | 0.040 |
| | 18 | 12960 | 665 | 0.045 | 12240 | 500 | 0.035 | 10800 | 385 | 0.025 |
| | 20 | 12960 | 665 | 0.045 | 12240 | 500 | 0.035 | 10800 | 385 | 0.025 |
| | 22 | 11520 | 525 | 0.045 | 10880 | 395 | 0.035 | 9600 | 305 | 0.025 |
| | 26 | 11520 | 525 | 0.045 | 10880 | 395 | 0.035 | 9600 | 305 | 0.025 |
| | 30 | 11520 | 525 | 0.027 | 10880 | 395 | 0.021 | 9600 | 305 | 0.015 |
| | 35 | 8640 | 345 | 0.018 | 8160 | 260 | 0.014 | 7200 | 200 | 0.010 |
| | 40 | 8640 | 345 | 0.018 | 8160 | 260 | 0.014 | 7200 | 200 | 0.010 |
| | 45 | 4320 | 150 | 0.018 | 4080 | 110 | 0.014 | 3600 | 85 | 0.010 |
| | 50 | 4320 | 150 | 0.018 | 4080 | 110 | 0.014 | 3600 | 85 | 0.010 |
| | 60 | 4320 | 150 | 0.018 | 4080 | 110 | 0.014 | 3600 | 85 | 0.010 |
| 2.5 | 8 | 12300 | 970 | 0.158 | 11600 | 680 | 0.123 | 10300 | 510 | 0.088 |
| | 10 | 12300 | 970 | 0.158 | 11600 | 680 | 0.123 | 10300 | 510 | 0.088 |
| | 12 | 12300 | 970 | 0.158 | 11600 | 680 | 0.123 | 10300 | 510 | 0.088 |
| | 14 | 11070 | 785 | 0.090 | 10440 | 550 | 0.070 | 9270 | 415 | 0.050 |
| | 16 | 11070 | 785 | 0.090 | 10440 | 550 | 0.070 | 9270 | 415 | 0.050 |
| | 18 | 11070 | 785 | 0.090 | 10440 | 550 | 0.070 | 9270 | 415 | 0.050 |
| | 20 | 11070 | 785 | 0.090 | 10440 | 550 | 0.070 | 9270 | 415 | 0.050 |
| | 22 | 11070 | 785 | 0.056 | 10440 | 550 | 0.044 | 9270 | 415 | 0.031 |
| | 26 | 9840 | 620 | 0.056 | 9280 | 435 | 0.044 | 8240 | 325 | 0.031 |
| | 30 | 9840 | 620 | 0.056 | 9280 | 435 | 0.044 | 8240 | 325 | 0.031 |
| | 35 | 9840 | 620 | 0.034 | 9280 | 435 | 0.026 | 8240 | 325 | 0.019 |
| | 40 | 7380 | 405 | 0.034 | 6960 | 285 | 0.026 | 6180 | 215 | 0.019 |
| | 45 | 7380 | 405 | 0.023 | 6960 | 285 | 0.018 | 6180 | 215 | 0.013 |
| | 50 | 7380 | 405 | 0.023 | 6960 | 285 | 0.018 | 6180 | 215 | 0.013 |
| 3.0 | 6 | 10900 | 860 | 0.270 | 10300 | 605 | 0.210 | 6600 | 450 | 0.150 |
| | 8 | 10900 | 860 | 0.270 | 10300 | 605 | 0.210 | 6600 | 450 | 0.150 |
| | 10 | 10900 | 860 | 0.189 | 10300 | 605 | 0.147 | 6600 | 450 | 0.105 |
| | 12 | 10900 | 860 | 0.189 | 10300 | 605 | 0.147 | 6600 | 450 | 0.105 |
| | 14 | 10900 | 860 | 0.189 | 10300 | 605 | 0.147 | 6600 | 450 | 0.105 |
| | 16 | 9810 | 695 | 0.108 | 9270 | 490 | 0.084 | 5940 | 365 | 0.060 |
| | 18 | 9810 | 695 | 0.108 | 9270 | 490 | 0.084 | 5940 | 365 | 0.060 |
| | 20 | 9810 | 695 | 0.108 | 9270 | 490 | 0.084 | 5940 | 365 | 0.060 |
| | 22 | 9810 | 695 | 0.108 | 9270 | 490 | 0.084 | 5940 | 365 | 0.060 |
| | 26 | 9810 | 695 | 0.068 | 9270 | 490 | 0.053 | 5940 | 365 | 0.038 |
| | 30 | 9810 | 695 | 0.068 | 9270 | 490 | 0.053 | 5940 | 365 | 0.038 |
| | 35 | 8720 | 550 | 0.068 | 8240 | 385 | 0.053 | 5280 | 290 | 0.038 |
| | 40 | 8720 | 550 | 0.041 | 8240 | 385 | 0.032 | 5280 | 290 | 0.023 |

## UE512 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 3.0 | 45 | 8720 | 550 | 0.041 | 8240 | 385 | 0.032 | 5280 | 290 | 0.023 |
| | 50 | 6540 | 360 | 0.027 | 6180 | 255 | 0.021 | 3960 | 190 | 0.015 |
| | 60 | 6540 | 360 | 0.027 | 6180 | 255 | 0.021 | 3960 | 190 | 0.015 |
| 4.0 | 8 | 8000 | 1300 | 0.360 | 7600 | 1160 | 0.280 | 6700 | 770 | 0.200 |
| | 10 | 8000 | 1300 | 0.360 | 7600 | 1160 | 0.280 | 6700 | 770 | 0.200 |
| | 12 | 8000 | 1300 | 0.360 | 7600 | 1160 | 0.280 | 6700 | 770 | 0.200 |
| | 14 | 8000 | 1300 | 0.252 | 7600 | 1160 | 0.196 | 6700 | 770 | 0.140 |
| | 16 | 8000 | 1300 | 0.252 | 7600 | 1160 | 0.196 | 6700 | 770 | 0.140 |
| | 18 | 8000 | 1300 | 0.252 | 7600 | 1160 | 0.196 | 6700 | 770 | 0.140 |
| | 20 | 8000 | 1300 | 0.252 | 7600 | 1160 | 0.196 | 6700 | 770 | 0.140 |
| | 22 | 7200 | 1055 | 0.144 | 6840 | 940 | 0.112 | 6030 | 625 | 0.080 |
| | 26 | 7200 | 1055 | 0.144 | 6840 | 940 | 0.112 | 6030 | 625 | 0.080 |
| | 30 | 7200 | 1055 | 0.144 | 6840 | 940 | 0.112 | 6030 | 625 | 0.080 |
| | 35 | 7200 | 1055 | 0.090 | 6840 | 940 | 0.070 | 6030 | 625 | 0.050 |
| | 40 | 7200 | 1055 | 0.090 | 6840 | 940 | 0.070 | 6030 | 625 | 0.050 |
| | 45 | 6400 | 830 | 0.090 | 6080 | 740 | 0.070 | 5360 | 495 | 0.050 |
| | 50 | 6400 | 830 | 0.090 | 6080 | 740 | 0.070 | 5360 | 495 | 0.050 |
| | 60 | 6400 | 830 | 0.054 | 6080 | 740 | 0.042 | 5360 | 495 | 0.030 |
| 5.0 | 16 | 6400 | 1155 | 0.315 | 6100 | 900 | 0.245 | 5400 | 605 | 0.175 |
| | 20 | 6400 | 1155 | 0.315 | 6100 | 900 | 0.245 | 5400 | 605 | 0.175 |
| | 26 | 5760 | 935 | 0.180 | 5490 | 730 | 0.140 | 4860 | 490 | 0.100 |
| | 30 | 5760 | 935 | 0.180 | 5490 | 730 | 0.140 | 4860 | 490 | 0.100 |
| | 35 | 5760 | 935 | 0.180 | 5490 | 730 | 0.140 | 4860 | 490 | 0.100 |
| | 40 | 5760 | 935 | 0.180 | 5490 | 730 | 0.140 | 4860 | 490 | 0.100 |
| | 50 | 5760 | 935 | 0.113 | 5490 | 730 | 0.088 | 4860 | 490 | 0.063 |
| | 60 | 5120 | 740 | 0.113 | 4880 | 575 | 0.088 | 4320 | 385 | 0.063 |
| 6.0 | 15 | 5300 | 1055 | 0.540 | 5000 | 820 | 0.420 | 4400 | 550 | 0.300 |
| | 20 | 5300 | 1055 | 0.378 | 5000 | 820 | 0.294 | 4400 | 550 | 0.210 |
| | 30 | 5300 | 1055 | 0.378 | 5000 | 820 | 0.294 | 4400 | 550 | 0.210 |
| | 32 | 4770 | 855 | 0.216 | 4500 | 665 | 0.168 | 3960 | 445 | 0.120 |
| 8.0 | 25 | 4000 | 950 | 0.504 | 3800 | 750 | 0.392 | 3300 | 500 | 0.280 |
| | 30 | 4000 | 950 | 0.504 | 3800 | 750 | 0.392 | 3300 | 500 | 0.280 |
| | 42 | 3600 | 770 | 0.288 | 3400 | 605 | 0.224 | 2950 | 405 | 0.160 |
| 10 | 30 | 3200 | 900 | 0.900 | 3050 | 680 | 0.700 | 2630 | 400 | 0.500 |
| | 35 | 3200 | 900 | 0.630 | 3050 | 680 | 0.490 | 2630 | 400 | 0.350 |
| | 45 | 3200 | 900 | 0.630 | 3050 | 680 | 0.490 | 2630 | 400 | 0.350 |
| 12 | 35 | 2650 | 800 | 1.080 | 2520 | 600 | 0.840 | 2180 | 350 | 0.600 |
| | 40 | 2650 | 800 | 0.756 | 2520 | 600 | 0.588 | 2180 | 350 | 0.420 |
| | 50 | 2650 | 800 | 0.756 | 2520 | 600 | 0.588 | 2180 | 350 | 0.420 |

# Recommended Cutting Condition

## UE512 SERIES

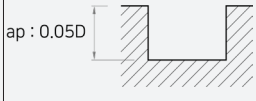
RPM = rev / min
FEED = mm / min

## UE522 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 6,300 | 60 | 5,040 | 50 | 3,150 | 25 |
| 3 | 4,410 | 70 | 3,570 | 60 | 2,200 | 30 |
| 4 | 3,570 | 85 | 2,840 | 70 | 1,790 | 35 |
| 5 | 3,050 | 105 | 2,420 | 85 | 1,580 | 40 |
| 6 | 2,630 | 125 | 2,100 | 105 | 1,370 | 50 |
| 8 | 2,000 | 135 | 1,580 | 105 | 1,050 | 50 |
| 10 | 1,680 | 135 | 1,370 | 105 | 840 | 50 |
| 12 | 1,370 | 105 | 1,160 | 95 | 700 | 40 |
| 16 | 1,160 | 95 | 890 | 75 | 560 | 35 |
| 20 | 840 | 70 | 680 | 50 | 420 | 25 |

RPM = rev / min
FEED = mm / min

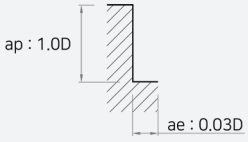
(ap : UP TO Ø 3.0 : 0.4mm)



## UE504H SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 45,000 | 750 | 37,000 | 560 | 23,000 | 300 |
| 2 | 23,500 | 800 | 18,000 | 540 | 12,000 | 360 |
| 3 | 15,750 | 810 | 12,600 | 580 | 8,280 | 380 |
| 4 | 12,150 | 830 | 9,540 | 600 | 6,345 | 400 |
| 6 | 9,450 | 900 | 7,470 | 640 | 4,950 | 440 |
| 8 | 7,110 | 860 | 5,625 | 620 | 3,780 | 410 |
| 10 | 5,580 | 800 | 4,410 | 570 | 2,925 | 380 |
| 12 | 4,770 | 800 | 3,780 | 570 | 2,520 | 380 |
| 16 | 3,600 | 810 | 2,900 | 570 | 2,000 | 400 |
| 20 | 3,000 | 810 | 2,300 | 570 | 1,600 | 400 |

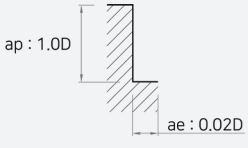
RPM = rev / min
FEED = mm / min




## UE514 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Stainless Steels (SUS) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | - | | HRc45 ~ HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | - | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1.0 | 22,000 | 310 | 13,500 | 180 | 10,750 | 140 | 8,500 | 50 |
| 1.5 | 17,000 | 320 | 10,700 | 190 | 8,500 | 150 | 6,500 | 50 |
| 2.0 | 13,900 | 330 | 9,070 | 200 | 7,560 | 165 | 6,000 | 60 |
| 2.5 | 12,000 | 350 | 7,600 | 220 | 6,000 | 180 | 4,500 | 60 |
| 3.0 | 10,700 | 380 | 6,670 | 240 | 5,110 | 200 | 4,030 | 70 |
| 4.0 | 9,070 | 680 | 5,540 | 420 | 4,650 | 330 | 3,530 | 70 |
| 5.0 | 7,560 | 720 | 4,530 | 430 | 3,800 | 360 | 2,780 | 85 |
| 6.0 | 6,670 | 790 | 4,030 | 490 | 3,400 | 390 | 2,400 | 95 |
| 8.0 | 5,040 | 850 | 3,020 | 450 | 2,520 | 420 | 2,010 | 130 |
| 10 | 3,910 | 730 | 2,400 | 360 | 2,010 | 360 | 1,630 | 105 |
| 12 | 3,300 | 620 | 2,010 | 300 | 1,630 | 280 | 1,400 | 95 |

RPM = rev / min
FEED = mm / min

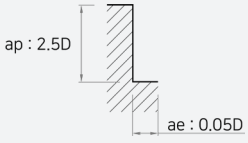


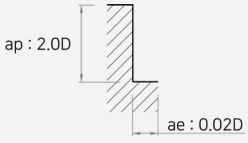
# Recommended Cutting Condition

## UE524 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 6,300 | 100 | 5,040 | 80 | 3,150 | 45 |
| 3 | 4,410 | 115 | 3,570 | 100 | 2,200 | 55 |
| 4 | 3,570 | 140 | 2,840 | 115 | 1,790 | 60 |
| 5 | 3,050 | 180 | 2,420 | 140 | 1,580 | 70 |
| 6 | 2,630 | 215 | 2,100 | 180 | 1,370 | 90 |
| 8 | 2,000 | 230 | 1,580 | 180 | 1,050 | 90 |
| 10 | 1,680 | 230 | 1,370 | 180 | 840 | 90 |
| 12 | 1,370 | 180 | 1,160 | 160 | 700 | 70 |
| 16 | 1,160 | 160 | 890 | 125 | 560 | 60 |
| 20 | 840 | 115 | 680 | 90 | 420 | 45 |

RPM = rev / min
FEED = mm / min

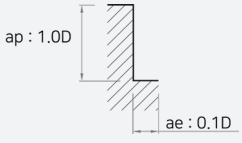


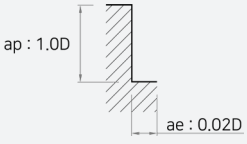




## ULE504 SERIES ▶ General Cutting

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Herdened Steels | | | | Stainless Steels | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | - | |
| Strength | ~1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 12,100 | 320 | 7,900 | 195 | 2,700 | 47 | 6,600 | 160 |
| 3 | 9,400 | 370 | 5,840 | 230 | 2,000 | 58 | 4,850 | 195 |
| 4 | 7,900 | 655 | 4,850 | 405 | 1,500 | 58 | 4,070 | 320 |
| 5 | 6,600 | 690 | 3,970 | 415 | 1,300 | 58 | 3,320 | 345 |
| 6 | 5,830 | 760 | 3,530 | 470 | 1,150 | 58 | 2,980 | 380 |
| 8 | 4,410 | 815 | 2,650 | 435 | 880 | 58 | 2,200 | 405 |
| 10 | 3,420 | 700 | 2,100 | 345 | 720 | 46 | 1,760 | 345 |
| 12 | 2,880 | 600 | 1,760 | 290 | 590 | 46 | 1,430 | 275 |
| 16 | 2,310 | 470 | 1,430 | 230 | 460 | 29 | 1,150 | 230 |
| 20 | 1,760 | 370 | 1,110 | 185 | 340 | 29 | 880 | 175 |
| 25 | 1,430 | 290 | 880 | 150 | 270 | 23 | 715 | 140 |

RPM = rev / min
FEED = mm / min

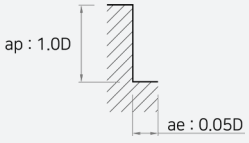


## UE504, UXE504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Stainless Steels (SUS) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | - | | HRc45 ~ HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | - | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 11,560 | 280 | 7,560 | 170 | 6,300 | 140 | 5,040 | 50 |
| 3 | 8,920 | 320 | 5,560 | 200 | 4,620 | 170 | 3,360 | 60 |
| 4 | 7,560 | 570 | 4,620 | 350 | 3,880 | 280 | 2,940 | 60 |
| 5 | 6,300 | 600 | 3,780 | 360 | 3,160 | 300 | 2,320 | 70 |
| 6 | 5,560 | 660 | 3,360 | 410 | 2,840 | 330 | 2,000 | 80 |
| 8 | 4,200 | 710 | 2,520 | 380 | 2,100 | 350 | 1,680 | 110 |
| 10 | 3,260 | 610 | 2,000 | 300 | 1,680 | 300 | 1,360 | 90 |
| 12 | 2,740 | 520 | 1,680 | 250 | 1,360 | 240 | 1,160 | 80 |
| 16 | 2,200 | 410 | 1,360 | 200 | 1,100 | 300 | 900 | 60 |
| 20 | 1,680 | 320 | 1,060 | 160 | 840 | 150 | 680 | 40 |
| 25 | 1,360 | 250 | 840 | 130 | 680 | 120 | 540 | 30 |

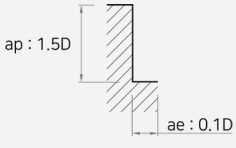
RPM = rev / min
FEED = mm / min

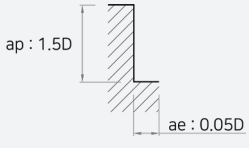


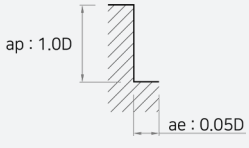

## UE506 SERIES ▶ General Cutting

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 5,560 | 2,000 | 3,880 | 1,370 | 1,580 | 210 |
| 8 | 4,200 | 2,000 | 2,940 | 1,370 | 1,160 | 210 |
| 10 | 3,360 | 2,000 | 2,320 | 1,370 | 1,000 | 210 |
| 12 | 2,840 | 1,680 | 2,000 | 1,160 | 840 | 180 |
| 16 | 2,100 | 1,260 | 1,480 | 880 | 640 | 130 |
| 20 | 1,680 | 1,010 | 1,160 | 690 | 500 | 110 |
| 25 | 1,500 | 900 | 1,100 | 600 | 430 | 90 |

RPM = rev / min
FEED = mm / min



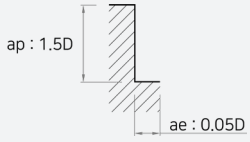



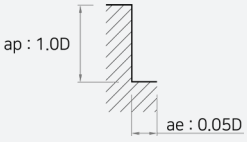
# Recommended Cutting Condition

## UE506 SERIES ▶ High Speed Cutting

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 6 | 16,800 | 6,090 | 8,400 | 3,050 |
| 8 | 12,600 | 6,090 | 6,300 | 3,050 |
| 10 | 9,980 | 5,990 | 5,040 | 3,050 |
| 12 | 8,400 | 5,040 | 4,200 | 2,520 |
| 16 | 6,300 | 3,780 | 3,160 | 1,890 |
| 20 | 5,040 | 3,050 | 2,520 | 1,470 |
| 25 | 4,500 | 2,700 | 2,200 | 1,300 |

RPM = rev / min
FEED = mm / min

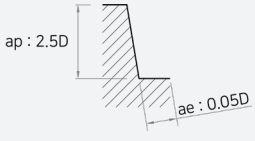



## UTE502 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | |
|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 0.3 | 45,000 | 135 | 35,000 | 105 |
| 0.4 | 36,000 | 144 | 27,900 | 113 |
| 0.6 | 25,200 | 144 | 18,900 | 113 |
| 0.8 | 18,000 | 144 | 13,950 | 108 |
| 1 | 14,850 | 149 | 11,250 | 113 |
| 2 | 7,560 | 153 | 5,670 | 113 |
| 3 | 3,969 | 108 | 3,213 | 90 |
| 4 | 3,213 | 126 | 2,556 | 104 |
| 6 | 2,367 | 189 | 1,890 | 153 |
| 8 | 1,800 | 225 | 1,422 | 162 |
| 10 | 1,440 | 225 | 1,170 | 167 |

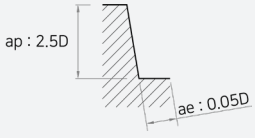
RPM = rev / min
FEED = mm / min



## UTE504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | |
|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 3 | 3,969 | 216 | 3,213 | 180 |
| 4 | 3,213 | 252 | 2,556 | 207 |
| 6 | 2,367 | 378 | 1,890 | 306 |
| 8 | 1,800 | 450 | 1,422 | 324 |
| 10 | 1,440 | 450 | 1,170 | 333 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## UR502 SERIES

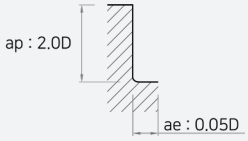
| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 44,000 | 145 | 28,800 | 60 | 17,600 | 40 |
| 0.3 | 41,000 | 170 | 27,000 | 70 | 16,500 | 45 |
| 0.4 | 41,000 | 170 | 27,000 | 70 | 16,500 | 45 |
| 0.5 | 36,000 | 190 | 23,400 | 80 | 14,300 | 50 |
| 0.6 | 30,000 | 210 | 19,800 | 90 | 12,100 | 55 |
| 0.8 | 30,000 | 210 | 19,800 | 90 | 12,100 | 55 |
| 1 | 27,600 | 240 | 18,000 | 100 | 11,000 | 60 |
| 1.5 | 22,000 | 250 | 13,500 | 110 | 8,500 | 60 |
| 2 | 18,000 | 260 | 11,560 | 120 | 7,200 | 70 |
| 2.5 | 15,000 | 270 | 9,500 | 130 | 6,100 | 70 |
| 3 | 13,240 | 280 | 8,560 | 140 | 5,280 | 70 |
| 4 | 10,720 | 340 | 6,820 | 170 | 4,300 | 80 |
| 5 | 9,160 | 420 | 5,800 | 200 | 3,800 | 100 |
| 6 | 7,900 | 500 | 5,040 | 250 | 3,280 | 120 |
| 8 | 6,000 | 540 | 3,800 | 250 | 2,520 | 120 |
| 10 | 5,040 | 540 | 3,280 | 250 | 2,020 | 120 |
| 12 | 4,120 | 420 | 2,780 | 230 | 1,680 | 100 |
| 16 | 3,100 | 360 | 2,100 | 170 | 1,280 | 80 |
| 20 | 2,520 | 280 | 1,640 | 120 | 1,000 | 60 |

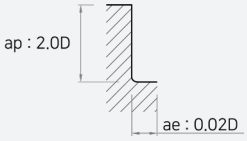
RPM = rev / min
FEED = mm / min

## UR512, UR504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 4,410 | 115 | 3,570 | 100 | 2,200 | 55 |
| 4 | 3,570 | 140 | 2,840 | 115 | 1,790 | 60 |
| 5 | 3,050 | 180 | 2,420 | 140 | 1,580 | 70 |
| 6 | 2,630 | 215 | 2,100 | 180 | 1,370 | 85 |
| 8 | 2,000 | 230 | 1,580 | 180 | 1,050 | 85 |
| 10 | 1,680 | 230 | 1,370 | 180 | 840 | 85 |
| 12 | 1,370 | 180 | 1,160 | 160 | 700 | 70 |
| 16 | 1,160 | 160 | 890 | 125 | 560 | 60 |
| 20 | 840 | 115 | 680 | 90 | 420 | 45 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## UR542 SERIES

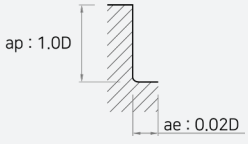
| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 50,000 | 170 | 34,500 | 75 | 21,150 | 45 |
| 0.3 | 50,000 | 200 | 32,000 | 85 | 20,000 | 50 |
| 0.4 | 50,000 | 200 | 32,000 | 85 | 20,000 | 50 |
| 0.5 | 43,000 | 220 | 28,000 | 95 | 17,100 | 60 |
| 0.6 | 36,400 | 250 | 24,000 | 110 | 14,500 | 65 |
| 0.8 | 36,400 | 250 | 24,000 | 110 | 14,500 | 65 |
| 1 | 33,100 | 280 | 21,600 | 120 | 13,200 | 70 |
| 1.5 | 26,400 | 300 | 16,200 | 130 | 10,200 | 70 |
| 2 | 21,600 | 310 | 13,800 | 140 | 8,640 | 80 |
| 2.5 | 18,000 | 320 | 11,400 | 150 | 7,320 | 80 |
| 3 | 15,900 | 330 | 10,300 | 160 | 6,300 | 80 |
| 4 | 12,800 | 400 | 8,200 | 200 | 5,150 | 95 |
| 5 | 11,000 | 500 | 7,000 | 240 | 4,560 | 120 |
| 6 | 9,500 | 600 | 6,000 | 300 | 3,930 | 140 |
| 8 | 7,200 | 640 | 4,550 | 300 | 3,020 | 140 |
| 10 | 6,000 | 640 | 4,000 | 300 | 2,420 | 140 |
| 12 | 5,000 | 500 | 3,340 | 270 | 2,000 | 120 |
| 16 | 3,720 | 450 | 2,520 | 210 | 1,540 | 95 |
| 20 | 3,000 | 330 | 1,950 | 140 | 1,200 | 70 |

RPM = rev / min
FEED = mm / min

## UR544, UXR514 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 33,100 | 360 | 21,600 | 260 | 13,200 | 140 |
| 1.5 | 26,400 | 370 | 16,200 | 270 | 10,200 | 140 |
| 2 | 21,600 | 380 | 13,800 | 280 | 8,640 | 150 |
| 2.5 | 18,000 | 390 | 11,400 | 300 | 7,320 | 150 |
| 3 | 15,900 | 400 | 10,300 | 310 | 6,300 | 150 |
| 4 | 12,800 | 500 | 8,200 | 360 | 5,150 | 160 |
| 5 | 11,000 | 510 | 7,000 | 430 | 4,560 | 200 |
| 6 | 9,500 | 510 | 6,000 | 430 | 3,930 | 200 |
| 8 | 7,200 | 550 | 4,550 | 430 | 3,020 | 200 |
| 10 | 6,000 | 550 | 4,000 | 430 | 2,420 | 200 |
| 12 | 5,000 | 430 | 3,340 | 380 | 2,000 | 160 |
| 16 | 3,720 | 330 | 2,520 | 280 | 1,540 | 135 |
| 20 | 3,000 | 270 | 1,950 | 210 | 1,200 | 100 |

RPM = rev / min
FEED = mm / min

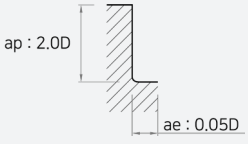


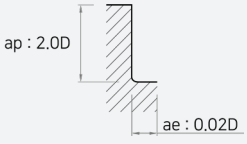
# Recommended Cutting Condition

## UXR504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 27,600 | 300 | 18,000 | 220 | 11,000 | 120 |
| 1.5 | 22,000 | 310 | 13,500 | 230 | 8,500 | 120 |
| 2 | 18,000 | 320 | 11,560 | 240 | 7,200 | 130 |
| 2.5 | 15,000 | 330 | 9,500 | 250 | 6,100 | 130 |
| 3 | 13,240 | 340 | 8,560 | 260 | 5,280 | 130 |
| 4 | 10,720 | 420 | 6,820 | 300 | 4,300 | 140 |
| 5 | 9,160 | 430 | 5,800 | 360 | 3,800 | 170 |
| 6 | 7,900 | 430 | 5,040 | 360 | 3,280 | 170 |
| 8 | 6,000 | 460 | 3,800 | 360 | 2,520 | 170 |
| 10 | 5,040 | 460 | 3,280 | 360 | 2,020 | 170 |
| 12 | 4,120 | 360 | 2,780 | 320 | 1,680 | 140 |
| 16 | 3,100 | 280 | 2,100 | 230 | 1,280 | 115 |
| 20 | 2,520 | 230 | 1,640 | 180 | 1,000 | 90 |

RPM = rev / min
FEED = mm / min

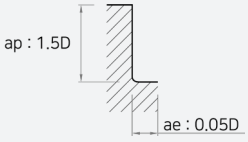


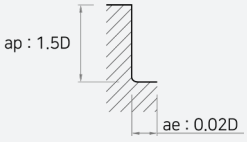




## UR506 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 14,880 | 3,210 | 14,100 | 2,940 | 9,600 | 2,940 |
| 8 | 12,000 | 3,300 | 11,400 | 3,000 | 7,200 | 2,760 |
| 10 | 9,600 | 2,940 | 9,300 | 2,700 | 5,700 | 2,460 |
| 12 | 7,800 | 2,700 | 7,500 | 2,460 | 4,800 | 2,280 |
| 16 | 6,000 | 2,400 | 5,820 | 2,220 | 3,600 | 2,040 |
| 20 | 4,800 | 2,010 | 4,680 | 2,040 | 2,880 | 1,920 |

RPM = rev / min
FEED = mm / min

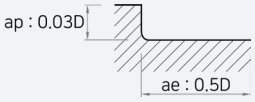


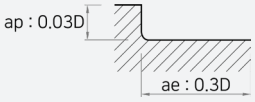



## UDR503 SERIES ▶ General Cutting

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6.0 | 5,100 | 3,500 | 5,500 | 3,750 | 3,850 | 2,700 |
| 8.0 | 3,800 | 3,400 | 4,150 | 3,700 | 2,850 | 2,550 |
| 10 | 3,800 | 3,750 | 3,600 | 3,500 | 2,700 | 2,700 |
| 12 | 3,200 | 4,200 | 3,250 | 4,250 | 2,250 | 2,300 |
| 16 | 2,400 | 3,100 | 2,250 | 2,900 | 1,700 | 1,750 |
| 20 | 1,900 | 2,500 | 1,800 | 2,350 | 1,350 | 1,400 |

RPM = rev / min
FEED = mm / min

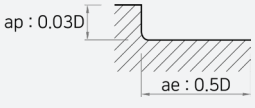


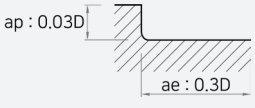




## UDR503 SERIES ▶ High Speed Cutting

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6.0 | 8,300 | 5,700 | 7,650 | 5,250 | 6,400 | 4,550 |
| 8.0 | 6,200 | 5,550 | 5,750 | 5,100 | 5,250 | 4,700 |
| 10 | 5,750 | 5,650 | 5,000 | 4,900 | 4,200 | 4,250 |
| 12 | 4,800 | 6,300 | 4,150 | 5,450 | 3,500 | 3,650 |
| 16 | 3,600 | 4,700 | 3,100 | 4,050 | 2,650 | 2,700 |
| 20 | 2,900 | 3,750 | 2,500 | 3,250 | 2,100 | 2,150 |

RPM = rev / min
FEED = mm / min



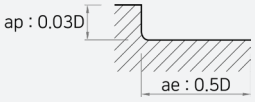



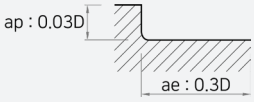
# Recommended Cutting Condition

## USPM4 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 49000 | 7650 | 40000 | 6500 | 35000 | 5750 |
| 1.5 | 37000 | 8550 | 30000 | 7200 | 27000 | 6400 |
| 2 | 29700 | 9000 | 24300 | 7560 | 21600 | 6750 |
| 3 | 19800 | 9900 | 16200 | 8100 | 14400 | 7650 |
| 4 | 15300 | 10800 | 12600 | 8550 | 10800 | 7920 |
| 6 | 9900 | 11700 | 8100 | 9900 | 7200 | 8640 |
| 8 | 7380 | 11700 | 6300 | 9900 | 5400 | 8640 |
| 10 | 5850 | 10800 | 4950 | 9000 | 4320 | 8550 |
| 12 | 4950 | 10800 | 4140 | 9000 | 3690 | 8100 |
| 16 | 3690 | 9000 | 3060 | 7920 | 2700 | 7020 |
| 20 | 2970 | 7200 | 2430 | 6300 | 2160 | 5670 |

RPM = rev / min
FEED = mm / min

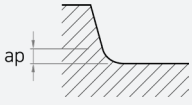



## UTR504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 0.4 | 40,000 | 630 | 0.008~0.016 | 32,000 | 450 | 0.008~0.012 | 22,000 | 270 | 0.004~0.008 |
| 0.6 | 30,000 | 630 | 0.012~0.024 | 23,000 | 450 | 0.012~0.018 | 15,000 | 270 | 0.006~0.012 |
| 0.8 | 22,500 | 630 | 0.016~0.032 | 17,000 | 450 | 0.016~0.024 | 11,500 | 270 | 0.008~0.016 |
| 1 | 18,000 | 630 | 0.020~0.040 | 13,500 | 450 | 0.020~0.030 | 9,000 | 270 | 0.010~0.020 |
| 1.2 | 14,400 | 630 | 0.025~0.050 | 11,700 | 450 | 0.025~0.040 | 7,200 | 270 | 0.012~0.025 |
| 1.5 | 11,700 | 630 | 0.030~0.060 | 9,000 | 450 | 0.030~0.050 | 5,850 | 270 | 0.015~0.030 |
| 2 | 9,000 | 630 | 0.040~0.080 | 7,200 | 450 | 0.040~0.060 | 4,500 | 270 | 0.020~0.040 |

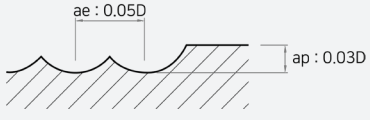
RPM = rev / min
FEED = mm / min



## UB502, UB502-P SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.1 | 40,000 | 550 | 40,000 | 500 | 33,000 | 400 |
| 0.2 | 30,000 | 720 | 30,000 | 630 | 27,000 | 575 |
| 0.3 | 30,000 | 900 | 30,000 | 810 | 27,000 | 720 |
| 0.4 | 30,000 | 1,140 | 30,000 | 1,020 | 27,000 | 900 |
| 0.5 | 30,000 | 1,440 | 30,000 | 1,260 | 27,000 | 1,140 |
| 0.6 | 30,000 | 1,740 | 30,000 | 1,500 | 27,000 | 1,320 |
| 0.8 | 30,000 | 2,340 | 30,000 | 1,980 | 27,000 | 1,800 |
| 1 | 30,000 | 2,880 | 30,000 | 2,520 | 27,000 | 2,280 |
| 1.2 | 30,000 | 3,060 | 28,800 | 2,580 | 25,800 | 2,310 |
| 1.5 | 30,000 | 3,240 | 28,800 | 2,700 | 25,800 | 2,400 |
| 2 | 29,820 | 3,420 | 28,680 | 2,880 | 24,000 | 2,400 |
| 3 | 19,860 | 3,600 | 19,080 | 3,180 | 15,900 | 2,400 |
| 4 | 14,940 | 3,600 | 14,340 | 3,180 | 12,000 | 2,400 |
| 5 | 11,160 | 3,480 | 10,680 | 2,940 | 9,000 | 2,250 |
| 6 | 8,340 | 2,910 | 8,040 | 2,460 | 6,600 | 1,860 |
| 8 | 6,660 | 2,520 | 6,420 | 2,100 | 5,400 | 1,620 |
| 10 | 5,580 | 2,220 | 5,340 | 1,860 | 4,500 | 1,440 |
| 12 | 4,170 | 1,770 | 4,008 | 1,500 | 3,360 | 1,140 |
| 16 | 3,340 | 1,590 | 3,210 | 1,320 | 2,700 | 1,020 |
| 20 | 2,670 | 1,410 | 2,580 | 1,170 | 2,160 | 900 |
| 25 | 2,130 | 1,150 | 2,060 | 950 | 1,730 | 730 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## UB512, UB512S6 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 0.1 | 0.2 | 50000 | 240 | 0.009 | 50000 | 215 | 0.007 | 50000 | 190 | 0.005 |
| | 0.3 | 50000 | 240 | 0.009 | 50000 | 215 | 0.007 | 50000 | 190 | 0.005 |
| | 0.5 | 50000 | 240 | 0.006 | 50000 | 215 | 0.005 | 50000 | 190 | 0.004 |
| | 1 | 45000 | 195 | 0.002 | 45000 | 175 | 0.002 | 45000 | 155 | 0.001 |
| 0.2 | 0.5 | 50000 | 335 | 0.018 | 50000 | 310 | 0.014 | 43200 | 260 | 0.010 |
| | 1 | 50000 | 335 | 0.013 | 50000 | 310 | 0.010 | 43200 | 260 | 0.007 |
| | 1.5 | 45000 | 270 | 0.007 | 45000 | 250 | 0.006 | 38880 | 210 | 0.004 |
| | 2 | 45000 | 270 | 0.005 | 45000 | 250 | 0.004 | 38880 | 210 | 0.003 |
| | 3 | 45000 | 270 | 0.003 | 45000 | 250 | 0.003 | 38880 | 210 | 0.002 |
| 0.3 | 1 | 50000 | 475 | 0.019 | 50000 | 430 | 0.015 | 42800 | 365 | 0.011 |
| | 1.5 | 50000 | 475 | 0.019 | 50000 | 430 | 0.015 | 42800 | 365 | 0.011 |
| | 2 | 45000 | 385 | 0.011 | 45000 | 350 | 0.008 | 38520 | 295 | 0.006 |
| | 2.5 | 45000 | 385 | 0.007 | 45000 | 350 | 0.005 | 38520 | 295 | 0.004 |
| | 3 | 45000 | 385 | 0.007 | 45000 | 350 | 0.005 | 38520 | 295 | 0.004 |
| | 4 | 40000 | 305 | 0.004 | 40000 | 275 | 0.003 | 34240 | 235 | 0.002 |
| | 5 | 30000 | 200 | 0.003 | 30000 | 180 | 0.002 | 25680 | 155 | 0.002 |
| 0.4 | 1 | 41000 | 490 | 0.036 | 38800 | 425 | 0.028 | 34200 | 340 | 0.020 |
| | 1.5 | 41000 | 490 | 0.025 | 38800 | 425 | 0.020 | 34200 | 340 | 0.014 |
| | 2 | 41000 | 490 | 0.025 | 38800 | 425 | 0.020 | 34200 | 340 | 0.014 |
| | 2.5 | 36900 | 395 | 0.014 | 34920 | 345 | 0.011 | 30780 | 275 | 0.008 |
| | 3 | 36900 | 395 | 0.014 | 34920 | 345 | 0.011 | 30780 | 275 | 0.008 |
| | 4 | 36900 | 395 | 0.009 | 34920 | 345 | 0.007 | 30780 | 275 | 0.005 |
| | 5 | 32800 | 315 | 0.009 | 31040 | 270 | 0.007 | 27360 | 220 | 0.005 |
| | 6 | 32800 | 315 | 0.005 | 31040 | 270 | 0.004 | 27360 | 220 | 0.003 |
| | 8 | 24600 | 205 | 0.004 | 23280 | 180 | 0.003 | 20520 | 145 | 0.002 |
| | 10 | 12300 | 90 | 0.004 | 11640 | 75 | 0.003 | 10260 | 60 | 0.002 |
| 0.5 | 1 | 34200 | 685 | 0.045 | 32300 | 580 | 0.035 | 28500 | 515 | 0.025 |
| | 1.5 | 34200 | 685 | 0.045 | 32300 | 580 | 0.035 | 28500 | 515 | 0.025 |
| | 2 | 34200 | 685 | 0.032 | 32300 | 580 | 0.025 | 28500 | 515 | 0.018 |
| | 2.5 | 34200 | 685 | 0.032 | 32300 | 580 | 0.025 | 28500 | 515 | 0.018 |
| | 3 | 30780 | 555 | 0.018 | 29070 | 470 | 0.014 | 25650 | 415 | 0.010 |
| | 4 | 30780 | 555 | 0.018 | 29070 | 470 | 0.014 | 25650 | 415 | 0.010 |
| | 5 | 30780 | 555 | 0.011 | 29070 | 470 | 0.009 | 25650 | 415 | 0.006 |
| | 6 | 27360 | 440 | 0.011 | 25840 | 370 | 0.009 | 22800 | 330 | 0.006 |
| | 8 | 20520 | 290 | 0.007 | 19380 | 245 | 0.005 | 17100 | 215 | 0.004 |
| | 10 | 20520 | 290 | 0.005 | 19380 | 245 | 0.004 | 17100 | 215 | 0.003 |
| | 12 | 10260 | 125 | 0.005 | 9690 | 105 | 0.004 | 8550 | 95 | 0.003 |
| | 14 | 10260 | 125 | 0.005 | 9690 | 105 | 0.004 | 8550 | 95 | 0.003 |
| | 16 | 3420 | 35 | 0.005 | 3230 | 30 | 0.004 | 2850 | 25 | 0.003 |
| 0.6 | 1 | 34200 | 1025 | 0.038 | 32300 | 840 | 0.029 | 28500 | 685 | 0.021 |
| | 2 | 34200 | 1025 | 0.038 | 32300 | 840 | 0.029 | 28500 | 685 | 0.021 |
| | 3 | 34200 | 1025 | 0.038 | 32300 | 840 | 0.029 | 28500 | 685 | 0.021 |

## UB512, UB512S6 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 0.6 | 4 | 30780 | 830 | 0.022 | 29070 | 680 | 0.017 | 25650 | 555 | 0.012 |
| | 5 | 30780 | 830 | 0.014 | 29070 | 680 | 0.011 | 25650 | 555 | 0.008 |
| | 6 | 30780 | 830 | 0.014 | 29070 | 680 | 0.011 | 25650 | 555 | 0.008 |
| | 8 | 27360 | 655 | 0.008 | 25840 | 540 | 0.006 | 22800 | 440 | 0.005 |
| | 10 | 20520 | 430 | 0.005 | 19380 | 355 | 0.004 | 17100 | 290 | 0.003 |
| | 12 | 20520 | 430 | 0.005 | 19380 | 355 | 0.004 | 17100 | 290 | 0.003 |
| | 14 | 10260 | 185 | 0.005 | 9690 | 150 | 0.004 | 8550 | 125 | 0.003 |
| | 16 | 10260 | 185 | 0.005 | 9690 | 150 | 0.004 | 8550 | 125 | 0.003 |
| 0.7 | 2 | 34200 | 1130 | 0.063 | 32300 | 930 | 0.049 | 28500 | 765 | 0.035 |
| | 4 | 30780 | 915 | 0.025 | 29070 | 755 | 0.020 | 25650 | 620 | 0.014 |
| | 6 | 30780 | 915 | 0.016 | 29070 | 755 | 0.012 | 25650 | 620 | 0.009 |
| | 8 | 27360 | 725 | 0.016 | 25840 | 595 | 0.012 | 22800 | 490 | 0.009 |
| | 10 | 27360 | 725 | 0.009 | 25840 | 595 | 0.007 | 22800 | 490 | 0.005 |
| | 12 | 20520 | 475 | 0.006 | 19380 | 390 | 0.005 | 17100 | 320 | 0.004 |
| 0.8 | 2 | 34200 | 1230 | 0.072 | 32300 | 1035 | 0.056 | 28500 | 855 | 0.040 |
| | 3 | 34200 | 1230 | 0.050 | 32300 | 1035 | 0.039 | 28500 | 855 | 0.028 |
| | 4 | 34200 | 1230 | 0.050 | 32300 | 1035 | 0.039 | 28500 | 855 | 0.028 |
| | 5 | 30780 | 995 | 0.029 | 29070 | 840 | 0.022 | 25650 | 695 | 0.016 |
| | 6 | 30780 | 995 | 0.029 | 29070 | 840 | 0.022 | 25650 | 695 | 0.016 |
| | 8 | 30780 | 995 | 0.018 | 29070 | 840 | 0.014 | 25650 | 695 | 0.010 |
| | 10 | 27360 | 785 | 0.018 | 25840 | 660 | 0.014 | 22800 | 545 | 0.010 |
| | 12 | 27360 | 785 | 0.011 | 25840 | 660 | 0.008 | 22800 | 545 | 0.006 |
| | 14 | 20520 | 515 | 0.007 | 19380 | 435 | 0.006 | 17100 | 360 | 0.004 |
| | 16 | 20520 | 515 | 0.007 | 19380 | 435 | 0.006 | 17100 | 360 | 0.004 |
| | 20 | 10260 | 220 | 0.007 | 9690 | 185 | 0.006 | 8550 | 155 | 0.004 |
| 0.9 | 4 | 29250 | 1120 | 0.032 | 27630 | 935 | 0.025 | 24390 | 775 | 0.018 |
| | 6 | 29250 | 1120 | 0.032 | 27630 | 935 | 0.025 | 24390 | 775 | 0.018 |
| | 8 | 29250 | 1120 | 0.020 | 27630 | 935 | 0.016 | 24390 | 775 | 0.011 |
| | 10 | 26000 | 885 | 0.020 | 24560 | 740 | 0.016 | 21680 | 610 | 0.011 |
| 1.0 | 2 | 30800 | 1540 | 0.090 | 29100 | 1310 | 0.070 | 25700 | 1075 | 0.050 |
| | 3 | 30800 | 1540 | 0.090 | 29100 | 1310 | 0.070 | 25700 | 1075 | 0.050 |
| | 4 | 30800 | 1540 | 0.063 | 29100 | 1310 | 0.049 | 25700 | 1075 | 0.035 |
| | 5 | 30800 | 1540 | 0.063 | 29100 | 1310 | 0.049 | 25700 | 1075 | 0.035 |
| | 6 | 27720 | 1245 | 0.036 | 26190 | 1060 | 0.028 | 23130 | 870 | 0.020 |
| | 7 | 27720 | 1245 | 0.036 | 26190 | 1060 | 0.028 | 23130 | 870 | 0.020 |
| | 8 | 27720 | 1245 | 0.036 | 26190 | 1060 | 0.028 | 23130 | 870 | 0.020 |
| | 10 | 27720 | 1245 | 0.023 | 26190 | 1060 | 0.018 | 23130 | 870 | 0.013 |
| | 12 | 24640 | 985 | 0.023 | 23280 | 840 | 0.018 | 20560 | 690 | 0.013 |
| | 14 | 24640 | 985 | 0.014 | 23280 | 840 | 0.011 | 20560 | 690 | 0.008 |
| | 16 | 18480 | 645 | 0.014 | 17460 | 550 | 0.011 | 15420 | 450 | 0.008 |
| | 18 | 18480 | 645 | 0.009 | 17460 | 550 | 0.007 | 15420 | 450 | 0.005 |
| | 20 | 18480 | 645 | 0.009 | 17460 | 550 | 0.007 | 15420 | 450 | 0.005 |

# Recommended Cutting Condition

## UB512, UB512S6 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 1.0 | 22 | 9240 | 275 | 0.009 | 8730 | 235 | 0.007 | 7710 | 195 | 0.005 |
| | 26 | 9240 | 275 | 0.009 | 8730 | 235 | 0.007 | 7710 | 195 | 0.005 |
| | 30 | 9240 | 275 | 0.009 | 8730 | 235 | 0.007 | 7710 | 195 | 0.005 |
| | 40 | 3080 | 75 | 0.009 | 2910 | 65 | 0.007 | 2570 | 55 | 0.005 |
| | 50 | 3080 | 75 | 0.006 | 2910 | 65 | 0.005 | 2570 | 55 | 0.003 |
| 1.2 | 4 | 26300 | 1375 | 0.076 | 24800 | 1150 | 0.059 | 21900 | 950 | 0.042 |
| | 6 | 26300 | 1375 | 0.076 | 24800 | 1150 | 0.059 | 21900 | 950 | 0.042 |
| | 8 | 23670 | 1115 | 0.043 | 22320 | 930 | 0.034 | 19710 | 770 | 0.024 |
| | 10 | 23670 | 1115 | 0.027 | 22320 | 930 | 0.021 | 19710 | 770 | 0.015 |
| | 12 | 23670 | 1115 | 0.027 | 22320 | 930 | 0.021 | 19710 | 770 | 0.015 |
| | 16 | 21040 | 880 | 0.016 | 19840 | 735 | 0.013 | 17520 | 610 | 0.009 |
| | 20 | 15780 | 580 | 0.011 | 14880 | 485 | 0.008 | 13140 | 400 | 0.006 |
| | 26 | 7890 | 245 | 0.011 | 7440 | 205 | 0.008 | 6570 | 170 | 0.006 |
| 1.4 | 6 | 21500 | 1295 | 0.088 | 20300 | 1100 | 0.069 | 18000 | 935 | 0.049 |
| | 8 | 19350 | 1050 | 0.050 | 18270 | 890 | 0.039 | 16200 | 755 | 0.028 |
| | 10 | 19350 | 1050 | 0.050 | 18270 | 890 | 0.039 | 16200 | 755 | 0.028 |
| | 16 | 17200 | 830 | 0.032 | 16240 | 705 | 0.025 | 14400 | 600 | 0.018 |
| 1.5 | 4 | 23900 | 1580 | 0.135 | 22600 | 1355 | 0.105 | 20000 | 1075 | 0.075 |
| | 5 | 23900 | 1580 | 0.095 | 22600 | 1355 | 0.074 | 20000 | 1075 | 0.053 |
| | 6 | 23900 | 1580 | 0.095 | 22600 | 1355 | 0.074 | 20000 | 1075 | 0.053 |
| | 7 | 23900 | 1580 | 0.095 | 22600 | 1355 | 0.074 | 20000 | 1075 | 0.053 |
| | 8 | 21510 | 1280 | 0.054 | 20340 | 1100 | 0.042 | 18000 | 870 | 0.030 |
| | 10 | 21510 | 1280 | 0.054 | 20340 | 1100 | 0.042 | 18000 | 870 | 0.03 |
| | 12 | 21510 | 1280 | 0.054 | 20340 | 1100 | 0.042 | 18000 | 870 | 0.030 |
| | 14 | 21510 | 1280 | 0.034 | 20340 | 1100 | 0.026 | 18000 | 870 | 0.019 |
| | 16 | 19120 | 1010 | 0.034 | 18080 | 865 | 0.026 | 16000 | 690 | 0.019 |
| | 18 | 19120 | 1010 | 0.034 | 18080 | 865 | 0.026 | 16000 | 690 | 0.019 |
| | 20 | 19120 | 1010 | 0.020 | 18080 | 865 | 0.016 | 16000 | 690 | 0.011 |
| | 22 | 19120 | 1010 | 0.020 | 18080 | 865 | 0.016 | 16000 | 690 | 0.011 |
| | 26 | 14340 | 665 | 0.014 | 13560 | 570 | 0.011 | 12000 | 450 | 0.008 |
| | 30 | 14340 | 665 | 0.014 | 13560 | 570 | 0.011 | 12000 | 450 | 0.008 |
| | 35 | 7170 | 285 | 0.010 | 6780 | 245 | 0.008 | 6000 | 195 | 0.005 |
| | 40 | 7170 | 285 | 0.010 | 6780 | 245 | 0.008 | 6000 | 195 | 0.005 |
| 1.6 | 4 | 22200 | 1555 | 0.101 | 21000 | 1300 | 0.078 | 18500 | 1110 | 0.056 |
| | 6 | 22200 | 1555 | 0.101 | 21000 | 1300 | 0.078 | 18500 | 1110 | 0.056 |
| | 8 | 22200 | 1555 | 0.101 | 21000 | 1300 | 0.078 | 18500 | 1110 | 0.056 |
| | 10 | 19980 | 1260 | 0.058 | 18900 | 1055 | 0.045 | 16650 | 900 | 0.032 |
| | 12 | 19980 | 1260 | 0.058 | 18900 | 1055 | 0.045 | 16650 | 900 | 0.032 |
| | 16 | 19980 | 1260 | 0.036 | 18900 | 1055 | 0.028 | 16650 | 900 | 0.020 |
| | 20 | 17760 | 995 | 0.036 | 16800 | 830 | 0.028 | 14800 | 710 | 0.020 |
| 1.8 | 4 | 22200 | 1780 | 0.113 | 21000 | 1470 | 0.088 | 18500 | 1225 | 0.063 |
| | 6 | 22200 | 1780 | 0.113 | 21000 | 1470 | 0.088 | 18500 | 1225 | 0.063 |

## UB512, UB512S6 SERIES

| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 1.8 | 8 | 22200 | 1780 | 0.113 | 21000 | 1470 | 0.088 | 18500 | 1225 | 0.063 |
| | 10 | 19980 | 1440 | 0.065 | 18900 | 1190 | 0.050 | 16650 | 990 | 0.036 |
| | 12 | 19980 | 1440 | 0.065 | 18900 | 1190 | 0.050 | 16650 | 990 | 0.036 |
| | 16 | 19980 | 1440 | 0.041 | 18900 | 1190 | 0.032 | 16650 | 990 | 0.023 |
| | 20 | 17760 | 1140 | 0.041 | 16800 | 940 | 0.032 | 14800 | 785 | 0.023 |
| 2.0 | 6 | 18000 | 1795 | 0.18 | 17000 | 1525 | 0.140 | 15000 | 1285 | 0.100 |
| | 8 | 18000 | 1795 | 0.126 | 17000 | 1525 | 0.098 | 15000 | 1285 | 0.070 |
| | 10 | 18000 | 1795 | 0.126 | 17000 | 1525 | 0.098 | 15000 | 1285 | 0.070 |
| | 12 | 16200 | 1455 | 0.072 | 15300 | 1235 | 0.056 | 13500 | 1040 | 0.040 |
| | 14 | 16200 | 1455 | 0.072 | 15300 | 1235 | 0.056 | 13500 | 1040 | 0.040 |
| | 16 | 16200 | 1455 | 0.072 | 15300 | 1235 | 0.056 | 13500 | 1040 | 0.040 |
| | 18 | 16200 | 1455 | 0.045 | 15300 | 1235 | 0.035 | 13500 | 1040 | 0.025 |
| | 20 | 16200 | 1455 | 0.045 | 15300 | 1235 | 0.035 | 13500 | 1040 | 0.025 |
| | 22 | 14400 | 1150 | 0.045 | 13600 | 975 | 0.035 | 12000 | 820 | 0.025 |
| | 26 | 14400 | 1150 | 0.045 | 13600 | 975 | 0.035 | 12000 | 820 | 0.025 |
| | 30 | 14400 | 1150 | 0.027 | 13600 | 975 | 0.021 | 12000 | 820 | 0.015 |
| | 35 | 10800 | 755 | 0.018 | 10200 | 640 | 0.014 | 9000 | 540 | 0.010 |
| | 40 | 10800 | 755 | 0.018 | 10200 | 640 | 0.014 | 9000 | 540 | 0.010 |
| | 45 | 5400 | 325 | 0.018 | 5100 | 275 | 0.014 | 4500 | 230 | 0.010 |
| | 50 | 5400 | 325 | 0.018 | 5100 | 275 | 0.014 | 4500 | 230 | 0.010 |
| | 60 | 5400 | 325 | 0.018 | 5100 | 275 | 0.014 | 4500 | 230 | 0.010 |
| 2.5 | 8 | 15800 | 1925 | 0.158 | 14900 | 1605 | 0.123 | 13200 | 1305 | 0.088 |
| | 10 | 15800 | 1925 | 0.158 | 14900 | 1605 | 0.123 | 13200 | 1305 | 0.088 |
| | 12 | 15800 | 1925 | 0.158 | 14900 | 1605 | 0.123 | 13200 | 1305 | 0.088 |
| | 16 | 14220 | 1560 | 0.090 | 13410 | 1300 | 0.070 | 11880 | 1055 | 0.050 |
| | 20 | 14220 | 1560 | 0.090 | 13410 | 1300 | 0.070 | 11880 | 1055 | 0.050 |
| | 22 | 14220 | 1560 | 0.056 | 13410 | 1300 | 0.044 | 11880 | 1055 | 0.031 |
| | 26 | 12640 | 1230 | 0.056 | 11920 | 1025 | 0.044 | 10560 | 835 | 0.031 |
| | 30 | 12640 | 1230 | 0.056 | 11920 | 1025 | 0.044 | 10560 | 835 | 0.031 |
| | 35 | 12640 | 1230 | 0.034 | 11920 | 1025 | 0.026 | 10560 | 835 | 0.019 |
| | 40 | 9480 | 810 | 0.034 | 8940 | 675 | 0.026 | 7920 | 550 | 0.019 |
| | 45 | 9480 | 810 | 0.023 | 8940 | 675 | 0.018 | 7920 | 550 | 0.013 |
| | 50 | 9480 | 810 | 0.023 | 8940 | 675 | 0.018 | 7920 | 550 | 0.013 |
| 3.0 | 6 | 13700 | 2050 | 0.270 | 12900 | 1730 | 0.21 | 11400 | 1435 | 0.150 |
| | 8 | 13700 | 2050 | 0.270 | 12900 | 1730 | 0.21 | 11400 | 1435 | 0.150 |
| | 10 | 13700 | 2050 | 0.189 | 12900 | 1730 | 0.147 | 11400 | 1435 | 0.105 |
| | 12 | 13700 | 2050 | 0.189 | 12900 | 1730 | 0.147 | 11400 | 1435 | 0.105 |
| | 14 | 13700 | 2050 | 0.189 | 12900 | 1730 | 0.147 | 11400 | 1435 | 0.105 |
| | 16 | 12330 | 1660 | 0.108 | 11610 | 1400 | 0.084 | 10260 | 1160 | 0.060 |
| | 18 | 12330 | 1660 | 0.108 | 11610 | 1400 | 0.084 | 10260 | 1160 | 0.060 |
| | 20 | 12330 | 1660 | 0.108 | 11610 | 1400 | 0.084 | 10260 | 1160 | 0.060 |
| | 22 | 12330 | 1660 | 0.108 | 11610 | 1400 | 0.084 | 10260 | 1160 | 0.060 |

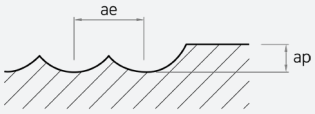
# Recommended Cutting Condition

## UB512, UB512S6 SERIES

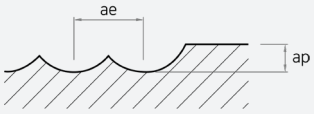
| Workpiece | | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | | Prehardened Steels (NAK, CENA, KP4) | | | Herdened Steels (SKD, SKT, STAVAX) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| Strength | | ~ 1100N/mm2 | | | 1100 ~ 1500N/mm2 | | | 1500 ~ 2000N/mm2 | | |
| Diameter (mm) | Effective Length (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| 3.0 | 26 | 12330 | 1660 | 0.068 | 11610 | 1400 | 0.053 | 10260 | 1160 | 0.038 |
| | 30 | 12330 | 1660 | 0.068 | 11610 | 1400 | 0.053 | 10260 | 1160 | 0.038 |
| | 35 | 10960 | 1310 | 0.068 | 10320 | 1105 | 0.053 | 9120 | 920 | 0.038 |
| | 40 | 10960 | 1310 | 0.041 | 10320 | 1105 | 0.032 | 9120 | 920 | 0.023 |
| | 45 | 10960 | 1310 | 0.041 | 10320 | 1105 | 0.032 | 9120 | 920 | 0.023 |
| | 50 | 8220 | 860 | 0.027 | 7740 | 725 | 0.021 | 6840 | 605 | 0.015 |
| | 60 | 8220 | 860 | 0.027 | 7740 | 725 | 0.021 | 6840 | 605 | 0.015 |
| 4.0 | 8 | 9800 | 1965 | 0.360 | 9300 | 1670 | 0.28 | 8200 | 1395 | 0.200 |
| | 10 | 9800 | 1965 | 0.360 | 9300 | 1670 | 0.28 | 8200 | 1395 | 0.200 |
| | 12 | 9800 | 1965 | 0.360 | 9300 | 1670 | 0.28 | 8200 | 1395 | 0.200 |
| | 14 | 9800 | 1965 | 0.252 | 9300 | 1670 | 0.196 | 8200 | 1395 | 0.140 |
| | 16 | 9800 | 1965 | 0.252 | 9300 | 1670 | 0.196 | 8200 | 1395 | 0.140 |
| | 18 | 9800 | 1965 | 0.252 | 9300 | 1670 | 0.196 | 8200 | 1395 | 0.140 |
| | 20 | 9800 | 1965 | 0.252 | 9300 | 1670 | 0.196 | 8200 | 1395 | 0.140 |
| | 22 | 8820 | 1590 | 0.144 | 8370 | 1355 | 0.112 | 7380 | 1130 | 0.080 |
| | 26 | 8820 | 1590 | 0.144 | 8370 | 1355 | 0.112 | 7380 | 1130 | 0.080 |
| | 30 | 8820 | 1590 | 0.144 | 8370 | 1355 | 0.112 | 7380 | 1130 | 0.080 |
| | 35 | 8820 | 1590 | 0.090 | 8370 | 1355 | 0.07 | 7380 | 1130 | 0.050 |
| | 40 | 8820 | 1590 | 0.090 | 8370 | 1355 | 0.07 | 7380 | 1130 | 0.050 |
| | 45 | 7840 | 1260 | 0.090 | 7440 | 1070 | 0.07 | 6560 | 895 | 0.050 |
| | 50 | 7840 | 1260 | 0.090 | 7440 | 1070 | 0.07 | 6560 | 895 | 0.050 |
| | 60 | 7840 | 1260 | 0.054 | 7440 | 1070 | 0.042 | 6560 | 895 | 0.030 |
| 5.0 | 15 | 7700 | 1845 | 0.315 | 7300 | 1455 | 0.245 | 6400 | 1285 | 0.175 |
| | 20 | 7700 | 1845 | 0.315 | 7300 | 1455 | 0.245 | 6400 | 1285 | 0.175 |
| | 26 | 6930 | 1495 | 0.180 | 6570 | 1180 | 0.14 | 5760 | 1040 | 0.100 |
| | 30 | 6930 | 1495 | 0.180 | 6570 | 1180 | 0.14 | 5760 | 1040 | 0.100 |
| | 35 | 6930 | 1495 | 0.180 | 6570 | 1180 | 0.14 | 5760 | 1040 | 0.100 |
| | 40 | 6930 | 1495 | 0.180 | 6570 | 1180 | 0.14 | 5760 | 1040 | 0.100 |
| | 50 | 6930 | 1495 | 0.113 | 6570 | 1180 | 0.088 | 5760 | 1040 | 0.063 |
| | 60 | 6160 | 1180 | 0.113 | 5840 | 930 | 0.088 | 5120 | 820 | 0.063 |
| 6.0 | 20 | 6500 | 1900 | 0.378 | 6200 | 1600 | 0.294 | 5500 | 1330 | 0.210 |
| | 30 | 6500 | 1900 | 0.378 | 6200 | 1600 | 0.294 | 5500 | 1330 | 0.210 |
| 8.0 | 25 | 4850 | 1800 | 0.504 | 4600 | 1500 | 0.392 | 4000 | 1280 | 0.280 |
| | 30 | 4850 | 1800 | 0.504 | 4600 | 1500 | 0.392 | 4000 | 1280 | 0.280 |
| 10.0 | 30 | 3850 | 1650 | 0.900 | 3680 | 1400 | 0.7 | 3200 | 1200 | 0.500 |
| | 40 | 3850 | 1650 | 0.630 | 3680 | 1400 | 0.49 | 3200 | 1200 | 0.350 |
| 12.0 | 32 | 3200 | 1520 | 1.080 | 3050 | 1300 | 0.84 | 2650 | 1100 | 0.600 |
| | 45 | 3200 | 1520 | 0.756 | 3050 | 1300 | 0.588 | 2650 | 1100 | 0.420 |

## UB512, UB512S6 SERIES

RPM = rev / min
FEED = mm / min




ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

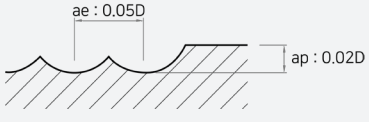



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

## UB532 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 35,000 | 2,800 | 33,000 | 2,600 | 12,000 | 900 |
| 4 | 26,000 | 2,300 | 25,000 | 2,200 | 9,000 | 800 |
| 5 | 21,000 | 2,100 | 20,000 | 2,000 | 7,000 | 700 |
| 6 | 17,000 | 1,900 | 16,000 | 1,800 | 6,000 | 650 |
| 8 | 13,000 | 1,700 | 12,000 | 1,600 | 4,500 | 550 |
| 10 | 10,500 | 1,450 | 10,000 | 1,400 | 3,500 | 500 |
| 12 | 9,000 | 1,400 | 8,000 | 1,300 | 3,000 | 450 |

RPM = rev / min
FEED = mm / min

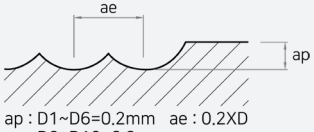


# Recommended Cutting Condition

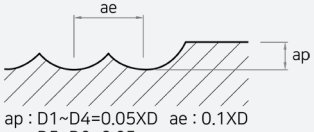
## UB542 SERIES ▶ General Cutting

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.1 | 16,500 | 80 | 25,500 | 185 | 25,500 | 160 |
| 0.2 | 16,500 | 90 | 25,500 | 220 | 25,500 | 200 |
| 0.3 | 15,300 | 112 | 24,000 | 260 | 24,000 | 220 |
| 0.4 | 15,300 | 112 | 24,000 | 260 | 24,000 | 220 |
| 0.5 | 13,300 | 128 | 20,800 | 300 | 20,800 | 250 |
| 0.6 | 11,200 | 144 | 17,600 | 330 | 17,600 | 280 |
| 0.8 | 11,200 | 144 | 17,600 | 330 | 17,600 | 280 |
| 1.0 | 10,180 | 160 | 16,000 | 370 | 16,000 | 320 |
| 1.5 | 9,500 | 220 | 13,000 | 500 | 12,800 | 400 |
| 2.0 | 9,250 | 260 | 11,500 | 640 | 11,300 | 590 |
| 3.0 | 8,000 | 370 | 10,200 | 880 | 9,800 | 850 |
| 4.0 | 6,720 | 420 | 8,500 | 880 | 8,200 | 850 |
| 5.0 | 5,840 | 460 | 7,500 | 880 | 7,200 | 850 |
| 6.0 | 5,500 | 660 | 6,900 | 920 | 6,500 | 880 |
| 8.0 | 4,600 | 740 | 5,600 | 840 | 5,300 | 800 |
| 10 | 4,070 | 820 | 4,850 | 800 | 4,650 | 770 |
| 12 | 3,700 | 890 | 4,350 | 800 | 4,150 | 770 |

RPM = rev / min
FEED = mm / min




ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

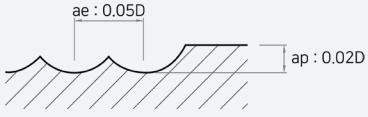



ap : D1~D4=0.05XD ae : 0.1XD
D5~D8=0.25mm
D10~D12=0.3mm

## USB502 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 13,500 | 1,700 | 13,200 | 1,620 | 12,500 | 860 |
| 4 | 10,600 | 1,700 | 10,300 | 1,620 | 9,800 | 860 |
| 5 | 9,400 | 1,650 | 9,050 | 1,570 | 8,600 | 860 |
| 6 | 8,600 | 1,750 | 8,250 | 1,670 | 7,850 | 865 |
| 8 | 7,000 | 1,550 | 6,700 | 1,460 | 6,350 | 890 |
| 10 | 6,050 | 1,450 | 5,800 | 1,360 | 5,450 | 870 |
| 12 | 5,450 | 1,420 | 5,200 | 1,330 | 4,900 | 785 |
| 16 | 4,300 | 1,200 | 4,000 | 1,100 | 3,700 | 650 |
| 20 | 3,600 | 1,050 | 3,200 | 900 | 3,000 | 550 |

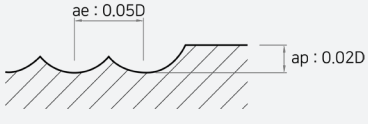
RPM = rev / min
FEED = mm / min




## UB503 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 13,500 | 1,700 | 13,200 | 1,620 | 12,500 | 860 |
| 4 | 10,600 | 1,700 | 10,300 | 1,620 | 9,800 | 860 |
| 5 | 9,400 | 1,650 | 9,050 | 1,570 | 8,600 | 860 |
| 6 | 8,600 | 1,750 | 8,250 | 1,670 | 7,850 | 865 |
| 8 | 7,000 | 1,550 | 6,700 | 1,460 | 6,350 | 890 |
| 10 | 6,050 | 1,450 | 5,800 | 1,360 | 5,450 | 870 |
| 12 | 5,450 | 1,420 | 5,200 | 1,330 | 4,900 | 785 |
| 16 | 4,300 | 1,200 | 4,000 | 1,100 | 3,700 | 650 |
| 20 | 3,600 | 1,050 | 3,200 | 900 | 3,000 | 550 |

RPM = rev / min
FEED = mm / min

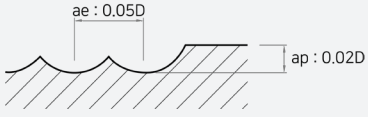


# Recommended Cutting Condition

## UB504 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 48,000 | 3,300 | 35,000 | 2,350 | 32,000 | 2,200 |
| 1.5 | 38,400 | 4,100 | 28,000 | 2,900 | 25,600 | 2,700 |
| 2 | 31,680 | 4,600 | 23,100 | 3,300 | 21,000 | 3,100 |
| 3 | 24,000 | 5,430 | 17,500 | 3,880 | 16,000 | 3,650 |
| 4 | 20,130 | 5,430 | 14,880 | 3,880 | 14,220 | 3,650 |
| 5 | 16,780 | 5,430 | 12,400 | 3,690 | 11,670 | 3,470 |
| 6 | 15,200 | 6,220 | 12,200 | 4,500 | 11,100 | 3,830 |
| 8 | 11,300 | 5,250 | 9,200 | 3,980 | 8,320 | 3,350 |
| 10 | 9,100 | 4,590 | 7,350 | 3,450 | 6,660 | 2,870 |
| 12 | 7,590 | 4,260 | 6,130 | 3,190 | 5,530 | 2,400 |

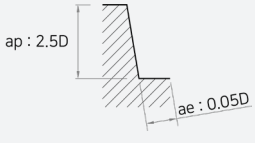
RPM = rev / min
FEED = mm / min




## UTB502 SERIES

| Workpiece | Alloy Steels Carbon Steels [SCM, SNCM, S45C] | | Prehardened Steels (NAK, CENA, KP4) | |
|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 0.4 | 36,000 | 144 | 27,900 | 113 |
| 0.6 | 25,200 | 144 | 18,900 | 113 |
| 0.8 | 18,000 | 144 | 13,950 | 108 |
| 1 | 14,850 | 149 | 11,250 | 113 |
| 2 | 7,560 | 153 | 5,670 | 113 |
| 3 | 3,969 | 108 | 3,213 | 90 |
| 4 | 3,213 | 126 | 2,556 | 104 |

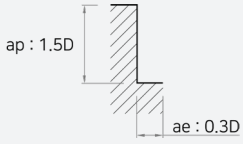
RPM = rev / min
FEED = mm / min

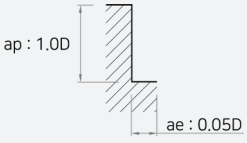


## UF50 SERIES

| Workpiece | Non ferrous Steel Alloy Steels Cast Iron | | Alloy Steels, Heat Resistant Steels | | Stainless Steel | | Heat Treatment Steel | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HRc30 | | HRc30 ~ HRc38 | | HRc38 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1200N/mm2 | | 1200 ~ 1400N/mm2 | | 1400 ~ 2000N/mm2 | | 2000N/mm2~ | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 15,600 | 2,320 | 12,400 | 840 | 8,400 | 570 | 3,400 | 260 | 2,400 | 190 |
| 8 | 11,600 | 2,320 | 9,200 | 840 | 6,300 | 570 | 2,400 | 240 | 1,800 | 180 |
| 10 | 9,200 | 2,320 | 7,600 | 840 | 5,100 | 570 | 2,000 | 290 | 1,300 | 190 |
| 12 | 8,000 | 2,400 | 6,000 | 800 | 4,200 | 570 | 1,680 | 260 | 1,200 | 190 |
| 14 | 6,800 | 2,400 | 5,200 | 840 | 3,600 | 570 | 1,400 | 200 | 900 | 130 |
| 16 | 6,000 | 2,400 | 4,800 | 760 | 3,300 | 510 | 1,200 | 160 | 800 | 110 |
| 18 | 5,200 | 2,320 | 4,400 | 720 | 2,700 | 420 | 1,100 | 150 | 700 | 100 |
| 20 | 4,800 | 2,160 | 3,600 | 560 | 2,400 | 360 | 1,000 | 150 | 660 | 100 |
| 25 | 4,300 | 2,150 | 3,200 | 620 | 2,160 | 410 | 900 | 160 | 600 | 100 |

RPM = rev / min
FEED = mm / min

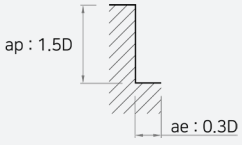


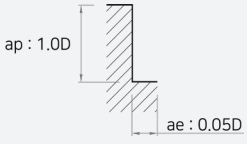




## UF51 SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, SNCM, S45C) | | Prehardened Steels (NAK, CENA, KP4) | | Herdened Steels (SKD, SKT, STAVAX) | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45~HRc55 | |
| Strength | ~ 1100N/mm2 | | 1100 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 12,400 | 840 | 8,400 | 570 | 3,400 | 260 |
| 8 | 9,200 | 840 | 6,300 | 570 | 2,400 | 240 |
| 10 | 7,600 | 840 | 5,100 | 570 | 2,000 | 290 |
| 12 | 6,000 | 800 | 4,200 | 570 | 1,680 | 260 |
| 14 | 5,200 | 840 | 3,600 | 570 | 1,400 | 200 |
| 16 | 4,800 | 760 | 3,300 | 510 | 1,200 | 160 |
| 18 | 4,400 | 720 | 2,700 | 420 | 1,100 | 150 |
| 20 | 3,600 | 560 | 2,400 | 360 | 1,000 | 150 |
| 25 | 3,200 | 620 | 2,160 | 410 | 900 | 160 |

RPM = rev / min
FEED = mm / min



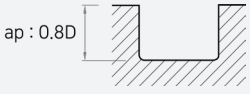



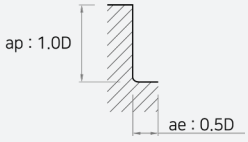
# Recommended Cutting Condition

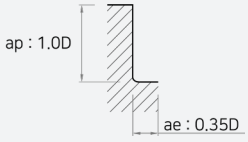
## UF51-H SERIES

| Workpiece | Alloy Steels Carbon Steels (SCM, S45C, S50C) | | Alloy Steels Carbon Steels Prehardened Steels (SCM, SKD, NAK, KP4) | | Alloy Steels Carbon Steels (SCM, S45C, S50C) | | Alloy Steels Carbon Steels Prehardened Steels (SCM, SKD, NAK, KP4) | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc25 | | HRc25 ~ HRc40 | | ~ HRc25 | | HRc25 ~ HRc40 | |
| Strength | - | | - | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 12,000 | 1,550 | 10,600 | 1,100 | 15,800 | 2,570 | 14,300 | 1,850 |
| 8 | 9,000 | 1,650 | 8,100 | 1,180 | 11,900 | 2,700 | 10,700 | 1,950 |
| 10 | 7,200 | 1,650 | 6,400 | 1,180 | 9,500 | 2,700 | 8,500 | 1,950 |
| 12 | 6,000 | 1,540 | 5,400 | 1,140 | 8,000 | 2,570 | 7,100 | 1,850 |
| 16 | 4,500 | 1,500 | 4,100 | 1,050 | 6,000 | 2,450 | 5,400 | 1,750 |
| 20 | 3,600 | 1,330 | 3,200 | 900 | 4,800 | 2,140 | 4,300 | 1,500 |

RPM = rev / min
FEED = mm / min



## TX202, TX222, TX302 SERIES

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Stainless Steels | | Cast Iron | | Alumunum Alloys | | Copper, Brass nonferrous Metals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | - | | - | | - | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | - | | - | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 14,300 | 105 | 8,500 | 65 | 7,150 | 50 | 18,700 | 205 | 44,000 | 330 | 24,700 | 200 |
| 1.5 | 9,350 | 150 | 5,550 | 85 | 5,600 | 80 | 12,100 | 205 | 27,500 | 385 | 20,300 | 300 |
| 2 | 7,850 | 160 | 5,150 | 100 | 4,300 | 80 | 9,350 | 220 | 22,000 | 460 | 16,500 | 340 |
| 3 | 6,100 | 180 | 3,800 | 120 | 3,150 | 100 | 6,050 | 220 | 15,400 | 460 | 11,000 | 340 |
| 4 | 5,150 | 255 | 3,150 | 155 | 2,650 | 130 | 4,600 | 220 | 11,000 | 460 | 8,800 | 340 |
| 5 | 4,300 | 270 | 2,550 | 160 | 2,150 | 135 | 3,650 | 220 | 9,150 | 460 | 6,800 | 340 |
| 6 | 3,800 | 300 | 2,300 | 190 | 1,950 | 155 | 2,950 | 255 | 7,600 | 485 | 5,700 | 375 |
| 8 | 2,850 | 325 | 1,700 | 170 | 1,450 | 155 | 2,200 | 275 | 5,700 | 485 | 4,400 | 375 |
| 10 | 2,200 | 280 | 1,350 | 135 | 1,150 | 135 | 1,850 | 285 | 4,600 | 485 | 3,400 | 375 |
| 12 | 1,850 | 240 | 1,150 | 110 | 950 | 110 | 1,450 | 295 | 3,750 | 485 | 2,850 | 375 |
| 14 | 1,700 | 215 | 1,050 | 100 | 850 | 100 | 1,300 | 310 | 3,300 | 485 | 2,400 | 375 |
| 16 | 1,500 | 185 | 950 | 95 | 700 | 95 | 1,100 | 320 | 2,850 | 485 | 2,200 | 375 |
| 20 | 1,150 | 145 | 700 | 70 | 550 | 70 | 900 | 340 | 2,200 | 485 | 1,700 | 375 |

RPM = rev / min
FEED = mm / min

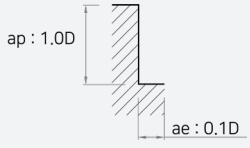
(ap : UP TO Ø 3.0 : 0.2D)

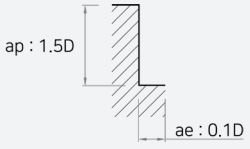
# Recommended Cutting Condition

## TX204, TX224, TX304 SERIES

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Stainless Steels | | Cast Iron | | Alumunum Alloys | | Copper, Brass nonferrous Metals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | - | | - | | - | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | - | | - | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 17,600 | 150 | 10,250 | 85 | 8,650 | 75 | 18,700 | 620 | 44,000 | 1,050 | 24,700 | 605 |
| 1.5 | 11,800 | 215 | 7,050 | 115 | 7,050 | 120 | 12,100 | 620 | 27500 | 1,160 | 20,300 | 910 |
| 2 | 9,850 | 240 | 6,450 | 145 | 5,350 | 120 | 9,350 | 640 | 22000 | 1,320 | 16,500 | 1,035 |
| 3 | 7,600 | 270 | 4,750 | 170 | 3,950 | 145 | 6,050 | 640 | 15400 | 1,320 | 11,000 | 1,035 |
| 4 | 6,450 | 485 | 3,950 | 300 | 3,300 | 240 | 4,600 | 640 | 11000 | 1,320 | 8,800 | 1,035 |
| 5 | 5,350 | 510 | 3,200 | 305 | 2,700 | 255 | 3,650 | 640 | 9150 | 1,320 | 6,800 | 1,035 |
| 6 | 4,750 | 560 | 2,850 | 350 | 2,400 | 280 | 2,950 | 770 | 7600 | 1,430 | 5,700 | 1,100 |
| 8 | 3,550 | 605 | 2,150 | 325 | 1,800 | 300 | 2,200 | 815 | 5700 | 1,430 | 4,400 | 1,100 |
| 10 | 2,750 | 520 | 1,700 | 255 | 1,450 | 255 | 1,850 | 860 | 4600 | 1,430 | 3,400 | 1,100 |
| 12 | 2,350 | 440 | 1,450 | 215 | 1,150 | 205 | 1,450 | 900 | 3750 | 1,430 | 2,850 | 1,100 |
| 14 | 2,100 | 395 | 1,300 | 195 | 1,050 | 190 | 1,300 | 945 | 3300 | 1,430 | 2,400 | 1,100 |
| 16 | 1,850 | 350 | 1,150 | 170 | 950 | 170 | 1,100 | 970 | 2850 | 1,430 | 2,200 | 1,100 |
| 20 | 1,450 | 270 | 900 | 135 | 700 | 130 | 900 | 1,035 | 2200 | 1,430 | 1,700 | 1,100 |

RPM = rev / min
FEED = mm / min



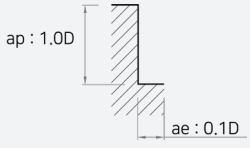



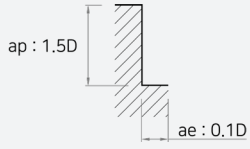

※ The FEED for long & extra long types, should be reduced by around 30~40%.

## TX304H SERIES

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Stainless Steels | | Cast Iron | | Alumunum Alloys | | Copper, Brass nonferrous Metals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ≤ HRc30 | | HRc30 ~ HRc45 | | - | | - | | - | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | - | | - | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 17,600 | 150 | 10,250 | 85 | 8,650 | 75 | 18,700 | 620 | 44,000 | 1,050 | 24,700 | 605 |
| 1.5 | 11,800 | 215 | 7,050 | 115 | 7,050 | 120 | 12,100 | 620 | 27,500 | 1,160 | 20,300 | 910 |
| 2 | 9,850 | 240 | 6,450 | 145 | 5,350 | 120 | 9,350 | 640 | 22,000 | 1,320 | 16,500 | 1,035 |
| 3 | 7,600 | 270 | 4,750 | 170 | 3,950 | 145 | 6,050 | 640 | 15,400 | 1,320 | 11,000 | 1,035 |
| 4 | 6,450 | 485 | 3,950 | 300 | 3,300 | 240 | 4,600 | 640 | 11,000 | 1,320 | 8,800 | 1,035 |
| 5 | 5,350 | 510 | 3,200 | 305 | 2,700 | 255 | 3,650 | 640 | 9,150 | 1,320 | 6,800 | 1,035 |
| 6 | 4,750 | 560 | 2,850 | 350 | 2,400 | 280 | 2,950 | 770 | 7,600 | 1,430 | 5,700 | 1,100 |
| 8 | 3,550 | 605 | 2,150 | 325 | 1,800 | 300 | 2,200 | 815 | 5,700 | 1,430 | 4,400 | 1,100 |
| 10 | 2,750 | 520 | 1,700 | 255 | 1,450 | 255 | 1,850 | 860 | 4,600 | 1,430 | 3,400 | 1,100 |
| 12 | 2,350 | 440 | 1,450 | 215 | 1,150 | 205 | 1,450 | 900 | 3,750 | 1,430 | 2,850 | 1,100 |
| 14 | 2,100 | 395 | 1,300 | 195 | 1,080 | 190 | 1,300 | 945 | 3,300 | 1,430 | 2,400 | 1,100 |
| 16 | 1,850 | 350 | 1,150 | 170 | 950 | 170 | 1,100 | 970 | 2,850 | 1,430 | 2,200 | 1,100 |
| 20 | 1,450 | 270 | 900 | 135 | 700 | 130 | 900 | 1,035 | 2,200 | 1,430 | 1,700 | 1,100 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## ZE302, ZE322 SERIES ▶ General Cutting

| Workpiece | Alloy Steels, Heat Resistant Steels | | Herdened Steels | | Stainless Steels | |
|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | - | |
| Strength | 1000 ~ 1250N/mm2 | | 1250 ~ 1750N/mm2 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 9,700 | 220 | 6,350 | 135 | 5,300 | 105 |
| 3 | 7,500 | 240 | 4,670 | 160 | 3,880 | 135 |
| 4 | 6,350 | 345 | 3,880 | 205 | 3,250 | 175 |
| 5 | 5,300 | 370 | 3,170 | 220 | 2,650 | 185 |
| 6 | 4,670 | 405 | 2,830 | 255 | 2,380 | 205 |
| 8 | 3,530 | 435 | 2,120 | 230 | 1,760 | 205 |
| 10 | 2,730 | 380 | 1,680 | 185 | 1,420 | 185 |
| 12 | 2,310 | 320 | 1,420 | 150 | 1,140 | 150 |
| 16 | 1,850 | 255 | 1,140 | 125 | 890 | 125 |
| 20 | 1,420 | 195 | 890 | 90 | 705 | 90 |
| 25 | 1,150 | 150 | 705 | 80 | 580 | 70 |

RPM = rev / min
FEED = mm / min

(ap : UP TO Ø 3.0 : 0.2D)

## ZE302, ZE322 SERIES ▶ High Speed Cutting

| Workpiece | Alloy Steels, Heat Resistant Steels | | Herdened Steels | | | | Stainless Steels | |
|---|---|---|---|---|---|---|---|---|
| Hardness | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc40 ~ HRc55 | | - | |
| Strength | 1000 ~ 1250N/mm2 | | 1250 ~ 1750N/mm2 | | 1750 ~ 2000N/mm2 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 18,000 | 665 | 11,800 | 415 | 8,700 | 175 | 9,800 | 345 |
| 3 | 11,000 | 655 | 6,800 | 435 | 5,600 | 185 | 6,200 | 370 |
| 4 | 10,300 | 725 | 6,300 | 430 | 4,300 | 185 | 5,300 | 370 |
| 5 | 9,350 | 715 | 5,570 | 420 | 3,700 | 185 | 4,620 | 355 |
| 6 | 8,200 | 750 | 4,930 | 470 | 3,250 | 185 | 4,100 | 390 |
| 8 | 6,300 | 770 | 3,780 | 410 | 2,470 | 185 | 3,120 | 355 |
| 10 | 4,830 | 750 | 2,940 | 360 | 2,000 | 160 | 2,470 | 310 |
| 12 | 4,100 | 750 | 2,520 | 345 | 1,680 | 160 | 2,100 | 300 |
| 16 | 3,260 | 715 | 2,000 | 355 | 1,890 | 150 | 1,940 | 290 |
| 20 | 2,520 | 665 | 1,580 | 310 | 1,680 | 150 | 1,630 | 275 |
| 25 | 2,000 | 635 | 1,260 | 340 | 1,570 | 150 | 1,420 | 290 |

RPM = rev / min
FEED = mm / min

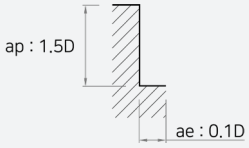
(ap : UP TO Ø 3.0 : 0.2D)

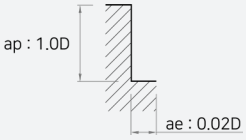
# Recommended Cutting Condition

## ZE304, ZE324 SERIES ▶ General Cutting

| Workpiece | Alloy Steels, Heat Resistant Steels | | Herdened Steels | | | | Stainless Steels | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 12,100 | 320 | 7,900 | 195 | 2,700 | 47 | 6,600 | 160 |
| 3 | 9,400 | 370 | 5,840 | 230 | 2,000 | 58 | 4,850 | 195 |
| 4 | 7,900 | 655 | 4,850 | 405 | 1,500 | 58 | 4,070 | 320 |
| 5 | 6,600 | 690 | 3,970 | 415 | 1,300 | 58 | 3,320 | 345 |
| 6 | 5,830 | 760 | 3,530 | 470 | 1,150 | 58 | 2,980 | 380 |
| 8 | 4,410 | 815 | 2,650 | 435 | 880 | 58 | 2,200 | 405 |
| 10 | 3,420 | 700 | 2,100 | 345 | 720 | 46 | 1,760 | 345 |
| 12 | 2,880 | 600 | 1,760 | 290 | 590 | 46 | 1,430 | 275 |
| 16 | 2,310 | 470 | 1,430 | 230 | 460 | 29 | 1,150 | 230 |
| 20 | 1,760 | 370 | 1,110 | 185 | 340 | 29 | 880 | 175 |
| 25 | 1,430 | 290 | 880 | 150 | 270 | 23 | 715 | 140 |

RPM = rev / min
FEED = mm / min



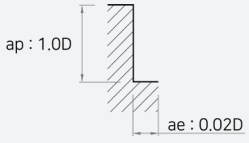




※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

## ZE304, ZE324 SERIES ▶ High Speed Cutting

| Workpiece | Alloy Steels, Heat Resistant Steels | | Herdened Steels | | | | Stainless Steels | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 31,400 | 1,230 | 23,500 | 520 | 12,600 | 275 | 21,600 | 465 |
| 3 | 19,300 | 1,210 | 13,600 | 735 | 8,900 | 390 | 13,500 | 660 |
| 4 | 18,100 | 1,330 | 12,600 | 865 | 7,090 | 465 | 11,800 | 775 |
| 5 | 16,400 | 1,310 | 11,100 | 1,010 | 6,040 | 530 | 10,300 | 910 |
| 6 | 14,400 | 1,380 | 9,900 | 1,100 | 5,300 | 580 | 9,100 | 990 |
| 8 | 11,000 | 1,430 | 7,600 | 1,090 | 3,990 | 575 | 6,900 | 980 |
| 10 | 8,500 | 1,380 | 5,880 | 1,110 | 3,150 | 580 | 5,420 | 1,000 |
| 12 | 7,200 | 1,380 | 5,040 | 1,090 | 2,620 | 575 | 4,600 | 985 |
| 16 | 5,700 | 1,320 | 3,990 | 1,010 | 2,000 | 535 | 3,590 | 910 |
| 20 | 4,400 | 1,270 | 3,150 | 930 | 1,580 | 490 | 2,840 | 840 |
| 25 | 3,500 | 1,170 | 2,520 | 755 | 1,260 | 390 | 2,270 | 680 |

RPM = rev / min
FEED = mm / min



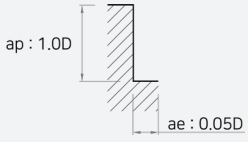

※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

# Recommended Cutting Condition

## ZR304H, ZR324H SERIES

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Herdened Steels | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc50 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 7,000 | 910 | 4,200 | 560 | 3,000 | 140 |
| 8 | 5,300 | 980 | 3,200 | 530 | 2,500 | 190 |
| 10 | 4,100 | 840 | 2,500 | 410 | 2,050 | 165 |
| 12 | 3,500 | 730 | 2,100 | 340 | 1,700 | 140 |

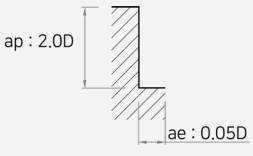
RPM = rev / min
FEED = mm / min

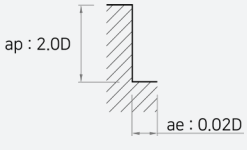



## ZR322 SERIES ▶ Side Cutting

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Herdened Steels | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 6,950 | 195 | 4,500 | 150 | 3,300 | 100 |
| 4 | 5,600 | 240 | 3,600 | 170 | 2,700 | 105 |
| 5 | 4,800 | 250 | 3,050 | 210 | 2,350 | 125 |
| 6 | 4,150 | 250 | 2,650 | 210 | 2,050 | 125 |
| 8 | 3,150 | 265 | 2,000 | 210 | 1,600 | 125 |
| 10 | 2,150 | 265 | 1,700 | 210 | 1,250 | 125 |
| 12 | 1,800 | 210 | 1,500 | 185 | 1,050 | 105 |
| 16 | 1,800 | 185 | 1,100 | 140 | 840 | 90 |
| 20 | 1,300 | 130 | 860 | 105 | 625 | 65 |

RPM = rev / min
FEED = mm / min



## ZR322 ERIES ▶ Slotting

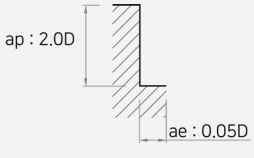
| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Herdened Steels | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 6,950 | 160 | 4,500 | 80 | 3,300 | 55 |
| 4 | 5,600 | 195 | 3,600 | 100 | 2,700 | 60 |
| 5 | 4,800 | 240 | 3,050 | 115 | 2,350 | 75 |
| 6 | 4,150 | 290 | 2,650 | 145 | 2,050 | 90 |
| 8 | 3,150 | 210 | 2,000 | 145 | 1,600 | 90 |
| 10 | 2,150 | 250 | 1,700 | 140 | 1,250 | 90 |
| 12 | 1,800 | 200 | 1,500 | 135 | 1,050 | 75 |
| 16 | 1,800 | 215 | 1,100 | 100 | 840 | 60 |
| 20 | 1,300 | 160 | 860 | 70 | 625 | 45 |

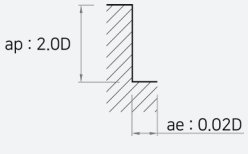
RPM = rev / min
FEED = mm / min

## ZR324 SERIES

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Herdened Steels | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 6,950 | 195 | 4,500 | 150 | 3,300 | 100 |
| 4 | 5,600 | 240 | 3,600 | 170 | 2,700 | 105 |
| 5 | 4,800 | 250 | 3,050 | 210 | 2,350 | 125 |
| 6 | 4,150 | 250 | 2,650 | 210 | 2,050 | 125 |
| 8 | 3,150 | 265 | 2,000 | 210 | 1,600 | 125 |
| 10 | 2,150 | 265 | 1,700 | 210 | 1,250 | 125 |
| 12 | 1,800 | 210 | 1,500 | 185 | 1,050 | 105 |
| 16 | 1,880 | 185 | 1,100 | 140 | 840 | 90 |
| 20 | 1,300 | 130 | 860 | 105 | 625 | 65 |

RPM = rev / min
FEED = mm / min



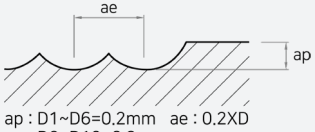



# Recommended Cutting Condition

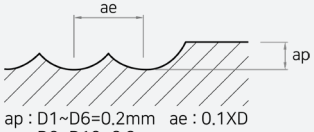
## DB312, DB342 SERIES ▶ General Cutting

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | | Herdened Steels | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc40 | | HRc40 ~ HRc55 | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1250N/mm2 | | 1500N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 16,500 | 290 | 13,300 | 230 | 6,100 | 105 |
| 1.5 | 16,500 | 405 | 12,700 | 310 | 5,590 | 140 |
| 2 | 15,100 | 865 | 11,200 | 565 | 4,900 | 175 |
| 2.5 | 15,100 | 865 | 11,200 | 565 | 4,900 | 175 |
| 3 | 13,800 | 780 | 10,500 | 530 | 4,750 | 175 |
| 4 | 11,000 | 850 | 8,800 | 610 | 4,410 | 205 |
| 5 | 9,600 | 945 | 7,600 | 665 | 3,860 | 205 |
| 6 | 8,900 | 1,150 | 7,200 | 955 | 3,340 | 220 |
| 8 | 7,500 | 1,500 | 6,050 | 1,060 | 2,590 | 255 |
| 10 | 6,700 | 1,750 | 5,300 | 1,170 | 2,140 | 260 |
| 12 | 6,150 | 2,000 | 4,900 | 1,280 | 1,840 | 280 |
| 16 | 5,000 | 1,950 | 3,900 | 1,220 | 1,420 | 280 |
| 20 | 4,350 | 1,900 | 3,400 | 1,200 | 1,170 | 290 |

RPM = rev / min
FEED = mm / min




ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm



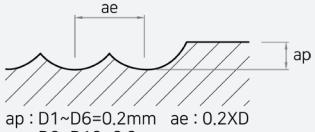

ap : D1~D6=0.2mm ae : 0.1XD
D8~D12=0.3mm

※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

## DB312, DB342 SERIES ▶ High Speed Cutting

| Workpiece | NON-Alloy Steels, Alloy Steels, Cast Iron | | Alloy Steels, Heat Resistant Steels | |
|---|---|---|---|---|
| Hardness | ~ HRc45 | | HRc30 ~ HRc40 | |
| Strength | ~ 1000N/mm2 | | 1500 ~ 2000N/mm2 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 1 | 26,000 | 1,500 | 26,000 | 920 |
| 1.5 | 24,000 | 1,600 | 24,000 | 990 |
| 2 | 22,000 | 1,700 | 22,000 | 1,080 |
| 2.5 | 22,000 | 2,000 | 20,000 | 1,130 |
| 3 | 22,000 | 2,300 | 17,800 | 1,200 |
| 4 | 22,000 | 3,350 | 14,300 | 1,300 |
| 5 | 22,000 | 4,150 | 12,600 | 1,380 |
| 6 | 22,000 | 4,600 | 11,000 | 1,440 |
| 8 | 17,500 | 4,600 | 8,800 | 1,440 |
| 10 | 14,700 | 4,450 | 7,350 | 1,380 |
| 12 | 12,800 | 4,450 | 6,400 | 1,330 |
| 16 | 10,000 | 4,000 | 5,000 | 1,150 |
| 20 | 8,350 | 3,650 | 4,150 | 1,060 |

RPM = rev / min
FEED = mm / min




ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm

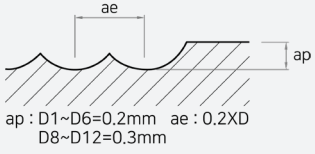
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

# Recommended Cutting Condition

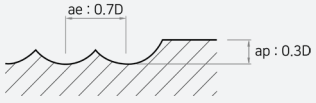
## TXB202, TXB222, TXB232, TXB302 SERIES

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | | | Herdened Steels | | Cast Iron | | Alumunum Alloys | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc50 | | - | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500N/mm2 | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 12,350 | 640 | 9,150 | 415 | 4,000 | 125 | 10,500 | 220 | 30,800 | 395 |
| 3 | 11,400 | 575 | 8,550 | 390 | 3,800 | 125 | 7,050 | 230 | 20,500 | 395 |
| 4 | 8,950 | 630 | 7,150 | 450 | 3,600 | 150 | 5,150 | 285 | 15,400 | 395 |
| 5 | 7,800 | 700 | 6,200 | 490 | 3,100 | 150 | 4,150 | 330 | 12,100 | 470 |
| 6 | 7,250 | 870 | 5,900 | 705 | 2,700 | 160 | 3,400 | 360 | 10,300 | 470 |
| 8 | 6,100 | 1,090 | 4,900 | 785 | 2,050 | 190 | 2,500 | 460 | 7,900 | 540 |
| 10 | 5,450 | 1,330 | 4,350 | 870 | 1,750 | 190 | 2,050 | 460 | 6,150 | 540 |
| 12 | 4,990 | 1,500 | 3,950 | 950 | 1,500 | 210 | 1,750 | 460 | 5,150 | 630 |
| 14 | 4,530 | 1,495 | 3,600 | 925 | 1,300 | 210 | 1,400 | 460 | 4,300 | 630 |
| 16 | 4,085 | 1,470 | 3,200 | 905 | 1,150 | 210 | 1,300 | 460 | 3,850 | 540 |
| 18 | 3,800 | 1,425 | 3,000 | 890 | 1,050 | 210 | 1,100 | 460 | 3,400 | 540 |
| 20 | 3,550 | 1,425 | 2,800 | 885 | 950 | 210 | 1,050 | 420 | 2,950 | 540 |

RPM = rev / min
FEED = mm / min




ap : D1~D6=0.2mm ae : 0.2XD
D8~D12=0.3mm




※ Please reduce cutting speed 30~40% from the above table when using long and extra long type

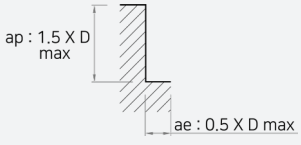
## TXB204, TXB304 SERIES

| Workpiece | Alloy Steels, Tool Steels | | | | Herdened Steels | | Cast Iron | | Alumunum Alloys | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc50 | | - | | - | |
| Strength | ~ 1000N/mm2 | | 1000 ~ 1500N/mm2 | | 1500N/mm2 | | - | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 15,400 | 1,000 | 11,400 | 600 | 5,000 | 200 | 13,100 | 300 | 38,500 | 600 |
| 3 | 14,300 | 900 | 10,700 | 600 | 4,800 | 200 | 8,800 | 300 | 25,600 | 600 |
| 4 | 11,200 | 900 | 8,900 | 700 | 4,500 | 200 | 6,400 | 400 | 19,300 | 600 |
| 5 | 9,800 | 1,100 | 7,800 | 700 | 3,900 | 200 | 5,200 | 500 | 15,100 | 700 |
| 6 | 9,100 | 1,300 | 7,400 | 1,100 | 3,400 | 200 | 4,300 | 500 | 12,900 | 700 |
| 8 | 7,600 | 1,600 | 6,100 | 1,200 | 2,600 | 300 | 3,100 | 700 | 9,900 | 800 |
| 10 | 6,800 | 2,000 | 5,400 | 1,300 | 2,200 | 300 | 2,600 | 700 | 7,700 | 800 |
| 12 | 6,200 | 2,300 | 4,900 | 1,400 | 1,900 | 300 | 2,200 | 700 | 6,400 | 900 |
| 14 | 5,700 | 2,200 | 4,500 | 1,400 | 1,600 | 300 | 1,800 | 700 | 5,400 | 900 |
| 16 | 5,100 | 2,200 | 4,000 | 1,400 | 1,400 | 300 | 1,600 | 700 | 4,800 | 800 |
| 18 | 4,800 | 2,100 | 3,800 | 1,300 | 1,300 | 300 | 1,400 | 700 | 4,300 | 800 |
| 20 | 4,400 | 2,100 | 3,500 | 1,300 | 1,200 | 300 | 1,300 | 600 | 3,700 | 800 |

## X-STAR SERIES

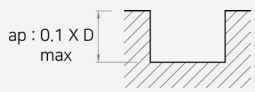
| Workpiece | Low Carbon Steels | | Low Carbon Steels | | Med Alloy Steels | | Mold&Die Steels | | Grey Cast Iron | | Cast Iron-Ductile | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HB175 | | ~HB275 | | ~HB275 | | ~HB275 | | ~HB200 | | ~HB300 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 16,500 | 335 | 13,585 | 276 | 11,320 | 230 | 5,820 | 118 | 15,360 | 300 | 7,765 | 158 |
| 4 | 12,340 | 326 | 10,190 | 326 | 8,520 | 340 | 4,380 | 175 | 11,550 | 462 | 5,810 | 232 |
| 5 | 9,895 | 502 | 8,150 | 413 | 6,790 | 345 | 3,490 | 177 | 9,215 | 468 | 4,655 | 236 |
| 6 | 8,250 | 586 | 6,795 | 483 | 5,660 | 403 | 2,910 | 207 | 7,680 | 546 | 3,880 | 276 |
| 8 | 6,185 | 754 | 5,095 | 620 | 4,245 | 517 | 2,185 | 266 | 5,760 | 702 | 2,910 | 354 |
| 10 | 4,950 | 955 | 4,075 | 786 | 3,395 | 656 | 1,745 | 337 | 4,610 | 889 | 2,330 | 449 |
| 12 | 4,125 | 963 | 3,395 | 793 | 2,830 | 661 | 1,455 | 340 | 3,840 | 897 | 1,940 | 453 |
| 14 | 3,535 | 890 | 2,910 | 733 | 2,425 | 592 | 1,250 | 314 | 3,290 | 829 | 1,665 | 419 |
| 16 | 3,095 | 817 | 2,545 | 672 | 2,125 | 561 | 1,090 | 288 | 2,880 | 761 | 1,455 | 384 |
| 18 | 2,750 | 809 | 2,265 | 667 | 1,885 | 556 | 970 | 285 | 2,560 | 754 | 1,295 | 381 |
| 20 | 2,475 | 804 | 2,040 | 662 | 1,700 | 552 | 875 | 283 | 2,305 | 749 | 1,165 | 378 |
| 25 | 1,975 | 631 | 1,630 | 521 | 1,360 | 435 | 700 | 230 | 1,850 | 600 | 930 | 300 |

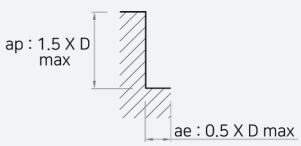
RPM = rev / min
FEED = mm / min




| Workpiece | Cast Iron Malleable | | Stainless 300 Series | | Stainless 400 Series | | Stainless PH Series | | Titanium Alloys | | Heat Resistant Steels | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HB300 | | ~HB275 | | ~HB185 | | ~HB325 | | ~HB295 | | ~HB300 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 4,850 | 95 | 9,705 | 175 | 13,585 | 250 | 8,085 | 125 | 9,705 | 225 | 2,590 | 50 |
| 4 | 3,660 | 146 | 7,245 | 290 | 10,190 | 407 | 6,050 | 242 | 7,245 | 290 | 1,910 | 76 |
| 5 | 2,910 | 147 | 5,820 | 300 | 8,150 | 430 | 4,850 | 250 | 5,820 | 355 | 1,550 | 75 |
| 6 | 2,425 | 173 | 4,850 | 355 | 6,795 | 560 | 4,045 | 300 | 4,850 | 405 | 1,295 | 75 |
| 8 | 1,820 | 221 | 3,640 | 405 | 5,095 | 635 | 3,030 | 355 | 3,640 | 455 | 970 | 100 |
| 10 | 1,455 | 280 | 2,910 | 405 | 4,075 | 635 | 2,425 | 355 | 2,910 | 455 | 775 | 100 |
| 12 | 1,215 | 283 | 2,425 | 405 | 3,395 | 635 | 2,020 | 355 | 2,425 | 455 | 645 | 100 |
| 14 | 1,040 | 262 | 2,080 | 405 | 2,910 | 635 | 1,735 | 355 | 2,080 | 455 | 555 | 100 |
| 16 | 910 | 240 | 1,820 | 405 | 2,545 | 635 | 1,515 | 355 | 1,820 | 455 | 485 | 100 |
| 18 | 810 | 238 | 1,615 | 380 | 2,265 | 560 | 1,350 | 300 | 1,615 | 405 | 430 | 100 |
| 20 | 730 | 236 | 1,455 | 380 | 2,040 | 560 | 1,215 | 300 | 1,455 | 405 | 390 | 100 |
| 25 | 585 | 187 | 1,160 | 370 | 1,630 | 560 | 970 | 300 | 1,160 | 405 | 305 | 73 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## X-STAR SERIES ▶ General Cutting

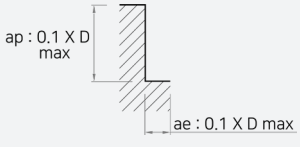
| Workpiece | Herdened Steels | |
|---|---|---|
| Hardness | HRc30 ~ HRc45 | |
| Diameter (mm) | RPM | FEED |
| 3 | 6,900 | 552 |
| 4 | 5,175 | 414 |
| 5 | 4,140 | 331 |
| 6 | 3,450 | 414 |
| 8 | 2,588 | 414 |
| 10 | 2,070 | 414 |
| 12 | 1,725 | 414 |
| 14 | 1,479 | 414 |
| 16 | 1,294 | 414 |
| 18 | 1,150 | 368 |
| 20 | 1,035 | 414 |
| 25 | 828 | 397 |

RPM = rev / min
FEED = mm / min

## X-STAR SERIES ▶ Side Cutting

| Workpiece | Herdened Steels | |
|---|---|---|
| Hardness | HRc30 ~ HRc45 | |
| Diameter (mm) | RPM | FEED |
| 3 | 8,493 | 679 |
| 4 | 6,369 | 510 |
| 5 | 5,096 | 611 |
| 6 | 4,246 | 849 |
| 8 | 3,185 | 764 |
| 10 | 2,548 | 713 |
| 12 | 2,123 | 764 |
| 14 | 1,820 | 728 |
| 16 | 1,592 | 701 |
| 18 | 1,415 | 679 |
| 20 | 1,274 | 662 |
| 25 | 1,019 | 611 |

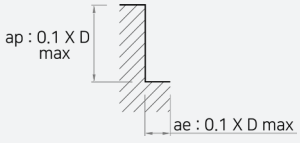
RPM = rev / min
FEED = mm / min



## X-STAR SERIES ▶ High Speed Cutting

| Workpiece | Herdened Steels | |
|---|---|---|
| Hardness | HRc30 ~ HRc45 | |
| Diameter (mm) | RPM | FEED |
| 3 | 18,047 | 2,166 |
| 4 | 13,535 | 1,624 |
| 5 | 10,828 | 1,732 |
| 6 | 9,023 | 2,166 |
| 8 | 6,768 | 1,895 |
| 10 | 5,414 | 1,732 |
| 12 | 4,512 | 1,985 |
| 14 | 3,867 | 1,856 |
| 16 | 3,384 | 1,895 |
| 18 | 3,008 | 1,805 |
| 20 | 2,707 | 1,841 |
| 25 | 2,166 | 1,646 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## SE502 SERIES ▶ Slotting

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | | | Stainless Steels 300 Series | |
|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc40 | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 13000 | 220 | 9800 | 160 | 21000 | 170 |
| 1.2 | 12500 | 210 | 9000 | 150 | 17500 | 140 |
| 1.5 | 12000 | 200 | 8300 | 140 | 14000 | 110 |
| 2 | 11560 | 190 | 7560 | 120 | 10500 | 85 |
| 2.5 | 10240 | 200 | 6560 | 130 | 8500 | 70 |
| 3 | 8920 | 210 | 5560 | 140 | 8000 | 65 |
| 4 | 7560 | 300 | 4620 | 180 | 7500 | 75 |
| 5 | 6300 | 320 | 3780 | 190 | 6000 | 80 |
| 6 | 5560 | 350 | 3360 | 220 | 5000 | 80 |
| 8 | 4200 | 380 | 2520 | 200 | 3750 | 90 |
| 10 | 3260 | 330 | 2000 | 160 | 3000 | 90 |
| 12 | 2740 | 280 | 1680 | 130 | 2500 | 95 |
| 14 | 2470 | 250 | 1520 | 120 | 2150 | 100 |
| 16 | 2200 | 220 | 1360 | 110 | 1880 | 105 |
| 18 | 1940 | 195 | 1210 | 95 | 1670 | 110 |
| 20 | 1680 | 170 | 1060 | 80 | 1500 | 115 |

RPM = rev / min
FEED = mm / min

(ap : UP TO Ø 3.0 : 0.2D)

## SE503 SERIES ▶ Slotting

| Work-piece | Carbon Steels, Alloy Steels, Tool Steels | | | | | | Cast Iron | | Stainless Steels | | Copper Alloy | | Ti Alloy | | Ti Alloy | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc45 | | | | | | | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 30000 | 1000 | 23000 | 800 | 16500 | 450 | 20000 | 500 | 16500 | 350 | 25000 | 360 | 16500 | 380 | 6500 | 100 |
| 1.5 | 20000 | 1000 | 15500 | 800 | 11000 | 450 | 13000 | 500 | 11000 | 350 | 16500 | 360 | 11000 | 380 | 4500 | 100 |
| 2 | 15000 | 1000 | 11500 | 800 | 8200 | 450 | 10000 | 500 | 8400 | 350 | 12500 | 360 | 8200 | 380 | 3500 | 100 |
| 2.5 | 12000 | 1000 | 9400 | 800 | 7500 | 450 | 8000 | 500 | 6500 | 350 | 10000 | 360 | 6500 | 380 | 2600 | 100 |
| 3 | 10080 | 950 | 7750 | 740 | 5550 | 395 | 6700 | 520 | 5550 | 350 | 8300 | 360 | 5550 | 395 | 2200 | 100 |
| 4 | 7550 | 1400 | 5850 | 1100 | 4200 | 595 | 5050 | 550 | 4200 | 320 | 6200 | 400 | 4200 | 595 | 1650 | 105 |
| 5 | 6000 | 1500 | 4700 | 1200 | 3300 | 650 | 4000 | 600 | 3300 | 350 | 5000 | 420 | 3300 | 600 | 1400 | 120 |
| 6 | 5050 | 1650 | 3850 | 1250 | 2800 | 700 | 3350 | 660 | 2800 | 370 | 4100 | 440 | 2800 | 700 | 1150 | 130 |
| 8 | 3750 | 1700 | 2950 | 1330 | 2100 | 710 | 2500 | 665 | 2100 | 375 | 3100 | 500 | 2100 | 710 | 850 | 120 |
| 10 | 3050 | 1650 | 2300 | 1250 | 1650 | 665 | 2000 | 630 | 1350 | 355 | 2500 | 530 | 1650 | 665 | 650 | 120 |
| 12 | 2500 | 1500 | 2000 | 1200 | 1350 | 605 | 1650 | 570 | 1350 | 320 | 2000 | 550 | 1350 | 605 | 555 | 110 |
| 14 | 2150 | 1550 | 1700 | 1200 | 1200 | 605 | 1450 | 580 | 1200 | 250 | 1700 | 600 | 1200 | 605 | 500 | 110 |
| 16 | 1850 | 1600 | 1450 | 1250 | 1000 | 650 | 1250 | 600 | 1000 | 200 | 1500 | 650 | 1000 | 610 | 400 | 115 |
| 18 | 1650 | 1650 | 1300 | 1300 | 920 | 700 | 1100 | 620 | 900 | 150 | 1300 | 700 | 900 | 615 | 350 | 120 |
| 20 | 1500 | 1700 | 1150 | 1350 | 840 | 750 | 1000 | 640 | 800 | 100 | 1200 | 750 | 800 | 620 | 320 | 125 |

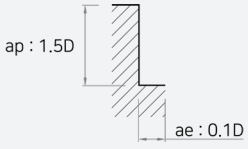
RPM = rev / min
FEED = mm / min

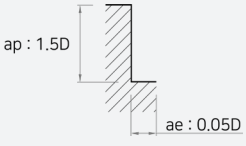
# Recommended Cutting Condition

## SE503 SERIES ▶ Side Cutting

| Work-piece | Carbon Steels, Alloy Steels, Tool Steels | | | | | | Cast Iron | | Stainless Steels | | Copper Alloy | | Ti Alloy | | Ti Alloy | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc45 | | | | | | | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 30000 | 1130 | 23000 | 904 | 16500 | 510 | 20000 | 565 | 16500 | 395 | 25000 | 405 | 16500 | 430 | 6500 | 115 |
| 1.5 | 20000 | 1130 | 15500 | 904 | 11000 | 510 | 13000 | 565 | 11000 | 395 | 16500 | 405 | 11000 | 430 | 4500 | 115 |
| 2 | 15000 | 1130 | 11500 | 904 | 8200 | 510 | 10000 | 565 | 8400 | 395 | 12500 | 405 | 8200 | 430 | 3500 | 115 |
| 2.5 | 12000 | 1130 | 9400 | 904 | 7500 | 510 | 8000 | 565 | 6500 | 395 | 10000 | 405 | 6500 | 430 | 2600 | 115 |
| 3 | 10080 | 1080 | 7750 | 850 | 5550 | 450 | 6700 | 605 | 5550 | 365 | 8300 | 390 | 5550 | 450 | 2200 | 110 |
| 4 | 7550 | 1630 | 5850 | 1260 | 4200 | 680 | 5050 | 630 | 4200 | 365 | 6200 | 440 | 4200 | 680 | 1650 | 125 |
| 5 | 6000 | 1695 | 4700 | 1355 | 3300 | 735 | 4000 | 680 | 3300 | 395 | 5000 | 475 | 3300 | 680 | 1400 | 135 |
| 6 | 5050 | 1910 | 3850 | 1470 | 2800 | 810 | 3350 | 755 | 2800 | 430 | 4100 | 490 | 2800 | 810 | 1150 | 150 |
| 8 | 3750 | 1950 | 2950 | 1500 | 2100 | 810 | 2500 | 770 | 2100 | 430 | 3100 | 550 | 2100 | 810 | 850 | 140 |
| 10 | 3050 | 1890 | 2300 | 1400 | 1650 | 775 | 2000 | 720 | 1350 | 415 | 2500 | 570 | 1650 | 775 | 650 | 140 |
| 12 | 2500 | 1700 | 2000 | 1340 | 1350 | 700 | 1650 | 665 | 1350 | 365 | 2000 | 620 | 1350 | 700 | 555 | 125 |
| 14 | 2150 | 1750 | 1700 | 1355 | 1200 | 685 | 1450 | 655 | 1200 | 280 | 1700 | 680 | 1200 | 685 | 500 | 125 |
| 16 | 1850 | 1805 | 1450 | 1410 | 1000 | 735 | 1250 | 680 | 1000 | 225 | 1500 | 735 | 1000 | 690 | 400 | 130 |
| 18 | 1650 | 1865 | 1300 | 1470 | 920 | 790 | 1100 | 700 | 900 | 170 | 1300 | 790 | 900 | 695 | 350 | 135 |
| 20 | 1500 | 1920 | 1150 | 1525 | 840 | 845 | 1000 | 725 | 800 | 115 | 1200 | 850 | 800 | 700 | 320 | 140 |

RPM = rev / min
FEED = mm / min



## SE504 , SR504 SERIES ▶ Slotting

| Workpiece | Alloy Steels, Cast Iron | | Stainless Steels 300 Series | | Stainless Steels 400 Series | | Titanium | | Inconel | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HB230 | | | | | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 40,500 | 300 | 20,000 | 250 | 28,000 | 160 | 23,925 | 225 | 9330 | 60 |
| 1.5 | 27,000 | 300 | 13,000 | 180 | 18,500 | 160 | 15,730 | 185 | 6135 | 50 |
| 2 | 20,300 | 300 | 10,000 | 150 | 14,000 | 160 | 12,010 | 165 | 4685 | 45 |
| 2.5 | 16,200 | 300 | 8,000 | 120 | 11,000 | 165 | 9,490 | 155 | 3700 | 40 |
| 3 | 13,500 | 275 | 6,690 | 105 | 9,350 | 145 | 8,045 | 135 | 3135 | 35 |
| 4 | 10,100 | 370 | 5,050 | 135 | 7,000 | 185 | 6,005 | 195 | 2340 | 50 |
| 5 | 8,090 | 410 | 4,050 | 165 | 5,600 | 230 | 4,815 | 360 | 1875 | 60 |
| 6 | 6,750 | 480 | 3,350 | 190 | 4,700 | 265 | 4,030 | 415 | 1570 | 70 |
| 8 | 5,050 | 620 | 2,500 | 250 | 3,500 | 340 | 3,000 | 545 | 1170 | 95 |
| 10 | 4,050 | 780 | 2,050 | 320 | 2,800 | 430 | 2,430 | 695 | 945 | 120 |
| 12 | 3,370 | 750 | 1,680 | 310 | 2,350 | 435 | 2,010 | 685 | 780 | 115 |
| 14 | 2,890 | 670 | 1,400 | 280 | 2,000 | 405 | 1,700 | 820 | 715 | 150 |
| 16 | 2,500 | 630 | 1,250 | 265 | 1,750 | 370 | 1,500 | 950 | 600 | 180 |
| 18 | 2,250 | 630 | 1,100 | 260 | 1,550 | 365 | 1,320 | 1,245 | 515 | 250 |
| 20 | 2,000 | 620 | 1,000 | 260 | 1,400 | 365 | 1,200 | 1,875 | 480 | 390 |

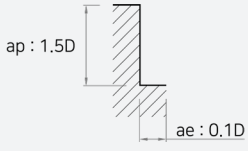
RPM = rev / min
FEED = mm / min

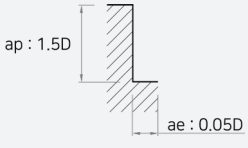
# Recommended Cutting Condition

## SE504, SR504 SERIES ▶ Side Cutting

| Workpiece | Alloy Steels, Cast Iron | | Stainless Steels 300 Series | | Stainless Steels 400 Series | | Titanium | | Inconel | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~HB230 | | | | | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 40,500 | 335 | 20,000 | 280 | 28,000 | 180 | 23,925 | 260 | 9570 | 65 |
| 1.5 | 27,000 | 335 | 13,000 | 200 | 18,500 | 180 | 15,730 | 215 | 6290 | 55 |
| 2 | 20,300 | 335 | 10,000 | 170 | 14,000 | 180 | 12,010 | 195 | 4805 | 50 |
| 2.5 | 16,200 | 335 | 8,000 | 135 | 11,000 | 185 | 9,490 | 180 | 3795 | 45 |
| 3 | 13,500 | 310 | 6,690 | 115 | 9,350 | 160 | 8,045 | 155 | 3215 | 40 |
| 4 | 10,100 | 415 | 5,050 | 150 | 7,000 | 205 | 6,000 | 335 | 2520 | 60 |
| 5 | 8,090 | 460 | 4,050 | 185 | 5,600 | 260 | 4,815 | 410 | 2020 | 75 |
| 6 | 6,750 | 540 | 3,350 | 215 | 4,700 | 295 | 4,030 | 470 | 1690 | 85 |
| 8 | 5,050 | 700 | 2,500 | 280 | 3,500 | 380 | 3,000 | 620 | 1260 | 110 |
| 10 | 4,050 | 880 | 2,050 | 360 | 2,800 | 485 | 2,430 | 790 | 1020 | 145 |
| 12 | 3,370 | 845 | 1,680 | 350 | 2,350 | 490 | 2,010 | 780 | 845 | 140 |
| 14 | 2,890 | 755 | 1,400 | 315 | 2,000 | 455 | 1,700 | 925 | 715 | 170 |
| 16 | 2,500 | 710 | 1,250 | 295 | 1,750 | 415 | 1,500 | 1075 | 600 | 205 |
| 18 | 2,250 | 710 | 1,100 | 290 | 1,550 | 410 | 1,320 | 1410 | 515 | 275 |
| 20 | 2,000 | 700 | 1,000 | 290 | 1,400 | 410 | 1,200 | 2120 | 480 | 430 |

RPM = rev / min
FEED = mm / min

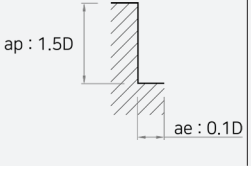


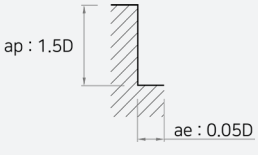



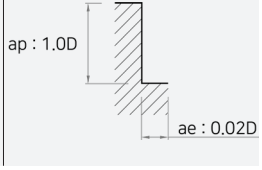

## SE506 SERIES ▶ Side Cutting - Normal Speed

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | | | Stainless Steels, Ti Alloy | | Inconel | |
|---|---|---|---|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc40 | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 5560 | 2000 | 3880 | 1370 | 3370 | 1100 | 1350 | 280 |
| 8 | 4200 | 2000 | 2940 | 1370 | 2490 | 1100 | 1000 | 280 |
| 10 | 3360 | 2000 | 2320 | 1370 | 1920 | 1100 | 440 | 280 |
| 12 | 2840 | 1680 | 2000 | 1160 | 1610 | 1000 | 400 | 250 |
| 16 | 2100 | 1260 | 1480 | 880 | 1160 | 770 | 310 | 190 |
| 20 | 1680 | 1010 | 1160 | 690 | 900 | 620 | 250 | 155 |

RPM = rev / min
FEED = mm / min



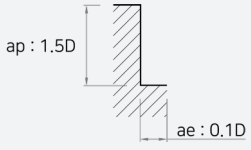



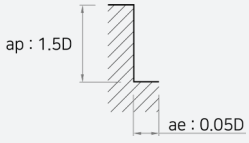



## SE506 SERIES ▶ Side Cutting - High Speed

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | | |
|---|---|---|---|---|
| Hardness | ~ HRc30 | | HRc30 ~ HRc40 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 6 | 22200 | 8000 | 16800 | 6090 |
| 8 | 16800 | 8000 | 12600 | 6090 |
| 10 | 13400 | 8000 | 9988 | 5990 |
| 12 | 11350 | 6720 | 8400 | 5040 |
| 16 | 8400 | 5040 | 6300 | 3780 |
| 20 | 6700 | 4040 | 5040 | 3050 |

RPM = rev / min
FEED = mm / min

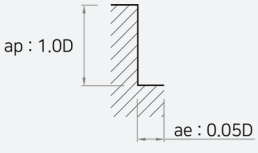



## SR505, SR507 SERIES ▶ Side Cutting

| Workpiece | Alloy Steels, Tool Steels (SKD61) | | Stainless Steels, Titanium | | High Hardened Steels | |
|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 3700 | 450 | 3200 | 380 | 1100 | 65 |
| 8 | 2800 | 400 | 2350 | 420 | 950 | 60 |
| 10 | 2250 | 325 | 1990 | 350 | 750 | 60 |
| 12 | 1990 | 300 | 1550 | 270 | 600 | 55 |
| 16 | 1550 | 250 | 1250 | 250 | 500 | 50 |
| 20 | 1200 | 180 | 900 | 150 | 350 | 50 |

RPM = rev / min
FEED = mm / min

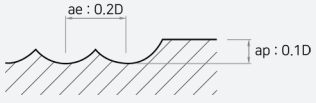


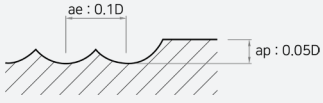
# Recommended Cutting Condition

## SB502 SERIES

| Workpiece | Alloy Steel, Cast Iron | | Alloy Steels, Prehardened Steels | | Heat Treated Steels | | | |
|---|---|---|---|---|---|---|---|---|
| Hardness | 150~250HB | | 25~35HRc | | 35~45HRc | | 45~55HRc | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 19100 | 770 | 12800 | 370 | 10200 | 270 | 8900 | 190 |
| 4 | 10800 | 1100 | 7200 | 550 | 5700 | 400 | 5000 | 280 |
| 6 | 7700 | 1300 | 5200 | 660 | 4100 | 480 | 3600 | 330 |
| 8 | 6000 | 1400 | 4000 | 700 | 3200 | 510 | 2800 | 360 |
| 10 | 4800 | 1400 | 3200 | 700 | 2600 | 520 | 2300 | 370 |
| 12 | 4000 | 1400 | 2700 | 710 | 2200 | 530 | 1900 | 370 |

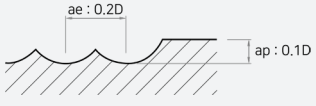
RPM = rev/min
FEED = mm/min

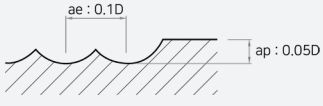



| Workpiece | Stainless Steels 300 Series | | | | Ni Alloy, Ti Alloy | | | |
|---|---|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 8900 | 210 | 6400 | 120 | 10200 | 270 | 8900 | 190 |
| 4 | 5000 | 310 | 3600 | 180 | 5700 | 400 | 5000 | 280 |
| 6 | 3600 | 380 | 2600 | 210 | 4100 | 480 | 3600 | 330 |
| 8 | 2800 | 400 | 2000 | 230 | 3200 | 510 | 2800 | 360 |
| 10 | 2300 | 410 | 1600 | 230 | 2600 | 520 | 2300 | 370 |
| 12 | 1900 | 410 | 1400 | 240 | 2200 | 530 | 1900 | 370 |

RPM = rev/min
FEED = mm/min

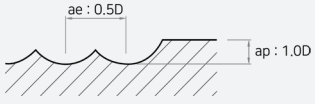


## SB504 SERIES

| Workpiece | Alloy Steel, Cast Iron | | Stainless Steels 300 Series, Titanium | | Stainless Steels 400 Series | |
|---|---|---|---|---|---|---|
| Hardness | ~ HB230 | | | | | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 13500 | 275 | 6690 | 105 | 9350 | 145 |
| 4 | 10100 | 370 | 5050 | 135 | 7000 | 185 |
| 5 | 8090 | 410 | 4050 | 165 | 5600 | 230 |
| 6 | 6750 | 480 | 3350 | 190 | 4700 | 265 |
| 8 | 5050 | 620 | 2500 | 250 | 3500 | 340 |
| 10 | 4050 | 780 | 2050 | 320 | 2800 | 430 |
| 12 | 3370 | 750 | 1680 | 310 | 2350 | 435 |
| 16 | 2530 | 700 | 1250 | 300 | 1750 | 395 |
| 20 | 2030 | 680 | 1000 | 290 | 1400 | 370 |

RPM = rev / min
FEED = mm / min




## SF51H SERIES ▶ Slotting

| Workpiece | Stainless Steels, Titanium alloys (SUS304, SUS316, Ti6A) | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 3 | 5000 | 380 |
| 4 | 4800 | 350 |
| 5 | 4700 | 350 |
| 6 | 4400 | 340 |
| 7 | 3800 | 340 |
| 8 | 3300 | 340 |
| 9 | 3000 | 340 |
| 10 | 2700 | 330 |
| 12 | 2200 | 330 |
| 14 | 2000 | 310 |
| 16 | 1750 | 300 |
| 20 | 1300 | 210 |

RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## WAE301 SERIES ▶ Slotting, General Cutting

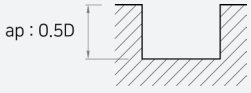
| Workpiece | Acrylic | | Alloy Steels | |
|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 1 | 32,000 | 2,000 | 23,000 | 1,300 |
| 2 | 32,000 | 2,200 | 23,000 | 1,500 |
| 3 | 25,000 | 2,400 | 18,000 | 1,700 |
| 4 | 20,000 | 2,400 | 15,000 | 1,800 |
| 5 | 15,000 | 2,200 | 12,000 | 1,800 |
| 6 | 13,500 | 2,300 | 10,000 | 1,800 |
| 8 | 10,000 | 2,400 | 7,800 | 1,900 |
| 10 | 8,000 | 2,400 | 6,000 | 2,000 |
| 12 | 7,000 | 2,200 | 5,000 | 1,900 |

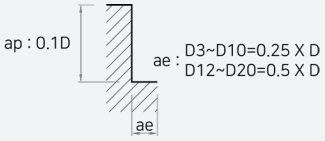
RPM = rev / min
FEED = mm / min

## WAE302 SERIES ▶ Side Cutting, Slotting

| Workpiece | Alloy Steels, Cast Iron | | Aluminium | |
|---|---|---|---|---|
| Hardness | ~ HB230 | | - | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 1 | 16,870 | 505 | 16,870 | 845 |
| 1.5 | 13,150 | 525 | 13,150 | 790 |
| 2 | 11,300 | 565 | 11,300 | 790 |
| 2.5 | 10,565 | 635 | 10,565 | 845 |
| 3 | 10,000 | 700 | 10,000 | 900 |
| 4 | 10,000 | 900 | 10,000 | 1,100 |
| 5 | 10,000 | 1,000 | 10,000 | 1,300 |
| 6 | 10,000 | 1,200 | 10,000 | 1,500 |
| 7 | 8,850 | 1,240 | 8,850 | 1,505 |
| 8 | 8,000 | 1,400 | 8,000 | 1,800 |
| 9 | 8,000 | 1,550 | 8,000 | 1,680 |
| 10 | 8,000 | 1,700 | 8,000 | 2,100 |
| 12 | 8,000 | 2,100 | 8,000 | 2,600 |
| 14 | 6,000 | 1,800 | 6,000 | 2,200 |
| 16 | 6,000 | 1,900 | 6,000 | 2,400 |
| 18 | 4,000 | 1,400 | 4,000 | 1,800 |
| 20 | 4,000 | 1,600 | 4,000 | 1,900 |

RPM = rev / min
FEED = mm / min



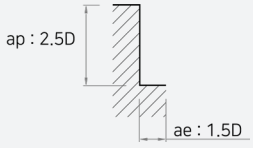



# Recommended Cutting Condition

## WAE30(2)3, WAR303 SERIES ▶ Side Cutting, General Cutting

| Workpiece | Aluminium, NON Ferrous Metals | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 3 | 7,000 | 455 |
| 4 | 7,000 | 546 |
| 5 | 7,000 | 651 |
| 6 | 7,000 | 756 |
| 8 | 5,600 | 861 |
| 10 | 5,600 | 1,050 |
| 12 | 5,600 | 882 |
| 14 | 4,200 | 1106 |
| 16 | 4,200 | 1,211 |
| 18 | 2,800 | 910 |
| 20 | 2,800 | 956 |

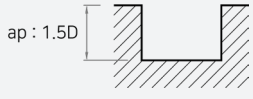
RPM = rev / min
FEED = mm / min




## WAE30(2)3, WAR303 SERIES ▶ Slotting, General Cutting

| Workpiece | Aluminium, NON Ferrous Metals | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 3 | 7,000 | 350 |
| 4 | 7,000 | 441 |
| 5 | 7,000 | 504 |
| 6 | 7,000 | 606 |
| 8 | 5,600 | 700 |
| 10 | 5,600 | 854 |
| 12 | 5,600 | 1,050 |
| 14 | 4,200 | 903 |
| 16 | 4,200 | 945 |
| 18 | 2,800 | 700 |
| 20 | 2,800 | 805 |

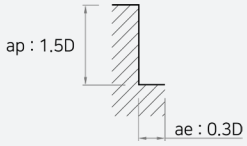
RPM = rev / min
FEED = mm / min



## WAR302 SERIES ▶ Side Cutting, General Cutting

| Workpiece | Aluminium Alloy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (<Si 4%) | | (<Si 8%) | | (Die Casting) | | (Cu) | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 4 | 24,000 | 4,800 | 19,900 | 3,980 | 16,000 | 3,200 | 12,000 | 2,400 |
| 6 | 16,000 | 3,840 | 13,200 | 3,160 | 10,600 | 2,544 | 8,000 | 1,920 |
| 8 | 12,000 | 3,600 | 9,900 | 2,970 | 8,000 | 2,400 | 6,000 | 1,800 |
| 10 | 9,500 | 3,420 | 8,000 | 2,880 | 6,300 | 2,260 | 4,800 | 1,720 |
| 12 | 8,000 | 3,200 | 6,600 | 2,640 | 5,300 | 2,120 | 4,000 | 1,600 |
| 14 | 6,800 | 2,990 | 5,600 | 2,460 | 4,500 | 1,980 | 3,400 | 1,490 |
| 16 | 6,000 | 3,000 | 5,000 | 2,500 | 4,000 | 2,000 | 3,000 | 1,500 |
| 18 | 5,300 | 2,600 | 4,400 | 2,200 | 3,500 | 1,750 | 2,600 | 1,300 |
| 20 | 4,800 | 2,400 | 4,000 | 2,000 | 3,200 | 1,600 | 2,400 | 1,200 |

RPM = rev / min
FEED = mm / min




## WAR302 SERIES ▶ Slotting, General Cutting

| Workpiece | Aluminium Alloy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (<Si 4%) | | (<Si 8%) | | (Die Casting) | | (Cu) | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 4 | 24,000 | 3,840 | 19,900 | 2,980 | 16,000 | 2,240 | 12,000 | 1,440 |
| 6 | 16,000 | 3,072 | 13,200 | 2,370 | 10,600 | 1,780 | 8,000 | 1,150 |
| 8 | 12,000 | 2,880 | 9,900 | 2,230 | 8,000 | 1,680 | 6,000 | 1,080 |
| 10 | 9,500 | 2,730 | 8,000 | 2,160 | 6,300 | 1,580 | 4,800 | 1,030 |
| 12 | 8,000 | 2,560 | 6,600 | 1,980 | 5,300 | 1,480 | 4,000 | 960 |
| 14 | 6,800 | 2,390 | 5,600 | 1,845 | 4,500 | 1,380 | 3,400 | 890 |
| 16 | 6,000 | 2,400 | 5,000 | 1,870 | 4,000 | 1,400 | 3,000 | 900 |
| 18 | 5,300 | 2,080 | 4,400 | 1,650 | 3,500 | 1,220 | 2,600 | 780 |
| 20 | 4,800 | 1,920 | 4,000 | 1,500 | 3,200 | 1,260 | 2,400 | 720 |

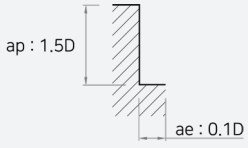
RPM = rev / min
FEED = mm / min

# Recommended Cutting Condition

## WAR502 SERIES ▶ Side Cutting, Slotting, General Cutting

| Workpiece | Aluminium Alloy (A7075) | | Aluminium Alloy Casting (Si13%) | | Magnesium Alloy, Copper Alloy - | |
|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 32,000 | 220 | 32,000 | 220 | 23,000 | 220 |
| 1.2 | 32,000 | 230 | 32,000 | 230 | 19,000 | 220 |
| 1.4 | 32,000 | 260 | 32,000 | 260 | 16,500 | 220 |
| 1.5 | 32,000 | 280 | 32,000 | 280 | 15,500 | 220 |
| 1.6 | 32,000 | 320 | 32,000 | 320 | 14,500 | 220 |
| 1.8 | 32,000 | 360 | 32,000 | 360 | 13,000 | 220 |
| 2 | 32,000 | 420 | 32,000 | 420 | 11,500 | 220 |
| 2.5 | 25,000 | 600 | 25,000 | 600 | 9,500 | 250 |
| 3 | 21,000 | 700 | 21,000 | 700 | 7,950 | 250 |
| 4 | 15,500 | 725 | 15,500 | 725 | 5,950 | 280 |
| 5 | 12,500 | 760 | 12,500 | 760 | 4,750 | 295 |
| 6 | 10,500 | 830 | 10,500 | 830 | 3,950 | 310 |
| 8 | 7,950 | 890 | 7,950 | 890 | 2,950 | 300 |
| 10 | 6,350 | 995 | 6,350 | 995 | 2,350 | 365 |
| 12 | 5,300 | 1,050 | 5,300 | 1,050 | 1,950 | 390 |

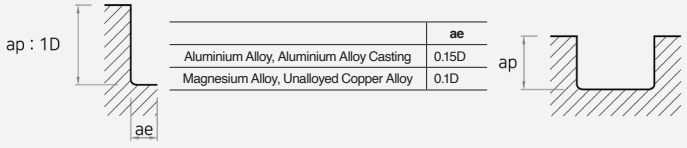
RPM = rev / min
FEED = mm / min



## WAR502 SERIES ▶ Side Cutting, Slotting, High Speed Cutting

| Workpiece | Aluminium Alloy (A7075) | | Aluminium Alloy Casting (Si13%) | | Magnesium Alloy, Copper Alloy - | |
|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 50,000 | 1,000 | 50,000 | 950 | 42,000 | 700 |
| 1.2 | 50,000 | 1,200 | 50,000 | 1,150 | 36,000 | 700 |
| 1.4 | 50,000 | 1,400 | 50,000 | 1,250 | 31,000 | 700 |
| 1.5 | 50,000 | 1,600 | 48,000 | 1,250 | 29,500 | 700 |
| 1.6 | 50,000 | 1,700 | 45,000 | 1,250 | 28,000 | 700 |
| 1.8 | 50,000 | 1,850 | 41,000 | 1,250 | 26,500 | 750 |
| 2 | 50,000 | 2,000 | 38,000 | 1,250 | 24,000 | 750 |
| 2.5 | 48,000 | 2,100 | 31,000 | 1,250 | 20,000 | 750 |
| 3 | 40,000 | 2,100 | 26,000 | 1,250 | 17,000 | 750 |
| 4 | 33,000 | 2,250 | 20,000 | 1,350 | 14,000 | 800 |
| 5 | 31,000 | 2,800 | 19,200 | 1,650 | 12,500 | 950 |
| 6 | 26,000 | 2,800 | 15,900 | 1,700 | 10,500 | 1,000 |
| 8 | 19,500 | 2,900 | 12,000 | 1,800 | 7,900 | 1,000 |
| 10 | 15,500 | 3,200 | 9,600 | 1,900 | 6,350 | 1,100 |
| 12 | 13,000 | 3,200 | 8,000 | 1,900 | 5,300 | 1,100 |

RPM = rev / min
FEED = mm / min

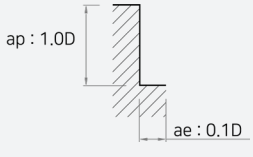



| | ae |
|---|---|
| Aluminium Alloy, Aluminium Alloy Casting | 0.15D |
| Magnesium Alloy, Unalloyed Copper Alloy | 0.1D |

## WAR503 SERIES ▶ Side Cutting, General Cutting

| Workpiece | Aluminium Alloy (A7075) | | Aluminium Alloy Casting (Si13%) | | Magnesium Alloy, Copper Alloy - | |
|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 21,000 | 1,100 | 21,000 | 1,100 | 7,950 | 325 |
| 4 | 15,500 | 1,250 | 15,500 | 1,250 | 5,950 | 365 |
| 5 | 12,500 | 1,300 | 12,500 | 1,275 | 4,750 | 385 |
| 6 | 10,500 | 1,400 | 10,500 | 1,400 | 3,950 | 400 |
| 8 | 7,950 | 1,500 | 7,950 | 1,500 | 2,950 | 460 |
| 10 | 6,350 | 1,700 | 6,350 | 1,700 | 2,350 | 475 |
| 12 | 5,300 | 1,750 | 5,300 | 1,750 | 1,950 | 510 |
| 16 | 3,950 | 1,750 | 3,950 | 1,750 | 1,450 | 510 |
| 20 | 3,150 | 1,750 | 3,150 | 1,750 | 1,150 | 510 |

RPM = rev / min
FEED = mm / min

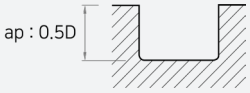


# Recommended Cutting Condition

## WAR503 SERIES ▶ Slotting, General Cutting

| Workpiece | Aluminium Alloy (A7075) | | Aluminium Alloy Casting (Si13%) | | Magnesium Alloy, Copper Alloy - | |
|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 40,000 | 2,100 | 24,000 | 1,250 | 17,000 | 625 |
| 4 | 32,000 | 2,250 | 19,200 | 1,550 | 14,300 | 800 |
| 5 | 32,000 | 3,250 | 19,200 | 1,950 | 12,700 | 925 |
| 6 | 26,500 | 3,500 | 15,900 | 2,150 | 10,600 | 960 |
| 8 | 20,000 | 3,750 | 12,000 | 2,250 | 8,000 | 1,130 |
| 10 | 16,000 | 4,300 | 9,600 | 2,580 | 6,350 | 1,150 |
| 12 | 13,300 | 4,400 | 8,000 | 2,650 | 5,300 | 1,250 |
| 16 | 10,000 | 4,400 | 6,000 | 2,650 | 4,000 | 1,250 |
| 20 | 8,000 | 4,400 | 4,800 | 2,650 | 3,200 | 1,250 |

RPM = rev / min
FEED = mm / min




## WAR503 SERIES ▶ Slotting, High Speed Cutting

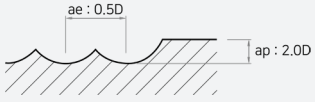
| Workpiece | Aluminium Alloy (A7075) | | Aluminium Alloy Casting (Si13%) | |
|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 3 | 40,000 | 1,450 | 24,000 | 880 |
| 4 | 32,000 | 1,700 | 19,200 | 1,000 |
| 5 | 32,000 | 2,200 | 19,200 | 1,350 |
| 6 | 26,500 | 2,400 | 15,900 | 1,450 |
| 8 | 20,000 | 2,500 | 12,000 | 1,500 |
| 10 | 16,000 | 2,800 | 9,600 | 1,700 |
| 12 | 13,300 | 2,950 | 8,000 | 1,800 |
| 16 | 10,000 | 3,000 | 6,000 | 1,800 |
| 20 | 8,000 | 3,000 | 4,800 | 1,800 |

RPM = rev / min
FEED = mm / min

## WAB312 SERIES

| Workpiece | Aluminium Alloy | | Copper Alloy | |
|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 6 | 18,000 | 1,750 | 5,500 | 440 |
| 8 | 14,000 | 2,000 | 4,200 | 500 |
| 10 | 14,000 | 2,350 | 4,200 | 580 |
| 12 | 14,000 | 3,000 | 4,200 | 750 |
| 16 | 11,000 | 2,700 | 3,300 | 670 |
| 20 | 8,000 | 2,200 | 2,200 | 600 |

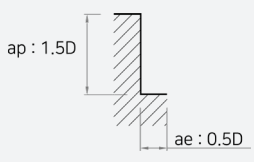
RPM = rev / min
FEED = mm / min




## WAF303 SERIES ▶ Slotting

| Workpiece | Aluminium, NON Ferrous Metals | | | |
|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 6 | 10,500 | 800 | 13,500 | 1,050 |
| 8 | 8,000 | 700 | 10,500 | 900 |
| 10 | 6,500 | 750 | 8,500 | 950 |
| 12 | 5,250 | 800 | 6,800 | 1,050 |
| 16 | 4,000 | 800 | 5,200 | 1,050 |
| 20 | 3,200 | 800 | 4,200 | 1,050 |

RPM = rev / min
FEED = mm / min



# Recommended Cutting Condition

## E302, E322, EL422 SERIES

| Processing method | Side Cutting | | | | Slotting | | | |
|---|---|---|---|---|---|---|---|---|
| | Depth of Cut : 1.5D, Width : 0.1D | | | | Depth of Cut : 0.5D, Width : 1D | | | |
| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | |
| Hardness | ~ HB225 | | HB225 ~ HB325 | | ~ HB225 | | HB225 ~ HB325 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 5,300 | 60 | 4,300 | 50 | 4,300 | 40 | 3,500 | 20 |
| 2 | 4,500 | 80 | 3,800 | 60 | 3,800 | 50 | 3,100 | 30 |
| 3 | 3,700 | 80 | 3,200 | 60 | 3,200 | 50 | 2,650 | 30 |
| 4 | 2,750 | 110 | 2,400 | 60 | 2,400 | 50 | 2,000 | 30 |
| 6 | 1,850 | 110 | 1,600 | 60 | 1,600 | 50 | 1,320 | 30 |
| 8 | 1,400 | 110 | 1,200 | 90 | 1,200 | 60 | 1,000 | 40 |
| 10 | 1,100 | 110 | 950 | 90 | 950 | 60 | 800 | 40 |
| 12 | 930 | 110 | 800 | 90 | 800 | 60 | 660 | 40 |
| 16 | 700 | 110 | 600 | 90 | 600 | 60 | 500 | 40 |
| 20 | 560 | 110 | 480 | 90 | 480 | 60 | 400 | 40 |
| 25 | 450 | 110 | 380 | 90 | 380 | 60 | 320 | 40 |

※ Please reduce cutting speed around 20~30% from the above table or E322, E422 series.

## E304, E324 SERIES

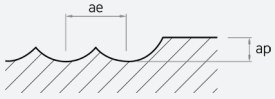
| Processing method | Side Cutting | | | | Slotting | | | |
|---|---|---|---|---|---|---|---|---|
| | Depth of Cut : 1.5D, Width : 0.1D | | | | Depth of Cut : 0.5D, Width : 1D | | | |
| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | |
| Hardness | ~ HB225 | | HB225 ~ HB325 | | ~ HB225 | | HB225 ~ HB325 | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1 | 5,300 | 60 | 4,300 | 50 | 4,300 | 40 | 3,500 | 20 |
| 2 | 4,500 | 80 | 3,800 | 60 | 3,800 | 50 | 3,100 | 30 |
| 3 | 3,700 | 80 | 3,200 | 60 | 3,200 | 50 | 2,650 | 30 |
| 4 | 2,750 | 110 | 2,400 | 60 | 2,400 | 50 | 2,000 | 30 |
| 6 | 1,850 | 110 | 1,600 | 60 | 1,600 | 50 | 1,320 | 30 |
| 8 | 1,400 | 110 | 1,200 | 90 | 1,200 | 60 | 1,000 | 40 |
| 10 | 1,100 | 110 | 950 | 90 | 950 | 60 | 800 | 40 |
| 12 | 930 | 110 | 800 | 90 | 800 | 60 | 660 | 40 |
| 16 | 700 | 110 | 600 | 90 | 600 | 60 | 500 | 40 |
| 20 | 560 | 110 | 480 | 90 | 480 | 60 | 400 | 40 |
| 25 | 450 | 110 | 380 | 90 | 380 | 60 | 320 | 40 |

※ Please reduce cutting speed around 20~30% from the above table or E324 series.

## B302, BL422 SERIES

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | |
|---|---|---|---|---|
| Hardness | ~ HB225 | | HB225 ~ HB325 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| R0.5 | 31,800 | 572 | 27,900 | 502 |
| R1 | 31,800 | 1,910 | 27,900 | 1,670 |
| R2 | 15,900 | 1,910 | 13,900 | 1,670 |
| R3 | 10,600 | 1,910 | 9,280 | 1,670 |
| R4 | 7,960 | 1,910 | 6,960 | 1,670 |
| R5 | 6,370 | 1,780 | 5,570 | 1,560 |
| R6 | 5,310 | 1,590 | 4,640 | 1,390 |
| R8 | 4,000 | 1,300 | 3,500 | 1,050 |
| R10 | 3,200 | 1,000 | 2,800 | 840 |
| R12.5 | 2,400 | 800 | 2,100 | 650 |

RPM = rev / min
FEED = mm / min



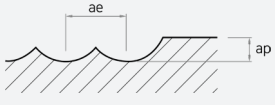

| R | ap | ae |
|---|---|---|
| R≤1.0 | 0.05 x up to R | 0.2 x up to R |
| 1.0< R | 0.1 x up to R | 0.2 x up to R |

※ Please reduce cutting speed around 20~30% from the above table or BL422 series.

## B304 SERIES

| Workpiece | Carbon Steels, Alloy Steels, Tool Steels | | Alloy Steels, Tool Steels | |
|---|---|---|---|---|
| Hardness | ~ HB225 | | HB225 ~ HB325 | |
| Diameter (mm) | RPM | FEED | RPM | FEED |
| R0.5 | 39,750 | 718.25 | 34,875 | 6,275 |
| R1 | 39,750 | 2,387.5 | 34,875 | 2,087.5 |
| R2 | 19,875 | 2,387.5 | 17,375 | 2,087.5 |
| R3 | 13,250 | 2,387.5 | 11,600 | 2,087.5 |
| R4 | 9,950 | 2,387.5 | 8,700 | 2,087.5 |
| R5 | 7,962.5 | 2,225 | 6,962.5 | 1,950 |
| R6 | 6,637.5 | 1,987.5 | 5,800 | 1,737.5 |
| R8 | 5,000 | 1,625 | 4,375 | 1,312.5 |
| R10 | 4,000 | 1,250 | 3,500 | 1050 |
| R12.5 | 3,000 | 1,000 | 2,625 | 812.5 |

RPM = rev / min
FEED = mm / min



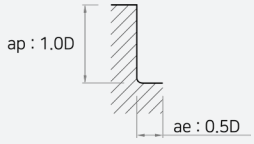

| R | ap | ae |
|---|---|---|
| R≤1.0 | 0.05 x up to R | 0.2 x up to R |
| 1.0< R | 0.1 x up to R | 0.2 x up to R |

# Recommended Cutting Condition

## RC502 SERIES

| Workpiece | Unalloyed Copper | | | |
|---|---|---|---|---|
| Diameter (mm) | RPM | FEED | RPM | FEED |
| 3 | 44,500 | 2,350 | 50,000 | 3,700 |
| 4 | 33,400 | 2,100 | 50,000 | 4,700 |
| 6 | 22,300 | 2,100 | 33,400 | 4,900 |
| 8 | 16,700 | 2,100 | 25,000 | 4,700 |
| 10 | 13,370 | 2,100 | 20,000 | 4,800 |
| 12 | 11,100 | 2,100 | 16,700 | 4,700 |

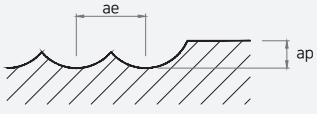
RPM = rev / min
FEED = mm / min



## BC502 SERIES

| Workpiece | | Unalloyed Copper | | | |
|---|---|---|---|---|---|
| Mill Dia (mm) | Diameter (mm) | RPM | FEED | Rd | Ad |
| 0.5 | 1 | 41,000 | 1,660 | 0.04 | 0.063 |
| 0.75 | 1.5 | 27,000 | 1,830 | 0.068 | 0.087 |
| 1 | 2 | 20,000 | 1,780 | 0.089 | 0.112 |
| 1.25 | 2.5 | 16,000 | 1,840 | 0.115 | 0.09 |
| 1.5 | 3 | 13,000 | 2,220 | 0.171 | 0.168 |
| 2 | 4 | 10,000 | 2,080 | 0.208 | 0.2 |
| 2.5 | 5 | 8,300 | 1,990 | 0.24 | 0.2 |
| 3 | 6 | 6,900 | 1,940 | 0.281 | 0.25 |
| 4 | 8 | 5,720 | 1,000 | 0.175 | 0.4 |
| 5 | 10 | 4,550 | 700 | 0.154 | 0.5 |
| 6 | 12 | 3,770 | 600 | 0.159 | 0.6 |

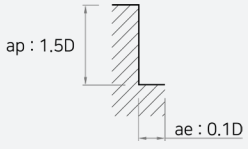
RPM = rev / min
FEED = mm / min



## GE SERIES

| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 0.4 | 40,000 | 200 |
| 0.6 | 40,000 | 350 |
| 0.8 | 40,000 | 550 |
| 1 | 40,000 | 700 |
| 2 | 25,000 | 800 |
| 3 | 20,000 | 800 |
| 4 | 18,000 | 950 |
| 5 | 14,000 | 1,200 |
| 6 | 11,000 | 1,400 |
| 8 | 8,000 | 1,300 |
| 10 | 6,500 | 1,200 |
| 12 | 5,500 | 1,200 |

RPM = rev / min
FEED = mm / min

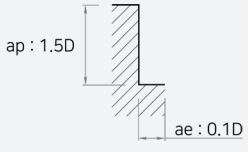



※ Please reduce cutting speed 50% from the above table when using long and extra long type

## WGE504 SERIES

| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 3 | 20,000 | 1,600 |
| 4 | 18,000 | 1,900 |
| 5 | 14,000 | 2,400 |
| 6 | 11,000 | 2,800 |
| 8 | 8,000 | 2,600 |
| 10 | 6,500 | 2,400 |
| 12 | 5,500 | 2,400 |
| 16 | 4,200 | 2,450 |
| 20 | 3,300 | 2,400 |

RPM = rev / min
FEED = mm / min



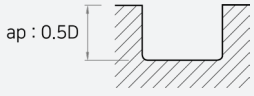

※ Please reduce cutting speed 50% from the above table when using long and extra long type

# Recommended Cutting Condition

## WGR502 SERIES

| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 0.4 | 40,000 | 640 |
| 0.6 | 40,000 | 640 |
| 0.8 | 40,000 | 800 |
| 1 | 40,000 | 960 |
| 1.2 | 40,000 | 1,200 |
| 1.5 | 40,000 | 1,440 |
| 2 | 40,000 | 1,600 |
| 3 | 27,000 | 1,900 |
| 4 | 20,000 | 2,300 |
| 5 | 16,000 | 2,300 |
| 6 | 14,000 | 2,300 |

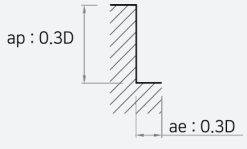
RPM = rev / min
FEED = mm / min




## WGR504 SERIES

| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 4 | 40,000 | 3,500 |
| 6 | 40,000 | 5,600 |
| 8 | 32,000 | 5,600 |
| 10 | 26,000 | 5,700 |
| 12 | 21,000 | 5,450 |
| 16 | 15,800 | 5,450 |
| 20 | 12,800 | 5,500 |

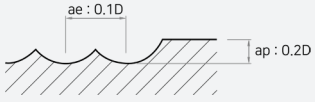
RPM = rev / min
FEED = mm / min



## G SERIES

| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 0.5 | 16,000 | 480 |
| 0.75 | 16,000 | 640 |
| 1 | 16,000 | 800 |
| 1.5 | 16,000 | 1,450 |
| 2 | 16,000 | 2,100 |
| 3 | 15,000 | 2,950 |
| 4 | 13,000 | 3,000 |
| 5 | 11,500 | 3,050 |
| 6 | 10,500 | 3,150 |
| 8 | 8,555 | 2,960 |

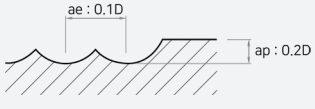
RPM = rev / min
FEED = mm / min




## WGB504 SERIES

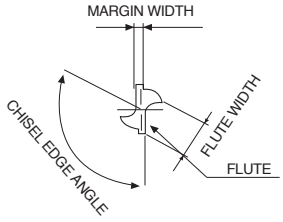
| Workpiece | Graphite | |
|---|---|---|
| Diameter (mm) | RPM | FEED |
| 1 | 20,000 | 700 |
| 2 | 16,000 | 1,200 |
| 3 | 16,000 | 2,000 |
| 4 | 16,000 | 3,100 |
| 5 | 15,000 | 3,800 |
| 6 | 15,000 | 4,400 |
| 8 | 13,000 | 4,500 |
| 10 | 12,000 | 4,600 |
| 12 | 10,000 | 4,700 |
| 16 | 7,500 | 3,800 |
| 20 | 6,000 | 3,500 |

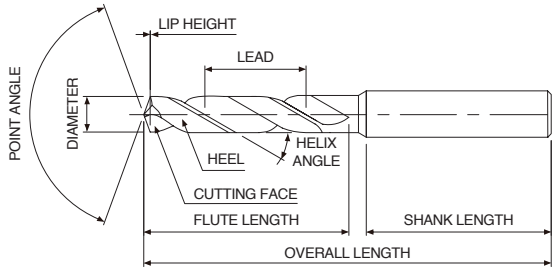
RPM = rev / min
FEED = mm / min

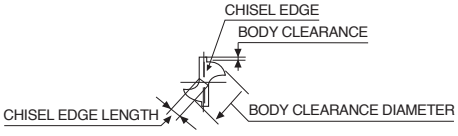


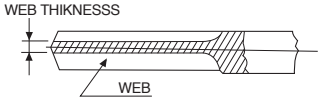
# Recommended Cutting Condition

## Nomenclature of Drill



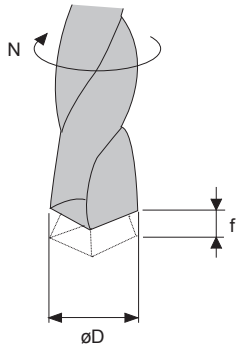






## Working of Main Angle

| POINT ANGLE | HELIX ANGLE | LIP RELIEF ANGLE |
|---|---|---|
| Low — High | Low — High | Low — High |
| Large → Torque → Small<br>Small → Thrust → Large | Bad → Torque → Good<br>Good → Thrust → Bad<br>Large → Rigidity of tool → Small | Small → Tool Wear → Large<br>Small → Unalloyed Copper → Large |




| | | |
|---|---|---|
| **· Cutting Speed**<br>$V = \frac{\pi \times D \times N}{1000}$ (m/min) | V : Cutting Speed<br>D : Diameter of drill<br>N : Revolution<br>π : 3.14 | (m/min)<br>(mm)<br>(rpm) |
| **· Feed**<br>F = Fn x N(m/rev) | F : Feed<br>Fn : Feed rate per revolution<br>N : Revolution | (m/rev)<br>(mm)<br>(rpm) |
| **· Helix Angle**<br>$\theta° = \text{Tan-1}\left(\frac{\pi D}{L}\right)$ | θ° : Helix angle<br>D : Diameter of drill<br>L : Lead<br>π : 3.14 | <br>(mm) |

## Technical Solutions about general problems to use drill

| Problems and Circumstances | Cause | Technical Countermeasures |
|---|---|---|
| Not drill into workpiece | • No enough Lip Relief<br>• Thick Web | • Re-grinding of Lip Relief<br>• Get the Web thinner |
| Chipping-off on margin part | • large jig-bushing | • Use the right sized bushing on drill |
| Balance of cutting flutes | • To overheat on drill during the operation | • Reduce feed rate Supply enoungh cutting oil |
| Chipped-off on cutting flutes | • Large relief angle<br>• High feed rate | • Adjust Lip Relief<br>• Reduce feed rate |
| Damage on tang | • Incomplete adhesiveness between soket and shaft | • Remove foreign substance and replace it to new one when it is worn out |
| Damage on a drill during a processing of brass | • Wrong choice of shape of drill<br>• Clogged-up with chips in groove | • Choose suitable drill for material |
| Crack on center of drill | • Lack of number of flutes<br>• Huge feed rate | • Re-grinding with proper relief angle<br>• Reduce feed rate |
| Getting hole size larger | • Difference between point angle and cutting flutes<br>• Loose main spindle | • Choose good qualitative drill<br>• Adjust spindle within measure |
| Damage on edge | • High feed rate<br>• Foreign substance on workpiece<br>• Lack of cutting oil supply on drill tip<br>• The wear and tear of a drill | • Grind tip of drill suitable for workpiece<br>• Reduce feed rate<br>• Regrind it on early stage |
| Irregular size of chip | • inappropriate grind on edge of flute or using only one side of flute | • Need a exact re-grinding<br>• Choose good qualitative drill |
| Roughness of hole | • Blunt edge of flute or inappropriate grinding excessive feed rate<br>• No supply cutting oil on tip of drill<br>• loose fixture | • Regrind flute edge angle<br>• Suppy plenty of appropriate cutting oil<br>• Reduce feed rate<br>• Fasten fixture |

# Recommended Cutting Condition

## NDPG, NDPK SERIES

| Workpiece | Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟ | | Alloy Steel(C>0.3%) Alloy Steels/S50C SCM ~1,060N/㎟ | | Grey Cast Iron <HB240 | | Grey Cast Iron <HB350 | | Stainless Steels | |
|---|---|---|---|---|---|---|---|---|---|---|
| V(m/min) | 80~120 | | 80~120 | | 120~200 | | 80~130 | | 40~45 | |
| Diameter (mm) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) |
| 1 | 13,000 | 0.04 | 13,000 | 0.04 | 21,300 | 0.04 | 14,200 | 0.04 | 7,160 | 0.03 |
| 2 | 13,000 | 0.06 | 13,000 | 0.06 | 21,300 | 0.06 | 14,200 | 0.06 | 7,160 | 0.04 |
| 3 | 13,000 | 0.13 | 13,000 | 0.13 | 21,000 | 0.13 | 14,000 | 0.13 | 4,780 | 0.07 |
| 4 | 9,500 | 0.14 | 9,500 | 0.14 | 16,000 | 0.14 | 10,500 | 0.14 | 3,600 | 0.08 |
| 5 | 7,600 | 0.15 | 7,600 | 0.15 | 13,000 | 0.15 | 8,300 | 0.15 | 2,850 | 0.09 |
| 6 | 6,400 | 0.17 | 6,400 | 0.17 | 11,000 | 0.17 | 6,900 | 0.17 | 2,400 | 0.1 |
| 8 | 4,800 | 0.21 | 4,800 | 0.21 | 8,000 | 0.21 | 5,200 | 0.21 | 1,800 | 0.12 |
| 10 | 3,800 | 0.25 | 3,800 | 0.25 | 6,400 | 0.25 | 4,150 | 0.25 | 1,450 | 0.15 |
| 12 | 3,200 | 0.27 | 3,200 | 0.27 | 5,300 | 0.27 | 3,450 | 0.27 | 1,200 | 0.17 |
| 14 | 2,750 | 0.29 | 2,750 | 0.29 | 4,550 | 0.29 | 3,000 | 0.29 | 1,000 | 0.19 |
| 16 | 2,400 | 0.31 | 2,400 | 0.31 | 4,000 | 0.31 | 2,600 | 0.31 | 900 | 0.21 |
| 18 | 2,100 | 0.33 | 2,100 | 0.33 | 3,550 | 0.33 | 2,300 | 0.33 | 800 | 0.23 |
| 20 | 1,900 | 0.35 | 1,900 | 0.35 | 3,200 | 0.35 | 2,100 | 0.35 | 700 | 0.25 |

※ Recommended conditions in the above table are ideal conditions, and work by adjusting the conditions according to the equipment and other conditions.

· 7D : Apply 85% of the table

## PF50, P50, HP50 SERIES

| Work piece | Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟ | | Alloy Steel(C≥0.3%) Alloy Steels/S50C SCM ~1,060N/㎟ | | SUJ2·SUS440 | | SKD61 HRc34~43 | | HRc43~48 | | SKD11 HRc48~53 | | Cast Iron FC 250~350 | | Ductile FC 400~500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V(m/min) | 80~125 | | 80~125 | | 63~80 | | 40~63 | | 32~45 | | 25~36 | | 80~125 | | 63~90 | |
| Diameter (mm) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) |
| 2 | 12,000 | 0.06~0.08 | 12,000 | 0.06~0.08 | 11,000 | 0.06~0.08 | 8,000 | 0.06~0.08 | 6,000 | 0.05~0.07 | 4,500 | 0.03~0.06 | 15,000 | 0.06~0.08 | 11,000 | 0.06~0.08 |
| 3 | 9,600 | 0.09~0.12 | 9,600 | 0.09~0.12 | 7,500 | 0.09~0.12 | 5,300 | 0.09~0.12 | 4,000 | 0.07~0.11 | 3,200 | 0.05~0.09 | 10,000 | 0.09~0.12 | 7,600 | 0.09~0.12 |
| 4 | 8,000 | 0.10~0.15 | 8,000 | 0.10~0.15 | 5,650 | 0.10~0.15 | 4,000 | 0.10~0.15 | 3,000 | 0.08~0.13 | 2,600 | 0.06~0.10 | 8,000 | 0.10~0.15 | 6,000 | 0.10~0.15 |
| 5 | 6,400 | 0.12~0.18 | 6,400 | 0.12~0.18 | 4,550 | 0.12~0.18 | 3,300 | 0.12~0.18 | 2,400 | 0.10~0.15 | 2,000 | 0.8~0.12 | 6,400 | 0.12~0.18 | 4,800 | 0.12~0.18 |
| 6 | 5,300 | 0.14~0.20 | 5,300 | 0.14~0.20 | 3,800 | 0.14~0.20 | 2,750 | 0.14~0.20 | 2,000 | 0.12~0.18 | 1,700 | 0.09~0.15 | 5,300 | 0.14~0.20 | 4,000 | 0.14~0.20 |
| 8 | 4,000 | 0.16~0.24 | 4,000 | 0.16~0.24 | 2,850 | 0.16~0.24 | 2,100 | 0.16~0.24 | 1,500 | 0.14~0.22 | 1,300 | 0.12~0.20 | 4,000 | 0.16~0.24 | 3,000 | 0.16~0.24 |
| 10 | 3,200 | 0.18~0.27 | 3,200 | 0.18~0.27 | 2,250 | 0.18~0.27 | 1,700 | 0.18~0.27 | 1,200 | 0.15~0.25 | 1,000 | 0.13~0.23 | 3,200 | 0.18~0.27 | 2,400 | 0.18~0.27 |
| 12 | 2,650 | 0.20~0.30 | 2,650 | 0.20~0.30 | 1,900 | 0.20~0.30 | 1,400 | 0.20~0.30 | 1,000 | 0.17~0.26 | 850 | 0.14~0.24 | 2,700 | 0.20~0.30 | 2,000 | 0.20~0.30 |
| 14 | 2,300 | 0.22~0.35 | 2,300 | 0.22~0.35 | 1,600 | 0.22~0.35 | 1,200 | 0.22~0.35 | 860 | 0.18~0.30 | 730 | 0.15~0.26 | 2,300 | 0.22~0.35 | 1,700 | 0.22~0.35 |
| 16 | 2,000 | 0.25~0.36 | 2,000 | 0.25~0.36 | 1,400 | 0.25~0.36 | 1,050 | 0.25~0.36 | 760 | 0.20~0.32 | 640 | 0.16~0.26 | 2,000 | 0.25~0.36 | 1,500 | 0.25~0.36 |
| 18 | 1,800 | 0.28~0.38 | 1,800 | 0.28~0.38 | 1,250 | 0.28~0.38 | 920 | 0.28~0.38 | 670 | 0.23~0.33 | 570 | 0.18~0.28 | 1,800 | 0.28~0.38 | 1,350 | 0.28~0.38 |
| 20 | 1,600 | 0.30~0.40 | 1,600 | 0.30~0.40 | 1,150 | 0.30~0.40 | 850 | 0.30~0.40 | 600 | 0.25~0.35 | 500 | 0.20~0.30 | 1,600 | 0.30~0.40 | 1,200 | 0.30~0.40 |

## SF, PI, HPI SERIES

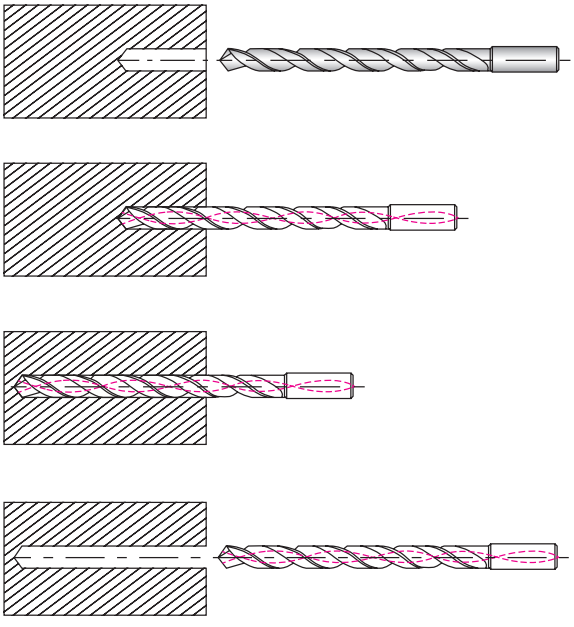
| Work piece | Alloy Steel(C<0.3%) Alloy Steels/SS400 SCM ~710N/㎟ | | Alloy Steel(C≥0.3%) Alloy Steels/S50C SCM ~1,060N/㎟ | | SUJ2·SUS440 | | SKD61 HRc34~43 | | HRc43~48 | | SKD11 HRc48~53 | | Cast Iron FC 250~350 | | Ductile FC 400~500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V(m/min) | 80~125 | | 80~125 | | 63~80 | | 40~63 | | 32~45 | | 25~36 | | 80~125 | | 63~90 | |
| Diameter (mm) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) |
| 3 | 12,000 | 0.09~0.12 | 13,000 | 0.09~0.12 | 7,600 | 0.09~0.12 | 6,400 | 0.09~0.12 | 5,300 | 0.07~0.11 | 3,800 | 0.05~0.09 | 12,000 | 0.09~0.12 | 8,500 | 0.09~0.12 |
| 4 | 9,500 | 0.1~0.15 | 10,000 | 0.1~0.15 | 5,700 | 0.1~0.15 | 4,800 | 0.1~0.15 | 4,000 | 0.08~0.13 | 2,950 | 0.06~0.1 | 9,000 | 0.1~0.15 | 6,350 | 0.1~0.15 |
| 5 | 7,600 | 0.12~0.18 | 8,000 | 0.12~0.18 | 4,600 | 0.12~0.18 | 3,800 | 0.12~0.18 | 3,200 | 0.1~0.15 | 2,300 | 0.08~0.12 | 7,600 | 0.12~0.18 | 5,100 | 0.12~0.18 |
| 6 | 6,400 | 0.14~0.20 | 6,600 | 0.14~0.20 | 3,800 | 0.14~0.20 | 3,200 | 0.14~0.20 | 2,650 | 0.12~0.18 | 1,900 | 0.09~0.15 | 6,400 | 0.14~0.20 | 4,250 | 0.14~0.20 |
| 8 | 4,800 | 0.16~0.24 | 5,000 | 0.16~0.24 | 2,900 | 0.16~0.24 | 2,400 | 0.16~0.24 | 2,000 | 0.14~0.22 | 1,450 | 0.12~0.2 | 4,800 | 0.16~0.24 | 3,200 | 0.16~0.24 |
| 10 | 3,800 | 0.18~0.27 | 4,000 | 0.18~0.27 | 2,300 | 0.18~0.27 | 1,900 | 0.18~0.27 | 1,600 | 0.15~0.25 | 1,150 | 0.13~0.23 | 3,800 | 0.18~0.27 | 2,550 | 0.18~0.27 |
| 12 | 3,200 | 0.20~0.30 | 3,300 | 0.20~0.30 | 1,900 | 0.20~0.30 | 1,600 | 0.20~0.30 | 1,300 | 0.17~0.26 | 950 | 0.14~0.24 | 3,200 | 0.20~0.30 | 2,100 | 0.20~0.30 |
| 14 | 2,700 | 0.22~0.35 | 2,800 | 0.22~0.35 | 1,600 | 0.22~0.35 | 1,350 | 0.22~0.35 | 1,150 | 0.18~0.3 | 800 | 0.15~0.26 | 2,700 | 0.22~0.35 | 1,800 | 0.22~0.35 |
| 16 | 2,400 | 0.25~0.36 | 2,500 | 0.25~0.36 | 1,400 | 0.25~0.36 | 1,200 | 0.25~0.36 | 1,000 | 0.2~0.32 | 700 | 0.16~0.26 | 2,400 | 0.25~0.36 | 1,600 | 0.25~0.36 |
| 18 | 2,100 | 0.28~0.38 | 2,200 | 0.28~0.38 | 1,300 | 0.28~0.38 | 1,100 | 0.28~0.38 | 900 | 0.23~0.33 | 650 | 0.18~0.28 | 2,100 | 0.28~0.38 | 1,400 | 0.28~0.38 |
| 20 | 1,900 | 0.30~0.40 | 2,000 | 0.30~0.40 | 1,150 | 0.30~0.40 | 1,000 | 0.30~0.40 | 800 | 0.25~0.35 | 600 | 0.2~0.3 | 1,900 | 0.30~0.40 | 1,250 | 0.30~0.40 |

· 8D : fn 70~80%

# Recommended Cutting Condition

## SF510, SF520 SERIES

| Workpiece | Carbon Steels, Alloy Steels ~1060 N/mm2 | | Cast Iron 250~350 N/mm2 | | Ductile Cast Iron 400~500 N/mm2 | |
|---|---|---|---|---|---|---|
| V(m/min) | 80~125 | | 80~125 | | 63~90 | |
| Diameter (mm) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) |
| 3 | 7,500 | 0.06 ~ 0.12 | 7,500 | 0.06 ~ 0.12 | 7,500 | 0.06 ~ 0.12 |
| 4 | 6,400 | 0.08 ~ 0.16 | 6,400 | 0.08 ~ 0.16 | 5,600 | 0.08 ~ 0.16 |
| 5 | 5,800 | 0.10 ~ 0.20 | 5,800 | 0.10 ~ 0.20 | 4,500 | 0.10 ~ 0.20 |
| 6 | 4,800 | 0.12 ~ 0.24 | 4,800 | 0.12 ~ 0.24 | 3,800 | 0.12 ~ 0.24 |
| 8 | 3,600 | 0.16 ~ 0.28 | 3,600 | 0.16 ~ 0.28 | 2,800 | 0.16 ~ 0.28 |
| 10 | 2,900 | 0.20 ~ 0.35 | 2,900 | 0.20 ~ 0.35 | 2,300 | 0.20 ~ 0.35 |
| 12 | 2,900 | 0.24 ~ 0.42 | 2,400 | 0.24 ~ 0.42 | 1,900 | 0.24 ~ 0.42 |
| 14 | 2,050 | 0.28 ~ 0.46 | 2,050 | 0.28 ~ 0.46 | 1,600 | 0.28 ~ 0.46 |



1. Guide Drilling should be done as Diameter+0.1mm between 3D and 5D
2. For Main Drilling, proceed with low RPM at Guide Drilling segment. (RPM 300, FEED 400mm/min)
3. Just before the end of Guide Drilling segment, reduce feed to zero and increase the RPM according to Recommended
4. After then, proceed main drilling by increasing feed without step drilling.
5. When coming out from Guide Drilling start point after drilling, RPM should be reduced as 300 and feed should be 1000 mm/min.
6. When coming out from Guide Drilling segment to the outside, the feed should be decreased as 50%

## SSD, SSTD, SSDL, SSTDL SERIES

| Workpiece | Tool Steels, Alloy Steels | | Aluminium, Aluminium Alloy | | Brass, Bronze | | Epoxy, Resin | |
|---|---|---|---|---|---|---|---|---|
| Diameter (mm) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) | RPM | fn (mm/rev) |
| 3 | 4,000~7,000 | 0.02 | 10,000~12,000 | 0.03 | 7,000~10,000 | 0.02 | 9,000~12,000 | 0.08 |
| 5 | 2,400~4,200 | 0.03 | 6,000~8,000 | 0.05 | 4,200~6,000 | 0.04 | 5,400~7,200 | 0.08 |
| 8 | 1,500~2,600 | 0.05 | 3,700~5,000 | 0.08 | 2,600~3,700 | 0.08 | 3,400~4,500 | 0.09 |
| 12 | 1,000~1,700 | 0.06 | 2,500~3,200 | 0.12 | 1,700~2,500 | 0.12 | 2,200~3,000 | 0.11 |

## APF505 SERIES

| Workpiece | Aluminium Alloy Steels | Cast Aluminium | Magnesium | Copper&Brass | Titanium |
|---|---|---|---|---|---|
| Type | 6061 | 380 | | | 6Al-4V |
| V(m/min) | 140~200 | 90~150 | 75~150 | 75~151 | 30~90 |
| Diameter (mm) | fn (mm/rev) | | | | |
| 4 | 0.15~0.20 | 0.11~0.23 | 0.11~0.23 | 0.08~0.18 | 0.08~0.18 |
| 6 | 0.19~0.38 | 0.15~0.30 | 0.15~0.30 | 0.15~0.23 | 0.15~0.23 |
| 8 | 0.27~0.45 | 0.23~0.38 | 0.23~0.38 | 0.15~0.23 | 0.15~0.23 |
| 10 | 0.34~0.53 | 0.23~0.45 | 0.23~0.45 | 0.15~0.30 | 0.15~0.30 |
| 12 | 0.45~0.60 | 0.27~0.53 | 0.27~0.53 | 0.23~0.38 | 0.23~0.38 |
| 16 | 0.49~0.75 | 0.30~0.60 | 0.30~0.60 | 0.21~0.45 | 0.21~0.45 |

# Recommended Cutting Condition

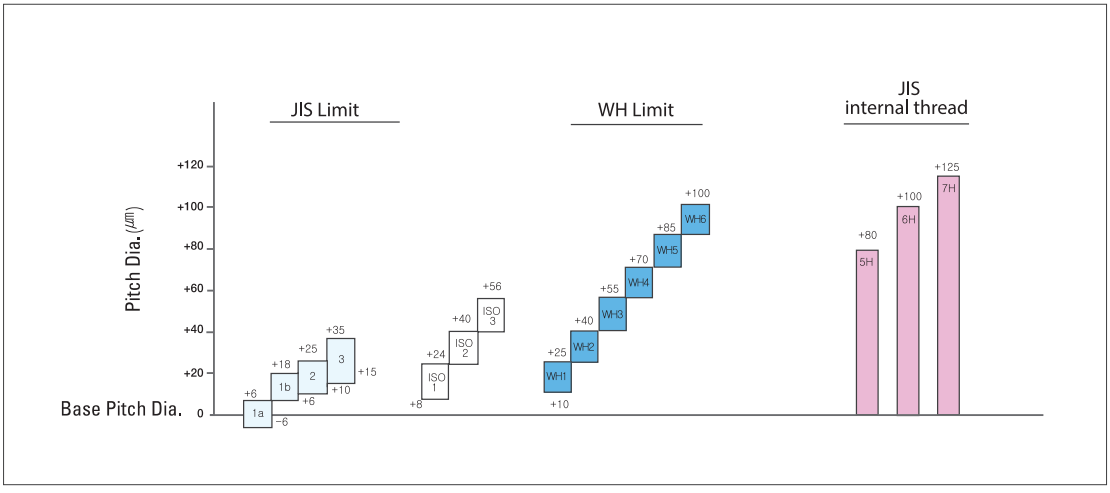
## WH Limits

WIDIN applies an unique WH limits system in order to fulfill the degree of an internal thread and provides users the best taps for suitable working and operating conditions.

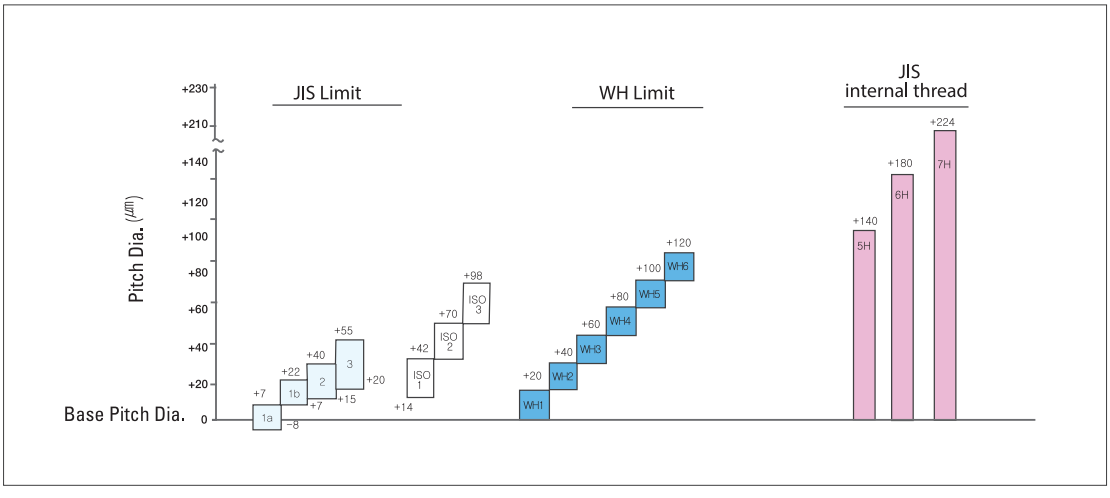
1. {P≤ 0.6(T.P.I≥40)}
Upper Limits : 0.010 + 0.015 x n
Lower Limits : Upper Limits - 0.015
Unit :mm (n=WH number)

2. {P≤ 0.7(T.P.I≤36)}
Upper Limits : 0.020 x n
Lower Limits : Upper Limits -0.020
Unit:mm (n=WH number)

### Example M3×0.5



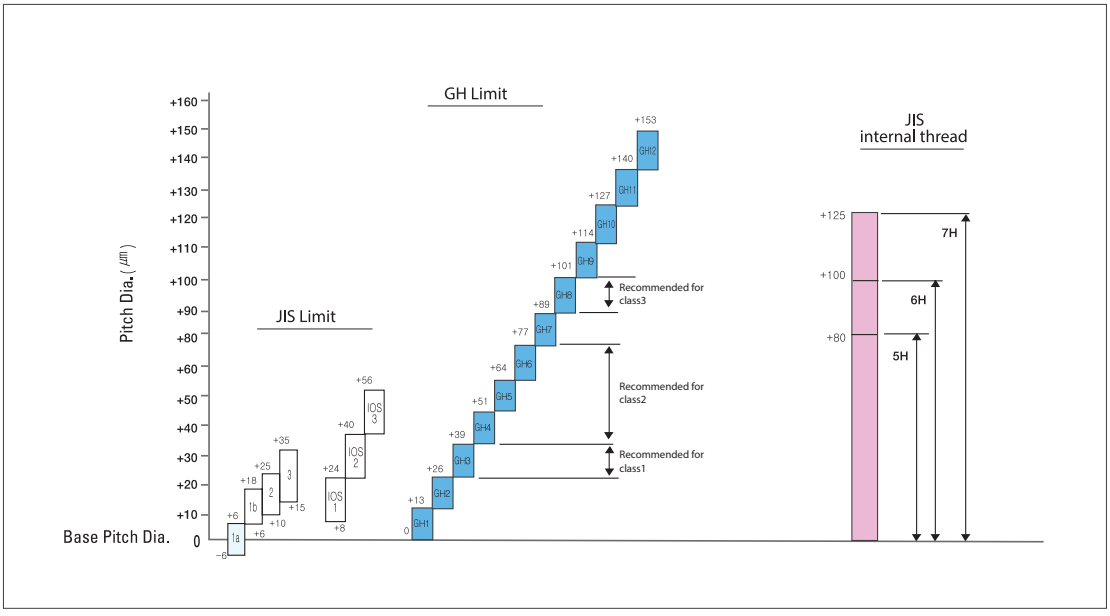

### Example M10×1.5



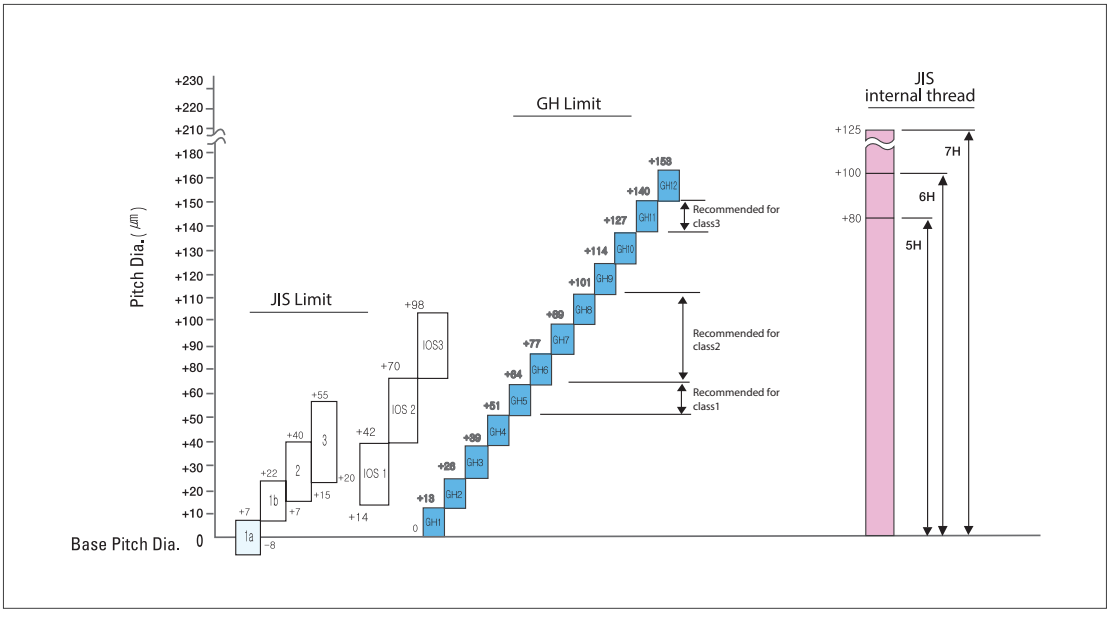
## GH Limits

Since roll taps process female threads by plastic deformation, strict drill diameter management is required, unlike other cutting taps. Tap limit is strictly applied to.
WIDIN adopts the limit of 12.7㎛(0.0005") increments.

### Example M3×0.5




### Example M10×1.5



# Recommended Cutting Condition

## Recommended tapping speeds and cutting fluids

Tapping speeds depend on very important factors such as material type of tap, chamfer length, drill size, work materials and cutting fluids.
Users need to check every aspect before applying it.
Morever, cutting fluids, cooling and abrasion resistance are three important factors affecting cutting fluids.
Therefore, users should provide enough fluids during the tapping process.

| Work Material | | Tapping(m/min) | | | | | Cutting Fluids | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Straight Tap | Spiral Tap | Point Tap | Carbide Tap | Roll Tap | Non Water soluble | Water soluble | Semidry | Dry |
| Low Carbon Steels | C~0.25% | 8~13 | 8~13 | 15~25 | - | 8~13 | ◎ | ○ | △ | △ |
| Medium Carbon Steels | C0.25~0.45% | 7~12 | 7~12 | 10~15 | - | 7~10 | ◎ | ○ | △ | △ |
| High Carbon Steels | C0.45%~ | 6~9 | 6~9 | 8~13 | - | 5~8 | ◎ | ○ | △ | △ |
| Alloy Steels | SCM | 7~12 | 7~12 | 10~15 | - | 5~8 | ◎ | △ | △ | △ |
| Hardened Steels | 25~45HRc | 3~5 | 3~5 | 4~6 | - | - | ◎ | △ | - | - |
| Stainless Steels | SUS | 4~7 | 5~8 | 8~13 | - | 5~10 | ◎ | ○ | - | - |
| Precipitation Hardened Stainless Steels | SUS630, SUS631 | 3~5 | 3~5 | 4~6 | - | - | ◎ | - | - | - |
| Tool Steels | SKD | 6~9 | 6~9 | 7~10 | - | - | ◎ | - | - | - |
| Cast Steels | SC | 6~11 | 6~11 | 10~15 | - | - | ◎ | ○ | - | - |
| Cast Iron | FC | 10~15 | - | - | 10~20 | - | ◎ | ○ | ○ | ○ |
| Ductile, Cast Iron | FCD | 7~12 | 7~12 | 10~20 | 10~20 | - | ◎ | ○ | ○ | - |
| Unalloyed Copper | Cu | 6~9 | 6~11 | 7~12 | 10~20 | 7~12 | ○ | ○ | - | - |
| Brass, Brass Casting | Bs, Bsc | 10~15 | 10~20 | 15~25 | 15~25 | 7~12 | ○ | ○ | ○ | ○ |
| Bronze, Bronze Casting | PB, PBC | 6~11 | 6~11 | 10~20 | 10~20 | 7~12 | ○ | ○ | - | - |
| Aluminum | AL | 10~20 | 10~20 | 15~25 | - | 10~20 | ◎ | ○ | △ | - |
| Aluminum, Alloy Casting | AC, ADC | 10~15 | 10~15 | 15~20 | 10~20 | 10~25 | ◎ | ○ | △ | - |
| Magnesium, Alloy Casting | MC | 7~12 | 7~12 | 10~15 | 10~20 | - | ◎ | ○ | ○ | - |
| Zinc, Alloy Casting | ZDC | 1~12 | 7~12 | 10~15 | 10~20 | 7~12 | ◎ | ○ | △ | - |
| Thermo, Setting Plastic | Bakelite, Phenol Epoxy | 10~20 | - | - | 15~25 | - | - | ○ | ○ | ○ |
| Thermo, Plastic | Vinyl Chloride Nylon | 10~20 | 10~15 | 10~20 | 10~20 | - | - | ○ | ○ | ○ |

◎: Ideal / ○:Good / △: Applicable / - : Not Applicable

## Recommended Drill hole size with JIS internal thread Class 2

| Spiral Tap, Point Tap, Straight Tap | | | |
|---|---|---|---|
| Thread Size | Recommended Drill Size(mm) | Drill Size(mm) | |
| | | Min | Max |
| M3 X 0.5 | 2.50 | 2.459 | 2.599 |
| M4 X 0.7 | 3.30 | 3.242 | 3.422 |
| M5 X 0.8 | 4.20 | 4.134 | 4.334 |
| M6 X 1.0 | 5.00 | 4.917 | 5.153 |
| M8 X 1.25 | 6.80 | 6.647 | 6.912 |
| M10 X 1.25 | 8.80 | 8.647 | 8.912 |
| M10 X 1.5 | 8.50 | 8.376 | 8.676 |
| M12 X 1.0 | 11.00 | 10.917 | 11.153 |
| M12 X 1.25 | 10.80 | 10.647 | 10.912 |
| M12 X 1.5 | 10.50 | 10.376 | 10.676 |
| M12 X 1.75 | 10.30 | 10.106 | 10.441 |
| M14 X 1.5 | 12.50 | 12.376 | 12.676 |
| M14 X 2.0 | 12.00 | 11.835 | 12.21 |
| M16 X 1.5 | 14.50 | 14.376 | 14.676 |
| M16 X 2.0 | 14.00 | 13.835 | 14.21 |
| M18 X 1.5 | 16.50 | 16.376 | 16.676 |
| M18 X 2.5 | 15.50 | 15.294 | 15.744 |
| M20 X 1.5 | 18.50 | 18.376 | 18.676 |
| M20 X 2.5 | 17.50 | 17.294 | 17.744 |

# Recommended Cutting Condition

## CFT, CCT, CCF SERIES ▶ Metric

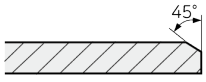
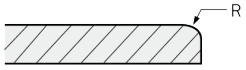
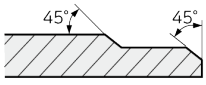
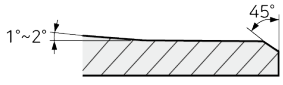
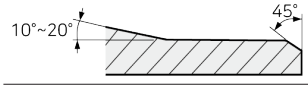
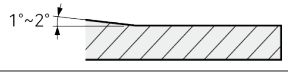
| Workpiece | Alloy Steel | | Alloy Steels | | Prehardened Steels | |
|---|---|---|---|---|---|---|
| | (<Si 4%) | | (<Si 8%) | | (Die Casting) | |
| Diameter (mm) | RPM | FEED | RPM | FEED | RPM | FEED |
| 2 | 3,400-7,000 | 70-100 | 2,600-5,200 | 50-90 | 2,000-4,000 | 40-60 |
| 3 | 2,700 - 5,300 | 60-85 | 2,100-4,200 | 45-70 | 1,600-3,200 | 35-50 |
| 4 | 2,000 - 4,000 | 50-70 | 1,600-3,200 | 40-55 | 1,200-2,400 | 30-40 |
| 5 | 1,700 - 3,400 | 45-60 | 1,400-2,600 | 35-50 | 1,000-2,000 | 26-35 |
| 6 | 1,300 - 2,700 | 40-50 | 1,100-2,100 | 30-40 | 800-1,600 | 22-30 |
| 7 | 1,150-2,400 | 35-45 | 950-1,900 | 28-37 | 700-1,400 | 21-28 |
| 8 | 1,000-2,000 | 30-40 | 800-1,600 | 26-34 | 600-1,200 | 20-25 |
| 9 | 900-1,800 | 30-40 | 700-1,450 | 24-32 | 550-1,100 | 18-23 |
| 10 | 800-1,600 | 30-37 | 600-1,300 | 23-29 | 500-1,000 | 17-22 |
| 11 | 750-1,450 | 30-37 | 550-1,200 | 22-28 | 450-900 | 16-21 |
| 12 | 700-1,300 | 28-35 | 500-1,100 | 21-27 | 400-800 | 16-20 |

## Recommendation of Cutting Conditions in Reamer

| Workpiece | | | Diameter(mm) | Cutting Conditions | |
|---|---|---|---|---|---|
| Material | Strength(Kg/mm2) | Hardness(HB) | | V(m/min) | fn(mm/rev) |
| Alloy Steel<br>Alloy Steels | ~ 100 | - | ~10<br>10~25<br>25~40 | 8 ~ 12 | 0.15 ~ 0.25<br>0.20 ~ 0.40<br>0.30 ~ 0.50 |
| | 100 ~ 140 | - | ~10<br>10~25<br>25~40 | 6 ~ 10 | 0.12 ~ 0.20<br>0.15 ~ 0.30<br>0.20 ~ 0.40 |
| Steel Castings | 40 ~ 50 | - | ~10<br>10~25<br>25~40 | 8 ~ 12 | 0.15 ~ 0.25<br>0.20 ~ 0.40<br>0.30 ~ 0.50 |
| | 50 ~ 70 | - | ~10<br>10~25<br>25~40 | 6 ~ 10 | 0.12 ~ 0.20<br>0.15 ~ 0.30<br>0.20 ~ 0.40 |
| Cast Iron | - | ~ 200 | ~10<br>10~25<br>25~40 | 8 ~ 15 | 0.20 ~ 0.30<br>0.30 ~ 0.50<br>0.40 ~ 0.70 |
| | - | 200 ~ | ~10<br>10~25<br>25~40 | 6 ~ 12 | 0.15 ~ 0.25<br>0.20 ~ 0.40<br>0.30 ~ 0.50 |
| Alumunum Alloys | - | - | ~10 | 15 ~ 25 | 0.20 ~ 0.30<br>0.30 ~ 0.50<br>0.40 ~ 0.70 |
| | - | - | 10~25<br>25~40 | 20 ~30 | |

# Recommended Cutting Condition

## The Effect of Chamfer

| Twist Direction | Characteristics |
|---|---|
|  | If the work piece is caught by sharp blade edge, dent occurs on the machined surface. It is applied to chucking reamer, etc. |
|  | Guide edge was rounded. The ground surface is excellent but round machining is difficult and it may deteriorate the machined surface. |
|  | It is 2 blade-type. Chip is produced in 2 stages and it provides good results. But regrinding is difficult. |
|  | The guide part of second stage of cutting edge is 1~2°. Cutting edge blade is long and life is limited. It provides good results on finish machining |
|  | The guide part of second stage is 10~20. It is very economical as the length of blade is short and utilized length is long |
|  | It is used for finish machining. It is applied to hand reamer. |

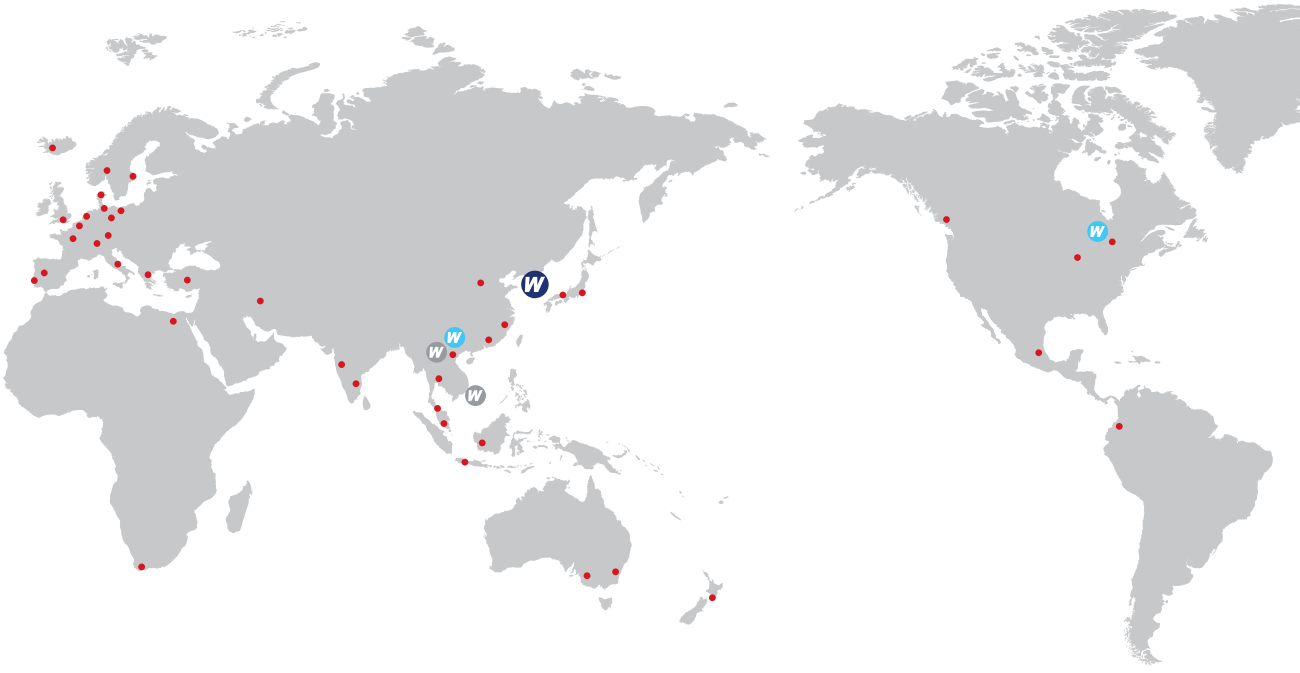
## The Effect of Twist Angle

| Twist Direction | Characteristics |
|---|---|
| (1) Straight blade (twist angle is 0°) | • Surface is generally poor except cast iron. |
| (2) Right twist blade | • Excellent machinability and easy to discharge chip<br>• Applicable work piece range is wide.<br>• Excellent for high hardness work piece<br>• Pulling the chip to the groove |
| (3) Left twist blade | • Excellent surface roughness for work piece of aluminium alloys, copper, and copper alloys<br>• It is good for machining soft materials<br>• Pushing the chip in the processing direction. |

## Trouble Shooting of Reaming

| Trouble | Plan | Measures |
|---|---|---|
| (1) Enlarged Hole | Increase burnishing effects | • Decrease chamfer angle<br>• Increase margin width<br>• Decrease back taper<br>• Grind 2 stages chamfer<br>• Check reamer diameter |
| | Suppress the occurrence of built-up-edge | • Increase margin width<br>• Grind 2 stages chamfer<br>• Change heat treatment conditions and microstructure of workpiece<br>• Increase cutting oil supply<br>• Increase cutting speed and reduce feed rate |
| | Reduce the unbalance of cutting force | • The cutting edge difference shall be less than 0.005mm<br>• Increase cutting speed<br>• Reduce the deviation of main axis and basic Diameter<br>• Check wear conditions of bush and replace it<br>• Change water soluble cutting oil to non-water soluble oil |
| (2) Shrinked Hole | Reduce finish effects | • Increase the clearance angle of cutting edge<br>• Decrease margin width<br>• Increase back taper<br>• Increase cutting speed |
| (3) Poor roundness | Reduce Chattering | • Increase the strength of machine<br>• Reduce the tolerance of bush<br>• Change to left helix reamer<br>• Increase margin width<br>• Increase back taper<br>• Decrease cutting speed<br>• Increase feed rate |
| (4) Poor surface roughness | Increase burnishing | • Use left helix<br>• Decrease chamfer angle<br>• Grind with 2 stage chamfer |
| | Remove deposit | • Increase rake angle<br>• Reduce feed rate<br>• Increase cutting speed |
| | Remove chattering | • The cutting edge difference shall be less than 0.005mm<br>• Increase cutting speed<br>• Align main axis center and basic diameter center<br>• Change water soluble cutting oil to non-water soluble oil |
| | Remove chip interference | • Change shape of flute type<br>• Increase the depth of flute |

# GLOBAL NETWORK



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