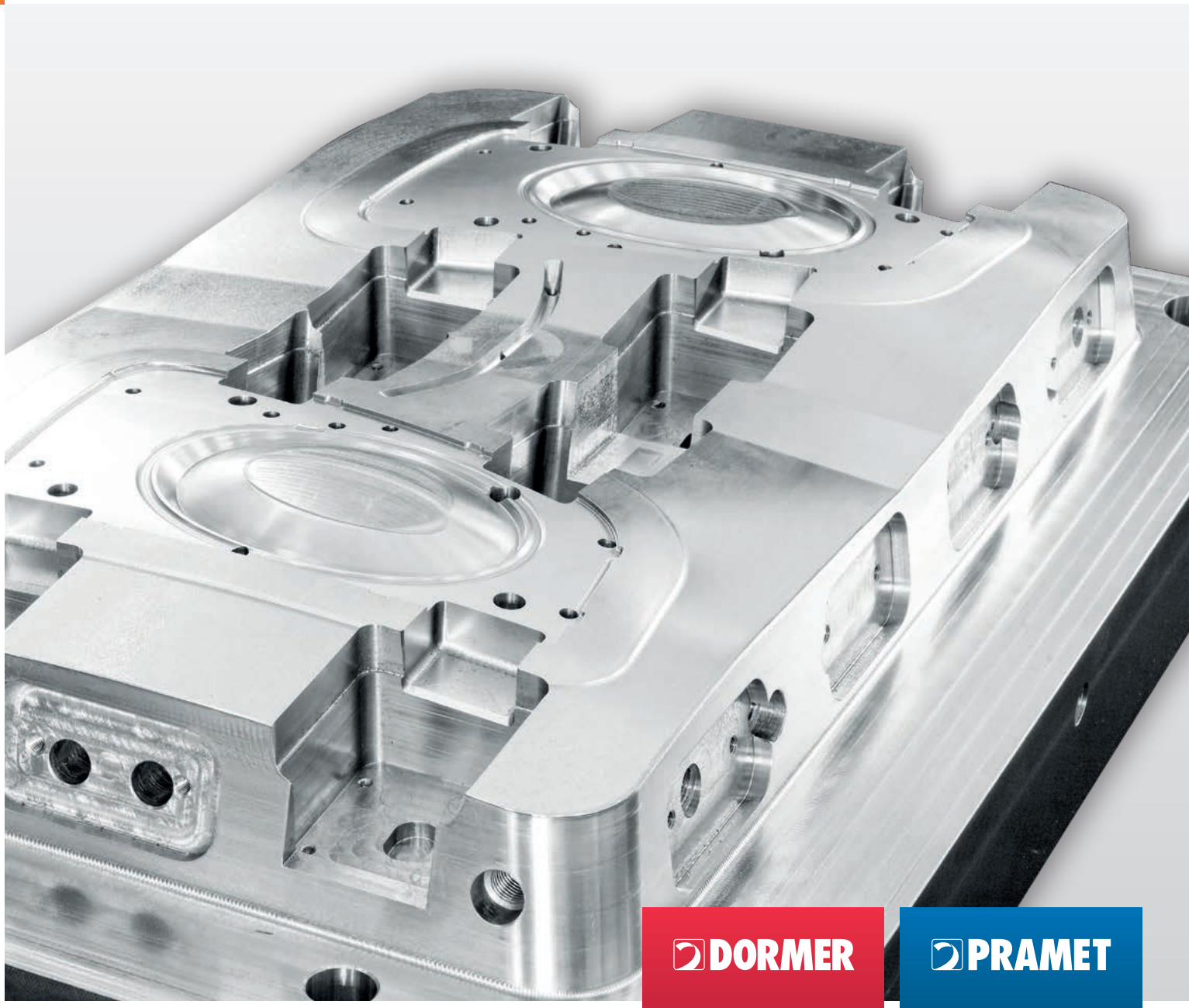
DORMER PRAMET

# MOLDE Y MATRIZ

2020



DORMER PRAMET

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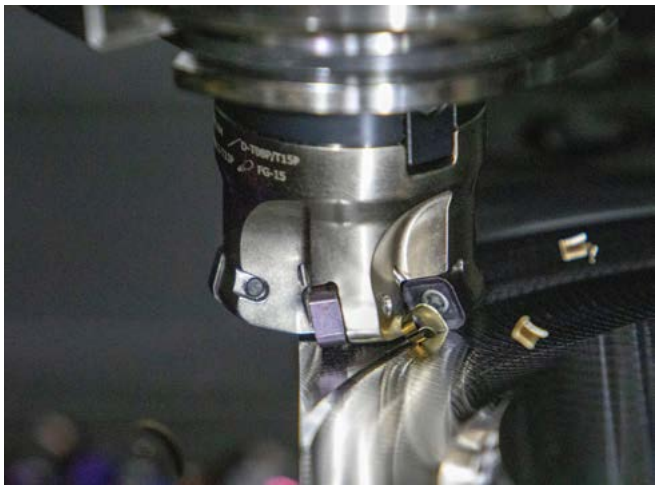
150 FRESAS METAL DURO INTEGRAL

## INTRODUCCION

En los últimos años, Dormer Pramet ha ampliado su variedad de herramientas de placas intercambiables y metal duro para dar soporte una amplia variedad de aplicaciones del molde y matriz.

Esta industria cuenta con una variedad de componentes, a menudo con materiales en unas condiciónes que hace que sean difíciles de mecanizar, con un requisito de herramientas capaces de soportar altos avances, así como la extraccion de grandes tasas de material.

Los componentes más comunes incluyen moldes de inyección de plástico, troqueles de forja, fundición a presión y micro moldes, los cuales cada uno requieren herramientas específicas para cada aplicación. Nuestra gama de aplicaciones cubre desde grandes desbastes hasta los acabados.



Con los diferentes materiales de la pieza y la variedad de tamaños de ellos, esto implica varias operaciones de mecanizado, las herramientas de corte adecuadas son primordiales. Dormer Pramet ofrece numerosas herramientas estándar y especiales - principalmente en el fresado con placa intercambiable.

Como parte de nuestra continua expansión en el sector del molde y matriz, Dormer Pramet ha creado un catalogo de fresado de alto avance con la introduccion de nuevas herramientas lanzadas recientemente.

Otra operación clave en aplicaciones del molde y matriz son tales como las operaciones de copiado y de acabado.

La familia de herramientas de fresado de placas intercambiables de Dormer Pramet incluye herramientas para el semiacabado y acabado de aceros, aceros endurecidos y hierros fundidos.

Desde una perspectiva de herramientas de metal duro, las fresas esféricas de metal duro admiten el fresado de perfiles 3D y contorno de superficies complejas. La gama S5xx para aceros endurecidos está disponible desde longuitudes cortas hasta extra-largas y cuentan con un doble radio para reducir las fuerzas de corte y soportar mayores avances. La gama S2xx es principalmente para el mecanizado de aceros inoxidables y super Aleaciones. El programa S7xx es nuestra opción de fresado multimaterial.

Todas las fresas de esta gama cuentan con un margen adicional en el filo de corte para un proceso más estable y seguro. Una gran gama de diámetros, longitudes y recubrimientos, así como perfiles de desbaste y las opciones de radios, hacen que sea una eleccion ideal.

Este diverso programa de herramientas de corte demuestra el compromiso de Dormer Pramet con el sector del molde y matriz, con nuevas herramientas previstas en el próximos Años.

Para más información acerca de la gama completa de Dormer Pramet, visita www.dormerpramet.com o contacta con tu oficina de ventas local.

# FRESADO ALTO AVANCE



La presión de reducción de costes es una realidad común en muchos entornos de producción. Una opción, sin embargo, permite reducir significativamente los tiempos de mecanizado sin necesidad de una inversión financiera importante: mecanizado de alto avance. Llevado a cabo con máquinas existentes, combina una baja profundidad de corte con un alto avance por diente siendo una alternativa de bajo costo las estrategias de mecanizado de alta velocidad.

Este programa cubre los diámetros de 6 a 175 mm, y soporta un avance  de 0,4 a 3 mm por diente.

## SOLUCIONES ALTO AVANCE

- FRESAS SBN10
- FRESAS SSN11
- FRESADO Penta HF
- FRESADO Avance ZD
- PLACAS PPHF PARA FRESAS K2-PPH
- Placas HF y HF2 PARA FRESAS SAD
- FRESA INTEGRAL ALTO AVANCE S536

## APLICACIONES

- PLANEADO
- FRESADO PLUNGE OBLICUO
- COPIADO
- INTERPOLACION HELICOIDAL
- TORNEADO
- RAMPA
- RANURADO
- FRESADO PLUNGE

# FRESAS COPIADO SRC

EXTRACTO CATALOGO

La línea SRC de fresas de copia, cuenta con una amplia gama de diámetros, cada uno de los cuales ofrece un mecanizado versátil y productivo. Son adecuadas para el fresado de planeado, interpolación helicoidal, rampa, plunge progresivo y fresado de alto avance.

## RASGOS Y BENEFICIOS

GAMA SRC

- Diseño doble negativo para un corte estable
- Placas RCMT en tamaño10, 12, 16, 20 diseñados para permitir un alto avance por diente, mayor profundidad de corte y mayor vida del filo.
- Compatible con tres geometrías (F, M, R), adecuadas para una amplia gama de materiales
- Amplia gama de fresas  (cilindricas, modulares y platos d efresar) y diámetros entre 25-160 mm
- Todas las fresas cuentan con refrigeracion interna.

# FRESAS DE COPIADO PARA SEMI ACABADOS Y ACABADOS

EXTRACTO CATALOGO

Nuestra familia de herramientas de fresado económicas se ha mejorado aún más con una nueva gama de herramientas altamente productivas. Las SCN05C (12-20 mm) y SWN04C (20-35 mm) admiten un corte suave en aplicaciones con voladizo largo. Con más filos de corte para una economía extrema y geometría wiper para mejorar el acabado superficial, lo que resulta en una reducción del tiempo de mecanizado para las operaciones de acabado.

## RASGOS Y BENEFICIOS

- **Productividad** - El paso fino aumenta el número de dientes y permite una mayor productividad que las fresas de paso estándar
- **Mayor calidad de la superficie**: la faceta wiper patentada generan un acabado superior en paredes y cara de componentes
- **Disminución de la vibración** - Optimizado para el fresado de cavidades profundas con corte particularmente suave en las esquinas y cajeras
- **Ahorro de costes por filo de corte** - Placas de doble cara con hasta 4 (SCN05C) o 6 filos de corte (SWN04C).
- **Evacuación óptima de la viruta** - Refrigeracion Interna

# METAL DURO INTEGRAL

EXTRACTO CATALOGO

La gama de fresas de metal duro integral de Dormer Pramet es ideal para las operaciones de fresado más comunes, como ranurado, fresado, fresado lateral y frontal, así como fresado en rampa y copia en una amplia gama de materiales. Las fresas de metal duro integral incluye gamas de herramientas recubiertas con opciones de cilindricas (con / sin chaflán), punta de bola y con radio, así como varias opciones de longitud.

## PROGRAMA

**S8** – fresas universales multiaplicación
**S7** – fresas de alto rendimiento para aceros de resistencia media, aceros inoxidables, titanio y aleaciones base niquel
**S5** – fresas diseñadas para fresado de alto rendimiento en aceros endureados superiores a 49HRC
**S2** – fresas de alto rendimiento para aceros de alta aleación, aceros inoxidables, titanio y aleaciones de níquel

## MATERIAL

METAL DURO MICROGRANO PREMIUM

- Una excelente combinación de dureza y Dureza
- Alta resistencia al desgaste
- Larga y consistente vida útil de la herramienta

## RECUBRIMIENTO

MULTI-CAPA (AlTiN) o (TiSiN)

- Mejora de la estabilidad del filo
- Excelente protección contra el desgaste
- Mayor RESISTENCIA AL CALOR
- Aumento de la vida útil de la herramienta

## HELICE Y PASO VARIABLE

- Ofrece mayor estabilidad y mejora los armónicos durante el proceso de fresado
- Reducción de posibles vibraciones y menor riesgo de astillado en los filos o esquinas
- Aumento de la estabilidad también permite que estas fresas para ser utilizados en una amplia variedad de materiales y aplicaciones en las que las fresas de tipo convencional no funcionan tan bien

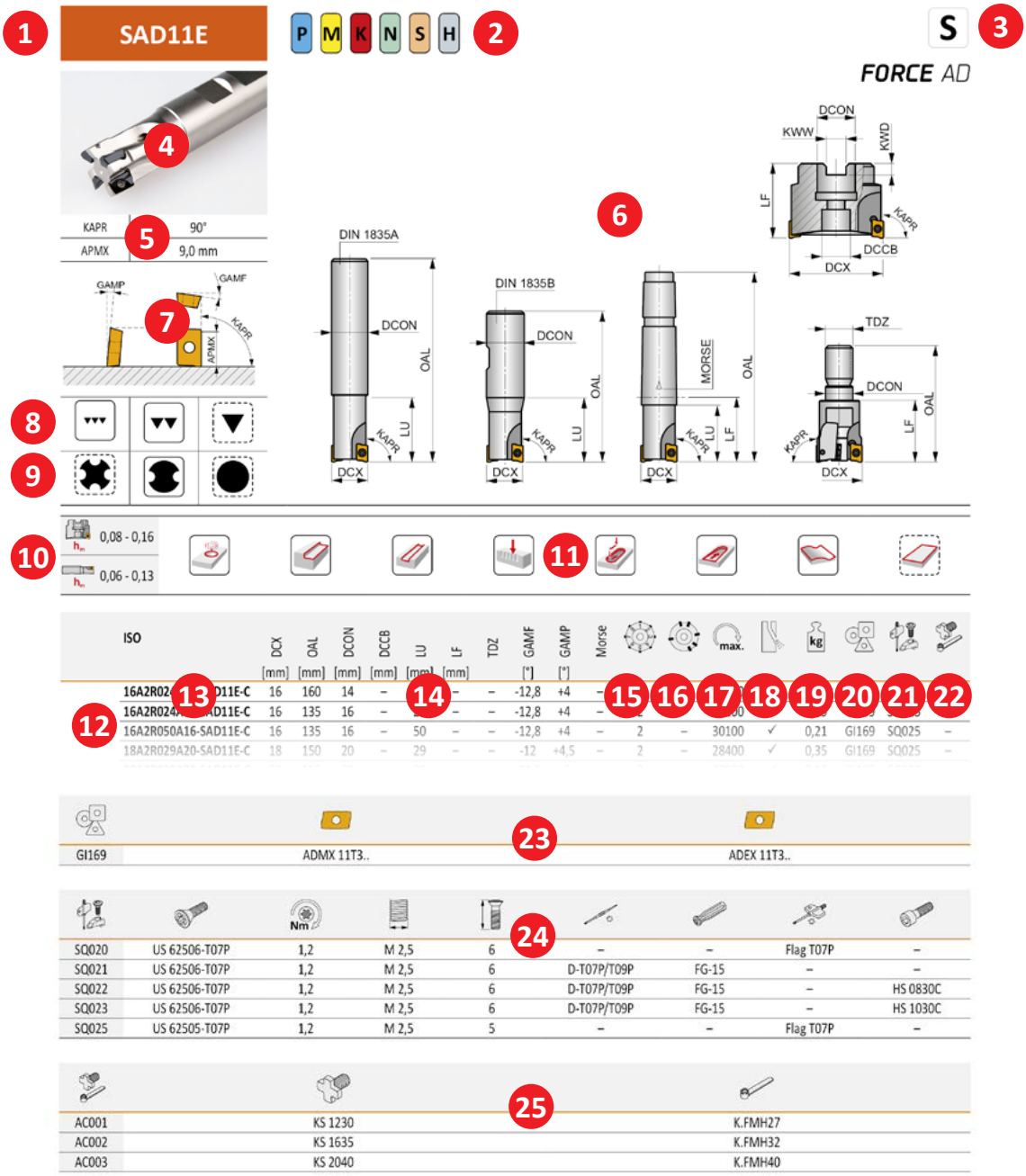
## MANGOS

ALTA PRECISION (h6)

- Se ofrece en la mayoría de las fresas como standard
- Los mangos cilíndricos están fabricados en DIN 6535HA y DIN 6535HB

Fresa S767 con paso y helice variables.

# FRESADO PLACA INTERCAMBIABLE




Típica página com fresa – os detalhes na página final serão diferentes.

| | |
|---|---|
| 1 | Designación de la fresa |
| 2 | Gupos de material |
| 3 | Sistema de fijación de la plaquita |
| 4 | Esquema Ilustrativo |
| 5 | Ángulo de posición y máxima profundidad de corte teórica [mm] |
| 6 | Esquema de la herramienta |
| 7 | Geometría de la herramienta |
| 8 | Calidad superficial alcanzable |

## VISION GENERAL - FRESAS

| | |
|---|---|
| 9 | Condiciones de corte /trabajo |
| 10 | Gama máxima de espesor medio de viruta [mm] para fresas con mango y/o fresas para montaje en cono |
| 11 | Posibilidades tecnológicas de la herramienta |
| 12 | Tipo de mango |
| 13 | Codificación ISO para fresas |
| 14 | Dimensiones [mm], ángulos [1] [°] y tipo de montaje de la herramienta |
| 15 | Número de dientes |
| 16 | Paso irregular |
| 17 | Máximas revoluciones de la fresa |
| 18 | Refrigeración interna |
| 19 | Peso [kg] |
| 20 | Grupo de plaquitas compatibles [2] |
| 21 | Grupo de repuestos [2] |
| 22 | Grupo de accesorios especiales [2] |
| 23 | Plaquitas compatibles |
| 24 | Repuestos |
| 25 | Accesorios especiales |

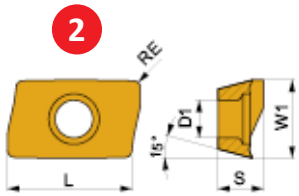
[1] GAMF = ângulo de inclinação radial (ver parte técnica)

GAMP = ângulo de inclinação axial (ver parte técnica)

[2] Peças sobressalentes e ícones de acessórios especiais são projetados esquematicamente para melhor compreensão. Eles não estão incluídos na lista de ícones. Os parafusos tem, em alguns casos, informações sobre o torque em Nm, comprimento do parafuso e tamanho da rosca.

## ADMX 11

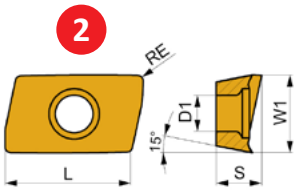
| | W1 | D1 | L | S |
|---|---|---|---|---|
| 11T3 | 6,530 | 2,90 | 11,00 | 3,97 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T304SR-F | M9340 | ◪ | ■ | | | ◪ | | ● | --- | 0,4 | 0,07 | 0,10 | 0,2 | 9,0 |
| | | ■ | ◪ | | | ◪ | | | | | 0,07 | 0,1 | 0,2 | 9,0 |
| | | ■ | ◪ | | | ◪ | | | | | 0,07 | 0,12 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ● | +/- | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ◪ | ■ | ◪ | | ● | - | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| ADMX 11T308SR-F | M9340 | ◪ | ■ | | | ◪ | | ✖ | --- | 0,8 | 0,07 | 0,10 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | | ✖ | - | 0,8 | 0,07 | 0,12 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | +/- | 0,8 | 0,07 | 0,12 | 0,2 | 9,0 |

## ADEX 11-FA

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 11T3 | 6,450 | 2,90 | 9,70 | 3,91 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 11T304FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,4 | 0,03 | 0,30 | 0,4 | 9,0 |
| | HF7 | | | | ■ | | | | | | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T308FR-FA | | | | | | | | | | | 0,03 | 0,3 | 0,2 | 9,0 |
| | HF7 | | | | ■ | | | | | | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T312FR-FA | M0315 | | | | ■ | | | ● | ++ | 1,2 | 0,03 | 0,30 | 0,2 | 9,0 |
| | HF7 | | | | ■ | | | ● | +/- | 1,2 | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T316FR-FA | HF7 | | | | ■ | | | ● | +/- | 1,6 | 0,03 | 0,30 | 0,2 | 9,0 |

| ISO | | FN | FX | M5315 | M9315 | M9325 | M9340 | M0315 | M6330 | M8310 | M8330 | M8340 | M8345 | 8215 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,07 | 0,18 | 392 | 392 | 347 | 311 | – | 266 | 329 | 333 | 284 | 225 | 311 | – |
| | ⧗ | 0,07 | 0,15 | 365 | 356 | 306 | 279 | – | 239 | 297 | 298 | 252 | 198 | 275 | – |
| | ✖ | 0,07 | 0,10 | 333 | 324 | 270 | 248 | – | 207 | 266 | 258 | 221 | 176 | 243 | – |
| M | ● | 0,07 | 0,18 | – | – | 176 | 185 | – | 189 | 167 | 190 | 167 | 135 | 185 | 72 |
| | ⧗ | 0,07 | 0,15 | – | – | 158 | 167 | – | 167 | 149 | 171 | 149 | 117 | 167 | 63 |
| | ✖ | 0,07 | 0,10 | – | – | 135 | 149 | – | 144 | 135 | 151 | 131 | 104 | 144 | 54 |
| K | ● | 0,07 | 0,18 | 374 | 374 | – | – | – | – | 311 | 318 | 270 | – | 293 | 117 |
| | ⧗ | 0,07 | 0,15 | 347 | 338 | – | – | – | – | 284 | 282 | 239 | – | 261 | 104 |
| | ✖ | 0,07 | 0,10 | 320 | 306 | – | – | – | – | 252 | 248 | 207 | – | 230 | 90 |
| N | ● | 0,07 | 0,18 | – | – | – | – | 684 | – | – | 837 | – | – | 774 | 306 |
| | ⧗ | 0,07 | 0,15 | – | – | – | – | 612 | – | – | 746 | – | – | 693 | 275 |
| | ✖ | 0,07 | 0,10 | – | – | – | – | 536 | – | – | 651 | – | – | 612 | 239 |
| S | ● | 0,07 | 0,18 | – | – | 86 | 90 | – | 95 | 81 | 93 | 81 | 68 | 90 | 36 |
| | ⧗ | 0,07 | 0,15 | – | – | 77 | 81 | – | 81 | 72 | 83 | 72 | 59 | 81 | 32 |
| | ✖ | 0,07 | 0,10 | – | – | 68 | 72 | – | 72 | 68 | 73 | 63 | 50 | 72 | 27 |
| H | ● | 0,07 | 0,18 | 77 | 77 | – | – | – | – | 63 | 59 | – | – | 59 | 23 |
| | ⧗ | 0,07 | 0,15 | 72 | 68 | – | – | – | – | 59 | 50 | – | – | 54 | 18 |
| | ✖ | 0,07 | 0,10 | 63 | 63 | – | – | – | – | 50 | 45 | – | – | 45 | 18 |

## VISION GENERAL - FRESAS

Página típica com insertos para fresamento – página final pode diferir em detalhes específicos. A maioria dos insertos podem ser encontrados neste catálogo logo após a fresa. Capítulo separado inclui somente insertos sem a fresa indicada em nossa oferta.

| | |
|---|---|
| 1 | Designación |
| 2 | Esquema de la plaquita |
| 3 | Tabla con tamaños de plaquita [mm] |
| 4 | Iconos – características específicas, tipo de filo de corte y foto representativa de la plaquita |
| 5 | Perfil del filo de corte |
| 6 | Codificación ISO de plaquitas |
| 7 | Calidad |
| 8 | Área de aplicación |
| 9 | Uso de plaquitas en función de las condiciones de trabajo |
| 10 | Influencia del uso de fluidos de corte en corte contínuo |
| 11 | Radio de plaquita [mm] |
| 12 | Gama máxima de avance [mm/diente] y profundidad de corte [mm] |
| 13 | Tabla de velocidades de corte iniciales para calidades, plaquitas disponibles |

# ICONOS Y SIMBOLOS - FRESADO

PRIMERA OPCION

ALTERNATIVA

## Iconos – fresas

| Características generales de las herramientas | |
|---|---|
| P M K N S H / P M K N H S | Grupos de materiales |
| ▾▾▾ / ▾▾▾ | Acabado<br>– calidad superficial muy buena |
| ▾▾ / ▾▾ | Mecanizado medio<br>– calidad superficial buena |
| ▼ / ▼ | Desbaste<br>– rugosidad superficial ilimitada |
| ● / ● | Condiciones estables |
| ✱ / ✱ | Condiciones inestables |
| ✖ / ✖ | Condiciones muy inestables |
| **Posibilidades tecnológicas de la herramienta** | |
| | Planeado |
| | Escuadrado |
| | Escuadrado profundo |
| | Fresado axial (plunging) |
| | Ranurado |
| | Ranurado profundo |
| | Achaflanado |
| | Copiado |
| | Fresado en rampa |
| | Fresado progresivo |
| | Interpolación helicoidal |
| **Tipo de mango** | |
| DIN 1835B | Fresa con mango WELDON |
| DIN 1835A | Fresa con mango cilíndrico |
| MODULAR | Sistema modular |
| ISO 6462 DIN 8030 | Montaje portafresas estándar |
| **Otros** | |
| Nm | Par de apriete del tornillo [Nm] |

## Iconos y símbolos – plaquitas

| Características | |
|---|---|
| 1 | Primera elección |
| U | Gama completa universal |
| | Piezas delgadas y de paredes delgadas |
| | Condiciones de trabajo pesadas |
| | Gran voladizo<br>(plaquitas de torneado) |
| HFC | Alto avance |
| W | Plaquita con geometría rascadora (Wiper) |

# ICONOS Y SIMBOLOS - FRESADO

| | |
|---|---|
| F | Filo vivo |
| E | Filo redondeado |
| T | Filo con faceta |
| S | Filo redondeado con faceta |
| K | Filo con doble faceta |
| P | Filo redondeado con doble faceta |
| **Condiciones de uso** | |
| ■ | Aplicación principal |
| ◪ | Aplicación secundaria |
| ● | Condiciones estables |
| ☻ | Condiciones inestables |
| ✖ | Condiciones muy inestables |
| - - - | Efecto muy negativo en la vida de filo – no se recomienda refrigerante |
| - - | Efecto negativo en la vida de filo – no se recomienda refrigerante |
| - | Efecto ligeramente negativo en la vida de filo |
| +/- | La influencia del refrigerante puede ser positiva o negativa – depende de las condiciones de trabajo |
| + | Efecto ligeramente positivo en la vida de filo |
| ++ | Efecto positivo en la vida de filo – se recomienda refrigerante |
| +++ | Efecto muy positivo en la vida de filo – se recomienda refrigerante |

**Iconos – sección técnica**

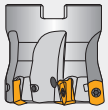
| | |
|---|---|
| X.V | Factor de multiplicación para la velocidad de corte |
| X.f | Factor de multiplicación para el avance |
| X.f | Factor de multiplicación para el avance (mecanizado con la fresa centrada) |
| X.f | Factor de multiplicación para el avance (mecanizado con la fresa descentrada) |
| RE | Radio de plaquita [mm] |
| BS | Tamaño de faceta [mm] |
| AP | Profundidad de corte [mm] |
| f | Avance (mm/diente) |
| 1 f | Avance inicial [mm/diente] |
| DCX | Diámetro de la fresa [mm] |
| DEF | Diámetro efectivo de la fresa [mm] |
| RPMX | Máximo ángulo de rampa [°] |
| APMX / I | Máxima profundidad en la dirección del corte [mm] |
| µm | Ondulación de la superficie [µm] |
| $f_e$ | Paso para fresado convencional [mm] |
| $f_e$ | Paso para fresado cruzado [mm] |
| $s_{max}$ $d_{min}$ | $s_{max}$ para $d_{min}$ [mm] |
| $s_{max}$ $d_{max}$ | $s_{max}$ para $d_{max}$ [mm] |
| | Número de filos en uso |
| max | Ancho máximo de la superficie mecanizada [mm] |
| max | Profundidad de corte en fresado axial [mm] |
| | Refrigerante |

| GRUPO ISO | | WMG (GRUPO DE MATERIAL) | | | DUREZA (HB O HRc) | RESTISTENCIA TRACCION (MPa) | EJEMPLOS DE MATERIAL (AISI, EN, DIN, SS, STN, BS, UNE, CN, AFNOR, GOST, UNI...) |
|---|---|---|---|---|---|---|---|
| P | P1 | P1.1 | Acero facil mecanizado (aceros al carbono con mayor maquinabilidad) | sulfrizados | < 240 HB | ≤ 830 | AISI 1108, EN 15S22, DIN 1.0723, SS 1922, ČSN 11120, BS 210A15, UNE F.210F, GB Y15, AFNOR 10F1, GOST A30, UNI CF10S20 |
| | | P1.2 | | sulfurizados y fosforizados | < 180 HB | ≤ 620 | AISI 1211, EN 11SMn30, DIN 1.0715, SS 1912, ČSN 11109, BS 230M7, UNE F.2111, GB Y15, AFNOR S250, GOST A40G, UNI CF9SMn28 |
| | | P1.3 | | sulfurizados/fosforizados y al plomo | < 180 HB | ≤ 620 | AISI 12L13, EN 11SMnPb30, DIN 1.0718, SS 1914, ČSN 12110, BS 210M16, UNE F.2114, GB Y15Pb, AFNOR S250Pb, GOST AS35G2, UNI CF10SPb20 |
| | P2 | P2.1 | ACEROS AL CARBONO (aceros compuestos principalmente de hierro y carbono) | contiene <0.25%c | < 180 HB | ≤ 620 | AISI 1015, EN C15, DIN 1.0401, SS 1350, ČSN 11301 , BS 080A15, UNE F.111, GB 15, AFNOR C18RR, GOST St2ps, UNI Fe360 |
| | | P2.2 | | contiene <0.55%c | < 240 HB | ≤ 830 | AISI 1030, EN C30, DIN 1.0528, SS 1550, ČSN 12031, BS 080M32, UNE F.1130, GB 30, AFNOR AF50C30, GOST 30G, UNI Fe590 |
| | | P2.3 | | contiene >0.55%c | < 300 HB | ≤ 1030 | AISI 1060, EN C60, DIN 1.0601, SS 165S, ČSN 12061, BS 080A62, UNE F513, GB 60, AFNOR 1C60, GOST 60G, UNI C60 |
| | P3 | P3.1 | ACEROS ALEADOS (aceros al carbono con un contenido de aleación del 10%) | recocido | < 180 HB | ≤ 620 | AISI 5015, EN 16Mo3, DIN 1.5415, SS 2912, ČSN 15020, BS 1501-240, UNE F.2601, GB 16Mo, AFNOR 15D3, GOST 15M, UNI 16Mo3KW |
| | | P3.2 | | templado y endurecido | 180 - 260 HB | > 620 ≤ 900 | AISI 4140, EN 42CrMo4, DIN 1.7225, SS 2244, ČSN 15142, BS 708M40, UNE F.8232, GB 42CrMo, AFNOR 42CD4, GOST 40ChFA, UNI 42CrMo4 |
| | | P3.3 | | | 260 - 360 HB | > 900 ≤ 1240 | AISI 4140, EN 42CrMo4, DIN 1.7225, SS 2244, ČSN 15142, BS 708M40, UNE F.8232, GB 42CrMo, AFNOR 42CD4, GOST 40ChFA, UNI 42CrMo4 |
| | P4 | P4.1 | ACERO DE HERRAMIENTAS (aleaciones especiales para herramientas, moldes y matrices) | recocido | < 26 HRC | ≤ 900 | AISI D2, EN X155CrVMo12-1, DIN 1.2370, SS 2736, ČSN 19573, BS BD2, UNE F.520A, GB Cr12Mo1V1, AFNOR Z160CDV12, GOST Ch12MF, UNI X155CrVMo121KU |
| | | P4.2 | | templado y endurecido | 26 - 39 HRC | > 900 ≤ 1240 | AISI D2, EN X155CrVMo12-1, DIN 1.2370, SS 2736, ČSN 19573, BS BD2, UNE F.520A, GB Cr12Mo1V1, AFNOR Z160CDV12, GOST Ch12MF, UNI X155CrVMo121KU |
| | | P4.3 | | | 39 - 45 HRC | > 1240 ≤ 1450 | AISI D2, EN X155CrVMo12-1, DIN 1.2370, SS 2736, ČSN 19573, BS BD2, UNE F.520A, GB Cr12Mo1V1, AFNOR Z160CDV12, GOST Ch12MF, UNI X155CrVMo121KU |
| M | M1 | M1.1 | ACERO INOXIDABLE FERRITICO (aleaciones al cromo no endurecidas) | | < 160 HB | ≤ 520 | AISI S429, EN X7Cr14, DIN 1.4001, SS 2326, BS 434S17, UNE F.3401, AFNOR Z8C12, GOST 08Ch13, UNI X6CrTi12 |
| | | M1.2 | | | 160 - 220 HB | > 520 ≤ 700 | AISI 446, EN X10CrAl24, DIN 1.4762, SS 2322, ČSN 17113, BS 430S17, UNE F.3154, GB 10Cr17, AFNOR Z10CAS24, GOST 12Ch17, UNI X16Cr26 |
| | M2 | M2.1 | ACERO INOXIDABLE MARTENSITICO (aleaciones al cromo endurecidas) | recocido | < 200 HB | ≤ 670 | AISI 430F, EN X14CrMoS17, DIN 1.4104, SS 2383, ČSN 17140, BS 410S21, UNE F.3117, AFNOR Z10CF17, UNI X10CrS17 |
| | | M2.2 | | enfriadas y templadas | 200 - 280 HB | > 670 ≤ 950 | AISI 440C, EN X105CrMo17, DIN 1.4125, SS 2385, ČSN 17023, BS 425C11, UNE F.3402; GB 102Cr17Mo, AFNOR Z100CD17, GOST 95Ch18, UNI GX6CrNi 13 04 |
| | | M2.3 | | templada por precipitacion | 280 - 380 HB | > 950 ≤ 1300 | AISI 420, EN X45Cr13, DIN 1.4034, ČSN 17029, BS 425C11, UNE F.3405, AFNOR Z44C14, GOST 20X17H12, UNI X30Cr13 |
| | M3 | M3.1 | ACERO INOXIDABLE AUSTENITICO (aleaciones cromo - niquel y cromo - niquel - manganeso) | | < 200 HB | ≤ 750 | AISI 308, EN X5CrNi18-12, DIN 1.4303, SS 2352, ČSN 17249, BS 305S17, UNE F.3513, GB 10Cr18Ni12, AFNOR Z8CN18.12, UNI X7CrNi18 10 |
| | | M3.2 | | | 200 - 260 HB | > 750 ≤ 870 | AISI 309, EN X15CrNiSi20-12, DIN 1.4828, ČSN 17251, BS 309S24, UNE F.3312, GB 1Cr23Ni13, AFNOR Z15CNS20.12, GOST 20Ch20N14S2, UNI 16CrNi23 14 |
| | | M3.3 | | | 260 - 300 HB | > 870 ≤ 1040 | AISI 5848, EN X45CrNiW18-9, DIN 1.4873, BS 331S40, UNE F.3211, AFNOR Z35CNWS14-4, UNI X45CrNiW 18 9 |
| | M4 | M4.1 | AUTENITICO-FERRITICO (DUPLEX) O ACERO INOXIDABLE SUPER AUSTENITICO | | < 300 HB | ≤ 990 | AISI 329, EN X1-NiCrMoCU25-20-5, DIN 1.4539, SS 2562, ČSN 17265, BS 318S13, UNE F.3552, GB 022Cr25NiMo2N, AFNOR Z1NCDU25.20 |
| | | M4.2 | ACEROS INOXIDABLE AUSTENITICOS ENDURECIDOS POR PRECIPITACION | | 300 - 380 HB | ≤ 1320 | AISI 631 (17-7PH), EN X7CrNiAL17-7, DIN 1.4568, SS 2388, ČSN 17465 , BS 301S13, UNE F.3217, GB 07Cr17Ni7Al, AFNOR 29CNA17-07, GOST 09Ch17N7Ju1, UNI X53CrMnNiN21 |
| K | K1 | K1.1 | FUNDICION GRIS (ASTM A48) O FUNDICION GRIS AUTOMOCION (ASTM A159) (fundicion hierro - carbono con micro estructura de grafito laminar) | ferritica o ferritica-perlitica | < 180 HB | ≤ 190 | ASTM A48 Grade 20 (F11401), EN-JL-100, DIN GG-10 (0.6010), SS 0110, STN 422410, BS Grade 150, UNE FG10, GB HAT 100, AFNOR Ft10D, GOST SC 10, UNI G10 |
| | | K1.2 | | ferritica-perlitica o perlitica | 180 - 240 HB | > 190 ≤ 310 | ASTM A48 Grade 30 (F12101), EN-JL-1030, DIN GG-20 (0.6020), SS 0120, STN 422420, BS Grade 220, UNE FG20, GB HT200, AFNOR Ft20D, GOST C420, UNI G20 |
| | | K1.3 | | perlitica | 240 - 280 HB | > 310 ≤ 390 | ASTM A48 Grade 50 (F13501), EN-JL-1060, DIN GG-35 (0.6035), SS 0135, STN 422435, BS Grade 350, UNE FG35, GB HAT300, AFNOR Ft35D, GOST SC35, UNI G35 |
| | K2 | K2.1 | FUNDICION MALEABLE (ASTM A602) (fundición de hierro-carbono con una microestructura libre de grafito) | ferritica | < 160 HB | ≤ 400 | ASTM A602 Grade M3210 (F20000), EN-JM-1130, DIN GTS-35 (0.8135), SS 0815, BS B340/12, UNE Type A, AFNOR MN 35-10, GOST K435-10 |
| | | K2.2 | | ferritica o perlitica | 160 - 200 HB | > 400 ≤ 550 | ASTM A602 Grade M4504 (F20001), EN-JM-1040, DIN GTS-50-05 (0.8045), BS P50-05, AFNOR MB 45-7 |
| | | K2.3 | | perlitica | 200 - 240 HB | > 550 ≤ 660 | ASTM A602 Grade M7002 (F20004), EN-JM-1140, DIN GTS-45 (0.8145), SS 0854, STN 422540, BS P 45-06, UNE Typ B, AFNOR MP 50-5, GOST K45-7, UNI GMN 45 |
| | K3 | K3.1 | FUNDICION DÚCTIL (ASTM A536) (fundición de hierro-carbono con microestructura de grafito nodular) | ferritica | < 180 HB | ≤ 560 | ASTM A536 Grade 60-40-18 (F32800), EN-JS-1030, DIN GGG-40 (0.7040), SS 0717, STN 422304, BS 420/12, UNE FGE 42-12, GB QT 400, AFNOR FGS 400-12, GOST B40 |
| | | K3.2 | | ferritica o perlitica | 180 - 220 HB | > 560 ≤ 680 | ASTM A536 Grade 80-55-06 (F33800), EN-JS-1050, DIN GGG-50 (0.7050), SS 0727, STN 422305, BS 500/7, UNE FGE 50-7, GB QT 500-7, AFNOR FGS 500-7, GOST B50 |
| | | K3.3 | | perlitica | 220 - 260 HB | > 680 ≤ 800 | ASTM A536 Grade 100-70-03 (F34800), EN-JS-1060, DIN GGG-60 (0.7060), SS 0732, STN 422306, BS 600/3, UNE FG70-2, GB QT 600-3, AFNOR FGS 600-3, GOST B60 |
| | K4 | K4.1 | FUNDICION GRIS AUSTENÍTICO (ASTM A436) (fundiciones de aleación de hierro-carbono con microestructura de grafito laminar austenítico) | | < 180 HB | ≤ 190 | ASTM A436 Type 1 (L-NiCuCr 15 6 2, F41000), EN-JL-3011, DIN GGL-NiMn 13 7 (0.6652), SS 0523, BS Grade F1, AFNOR FGL-Ni13Mn7, GOST S-NiMn 13 7 |
| | | K4.2 | FUNDICION DÚCTIL AUSTENÍTICA (ASTM A439 o ASTM A571) (fundiciones de hierro-carbono con microestructura de grafito nodular austenítico) | | < 240 HB | ≤ 740 | ASTM A439 Type D-2B (S-NiCr 20 3, F43001), EN-JS-3021, DIN GGG-NiMn 23 4, SS 0776, BS Grade S2M, AFNOR FGS Ni23 Mn4, GOST ЧН19Х3ШJ |
| | | K4.3 | FUNDICION DÚCTIL AUSTEMPERADA (ASTM A897) (fundiciones de hierro y carbono con microestructura de ausferrita) | | < 280 HB | > 840 ≤ 980 | ASTM A897 Grade 110-70-11 |
| | | K4.4 | | | 280 - 320 HB | > 980 ≤ 1130 | ASTM A897 Grade 125-80-10, EN-JS-1100, DIN GGG-90 (5.3400) |
| | | K4.5 | | | 320 - 360 HB | > 1130 ≤ 1280 | ASTM A897 Grade 2 (150-110-07), EN-JS-1110, DIN GGG-100 (5.3403) |
| | K5 | K5.1 | FUNDICION DE GRAFITO COMPACTADO CGI (ASTM A842) (fundición de hierro-carbono con estructura vermicular de grafito) | ferritico | < 180 HB | ≤ 400 | ASTM A842 Grade 300, EN-GJV-300, DIN GGV 30, GOST ЧВГ30, |
| | | K5.2 | | ferritico-perlitico | 180 - 220 HB | > 400 ≤ 450 | ASTM A842 Grade 350, EN-GJV-350, DIN GGV 35 (5.2200), GOST ЧВГ30, |
| | | K5.3 | | perlitico | 220 - 260 HB | > 450 ≤ 500 | ASTM A842 Grade 450, EN-GJV-450, DIN GGV 45, GOST ЧВГ45, |
| N | N1 | N1.1 | Aluminio forjado comercialmente puro | | < 60 HB | ≤ 240 | UNS A91200, EN AL99.0, DIN 3.0205, SS 4010, STN 424009, BS 1C, UNE L-3001, GB L5, AFNOR A4, GOST АДС, UNI 3567 |
| | | N1.2 | Aleaciones de aluminio forjado | templado medio | 60 - 100 HB | > 240 ≤ 400 | UNS A93004, EN AlMn0.5Mg0.5, DIN 3.0505, SS 4054, STN 424432, BS N31, UNE L-3831, GB LF2, AFNOR A-M1, GOST AMц, UNI 3568 |
| | | N1.3 | | templado completo | 100 - 150 HB | > 400 ≤ 590 | UNS A95083, EN AlMg4.5Mn0.7, DIN 3.3547, SS 4140, STN 424415, BS N8, UNE L-3321, GB AlMg4.5Mn, AFNOR A-G4.5Mn, GOST Amg 4.5, UNI P-AlMg4.4 |
| | N2 | N2.1 | Fundicion de aluminio | | < 75 HB | ≤ 240 | UNS A02080, EN AlCu4S, BS LM11, STN 424331, UNE Al Si1Cu, GOST AMg5K, UNI G-AlSi7Mg |
| | | N2.2 | | | 75 - 90 HB | > 240 ≤ 270 | UNS A02420, EN AlCu4Ni2Mg2, SS AlSi7MgFe, BS LM6, STN 424519, UNE Al-7SiMg, AFNOR A-S7G, GOST AK7, UNI G-AlSi7Mg |
| | | N2.3 | | | 90 - 140 HB | > 270 ≤ 440 | UNS A03360, EN G-ALCu4NiMg2, SS ALSi10Mg, STN 424336, BS LM 30, AFNOR A-S10G, UNI G-AlSi9Mg |
| | N3 | N3.1 | Aleaciones de cobre de facil mecanizacion | | | | UNS C14700, EN CuPb1P, DIN 2.1498, STN 423214, BS C111, AFNOR CuZn35Pb2, GOST L63-3, UNI CuS(P0.01) |
| | | N3.2 | Aleaciones de cobre de viruta corta con maquinabilidad moderada | | | | UNS C81540, EN CuNi2SiCr, DIN 2.0857, STN 423220, BS NS113, UNE CuSn12, AFNOR CuZn40, GOST L60, UNI P-CuZn-40 |
| | | N3.3 | Cobre electrolitico y aleaciones de cobre de viruta larga con baja maquinabilidad | | | | UNS C10100, EN CuAg0.1, DIN 2.1203, SS 5010, UNE CUSi3Mn1, AFNOR Cu-C2, GOST M1f, UNI Cu-OF |
| | N4 | N4.1 | Polimeros termoplasticos | | | | ABS, Acryl, Duraplast, Elastomer, EP, Epoxid, FEP, Fluor, Gummi, Kautschuk, Latex, MF, MPF, PA, PAI, PC, PE, PEEK, PEI, PES, PET, PF, Phenolharze, PI, PMMA, Polyamide, Polyester, Polyolefine, Polysulfon, POM, PP, PPE, PPS, PS, PSU, PTFE, PU, PUR, PVDF, SAN, SI, Styrol, UF, Ureol |
| | | N4.2 | Polimeros termoendurecibles | | | | Aramid, Epoxy, Fluoropolymer, Mehacrylate, Melamine, Phenolic, Polyester, Polyimide, Polymethacrylimide, Polyurethane |
| | | N4.3 | Composites o polimeros reforzados | | | | CFK, GFK, GMT, Honeycomb, Kevlar, LFT, Organo, SMC |
| | N5 | N5.1 | Grafito | | | | CGM-1, CM-00, GM-10, GM-11, GR030, GR030PI, GR060, GR060PI, GR125, MC-01, MC-01R0, MC-03, MC-03M |
| S | S1 | S1.1 | Titanio o aleaciones de titanio | | < 200 HB | ≤ 660 | UNS R50250 (Grade 1), EN Ti 99.6, DIN 3.7035, BS TA.2, UNE Ti-Po2, AFNOR T-40, GOST BT1-00 |
| | | S1.2 | | | 200 - 280 HB | > 660 ≤ 950 | UNS R56404 (Grade 29), EN Ti2Cu, DIN 3.7124, BS TA.21, UNE Ti-P11, AFNOR T-U2 |
| | | S1.3 | | | 280 - 360 HB | > 950 ≤ 1200 | UNS R54250 (Grade 38), EN TiAl6V4, DIN 3.7165, ČSN TiAl6VELI, BS TA. 13, UNE Ti-P63, AFNOR T-A6V, GOST BT6 |
| | S2 | S2.1 | Aleaciones alta temperatura con base hierro | | < 200 HB | ≤ 690 | UNS N08801 (Incoloy 801), EN X8 NiCrAlTi31-21, DIN 1.4959, BS NA 15, AFNOR Z8NC33-21 |
| | | S2.2 | | | 200 - 280 HB | > 690 ≤ 970 | UNS N19907, EN X6NiCrTiMoVB25-15-2, DIN 1.4980, SS 2570, BS HR52, AFNOR Z6NCTDV25.15B, GOST 36HXTIO |
| | S3 | S3.1 | Aleaciones alta temperatura con base niquel | | < 280 HB | ≤ 940 | UNS A09706 (Inconel 706), EN NiCr25FeAl, DIN 2.4856, BS HR 6, ČSN Inconel 625, UNE F.3313, GB 1Cr16Ni35, AFNOR NC22FeDNB, GOST XH38BT |
| | | S3.2 | | | 280 - 360 HB | > 940 ≤ 1200 | UNS N07001, EN NiCr20Co13Mo4Ti3Al, DIN 2.4654, BS HR 2, ČSN Waspaloy, AFNOR NCKD 20ATV, GOST XH80TБIO |
| | S4 | S4.1 | Aleaciones alta temperatura con base cobalto | | < 240 HB | ≤ 800 | UNS R30016 (Stellite 6b), EN CoCr20W15Ni, DIN 2.4964, AFNOR KC 20 WN, GOST ЛIKS2 |
| | | S4.2 | | | 240 - 320 HB | > 800 ≤ 1070 | UNS R30016 (Stellite 6b), EN CoCr20W15Ni, DIN 2.4964, AFNOR KC 20 WN, GOST ЛIKS2 |
| H | H1 | H1.1 | Fundicion en frio | | < 440 HB | | UNS F45001, EN-GJS-1050-6, DIN 5.3406, SS 0512, BS Grade 2A |
| | H2 | H2.1 | Fundiciones templadas | | < 55 HRC | | UNS F45003, EN-GJS-1400-1, DIN 5.3405, SS 0457, BS Grade 3D |
| | | H2.2 | | | > 55 HRC | | UNS F45003, EN G-X260NiCr4-2, DIN 0.9620, SS 0466, BS Grade S |
| | H3 | H3.1 | Aceros templados <55HRc | | < 51 HRC | | AISI 4135, EN 34CrMo4, DIN 1.7220, SS 2234, STN 415131, BS 198, UNE F.1250, GB 35CrMo, AFNOR 35CD4, GOST AC38XГM, UNI 35CrMo4KB |
| | | H3.2 | | | 51 - 55 HRC | | AISI 4135, EN 34CrMo4, DIN 1.7220, SS 2234, STN 415131, BS 198, UNE F.1250, GB 35CrMo, AFNOR 35CD4, GOST AC38XГM, UNI 35CrMo4KB |
| | H4 | H4.1 | Acero templados >55HRC | | 55 - 59 HRC | | UNS T31501, EN 100MnCrW4, DIN 1.2510, SS 2140, STN 419413, BS BO1, UNE F.5220, GB 9CrWMn, AFNOR 90MWCrV5, GOST 9XBГ, UNI 95MNWCr5KU |
| | | H4.2 | | | > 59 HRC | | UNS T31501, EN 100MnCrW4, DIN 1.2510, SS 2140, STN 419413, BS BO1, UNE F.5220, GB 9CrWMn, AFNOR 90MWCrV5, GOST 9XBГ, UNI 95MNWCr5KU |

## ALTO AVANCE

### SBN10

| 20° | APMX [mm] | 1,0 |
|---|---|---|
| | DCX [mm] | 16 – 42 |



| | | | | |
|---|---|---|---|---|
| BN.. 10T3 | P | M | K |
| AN.. 10T3 | | S | H |
| | 18 – 24 | | |

### SPD09

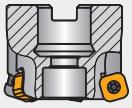
| 19° | APMX [mm] | 2,0 |
|---|---|---|
| | DCX [mm] | 32 – 140 |

PENTA HF

| | | | |
|---|---|---|---|
| PD.. 0905 | P | M | K |
| | N | S | H |
| | 25 – 30 | | |

### SSN11

| 18° | APMX [mm] | 1,7 |
|---|---|---|
| | DCX [mm] | 32 – 125 |



| | | | |
|---|---|---|---|
| SN.. 1104 | P | M | K |
| | | S | H |
| | 31 – 34 | | |

### SZD07

| – | APMX [mm] | 1,0 |
|---|---|---|
| | DCX [mm] | 16 – 32 |

AVANCE ZD

| | | | |
|---|---|---|---|
| ZD.. 0703 | P | | K |
| | | | H |
| | 35 – 38 | | |

### SZD09

| – | APMX [mm] | 1,0 |
|---|---|---|
| | DCX [mm] | 25 – 66 |

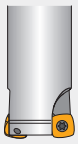
AVANCE ZD

| | | | |
|---|---|---|---|
| ZD.. 09T3 | P | | K |
| | | | H |
| | 39 – 42 | | |

### SZD12

| – | APMX [mm] | 1,6 |
|---|---|---|
| | DCX [mm] | 32 – 80 |

AVANCE ZD



| | | | |
|---|---|---|---|
| ZD.. 1204 | P | | K |
| | | | H |
| | 43 – 46 | | |

### SAD07D

| 90° | APMX [mm] | 0,3 |
|---|---|---|
| | DCX [mm] | 10 – 14 |

FORCE AD

| | | | |
|---|---|---|---|
| ADEX 0702 | P | M | K |
| | N | S | H |
| | 128-133 | | |

### SAD11E

| 90° | APMX [mm] | 0,6 |
|---|---|---|
| | DCX [mm] | 16 – 125 |

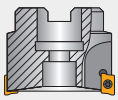
FORCE AD

| | | | |
|---|---|---|---|
| ADEX 11T3 | P | M | K |
| | N | S | H |
| | 134-141 | | |

### SAD16E

| 90° | APMX [mm] | 1,3 |
|---|---|---|
| | DCX [mm] | 25 – 175 |

FORCE AD



| | | | |
|---|---|---|---|
| ADEX 1606 | P | M | K |
| | N | S | H |
| | 142-149 | | |

## COPIADO - PLACA REDONDA

### SRC10

| | | |
|---|---|---|
| – | APMX [mm] | 5,0 |
| | DCX [mm] | 25 – 66 |

| | | | | |
|---|---|---|---|---|
| | RC.. 10T3 | P | M | K |
| | | N | S | H |
| | | 47 – 50 | | |

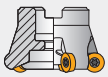
### SRC12

| | | |
|---|---|---|
| – | APMX [mm] | 6,0 |
| | DCX [mm] | 40 – 100 |

| | | | | |
|---|---|---|---|---|
| | RC.. 1204 | P | M | K |
| | | N | S | H |
| | | 51 – 55 | | |

### SRC16

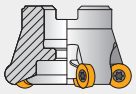
| | | |
|---|---|---|
| – | APMX [mm] | 8,0 |
| | DCX [mm] | 63 – 160 |



| | | | | |
|---|---|---|---|---|
| | RC.. 1606 | P | M | K |
| | | N | S | H |
| | | 56 – 59 | | |

### SRC20

| | | |
|---|---|---|
| – | APMX [mm] | 10,0 |
| | DCX [mm] | 80 – 160 |



| | | | | |
|---|---|---|---|---|
| | RC.. 2006 | P | M | K |
| | | N | S | H |
| | | 60 – 63 | | |

### SRD05

| | | |
|---|---|---|
| – | APMX [mm] | 1,5 |
| | DCX [mm] | 10 – 15 |

| | | | | |
|---|---|---|---|---|
| | RD.. 0501 | P | M | K |
| | | | | H |
| | | 64 – 66 | | |

### SRD07

| | | |
|---|---|---|
| – | APMX [mm] | 2,0 |
| | DCX [mm] | 15 – 25 |

| | | | | |
|---|---|---|---|---|
| | RD.. 07T1 | P | M | K |
| | RD.. 0702 | N | S | H |
| | | 67 – 71 | | |

### SRD10

| | | |
|---|---|---|
| – | APMX [mm] | 2,5 |
| | DCX [mm] | 20 – 35 |

| | | | | |
|---|---|---|---|---|
| | RD.. 1003 | P | M | K |
| | | N | S | H |
| | | 72 – 77 | | |

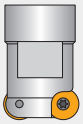
### SRD12

| | | |
|---|---|---|
| – | APMX [mm] | 3,0 |
| | DCX [mm] | 24 – 80 |

| | | | | |
|---|---|---|---|---|
| | RD.. 12T3 | P | M | K |
| | | N | S | H |
| | | 78 – 83 | | |

### SRD16

| | | |
|---|---|---|
| – | APMX [mm] | 4,0 |
| | DCX [mm] | 32 – 100 |



| | | | | |
|---|---|---|---|---|
| | RD.. 1604 | P | M | K |
| | | N | S | H |
| | | 84 – 89 | | |

## FRESAS COPIADO - PLACAS ESFERICAS

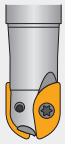
### K2-PPH

| 90° | APMX [mm] | 4,0 |
|---|---|---|
| | DCX [mm] | 8 - 32 |

| | | | | |
|---|---|---|---|---|
| PPH | P | M | K |
| PPHF | N | S | H |
| PPHT | 90 – 101 | | |

### L2-SZP

| – | APMX [mm] | 44,7 |
|---|---|---|
| | DCX [mm] | 10 – 50 |



| | | | |
|---|---|---|---|
| ZP | P | M | K |
| | | S | H |
| | 102-107 | | |

### K2-SRC

| – | APMX [mm] | 3,2 |
|---|---|---|
| | DCX [mm] | 8 – 32 |

| | | | |
|---|---|---|---|
| RC | P | | K |
| | | | H |
| | 108-116 | | |

### K2-SLC

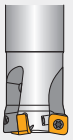
| 90° | APMX [mm] | 4,0 |
|---|---|---|
| | DCX [mm] | 8 – 20 |

| | | | |
|---|---|---|---|
| LC | P | | K |
| | | | H |
| | 117-121 | | |

## FRESAS DE COPIADO - ACABADO

### SCN05C

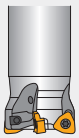
| 93° | APMX [mm] | 1,0 |
|---|---|---|
| | DCX [mm] | 12 - 20 |



| | | | |
|---|---|---|---|
| CNHX 05 | P | | K |
| | | | H |
| | 122-124 | | |

### SWN04C

| 93° | APMX [mm] | 2,0 |
|---|---|---|
| | DCX [mm] | 20 - 35 |



| | | | |
|---|---|---|---|
| WNHX 04 | P | | K |
| | | | H |
| | 125-127 | | |

## ESCUADRADO

### SAD07D

| 90° | APMX [mm] | 5,0 |
|---|---|---|
| | DCX [mm] | 10 – 32 |

FORCE AD

| | | | |
|---|---|---|---|
| AD.. 0702 | P | M | K |
| | N | S | H |
| | 128-133 | | |

### SAD11E

| 90° | APMX [mm] | 9,0 |
|---|---|---|
| | DCX [mm] | 16 – 125 |

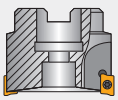
FORCE AD

| | | | |
|---|---|---|---|
| AD.. 11T3 | P | M | K |
| | N | S | H |
| | 134-141 | | |

### SAD16E

| 90° | APMX [mm] | 13,0 |
|---|---|---|
| | DCX [mm] | 25 – 175 |

FORCE AD



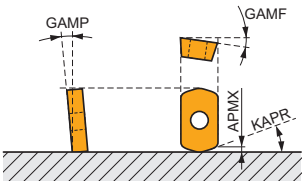
| | | | |
|---|---|---|---|
| AD.. 1606 | P | M | K |
| | N | S | H |
| | 142-149 | | |

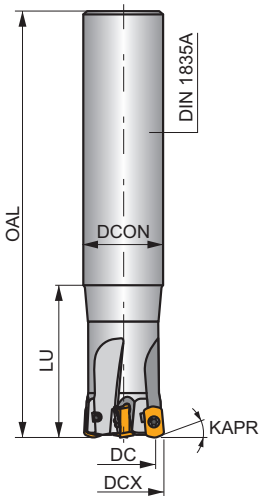
# SBN10

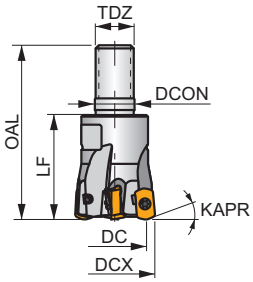
P M K S H

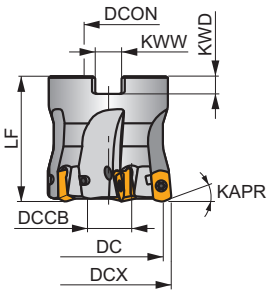
S

| | |
|---|---|
| KAPR | 20° |
| APMX | 1,0 mm |




$h_m$ 0,17-0,41

$h_m$ 0,17-0,41

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | KWW [mm] | KWD [mm] | GAMP [°] | GAMF [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 16E2R030A16-SBN10-C | 16 | 100 | 16 | – | 30 | – | – | – | – | -10 | -12 | 2 | – | 31100 | ✓ | 0,12 | GI329 | CO310 |
| | 16E2R050A16-SBN10-C | 16 | 150 | 16 | – | 50 | – | – | – | – | -10 | -12 | 2 | – | 31100 | ✓ | 0,18 | GI329 | CO310 |
| | 16E2R030A14-SBN10-C | 16 | 150 | 14 | – | 30 | – | – | – | – | -10 | -12 | 2 | – | 31100 | ✓ | 0,15 | GI329 | CO310 |
| | 18E2R030A16-SBN10-C | 18 | 150 | 16 | – | 30 | – | – | – | – | -10 | -11 | 2 | – | 29200 | ✓ | 0,20 | GI329 | CO310 |
| | 20E3R040A20-SBN10-C | 20 | 130 | 20 | – | 40 | – | – | – | – | -10 | -10 | 3 | – | 27700 | ✓ | 0,25 | GI329 | CO310 |
| | 20E3R080A20-SBN10-C | 20 | 160 | 20 | – | 80 | – | – | – | – | -10 | -10 | 3 | – | 27700 | ✓ | 0,29 | GI329 | CO310 |
| | 20E3R040A18-SBN10-C | 20 | 180 | 18 | – | 40 | – | – | – | – | -10 | -10 | 3 | – | 27700 | ✓ | 0,30 | GI329 | CO310 |
| | 20E4R040A20-SBN10-C | 20 | 130 | 20 | – | 40 | – | – | – | – | -10 | -10 | 4 | – | 27700 | ✓ | 0,26 | GI329 | CO310 |
| | 25E4R050A25-SBN10-C | 25 | 140 | 25 | – | 50 | – | – | – | – | -10 | -9 | 4 | ✓ | 24800 | ✓ | 0,42 | GI329 | CO310 |
| | 25E4R100A25-SBN10-C | 25 | 180 | 25 | – | 100 | – | – | – | – | -10 | -9 | 4 | ✓ | 24800 | ✓ | 0,51 | GI329 | CO310 |
| | 25E4R050A22-SBN10-C | 25 | 220 | 22 | – | 50 | – | – | – | – | -10 | -9 | 4 | ✓ | 24800 | ✓ | 0,54 | GI329 | CO310 |
| | 25E5R050A25-SBN10-C | 25 | 140 | 25 | – | 50 | – | – | – | – | -10 | -9 | 5 | – | 24800 | ✓ | 0,50 | GI329 | CO310 |
| | 32E5R070A32-SBN10-C | 32 | 150 | 32 | – | 70 | – | – | – | – | -10 | -8 | 5 | ✓ | 21900 | ✓ | 0,73 | GI329 | CO310 |
| | 32E6R070A32-SBN10-C | 32 | 150 | 32 | – | 70 | – | – | – | – | -10 | -8 | 6 | ✓ | 21900 | ✓ | 0,73 | GI329 | CO310 |
| | 32E5R120A32-SBN10-C | 32 | 200 | 32 | – | 120 | – | – | – | – | -10 | -8 | 5 | ✓ | 21900 | ✓ | 0,94 | GI329 | CO310 |
| | 35E5R050A32-SBN10-C | 35 | 200 | 32 | – | 50 | – | – | – | – | -10 | -7,5 | 5 | ✓ | 21000 | ✓ | 1,08 | GI329 | CO310 |
| | 35E6R050A32-SBN10-C | 35 | 200 | 32 | – | 50 | – | – | – | – | -10 | -7,5 | 6 | ✓ | 21000 | ✓ | 1,08 | GI329 | CO310 |
| MODULAR | 16E2R025M08-SBN10-C | 16 | 43 | 8,5 | – | – | 25 | M8 | – | – | -10 | -12 | 2 | – | 31100 | ✓ | 0,03 | GI329 | CO310 |
| | 18E2R025M08-SBN10-C | 18 | 43 | 8,5 | – | – | 25 | M8 | – | – | -10 | -11 | 2 | – | 29200 | ✓ | 0,03 | GI329 | CO310 |
| | 20E3R030M10-SBN10-C | 20 | 49 | 10,5 | – | – | 30 | M10 | – | – | -10 | -10 | 3 | – | 27700 | ✓ | 0,05 | GI329 | CO310 |
| | 20E4R030M10-SBN10-C | 20 | 49 | 10,5 | – | – | 30 | M10 | – | – | -10 | -10 | 4 | – | 27700 | ✓ | 0,05 | GI329 | CO310 |
| | 25E4R033M12-SBN10-C | 25 | 55 | 12,5 | – | – | 33 | M12 | – | – | -10 | -9 | 4 | ✓ | 24800 | ✓ | 0,08 | GI329 | CO310 |
| | 25E5R033M12-SBN10-C | 25 | 55 | 12,5 | – | – | 33 | M12 | – | – | -10 | -9 | 5 | – | 24800 | ✓ | 0,19 | GI329 | CO310 |
| | 28E5R035M12-SBN10-C | 28 | 57 | 12,5 | – | – | 35 | M12 | – | – | -10 | -8,5 | 5 | ✓ | 23400 | ✓ | 0,10 | GI329 | CO310 |
| | 32E5R040M16-SBN10-C | 32 | 63 | 17 | – | – | 40 | M16 | – | – | -10 | -8 | 5 | ✓ | 21900 | ✓ | 0,19 | GI329 | CO310 |
| | 32E6R040M16-SBN10-C | 32 | 63 | 17 | – | – | 40 | M16 | – | – | -10 | -8 | 6 | ✓ | 21900 | ✓ | 0,19 | GI329 | CO310 |
| | 35E6R043M16-SBN10-C | 35 | 66 | 17 | – | – | 43 | M16 | – | – | -10 | -7,5 | 6 | ✓ | 21000 | ✓ | 0,22 | GI329 | CO310 |

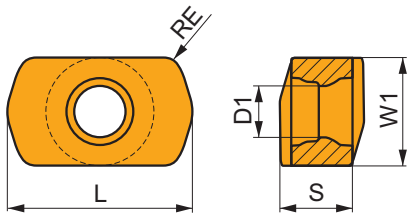
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | KWW [mm] | KWD [mm] | GAMP [°] | GAMF [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODULAR | **40E6R043M16-SBN10-C** | 40 | 66 | 17 | – | – | 43 | M16 | – | – | -10 | -7 | 6 | ✓ | 19600 | ✓ | 0,26 | GI329 | CO310 |
| | **40E7R043M16-SBN10-C** | 40 | 66 | 17 | – | – | 43 | M16 | – | – | -10 | -7 | 7 | ✓ | 19600 | ✓ | 0,26 | GI329 | CO310 |
| ISO 6462 DIN 8030 | **40A05R-SMOBN10-C** | 40 | – | 16 | 14,1 | – | 40 | – | 8,4 | 5,6 | -10 | -7 | 5 | ✓ | 19600 | ✓ | 0,21 | GI329 | CO312 |
| | **40A07R-SMOBN10-C** | 40 | – | 16 | 14,1 | – | 40 | – | 8,4 | 5,6 | -10 | -7 | 7 | ✓ | 19600 | ✓ | 0,22 | GI329 | CO312 |
| | **42A05R-SMOBN10-C** | 42 | – | 16 | 14,1 | – | 40 | – | 8,4 | 5,6 | -10 | -7 | 5 | ✓ | 19100 | ✓ | 0,23 | GI329 | CO312 |
| | **42A07R-SMOBN10-C** | 42 | – | 16 | 14,1 | – | 40 | – | 8,4 | 5,6 | -10 | -7 | 7 | ✓ | 19100 | ✓ | 0,24 | GI329 | CO312 |

| | | |
|---|---|---|
| GI329 | BNGX 10T3.. | ANHX 10T3.. |

| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO310 | US42507-T07P | 0,9 | M 2,5 | 7 | – | – | Flag T07P | – |
| CO312 | US42507-T07P | 0,9 | M 2,5 | 7 | D-T07P/T09P | FG-15 | – | HS0830C |

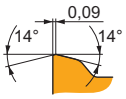
## BNGX 10

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 10T3 | 5,800 | 2,76 | 9,92 | 3,90 |




| | ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **BNGX 10T308SR-M** | **M9325** | ■ | | | | | | | - - - | 0,8 | 0,20 | 1,05 | 0,3 | 1,0 |
| | | **M6330** | ◪ | | | | | | | - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| | | **M8310** | ■ | | ■ | | | ◪ | | - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| | | **M8330** | ■ | | ■ | | | ◪ | | - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| | | **M8340** | ■ | | ◪ | | | | | + / - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| | | **M8345** | ■ | | | | | | | + / - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| | | **8215** | ■ | | ■ | | | ◪ | | - | 0,8 | 0,20 | 1,40 | 0,3 | 1,0 |
| HFC | **BNGX 10T308SR-MM** | **M9325** | ◪ | ◪ | | | ◪ | | | - - - | 0,8 | 0,20 | 0,83 | 0,3 | 1,0 |
| | | **M9340** | ◪ | ■ | | | ■ | | | - - - | 0,8 | 0,20 | 0,83 | 0,3 | 1,0 |
| | | **M6330** | ◪ | ■ | | | ■ | | | - | 0,8 | 0,25 | 1,10 | 0,3 | 1,0 |
| | | **M8310** | ◪ | ◪ | | | | | | - | 0,8 | 0,25 | 1,10 | 0,3 | 1,0 |
| | | **M8330** | ◪ | ◪ | | | | | | - | 0,8 | 0,25 | 1,10 | 0,3 | 1,0 |
| | | **M8340** | ◪ | ■ | | | ■ | | | + / - | 0,8 | 0,25 | 1,10 | 0,3 | 1,0 |
| | | **M8345** | ◪ | ■ | | | ■ | | | + / - | 0,8 | 0,25 | 1,10 | 0,3 | 1,0 |

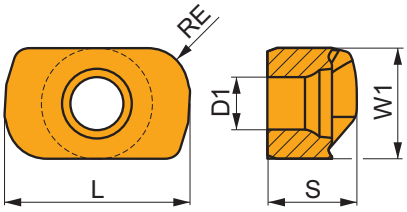
| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BNGX 10T308SR-HM** | **M8310** | | | ■ | | | ■ | ✖ | - | 0,8 | 0,10 | 1,00 | 0,1 | 1,0 |
| | **M8330** | | | ■ | | | ◪ | ✖ | - | 0,8 | 0,10 | 1,00 | 0,1 | 1,0 |
| | **8215** | | | ■ | | | ■ | ✖ | - | 0,8 | 0,10 | 1,00 | 0,1 | 1,0 |

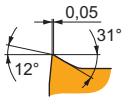



| ISO | | FN | FX | M9325 | M9340 | M6330 | M8310 | M8330 | M8340 | M8345 | 8215 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,20 | 1,40 | 296 | 264 | 212 | 267 | 244 | 222 | 177 | 257 |
| | ⧗ | 0,20 | 1,16 | 272 | 243 | 195 | 246 | 224 | 204 | 162 | 236 |
| | ✖ | 0,20 | 0,93 | 234 | 209 | 167 | 205 | 187 | 175 | 140 | 194 |
| M | ● | 0,25 | 1,10 | 149 | 155 | 149 | 127 | 137 | 132 | 104 | 142 |
| | ⧗ | 0,25 | 0,88 | 137 | 143 | 137 | 117 | 126 | 121 | 95 | 130 |
| | ✖ | 0,25 | 0,66 | 117 | 123 | 117 | 100 | 108 | 104 | 82 | 112 |
| K | ● | 0,20 | 1,50 | – | – | – | 253 | 230 | 208 | – | 242 |
| | ⧗ | 0,20 | 1,25 | – | – | – | 233 | 211 | 191 | – | 223 |
| | ✖ | 0,20 | 1,00 | – | – | – | 200 | 181 | 164 | – | 191 |
| S | ● | 0,20 | 0,90 | 68 | 72 | 65 | 59 | 63 | 59 | 47 | – |
| | ⧗ | 0,20 | 0,77 | 62 | 66 | 60 | 54 | 58 | 54 | 43 | – |
| | ✖ | 0,10 | 0,66 | 53 | 57 | 52 | 46 | 50 | 46 | 37 | – |
| H | ● | 0,05 | 0,70 | – | – | – | 53 | 48 | – | – | 51 |
| | ⧗ | 0,05 | 0,56 | – | – | – | 49 | 45 | – | – | 47 |
| | ✖ | 0,05 | 0,42 | – | – | – | 42 | 38 | – | – | 40 |

# ANHX 10

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 10T3 | 5,800 | 2,76 | 9,72 | 4,70 |



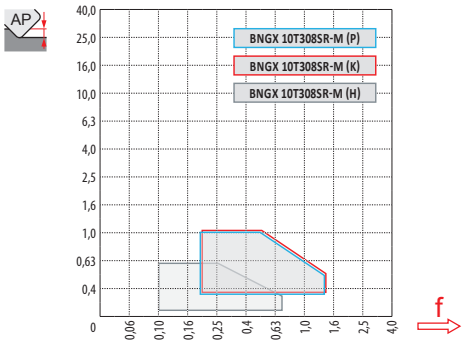

| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANHX 10T320SR-F | M8310 | ■ | ◪ | | | | ◪ | ✱ | - | 2,0 | 0,05 | 0,15 | 0,1 | 3,0 |
| | M8330 | ■ | ◪ | | | | ◪ | ✖ | - | 2,0 | 0,05 | 0,15 | 0,1 | 3,0 |
| | M8340 | ■ | ◪ | | | ◪ | | ✖ | + / - | 2,0 | 0,05 | 0,15 | 0,1 | 3,0 |

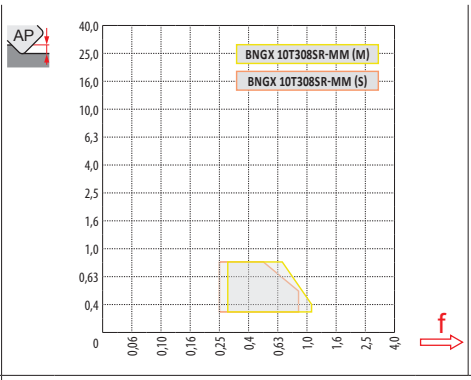
| ISO | | FN | FX | M8310 | M8330 | M8340 |
|---|---|---|---|---|---|---|
| P | ● | 0,05 | 0,15 | 400 | 323 | 323 |
| | ✱ | 0,05 | 0,12 | 368 | 297 | 297 |
| | ✖ | 0,05 | 0,10 | 316 | 255 | 255 |
| M | ● | 0,05 | 0,15 | 203 | 190 | 213 |
| | ✱ | 0,05 | 0,12 | 186 | 175 | 196 |
| | ✖ | 0,05 | 0,09 | 160 | 150 | 168 |
| K | ● | 0,05 | 0,15 | 378 | 303 | 340 |
| | ✱ | 0,05 | 0,12 | 347 | 278 | 313 |
| | ✖ | 0,05 | 0,10 | 298 | 239 | 269 |
| S | ● | 0,05 | 0,15 | 90 | 85 | 95 |
| | ✱ | 0,05 | 0,13 | 83 | 78 | 87 |
| | ✖ | 0,05 | 0,11 | 71 | 67 | 75 |
| H | ● | 0,05 | 0,15 | 78 | 70 | - |
| | ✱ | 0,05 | 0,12 | 71 | 64 | - |
| | ✖ | 0,05 | 0,09 | 61 | 55 | - |

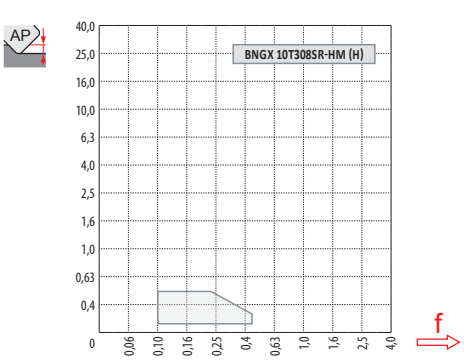
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

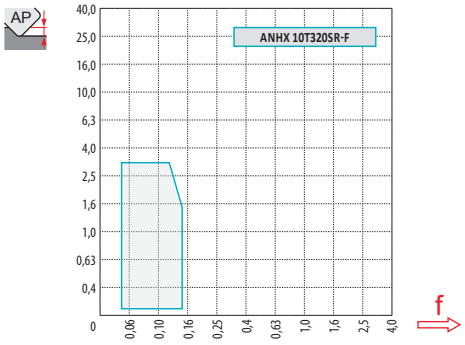
| | BNGX 10-M | BNGX 10-MM | BNGX 10-HM |
|---|---|---|---|
| RE | 0,8 | 0,8 | 0,8 |
| BS | – | – | – |

| | ANHX 10 - F |
|---|---|
| RE | 2,0 |
| BS | 0,92 |



| BNGX 10 (HFC) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DCX | AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
| 16 | | 9,40 | 12,85 | 13,36 | 13,80 | 14,20 | 14,56 | 14,88 | 15,19 | 15,47 |
| 18 | | 11,40 | 14,85 | 15,36 | 15,80 | 16,20 | 16,56 | 16,88 | 17,19 | 17,47 |
| 20 | | 13,40 | 16,85 | 17,36 | 17,80 | 18,20 | 18,56 | 18,88 | 19,19 | 19,47 |
| 25 | DEF | 18,40 | 21,85 | 22,36 | 22,80 | 23,20 | 23,56 | 23,88 | 24,19 | 24,47 |
| 32 | | 25,40 | 28,85 | 29,36 | 29,80 | 30,20 | 30,56 | 30,88 | 31,19 | 31,47 |
| 35 | | 28,40 | 31,85 | 32,36 | 32,80 | 33,20 | 33,56 | 33,88 | 34,19 | 34,47 |
| 40 | | 33,40 | 36,85 | 37,36 | 37,80 | 38,20 | 38,56 | 38,88 | 39,19 | 39,47 |
| 42 | | 35,40 | 38,85 | 39,36 | 39,80 | 40,20 | 40,56 | 40,88 | 41,19 | 41,47 |

| | AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 f | – | 1,30 | 1,10 | 0,90 | 0,80 | 0,72 | 0,68 | 0,65 | 0,50 |

| BNGX 10 | | |
|---|---|---|
| DCX | max | FX |
| 16 | 3,5 | 0,12 |
| 18 | 3,5 | 0,12 |
| 20 | 4,0 | 0,15 |
| 25 | 4,0 | 0,15 |
| 28 | 4,0 | 0,17 |
| 32 | 4,0 | 0,17 |
| 35 | 4,0 | 0,17 |
| 40 | 4,0 | 0,17 |
| 42 | 4,0 | 0,17 |

| BNGX 10 (HFC) | | | |
|---|---|---|---|
| AP | 0,3 | 0,6 | 1,0 |
| 1 f | 1,10 | 0,60 | 0,30 |

| BNGX 10 (HFC) | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 16 | 4,0 | 1/16 |
| 18 | 4,0 | 1/16 |
| 20 | 4,0 | 1/16 |
| 25 | 2,8 | 1/22 |
| 28 | 2,3 | 1/26 |
| 32 | 1,9 | 1/32 |
| 35 | 1,7 | 1/35 |
| 40 | 1,3 | 1/46 |
| 42 | 1,3 | 1/46 |

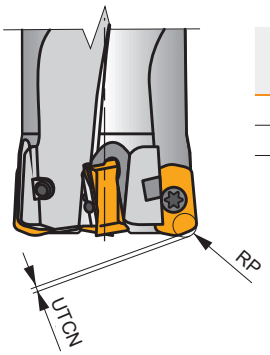
| ANHX 10 | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 16 | 1,6 | 2,65/100 |
| 18 | 1,3 | 2,15/100 |
| 20 | 1,1 | 1,80/100 |
| 25 | 0,8 | 1,25/100 |
| 28 | 0,7 | 1,10/100 |
| 32 | 0,5 | 0,75/100 |
| 35 | 0,5 | 0,75/100 |
| 40 | 0,4 | 0,55/100 |
| 42 | 0,4 | 0,55/100 |

| BNGX 10 (HFC) | | |
|---|---|---|
| DCX | AP | FX |
| 16 | 0,4 | 0,15 |
| 18 | 0,7 | 0,15 |
| 20 | 0,7 | 0,15 |
| 25 | 0,7 | 0,15 |
| 32 | 0,7 | 0,2 |
| 35 | 0,7 | 0,2 |
| 40 | 0,7 | 0,2 |
| 42 | 0,7 | 0,2 |

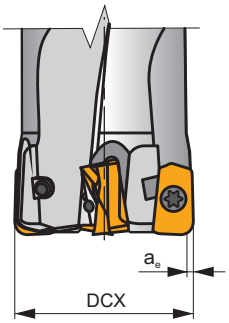
| BNGX 10 (HFC) | | | | |
|---|---|---|---|---|
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
| 16 | 22,4 | 31,8 | 0,5 | 0,5 |
| 18 | 25,4 | 35,8 | 0,5 | 0,5 |
| 20 | 29,4 | 39,8 | 0,5 | 0,5 |
| 25 | 39,4 | 49,8 | 0,5 | 0,5 |
| 28 | 45,4 | 55,8 | 0,5 | 0,5 |
| 32 | 53,4 | 63,8 | 0,5 | 0,5 |
| 35 | 59,4 | 69,8 | 0,5 | 0,5 |
| 40 | 69,4 | 79,8 | 0,5 | 0,5 |
| 42 | 73,4 | 83,8 | 0,5 | 0,5 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | $f_e$ | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 18 | | 0,465 | 0,600 | 0,849 | 1,039 | 1,200 | 1,470 | 1,697 | 1,897 | 2,078 | 2,400 | 2,683 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 35 | | 0,648 | 0,837 | 1,183 | 1,449 | 1,673 | 2,049 | 2,366 | 2,646 | 2,898 | 3,347 | 3,742 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 42 | | 0,710 | 0,917 | 1,296 | 1,587 | 1,833 | 2,245 | 2,592 | 2,898 | 3,175 | 3,666 | 4,099 |

| ANHX 10 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| 2,0 | $f_e$ | 0,219 | 0,283 | 0,400 | 0,490 | 0,566 | 0,693 | 0,800 | 0,894 | 0,980 | 1,131 | 1,265 |




| BNGX | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| BNGX 10T308 | 1,60 | 0,44 |




| ANHX | max $a_e$/DCX |
|---|---|
| | [mm] |
| ANHX 10T320 | 0,05 |

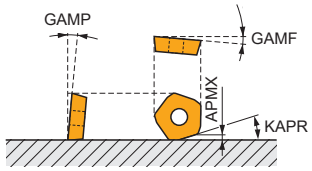
# SPD09

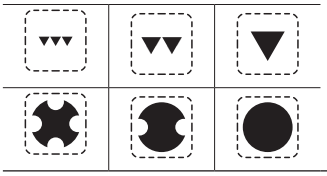
P M K N S H

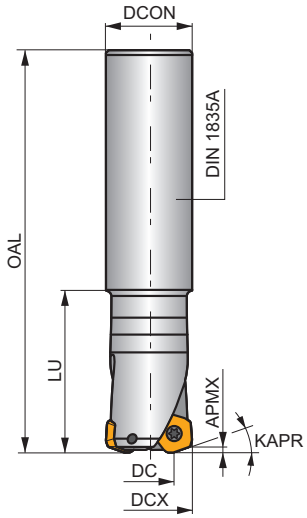
S

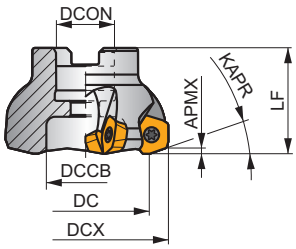
**PENTA** *HF*

| | |
|---|---|
| KAPR | 19° |
| APMX | 2,0 mm |






| | |
|---|---|
| $h_m$ | 0,065 - 0,975 |
| $h_m$ | 0,065 - 0,975 |

| | ISO | DCX [mm] | DC [mm] | OAL [mm] | LF [mm] | DCON [mm] | DCCB [mm] | LU [mm] | GAMP [°] | GAMF [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 32E2R060A32-SPD09-C | 32 | – | 250 | – | 32 | – | 60 | -24 | +10 | 2 | – | 13100 | ✓ | 1,54 | GI245 | CO340 | – |
| | 40E3R060A32-SPD09-C | 40 | – | 250 | – | 32 | – | 60 | -11 | +10 | 3 | – | 11700 | ✓ | 1,43 | GI245 | CO340 | – |
| ISO 6462 DIN 8030 | 42A03R-S19PD09-C | 42 | 28 | – | 40 | 16 | 12 | – | -8 | +10 | 3 | – | 11500 | ✓ | 0,18 | GI245 | CO342 | – |
| | 50A04R-S19PD09-C | 50 | 36 | – | 40 | 22 | 18 | – | -3 | +10 | 4 | – | 10500 | ✓ | 0,23 | GI245 | CO343 | – |
| | 50A05R-S19PD09-C | 50 | 36 | – | 40 | 22 | 18 | – | -3 | +10 | 5 | – | 10500 | ✓ | 0,36 | GI245 | CO343 | – |
| | 52A04R-S19PD09-C | 52 | 38 | – | 40 | 22 | 18 | – | -3 | +10 | 4 | – | 10300 | ✓ | 0,25 | GI245 | CO343 | – |
| | 63A05R-S19PD09-C | 63 | 49 | – | 40 | 22 | 18 | – | -1 | +10 | 5 | – | 9400 | ✓ | 0,33 | GI245 | CO343 | – |
| | 63A06R-S19PD09-C | 63 | 49 | – | 40 | 22 | 18 | – | -1 | +10 | 6 | – | 9300 | ✓ | 0,47 | GI245 | CO343 | – |
| | 66A06R-S19PD09-C | 66 | 52 | – | 40 | 22 | 18 | – | -1 | +10 | 6 | – | 9200 | ✓ | 0,35 | GI245 | CO343 | – |
| | 66A06R-S19PD09-CF | 66 | 52 | – | 50 | 27 | 22 | – | -1 | +10 | 6 | – | 9100 | ✓ | 0,68 | GI245 | CO344 | – |
| | 80A05R-S19PD09-C | 80 | 66 | – | 50 | 27 | 37 | – | -1 | +10 | 5 | – | 8300 | ✓ | 0,84 | GI245 | CO341 | AC001 |
| | 80A06R-S19PD09-C | 80 | 66 | – | 50 | 27 | 37 | – | -1 | +10 | 6 | – | 8300 | ✓ | 0,88 | GI245 | CO341 | AC001 |
| | 100A06R-S19PD09-C | 100 | 86 | – | 50 | 32 | 45 | – | -1 | +10 | 6 | – | 7400 | ✓ | 1,46 | GI245 | CO341 | AC002 |
| | 100A08R-S19PD09-C | 100 | 86 | – | 50 | 32 | 45 | – | -1 | +10 | 8 | – | 7400 | ✓ | 1,40 | GI245 | CO341 | AC002 |
| | 125A08R-S19PD09-C | 125 | 111 | – | 63 | 40 | 36 | – | -1 | +10 | 8 | – | 6600 | ✓ | 3,16 | GI245 | CO349 | – |
| | 125A10R-S19PD09-C | 125 | 111 | – | 63 | 40 | 36 | – | -1 | +10 | 10 | – | 6600 | ✓ | 3,15 | GI245 | CO349 | – |
| | 140A08R-S19PD09-C | 140 | 126 | – | 63 | 40 | 36 | – | -1 | +10 | 8 | – | 6200 | ✓ | 3,62 | GI245 | CO349 | – |

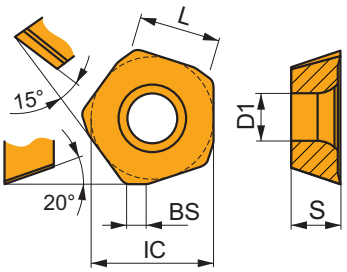
| | | | |
|---|---|---|---|
| GI245 | PD.X 0905ZE.. | PDKT 0905.. | PDMW 0905.. |

| | | Nm | | | | | |
|---|---|---|---|---|---|---|---|
| CO340 | US 45011-T20P | 5,0 | M 5 | 11 | – | – | Flag T20P |
| CO341 | US 45011-T20P | 5,0 | M 5 | 11 | SDR T20P-T | – | – |
| CO342 | US 45011-T20P | 5,0 | M 5 | 11 | SDR T20P-T | HS 90835 | – |
| CO343 | US 45011-T20P | 5,0 | M 5 | 11 | SDR T20P-T | HS 1030C | – |
| CO344 | US 45011-T20P | 5,0 | M 5 | 11 | SDR T20P-T | HS 1230C | – |
| CO349 | US 45011-T20P | 5,0 | M 5 | 11 | SDR T20P-T | HSD 2040 | – |

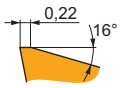
| | | |
|---|---|---|
| AC001 | KS 1230 | K.FMH27 |
| AC002 | KS 1635 | K.FMH32 |

## PDKX 09

| | BS | IC | D1 | L | S |
|---|---|---|---|---|---|
| 0905 | 2,00 | 13,500 | 5,50 | 9,00 | 5,47 |

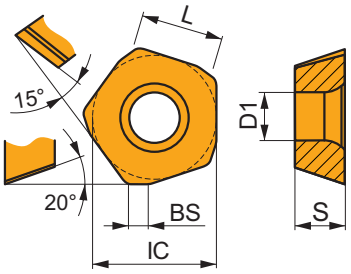



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDKX 0905ZEER-FM | M9340 | ◪ | ■ | | | ◪ | | --- | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | M6330 | ◪ | ■ | | | ◪ | | - | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8345 | ■ | ■ | | | ◪ | | + / - | – | 0,50 | 2,50 | 0,3 | 2,0 |

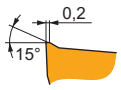



## PDMX 09

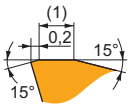
| | BS | IC | D1 | L | S |
|---|---|---|---|---|---|
| 0905 | 2,00 | 13,500 | 5,50 | 9,00 | 5,47 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDMX 0905ZEER-M | M9340 | ◪ | ■ | | | ◪ | | --- | – | 0,50 | 1,75 | 0,3 | 2,0 |
| | M8330 | ■ | ◪ | ◪ | | | | - | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8345 | ■ | ■ | | | ◪ | | + / - | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | 8215 | ◪ | ◪ | ◪ | | | | - | – | 0,50 | 2,50 | 0,3 | 2,0 |

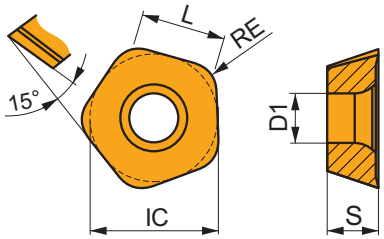


| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDMX 0905ZESR-R | M9325 | ◪ | | | | | | ✖ | - - - | – | 0,50 | 1,75 | 0,3 | 2,0 |
| | M8330 | ◪ | | ■ | | | ◪ | ✖ | - | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8345 | ◪ | | | | | | ✖ | + / - | – | 0,50 | 2,50 | 0,3 | 2,0 |
| | 8215 | ◪ | | ■ | | | ■ | ✖ | - | – | 0,50 | 2,50 | 0,3 | 2,0 |

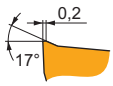



## PDKT 09

| | IC | D1 | L | S |
|---|---|---|---|---|
| 0905 | 13,500 | 5,50 | 9,00 | 5,47 |

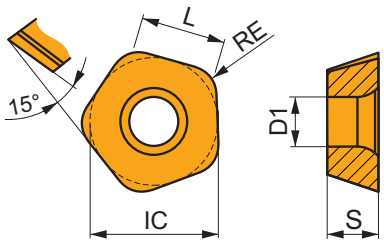



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDKT 090530ER-FM | M9325 | ■ | ◪ | | | | | ✖ | - - - | 3,0 | 0,50 | 1,75 | 0,3 | 2,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8310 | ■ | ◪ | ◪ | | | | ✖ | - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8330 | ■ | ◪ | ◪ | | | | ✖ | - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |
| | 8215 | ■ | ◪ | ◪ | | | | ✖ | - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |

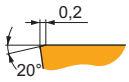



## PDMW 09

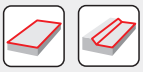
| | IC | D1 | L | S |
|---|---|---|---|---|
| 0905 | 13,500 | 5,50 | 9,00 | 5,47 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDMW 090530SR | M9315 | ◪ | | ◪ | | | ◪ | ✖ | - - - | 3,0 | 0,50 | 1,75 | 0,3 | 2,0 |
| | M9325 | ◪ | | ■ | | | | ✖ | - - - | 3,0 | 0,50 | 1,75 | 0,3 | 2,0 |
| | M8310 | ◪ | | ■ | | | ■ | ✖ | - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |
| | M8345 | ◪ | | | | | | ✖ | + / - | 3,0 | 0,50 | 2,50 | 0,3 | 2,0 |

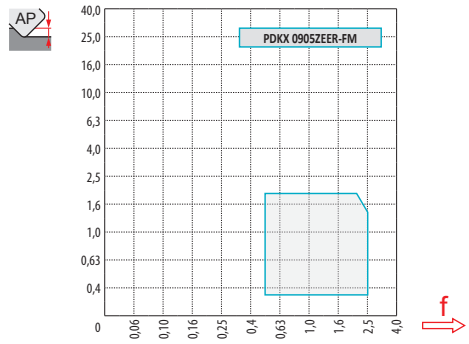


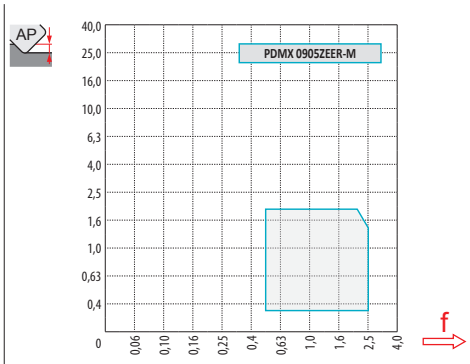
| ISO | | FN | FX | M9315 | M9325 | M9340 | M6330 | M8310 | M8330 | M8345 | 8215 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,50 | 2,50 | 479 | 424 | 380 | 325 | 402 | 370 | 275 | 380 |
| | ⧗ | 0,50 | 2,00 | 435 | 374 | 341 | 292 | 363 | 332 | 242 | 336 |
| | ✖ | 0,50 | 1,50 | 396 | 330 | 303 | 253 | 325 | 287 | 215 | 297 |
| M | ● | 0,50 | 2,50 | – | 215 | 226 | 231 | 204 | 219 | 165 | 226 |
| | ⧗ | 0,50 | 2,00 | – | 193 | 204 | 204 | 182 | 197 | 143 | 204 |
| | ✖ | 0,50 | 1,50 | – | 165 | 182 | 176 | 165 | 174 | 127 | 176 |
| K | ● | 0,50 | 2,50 | 457 | – | – | – | 380 | 354 | – | 358 |
| | ⧗ | 0,50 | 2,00 | 413 | – | – | – | 347 | 314 | – | 319 |
| | ✖ | 0,50 | 1,50 | 374 | – | – | – | 308 | 275 | – | 281 |
| N | ● | 0,50 | 2,50 | – | – | – | – | – | 931 | – | 946 |
| | ⧗ | 0,50 | 2,00 | – | – | – | – | – | 830 | – | 847 |
| | ✖ | 0,50 | 1,50 | – | – | – | – | – | 724 | – | 748 |
| S | ● | 0,50 | 2,15 | – | 105 | 110 | 116 | 99 | 107 | 83 | 110 |
| | ⧗ | 0,50 | 1,80 | – | 94 | 99 | 99 | 88 | 96 | 72 | 99 |
| | ✖ | 0,50 | 1,40 | – | 83 | 88 | 88 | 83 | 85 | 61 | 88 |
| H | ● | 0,50 | 2,00 | 94 | – | – | – | 77 | 73 | – | 72 |
| | ⧗ | 0,50 | 1,60 | 83 | – | – | – | 72 | 62 | – | 66 |
| | ✖ | 0,50 | 1,20 | 77 | – | – | – | 61 | 56 | – | 55 |

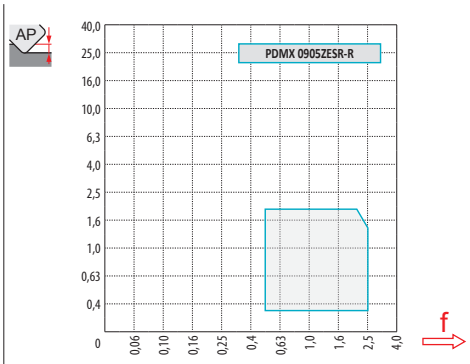


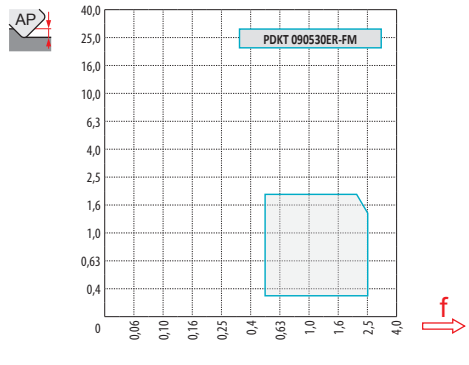
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

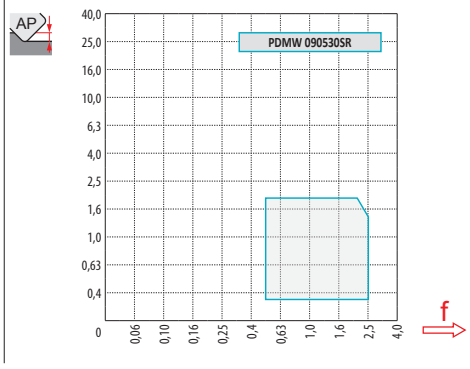
| | PDKX 09-FM | PDMX 09-M | PDMX 09-R | PDKT 09-FM | PDMW 09 |
|---|---|---|---|---|---|
| RE | – | – | – | 3,0 | 3,0 |
| BS | 2,00 | 2,00 | 2,00 | – | – |




| DCX | AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,25 | 1,50 | 2,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | DEF | 18,4 | 20,1 | 20,7 | 21,3 | 21,9 | 22,5 | 23,0 | 23,6 | 24,2 | 25,7 | 27,1 | 30,0 |
| 40 | | 25,5 | 27,2 | 27,8 | 28,4 | 29,0 | 29,6 | 30,1 | 30,7 | 31,3 | 32,8 | 34,2 | 37,1 |
| 42 | | 27,5 | 29,2 | 29,8 | 30,4 | 31,0 | 31,6 | 32,1 | 32,7 | 33,3 | 34,8 | 36,2 | 39,1 |
| 50 | | 35,3 | 37,0 | 37,6 | 38,2 | 38,8 | 39,4 | 39,9 | 40,5 | 41,1 | 42,6 | 44,0 | 46,9 |
| 52 | | 37,3 | 39,0 | 39,6 | 40,2 | 40,8 | 41,4 | 41,9 | 42,5 | 43,1 | 44,6 | 46,0 | 48,9 |
| 63 | | 48,2 | 49,9 | 50,5 | 51,1 | 51,7 | 52,3 | 52,8 | 53,4 | 54,0 | 55,5 | 56,9 | 59,8 |
| 66 | | 51,2 | 52,9 | 53,5 | 54,1 | 54,7 | 55,3 | 55,8 | 56,4 | 57,0 | 58,5 | 59,9 | 62,8 |
| 80 | | 65,3 | 67,0 | 67,6 | 68,2 | 68,8 | 69,4 | 69,9 | 70,5 | 71,1 | 72,6 | 74,0 | 76,9 |
| 100 | | 85,3 | 87,0 | 87,6 | 88,2 | 88,8 | 89,4 | 89,9 | 90,5 | 91,1 | 92,6 | 94,0 | 96,9 |

| AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,25 | 1,50 | 2,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 3,00 | 3,00 | 2,90 | 2,80 | 2,70 | 2,60 | 2,50 | 2,40 | 2,25 | 1,50 | 1,50 |

Siga las instrucciones proporcionadas para el fresado de superficies planas. Al fresar cerca de superficies verticales, disminuya el avance por diente (fz) en un 50 % para evitar vibraciones y daños en el filo

| DCX | max | FX |
|---|---|---|
| 32 | 5,0 | 0,20 |
| 40 | 5,0 | 0,20 |
| 42 | 5,0 | 0,20 |
| 50 | 6,0 | 0,20 |
| 52 | 6,0 | 0,20 |
| 63 | 7,0 | 0,25 |
| 66 | 7,0 | 0,25 |
| 80 | 8,0 | 0,30 |
| 100 | 8,0 | 0,30 |

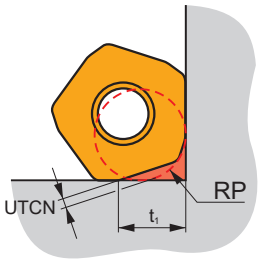
| | HFC | | |
|---|---|---|---|
| AP | 0,5 | 1,0 | 2,0 |
| 1 f | 2,99 | 2,30 | 1,49 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 40 | 8,0 | 1,80/16 |
| 42 | 8,0 | 2,00/16 |
| 50 | 8,0 | 2,00/16 |
| 52 | 8,0 | 2,00/16 |
| 63 | 7,0 | 2,00/18 |
| 66 | 6,0 | 2,00/21 |
| 80 | 5,0 | 2,00/24 |
| 100 | 3,0 | 2,00/40 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 40 | 63,7 | 80,0 | 2,00 | 2,00 |
| 42 | 67,5 | 84,0 | 2,00 | 2,00 |
| 50 | 83,3 | 100,0 | 2,00 | 2,00 |
| 52 | 87,3 | 104,0 | 2,00 | 2,00 |
| 63 | 109,2 | 126,0 | 2,00 | 2,00 |
| 66 | 115,2 | 132,0 | 2,00 | 2,00 |
| 80 | 143,3 | 160,0 | 2,00 | 2,00 |
| 100 | 183,3 | 200,0 | 2,00 | 2,00 |

| DCX | AP | FX |
|---|---|---|
| 32 | 1,8 | 0,20 |
| 40 | 1,8 | 0,20 |
| 42 | 2,0 | 0,20 |
| 50 | 2,0 | 0,20 |
| 52 | 2,0 | 0,20 |
| 63 | 2,0 | 0,25 |
| 66 | 2,0 | 0,25 |
| 80 | 2,0 | 0,30 |
| 100 | 2,0 | 0,30 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 42 | | 0,710 | 0,917 | 1,296 | 1,587 | 1,833 | 2,245 | 2,592 | 2,898 | 3,175 | 3,666 | 4,099 |
| 50 | $f_e$ | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 63 | | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |



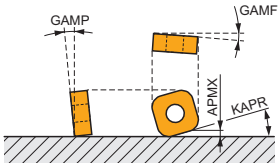

| DCX | RP | UTCN | $t_1$ |
|---|---|---|---|
| [mm] | [mm] | [mm] | [mm] |
| 32 | 4,5 | 1,1 | 6,8 |
| 40 – 140 | 4,5 | 1,1 | 7,3 |

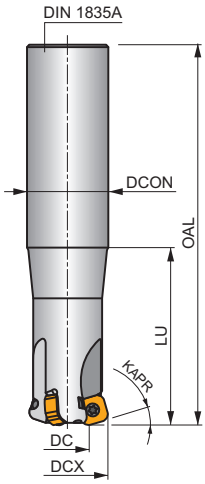
# SSN11

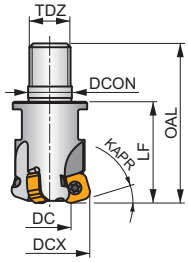
P M K S H

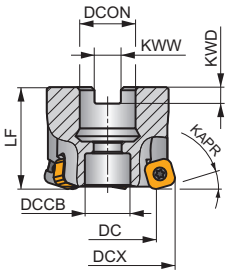
S

| | |
|---|---|
| KAPR | 18° |
| APMX | 1,7 mm |




| | |
|---|---|
| $h_m$ | 0,20-0,46 |
| $h_m$ | 0,20-0,46 |

| | ISO | DCX [mm] | DC [mm] | OAL [mm] | LF [mm] | DCON [mm] | DCCB [mm] | LU [mm] | TDZ | KWW [mm] | KWD [mm] | GAMP [°] | GAMF [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 32E3R070A32-SSN11-C | 32 | 18,3 | 150 | – | 32 | – | 70 | – | – | – | -10 | -11,5 | 3 | – | 17500 | ✓ | 0,69 | GI339 | C0314 | – |
| | 32E3R120A32-SSN11-C | 32 | 18,3 | 200 | – | 32 | – | 120 | – | – | – | -10 | -11,5 | 3 | – | 17500 | ✓ | 0,89 | GI339 | C0314 | – |
| | 35E3R050A32-SSN11-C | 35 | 21,2 | 200 | – | 32 | – | 50 | – | – | – | -10 | -11 | 3 | – | 16800 | ✓ | 1,05 | GI339 | C0314 | – |
| MODULAR | 32E3R040M16-SSN11-C | 32 | 18,3 | 63 | 40 | 17 | – | – | M16 | – | – | -10 | -11,5 | 3 | – | – | ✓ | 0,17 | GI339 | C0314 | – |
| | 35E3R040M16-SSN11-C | 35 | 21,2 | 63 | 40 | 17 | – | – | M16 | – | – | -10 | -11 | 3 | – | – | ✓ | 0,19 | GI339 | C0314 | – |
| | 40E4R043M16-SSN11-C | 40 | 26,2 | 66 | 43 | 17 | – | – | M16 | – | – | -10 | -10,5 | 4 | ✓ | – | ✓ | 0,23 | GI339 | C0314 | – |
| ISO 6462 DIN 8030 | 40A04R-SMOSN11-C | 40 | 26,2 | – | 40 | 16 | 12,4 | – | – | 8,4 | 5,6 | -10 | -10,5 | 4 | ✓ | 15700 | ✓ | 0,19 | GI339 | C0316 | – |
| | 42A04R-SMOSN11-C | 42 | 28,2 | – | 40 | 16 | 14,1 | – | – | 8,4 | 5,6 | -10 | -10,5 | 4 | ✓ | 15300 | ✓ | 0,21 | GI339 | C0318 | – |
| | 50A05R-SMOSN11-C | 50 | 36,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 5 | ✓ | 14000 | ✓ | 0,31 | GI339 | C0320 | – |
| | 50A06R-SMOSN11-C | 50 | 36,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 6 | ✓ | 14000 | ✓ | 0,31 | GI339 | C0320 | – |
| | 52A05R-SMOSN11-C | 52 | 38,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 5 | ✓ | 13800 | ✓ | 0,34 | GI339 | C0320 | – |
| | 52A06R-SMOSN11-C | 52 | 38,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 6 | ✓ | 13800 | ✓ | 0,33 | GI339 | C0320 | – |
| | 63A06R-SMOSN11-C | 63 | 49,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 6 | ✓ | 12500 | ✓ | 0,46 | GI339 | C0320 | – |
| | 63A08R-SMOSN11-C | 63 | 49,1 | – | 40 | 22 | 18,1 | – | – | 10,4 | 6,3 | -10 | -10 | 8 | ✓ | 12500 | ✓ | 0,47 | GI339 | C0320 | – |
| | 66A06R-SMOSN11-C | 66 | 52,1 | – | 50 | 27 | 18,1 | – | – | 12,4 | 7 | -10 | -10 | 6 | ✓ | 12200 | ✓ | 0,74 | GI339 | C0322 | – |
| | 66A08R-SMOSN11-C | 66 | 52,1 | – | 50 | 27 | 18,1 | – | – | 12,4 | 7 | -10 | -10 | 8 | ✓ | 12200 | ✓ | 0,75 | GI339 | C0322 | – |
| | 80A07R-SMOSN11-C | 80 | 66,1 | – | 50 | 27 | 38,1 | – | – | 12,4 | 7 | -10 | -10 | 7 | ✓ | 11100 | ✓ | 0,95 | GI339 | C0324 | AC001 |
| | 80A09R-SMOSN11-C | 80 | 66,1 | – | 50 | 27 | 38,1 | – | – | 12,4 | 7 | -10 | -10 | 9 | ✓ | 11100 | ✓ | 0,93 | GI339 | C0324 | AC001 |
| | 100A08R-SMOSN11-C | 100 | 86,1 | – | 50 | 32 | 45,1 | – | – | 14,4 | 8 | -10 | -10 | 8 | ✓ | 9900 | ✓ | 1,63 | GI339 | C0324 | AC002 |
| | 115A08R-SMOSN11-C | 115 | 101,1 | – | 50 | 32 | 45,1 | – | – | 14,4 | 8 | -10 | -10 | 8 | ✓ | 9200 | ✓ | 2,09 | GI339 | C0324 | AC002 |
| | 125A08R-SMOSN11-C | 125 | 111,1 | – | 63 | 40 | 56,1 | – | – | 16,4 | 9 | -10 | -10 | 8 | ✓ | 8900 | ✓ | 3,16 | GI339 | C0324 | AC003 |

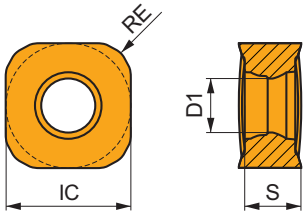
| | |
|---|---|
| GI339 | SNGX 1104.. |

| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| C0314 | US 44012-T15P | 3,5 | M4 | 12 | – | – | Flag T15P | – |
| C0316 | US 44012-T15P | 3,5 | M4 | 12 | D-T08P/T15P | FG-15 | – | HCS0840C |
| C0318 | US 44012-T15P | 3,5 | M4 | 12 | D-T08P/T15P | FG-15 | – | HS90835 |
| C0320 | US 44012-T15P | 3,5 | M4 | 12 | D-T08P/T15P | FG-15 | – | HS1030C |
| C0322 | US 44012-T15P | 3,5 | M4 | 12 | D-T08P/T15P | FG-15 | – | HS1230C |
| C0324 | US 44012-T15P | 3,5 | M4 | 12 | D-T08P/T15P | FG-15 | - | - |

| | | |
|---|---|---|
| AC001 | KS 1230 | K.FMH27 |
| AC002 | KS 1635 | K.FMH32 |
| AC003 | KS 2040 | K.FMH40 |

## SNGX 11

| | IC | D1 | S |
|---|---|---|---|
| 1104 | 10,6 | 4,56 | 4,76 |

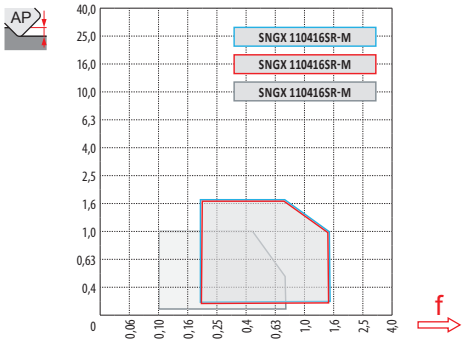


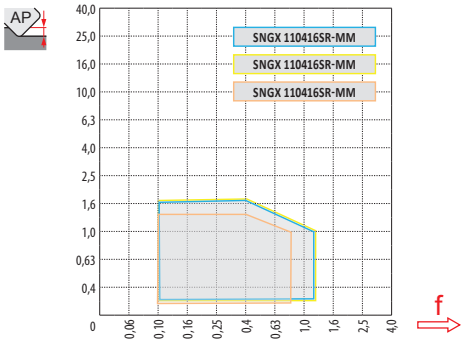

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNGX 110416SR-M | M9325 | ■ | | | | | | ⧗ | --- | 1,6 | 0,2 | 1,13 | 0,2 | 1,7 |
| | M9340 | ■ | | | | | | ✖ | --- | 1,6 | 0,2 | 1,13 | 0,2 | 1,7 |
| | M8310 | ■ | | ◪ | | | ◪ | ✖ | - | 1,6 | 0,2 | 1,5 | 0,2 | 1,7 |
| | M8330 | ■ | | ◪ | | | ◪ | ✖ | - | 1,6 | 0,2 | 1,5 | 0,2 | 1,7 |
| | M8340 | ■ | | ◪ | | | | ✖ | +/- | 1,6 | 0,2 | 1,5 | 0,2 | 1,7 |
| | 8215 | ■ | | ◪ | | | ◪ | ✖ | - | 1,6 | 0,2 | 1,5 | 0,2 | 1,7 |
| SNGX 110416SR-MM | M9340 | ◪ | ■ | | | ■ | | ⧗ | --- | 1,6 | 0,1 | 0,9 | 0,2 | 1,7 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | 1,6 | 0,1 | 1,2 | 0,2 | 1,7 |
| | M8340 | ◪ | ■ | | | ■ | | ✖ | +/- | 1,6 | 0,1 | 1,2 | 0,2 | 1,7 |
| | M8345 | ◪ | ■ | | | ■ | | ✖ | +/- | 1,6 | 0,1 | 1,2 | 0,2 | 1,7 |

| ISO | | FN | FX | M9325 | M9340 | M6330 | M8310 | M8330 | M8340 | M8345 | 8215 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,20 | 1,50 | 335 | 299 | 230 | 290 | 273 | 246 | 193 | 275 |
| | ⧗ | 0,20 | 1,25 | 308 | 275 | 212 | 267 | 251 | 227 | 177 | 253 |
| | ✖ | 0,20 | 1,00 | 265 | 236 | 182 | 229 | 215 | 195 | 152 | 217 |
| M | ● | 0,10 | 1,20 | - | 175 | 163 | - | - | 143 | 113 | - |
| | ⧗ | 0,10 | 1,00 | - | 161 | 150 | - | - | 131 | 104 | - |
| | ✖ | 0,10 | 0,80 | - | 138 | 128 | - | - | 113 | 89 | - |
| K | ● | 0,20 | 1,50 | - | - | - | 275 | 258 | 238 | - | 260 |
| | ⧗ | 0,20 | 1,25 | - | - | - | 253 | 237 | 219 | - | 239 |
| | ✖ | 0,20 | 1,00 | - | - | - | 217 | 203 | 188 | - | 205 |
| S | ● | 0,10 | 0,84 | - | 80 | 73 | - | - | 63 | 50 | - |
| | ⧗ | 0,10 | 0,70 | - | 74 | 67 | - | - | 58 | 46 | - |
| | ✖ | 0,10 | 0,60 | - | 63 | 57 | - | - | 49 | 40 | - |
| H | ● | 0,10 | 0,75 | - | - | - | 58 | 53 | - | - | 53 |
| | ⧗ | 0,10 | 0,60 | - | - | - | 53 | 48 | - | - | 48 |
| | ✖ | 0,10 | 0,45 | - | - | - | 45 | 41 | - | - | 41 |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,02 | 1,01 | 0,99 | 0,98 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | SNGX 11 - M | SNGX 11 - MM |
|---|---|---|
| RE | 1,6 | 1,6 |
| BS | - | - |




HFC

| DCX | AP | 0,00 | 0,20 | 0,40 | 0,60 | 0,80 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 | 1,70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | | 18,30 | 19,53 | 20,76 | 21,99 | 23,22 | 24,46 | 25,07 | 25,69 | 26,30 | 26,92 | 27,53 | 28,15 | 28,76 |
| 35 | | 21,20 | 22,43 | 23,66 | 24,89 | 26,12 | 27,36 | 27,97 | 28,59 | 29,20 | 29,82 | 30,43 | 31,05 | 31,66 |
| 40 | | 26,20 | 27,43 | 28,66 | 29,89 | 31,12 | 32,36 | 32,97 | 33,59 | 34,20 | 34,82 | 35,43 | 36,05 | 36,66 |
| 42 | | 28,20 | 29,43 | 30,66 | 31,89 | 33,12 | 34,36 | 34,97 | 35,59 | 36,20 | 36,82 | 37,43 | 38,05 | 38,66 |
| 50 | | 36,10 | 37,33 | 38,56 | 39,79 | 41,02 | 42,26 | 42,87 | 43,49 | 44,10 | 44,72 | 45,33 | 45,95 | 46,56 |
| 52 | DEF | 38,10 | 39,33 | 40,56 | 41,79 | 43,02 | 44,26 | 44,87 | 45,49 | 46,10 | 46,72 | 47,33 | 47,95 | 48,56 |
| 63 | | 49,10 | 50,33 | 51,56 | 52,79 | 54,02 | 55,26 | 55,87 | 56,49 | 57,10 | 57,72 | 58,33 | 58,95 | 59,56 |
| 66 | | 52,10 | 53,33 | 54,56 | 55,79 | 57,02 | 58,26 | 58,87 | 59,49 | 60,10 | 60,72 | 61,33 | 61,95 | 62,56 |
| 80 | | 66,10 | 67,33 | 68,56 | 69,79 | 71,02 | 72,26 | 72,87 | 73,49 | 74,10 | 74,72 | 75,33 | 75,95 | 76,56 |
| 100 | | 86,10 | 87,33 | 88,56 | 89,79 | 91,02 | 92,26 | 92,87 | 93,49 | 94,10 | 94,72 | 95,33 | 95,95 | 96,56 |
| 115 | | 101,10 | 102,33 | 103,56 | 104,79 | 106,02 | 107,26 | 107,87 | 108,49 | 109,10 | 109,72 | 110,33 | 110,95 | 111,56 |
| 125 | | 111,10 | 112,33 | 113,56 | 114,79 | 116,02 | 117,26 | 117,87 | 118,49 | 119,10 | 119,72 | 120,33 | 120,95 | 121,56 |

| | AP | – | 0,20 | 0,40 | 0,60 | 0,80 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 | 1,70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 ⇨f | – | 1,37 | 0,98 | 0,81 | 0,71 | 0,64 | 0,62 | 0,59 | 0,58 | 0,56 | 0,54 | 0,53 | 0,52 |

| SNGX | | |
|---|---|---|
| DCX | max | FX |
| 32 | 5,0 | 0,25 |
| 35 | 5,0 | 0,25 |
| 40 | 5,2 | 0,30 |
| 42 | 5,2 | 0,30 |
| 50 | 5,3 | 0,30 |
| 52 | 5,3 | 0,30 |
| 63 | 5,4 | 0,30 |
| 66 | 5,4 | 0,30 |
| 80 | 5,5 | 0,35 |
| 100 | 5,5 | 0,35 |
| 115 | 5,5 | 0,35 |
| 125 | 5,5 | 0,35 |

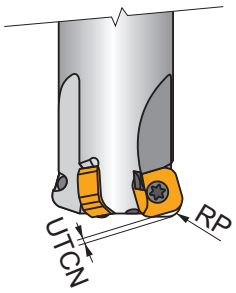
| SNGX (HFC) | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 32 | 0,8 | 1,4/100 |
| 35 | 0,8 | 1,4/100 |
| 40 | 0,7 | 1,2/100 |
| 42 | 0,7 | 1,2/100 |
| 50 | 0,5 | 0,9/100 |
| 52 | 0,5 | 0,9/100 |
| 63 | 0,4 | 0,7/100 |
| 66 | 0,4 | 0,7/100 |
| 80 | 0,3 | 0,5/100 |
| 100 | 0,2 | 0,3/100 |
| 115 | 0,2 | 0,3/100 |
| 125 | 0,2 | 0,3/100 |

| SNGX (HFC) | | |
|---|---|---|
| DCX | AP | FX |
| 32 | 0,2 | 0,3 |
| 35 | 0,2 | 0,3 |
| 40 | 0,2 | 0,3 |
| 42 | 0,2 | 0,3 |
| 50 | 0,3 | 0,4 |
| 52 | 0,3 | 0,4 |
| 63 | 0,3 | 0,4 |
| 66 | 0,3 | 0,4 |
| 80 | 0,3 | 0,4 |
| 100 | 0,3 | 0,4 |
| 115 | 0,3 | 0,4 |
| 125 | 0,3 | 0,4 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 35 | | 0,648 | 0,837 | 1,183 | 1,449 | 1,673 | 2,049 | 2,366 | 2,646 | 2,898 | 3,347 | 3,742 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 42 | | 0,710 | 0,917 | 1,296 | 1,587 | 1,833 | 2,245 | 2,592 | 2,898 | 3,175 | 3,666 | 4,099 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | $f_e$ | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 63 | | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |
| 100 | | 1,095 | 1,414 | 2,000 | 2,449 | 2,828 | 3,464 | 4,000 | 4,472 | 4,899 | 5,657 | 6,325 |
| 115 | | 1,175 | 1,517 | 2,145 | 2,627 | 3,033 | 3,715 | 4,290 | 4,796 | 5,254 | 6,066 | 6,782 |
| 125 | | 1,225 | 1,581 | 2,236 | 2,739 | 3,162 | 3,873 | 4,472 | 5,000 | 5,477 | 6,325 | 7,071 |

| SNGX | | | | |
|---|---|---|---|---|
| AP | 0,2 | 0,5 | 1,0 | 1,7 |
| 1 f | 1,20 | 1,00 | 0,50 | 0,25 |

| SNGX (HFC) | | | | |
|---|---|---|---|---|
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ |
| 32 | 48,0 | 63,8 | 0,7 | 1,4 |
| 35 | 54,0 | 69,8 | 0,8 | 1,5 |
| 40 | 64,0 | 79,8 | 0,9 | 1,5 |
| 42 | 68,0 | 83,8 | 1,0 | 1,6 |
| 50 | 84,0 | 99,8 | 0,9 | 1,4 |
| 52 | 88,0 | 103,8 | 1,0 | 1,4 |
| 63 | 109,0 | 125,8 | 1,0 | 1,4 |
| 66 | 115,0 | 131,8 | 1,1 | 1,4 |
| 80 | 143,0 | 159,8 | 1,0 | 1,3 |
| 100 | 183,0 | 199,8 | 0,9 | 1,1 |
| 115 | 213,0 | 229,8 | 1,1 | 1,3 |
| 125 | 233,0 | 249,8 | 1,2 | 1,4 |




| SNGX | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| SNGX 110416 | 4,6 | 0,92 |

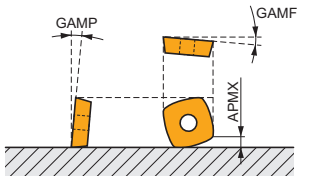
# SZD07

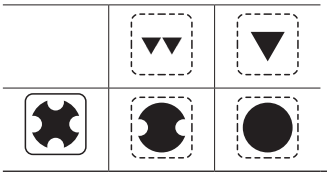
P K H

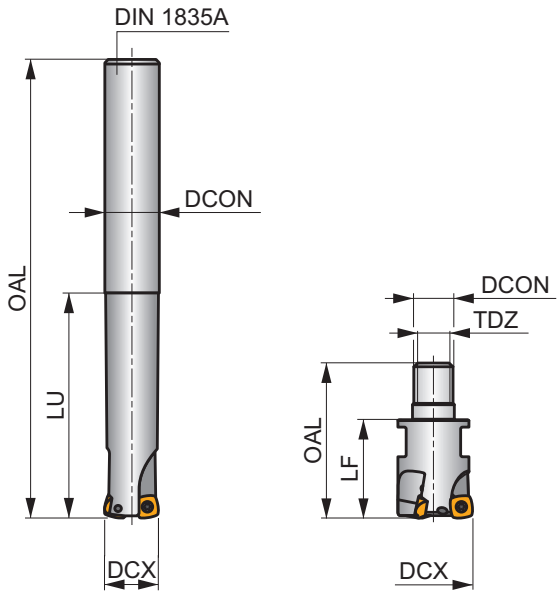
S

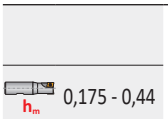
## AVANCE ZD

| APMX | 1,0 mm |
|---|---|

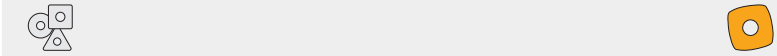


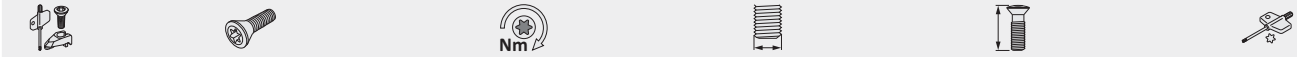


| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | TDZ | GAMP [°] | GAMF [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | **16E2R030A16-SZD07** | 16 | 100 | 16,0 | 30 | – | – | -5 | +8 | 2 | – | 47400 | ✓ | 0,13 | GI201 | CO350 |
| | **16E2R065A16-SZD07** | 16 | 145 | 16,0 | 65 | – | – | -5 | +8 | 2 | – | 47400 | ✓ | 0,19 | GI201 | CO350 |
| | **20E3R040A20-SZD07** | 20 | 120 | 20,0 | 40 | – | – | -5 | +8 | 3 | – | 42400 | ✓ | 0,25 | GI201 | CO350 |
| | **20E3R080A20-SZD07** | 20 | 165 | 20,0 | 80 | – | – | -5 | +8 | 3 | – | 42400 | ✓ | 0,33 | GI201 | CO350 |
| | **25E3R050A25-SZD07** | 25 | 140 | 25,0 | 50 | – | – | -5 | +8 | 3 | – | 37900 | ✓ | 0,47 | GI201 | CO350 |
| | **25E3R100A25-SZD07** | 25 | 190 | 25,0 | 100 | – | – | -5 | +8 | 3 | – | 37900 | ✓ | 0,60 | GI201 | CO350 |
| MODULAR | **16E2R030M08-SZD07** | 16 | 48 | 8,5 | – | 30 | M8 | -5 | +8 | 2 | – | – | ✓ | 0,04 | GI201 | CO350 |
| | **20E3R030M10-SZD07** | 20 | 49 | 10,5 | – | 30 | M10 | -5 | +8 | 3 | – | – | ✓ | 0,08 | GI201 | CO350 |
| | **25E3R032M12-SZD07** | 25 | 54 | 12,5 | – | 32 | M12 | -5 | +8 | 3 | – | – | ✓ | 0,15 | GI201 | CO350 |
| | **25E4R032M12-SZD07** | 25 | 54 | 12,5 | – | 32 | M12 | -5 | +8 | 4 | ✓ | – | ✓ | 0,04 | GI201 | CO350 |
| | **32E4R040M16-SZD07** | 32 | 65 | 17,0 | – | 40 | M16 | -5 | +8 | 4 | ✓ | – | ✓ | 0,22 | GI201 | CO350 |



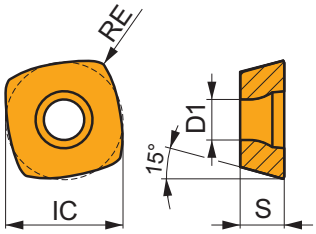
| | |
|---|---|
| GI201 | ZDCW 0703.. |




| | | | | | |
|---|---|---|---|---|---|
| CO350 | US 2205-T07P | 0,9 | M 2,2 | 5 | Flag T07P |

# ZDCW 07

| | IC | D1 | S |
|---|---|---|---|
| 0703 | 6,800 | 2,60 | 3,18 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZDCW 070304 | M8310 | ■ | | ■ | | | ■ | | - | 0,4 | 0,15 | 1,50 | 0,3 | 1,0 |
| | M8325 | ■ | | ◪ | | | | | - | 0,4 | 0,15 | 1,50 | 0,3 | 1,0 |
| | M8345 | ■ | | | | | | | + / - | 0,4 | 0,15 | 1,50 | 0,3 | 1,0 |

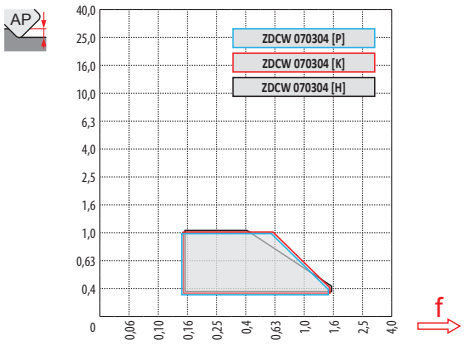
HFC

20° 0,15

| ISO | | FN | FX | M8310 | M8325 | M8345 |
|---|---|---|---|---|---|---|
| P | ● | 0,15 | 1,50 | 383 | 294 | 263 |
| | | 0,15 | 1,25 | 347 | 263 | 231 |
| | ✖ | 0,15 | 1,00 | 310 | 231 | 205 |
| K | ● | 0,15 | 1,50 | 362 | 278 | – |
| | | 0,15 | 1,25 | 331 | 247 | – |
| | ✖ | 0,15 | 1,00 | 294 | 221 | – |
| H | ● | 0,15 | 1,00 | 74 | – | – |
| | | 0,15 | 0,80 | 68 | – | – |
| | ✖ | 0,15 | 0,60 | 58 | – | – |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

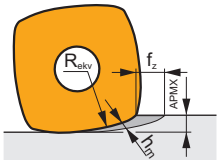
| | ZDCW 07 |
|---|---|
| RE | 0,4 |
| BS | – |



| DCX | AP 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|
| 16 | 6,0 | 12,0 | 12,9 | 13,7 | 14,4 | 15,1 | 15,7 | 16,2 | 16,8 |
| 20 | 10,0 | 16,0 | 16,9 | 17,7 | 18,4 | 19,1 | 19,7 | 20,2 | 20,8 |
| 25 | 15,0 | 21,0 | 21,9 | 22,7 | 23,4 | 24,1 | 24,7 | 25,2 | 25,8 |
| 32 | 22,0 | 28,0 | 28,9 | 29,7 | 30,4 | 31,1 | 31,7 | 32,2 | 32,8 |

DEF

| AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 1,50 | 1,50 | 1,13 | 1,00 | 0,88 | 0,75 | 0,61 | 0,60 |




$$f_z = h_m \sqrt{\frac{2R_{ekv.}}{APMX}} \quad \text{[mm/diente]}$$

Siga las instrucciones proporcionadas para el fresado de superficies planas. Al fresar cerca de superficies verticales, disminuya el avance por diente (fz) en un 50 % para evitar vibraciones y daños en el filo

| DCX | max | FX |
|---|---|---|
| 16 | 5,6 | 0,12 |
| 20 | 5,6 | 0,15 |
| 25 | 5,6 | 0,17 |
| 32 | 5,6 | 0,17 |

| HFC | | |
|---|---|---|
| AP 0,3 | 0,6 | 1,0 |
| 1 f 1,50 | 0,80 | 0,40 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 16 | 7,8 | 1,0/9 |
| 20 | 9,7 | 1,0/7 |
| 25 | 4,9 | 1,0/13 |
| 32 | 2,8 | 1,0/22 |

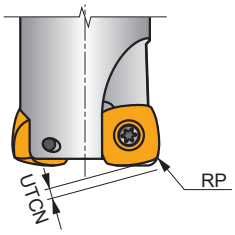
HFC

| DCX | RPMX | APMX / l |
|---|---|---|
| 16 | 0,5 | 0,75/100 |
| 20 | 0,3 | 0,40/100 |
| 25 | 0,2 | 0,20/100 |
| 32 | 0,1 | 0,05/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ |
|---|---|---|---|---|
| 16 | 21,0 | 32,0 | 0,10 | 0,40 |
| 20 | 29,0 | 40,0 | 0,10 | 0,30 |
| 25 | 39,0 | 50,0 | 0,15 | 0,25 |
| 32 | 53,0 | 64,0 | 0,10 | 0,15 |

| DCX | AP | FX |
|---|---|---|
| 16 | 0,05 | 0,12 |
| 20 | 0,05 | 0,15 |
| 25 | 0,05 | 0,17 |
| 32 | 0,05 | 0,17 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 20 | $f_e$ | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |




| ZDCW 07 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| **ZDCW 070304** | 1,70 | 0,60 |

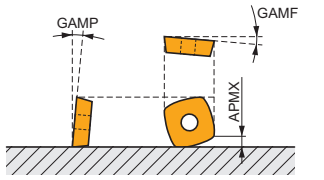
# SZD09

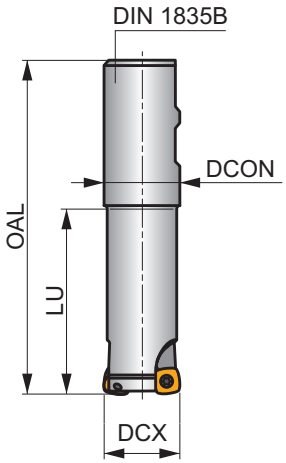
P K H

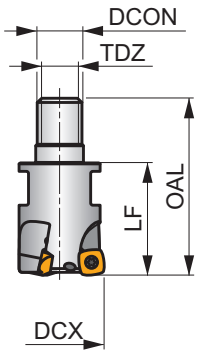
S

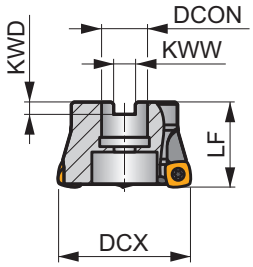
## AVANCE ZD

| APMX | 1,0 mm |
|---|---|




| | |
|---|---|
| $h_m$ | 0,31 - 0,618 |
| $h_m$ | 0,31 - 0,618 |

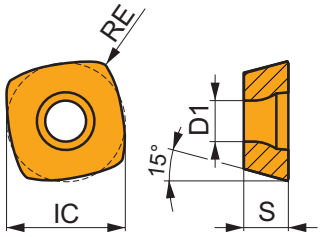
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | TDZ | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835B | 25E2R080B25-SZD09-C | 25 | 140 | 25 | 80 | – | – | – | – | -6 | +10 | 2 | – | 22800 | ✓ | 0,49 | GI191 | SQ400 |
| | 25E2R140B25-SZD09-C | 25 | 200 | 25 | 140 | – | – | – | – | -6 | +10 | 2 | – | 22800 | ✓ | 0,60 | GI191 | SQ400 |
| | 25E2R240B25-SZD09-C | 25 | 300 | 25 | 240 | – | – | – | – | -6 | +10 | 2 | – | 22800 | ✓ | 0,90 | GI191 | SQ400 |
| | 32E2R080B32-SZD09-C | 32 | 140 | 32 | 80 | – | – | – | – | -6 | +10 | 2 | – | 20100 | ✓ | 0,80 | GI191 | SQ400 |
| | 32E2R140B32-SZD09-C | 32 | 200 | 32 | 140 | – | – | – | – | -6 | +10 | 2 | – | 20100 | ✓ | 1,07 | GI191 | SQ400 |
| | 32E2R240B32-SZD09-C | 32 | 300 | 32 | 240 | – | – | – | – | -6 | +10 | 2 | – | 20100 | ✓ | 1,57 | GI191 | SQ400 |
| MODULAR | 25E2R032M12-SZD09-C | 25 | 54 | 12,5 | – | 32 | M12 | – | – | -6 | +10 | 2 | – | – | ✓ | 0,15 | GI191 | SQ400 |
| | 25E3R032M12-SZD09-C | 25 | 54 | 12,5 | – | 32 | M12 | – | – | -6 | +10 | 3 | – | – | ✓ | 0,14 | GI191 | SQ400 |
| | 32E3R040M16-SZD09-C | 32 | 63 | 17 | – | 40 | M16 | – | – | -6 | +10 | 3 | – | – | ✓ | 0,26 | GI191 | SQ400 |
| | 35E4R040M16-SZD09-C | 35 | 63 | 17 | – | 40 | M16 | – | – | -6 | +10 | 4 | ✓ | – | ✓ | 0,22 | GI191 | SQ400 |
| | 42E4R040M16-SZD09-C | 42 | 63 | 17 | – | 40 | M16 | – | – | -6 | +10 | 4 | ✓ | – | ✓ | 0,27 | GI191 | SQ400 |
| ISO 6462 DIN 8030 | 40A03R-SMOZD09-C | 40 | – | 16 | – | 40 | – | 8,4 | 5,6 | -6 | +10 | 3 | – | 18000 | ✓ | 0,36 | GI191 | SQ402 |
| | 40A04R-SMOZD09-C | 40 | – | 16 | – | 40 | – | 8,4 | 5,6 | -6 | +10 | 4 | ✓ | 18000 | ✓ | 0,44 | GI191 | SQ402 |
| | 50A05R-SMOZD09-C | 50 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 5 | ✓ | 16000 | ✓ | 0,43 | GI191 | SQ403 |
| | 52A05R-SMOZD09-C | 52 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 5 | ✓ | 15700 | ✓ | 0,46 | GI191 | SQ403 |
| | 63A06R-SMOZD09-C | 63 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 6 | ✓ | 14300 | ✓ | 0,60 | GI191 | SQ403 |
| | 66A06R-SMOZD09-C | 66 | – | 27 | – | 50 | – | 12,0 | 7 | -6 | +10 | 6 | ✓ | 14000 | ✓ | 0,89 | GI191 | CO364 |

| | |
|---|---|
| GI191 | ZDCW 09T3.. |

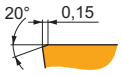
| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SQ400 | US 3006-T09P | 2,0 | M 3 | 6 | – | – | Flag T09P | – |
| SQ402 | US 3006-T09P | 2,0 | M 3 | 6 | D-T07P/T09P | FG-15 | – | HS 0830C |
| SQ403 | US 3006-T09P | 2,0 | M 3 | 6 | D-T07P/T09P | FG-15 | – | HS 1030C |
| CO364 | US 3006-T09P | 2,0 | M 3 | 6 | D-T07P/T09P | FG-15 | HS 1230C | – |

# ZDCW 09

| | IC | D1 | S |
|---|---|---|---|
| 09T3 | 9,525 | 3,40 | 3,97 |



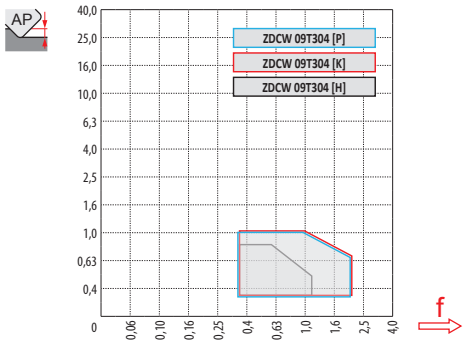

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZDCW 09T304 | M8310 | ■ | | ■ | | | ■ | ● | - | 0,4 | 0,30 | 2,00 | 0,3 | 1,0 |
| | M8325 | ■ | | ◪ | | | | ● | - | 0,4 | 0,30 | 2,00 | 0,3 | 1,0 |
| | M8345 | ■ | | | | | | ● | + / - | 0,4 | 0,30 | 2,00 | 0,3 | 1,0 |




| ISO | | FN | FX | M8310 | M8325 | M8345 |
|---|---|---|---|---|---|---|
| P | ● | 0,30 | 2,00 | 402 | 308 | 275 |
| | ● | 0,30 | 1,80 | 363 | 275 | 242 |
| | ✖ | 0,30 | 1,60 | 325 | 242 | 215 |
| K | ● | 0,30 | 2,00 | 380 | 292 | - |
| | ● | 0,30 | 1,80 | 347 | 259 | - |
| | ✖ | 0,30 | 1,60 | 308 | 231 | - |
| H | ● | 0,30 | 1,60 | 77 | - | - |
| | ● | 0,30 | 1,40 | 72 | - | - |
| | ✖ | 0,30 | 1,20 | 61 | - | - |

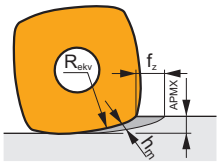
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | ZDCW 09 |
|---|---|
| RE | 0,4 |
| BS | – |




| DCX | AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | DEF | 11,6 | 17,4 | 18,2 | 19,0 | 19,7 | 20,3 | 20,9 | 21,5 | 22,0 |
| 32 | | 18,7 | 24,5 | 25,3 | 26,1 | 26,8 | 27,4 | 28,0 | 28,6 | 29,1 |
| 40 | | 27,7 | 33,5 | 34,3 | 35,1 | 35,8 | 36,4 | 37,0 | 37,6 | 38,1 |

| AP | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 2,00 | 2,00 | 2,00 | 1,75 | 1,50 | 1,25 | 1,13 | 1,00 |




$$f_z = h_m \sqrt{\frac{2R_{ekv.}}{APMX}}$$ [mm/diente]

Siga las instrucciones proporcionadas para el fresado de superficies planas. Al fresar cerca de superficies verticales, disminuya el avance por diente (fz) en un 50 % para evitar vibraciones y daños en el filo

| DCX | max | FX |
|---|---|---|
| 25 | 7,7 | 0,15 |
| 32 | 7,7 | 0,17 |
| 40 | 7,7 | 0,20 |

| | HFC | | |
|---|---|---|---|
| AP | 0,3 | 0,6 | 1,0 |
| 1 f | 2,00 | 1,50 | 1,00 |

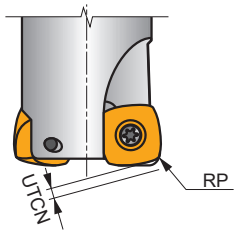
| DCX | RPMX | APMX / l |
|---|---|---|
| 25 | 12,0 | 1,0/6 |
| 32 | 7,5 | 1,0/11 |
| 40 | 3,6 | 1,0/17 |

| HFC | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 25 | 0,9 | 1,00/65 |
| 32 | 0,5 | 0,75/100 |
| 40 | 0,4 | 0,55/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 25 | 35,0 | 50,0 | 0,45 | 1,00 |
| 32 | 49,0 | 64,0 | 0,45 | 0,85 |
| 40 | 65,0 | 80,0 | 0,50 | 0,85 |

| DCX | AP | FX |
|---|---|---|
| 25 | 0,15 | 0,15 |
| 32 | 0,15 | 0,17 |
| 40 | 0,15 | 0,20 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | $f_e$ | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |




| ZDCW 09 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| ZDCW 09T304 | 2,27 | 0,52 |

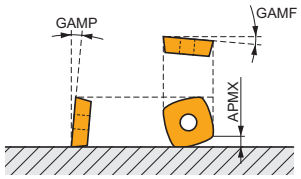
# SZD12

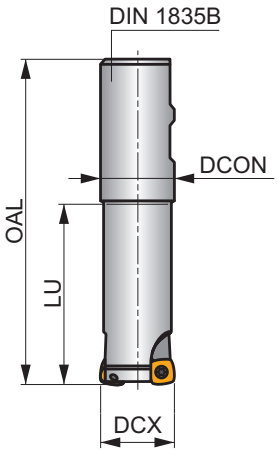
P K H

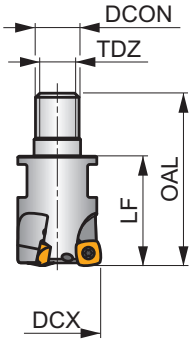
S

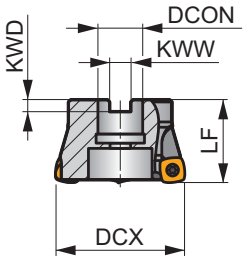
## AVANCE ZD

| APMX | 1,6 mm |
|---|---|




| | |
|---|---|
| $h_m$ | 0,46 - 0,925 |
| $h_m$ | 0,46 - 0,925 |

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | TDZ | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835B | 40E4R080B32-SZD12-C | 40 | 140 | 32 | 80 | – | – | – | – | -6 | +10 | 4 | ✓ | 15700 | ✓ | 0,78 | GI192 | SQ220 | – |
| | 40E4R140B32-SZD12-C | 40 | 200 | 32 | 140 | – | – | – | – | -6 | +10 | 4 | ✓ | 15700 | ✓ | 1,13 | GI192 | SQ220 | – |
| | 40E4R240B32-SZD12-C | 40 | 300 | 32 | 240 | – | – | – | – | -6 | +10 | 4 | ✓ | 15700 | ✓ | 1,58 | GI192 | SQ220 | – |
| MODULAR | 32E3R040M16-SZD12-C | 32 | 63 | 17 | – | 40 | M16 | – | – | -6 | +10 | 3 | – | – | ✓ | 0,24 | GI192 | SQ220 | – |
| | 40E4R040M16-SZD12-C | 40 | 63 | 17 | – | 40 | M16 | – | – | -6 | +10 | 4 | – | – | ✓ | 0,27 | GI192 | SQ220 | – |
| ISO 6462 DIN 8030 | 50A04R-SMOZD12-C | 50 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 4 | ✓ | 14000 | ✓ | 0,47 | GI192 | SQ033 | – |
| | 52A04R-SMOZD12-C | 52 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 4 | ✓ | 13700 | ✓ | 0,47 | GI192 | SQ033 | – |
| | 63A04R-SMOZD12-C | 63 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 4 | ✓ | 12500 | ✓ | 0,65 | GI192 | SQ033 | – |
| | 63A05R-SMOZD12-C | 63 | – | 22 | – | 40 | – | 10,4 | 6,4 | -6 | +10 | 5 | ✓ | 12500 | ✓ | 0,63 | GI192 | SQ033 | – |
| | 66A05R-SMOZD12-C | 66 | – | 27 | – | 50 | – | 12,0 | 7,0 | -6 | +10 | 5 | ✓ | 12200 | ✓ | 0,88 | GI192 | CO371 | – |
| | 80A05R-SMOZD12-C | 80 | – | 27 | – | 50 | – | 12,0 | 7,0 | -6 | +10 | 5 | ✓ | 11100 | ✓ | 1,12 | GI192 | CO371 | AC001 |

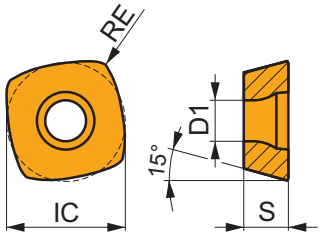
| | |
|---|---|
| GI192 | ZDEW 1204.. |

| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO371 | US 4011-T15P | 3,5 | M 4 | 11 | D-T08P/T15P | FG-15 | – | – |
| SQ033 | US 4011-T15P | 3,5 | M 4 | 11 | D-T08P/T15P | FG-15 | – | HS 1030C |
| SQ220 | US 4011-T15P | 3,5 | M 4 | 11 | – | – | Flag T15P | – |

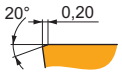
| | | |
|---|---|---|
| AC001 | KS 1230 | K.FMH27 |

# ZDEW 12

| | IC | D1 | S |
|---|---|---|---|
| 1204 | 12,700 | 4,40 | 4,76 |



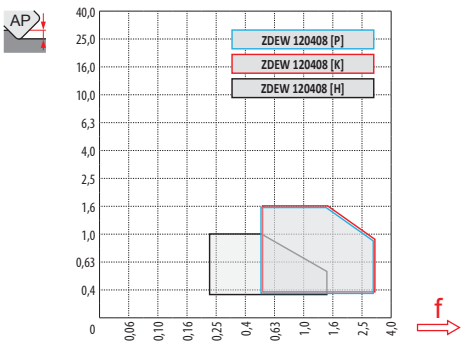

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZDEW 120408 | M4303 | ◪ | | ■ | | | ■ | ⚙ | - | 0,8 | 0,50 | 3,00 | 0,3 | 1,6 |
| | M8310 | ■ | | ■ | | | ■ | ⚙ | - | 0,8 | 0,50 | 3,00 | 0,3 | 1,6 |
| | M8325 | ■ | | ◪ | | | | ⚙ | - | 0,8 | 0,50 | 3,00 | 0,3 | 1,6 |
| | M8345 | ■ | | | | | | ✖ | + / - | 0,8 | 0,50 | 3,00 | 0,3 | 1,6 |




| ISO | | FN | FX | M4303 | M8310 | M8325 | M8345 |
|---|---|---|---|---|---|---|---|
| P | ● | 0,50 | 3,00 | 411 | 420 | 322 | 288 |
| | ⚙ | 0,50 | 2,50 | 363 | 380 | 288 | 253 |
| | ✖ | 0,50 | 2,00 | 324 | 339 | 253 | 224 |
| K | ● | 0,50 | 3,00 | 390 | 397 | 305 | – |
| | ⚙ | 0,50 | 2,50 | 351 | 362 | 270 | – |
| | ✖ | 0,50 | 2,00 | 305 | 322 | 242 | – |
| H | ● | 0,50 | 2,00 | 83 | 81 | – | – |
| | ⚙ | 0,50 | 1,50 | 76 | 75 | – | – |
| | ✖ | 0,50 | 1,00 | 62 | 63 | – | – |

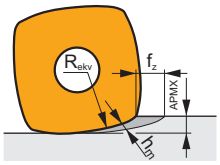
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | ZDEW 12 |
|---|---|
| RE | 0,8 |
| BS | – |



| DCX | AP | 0,00 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | DEF | 14,5 | 22,7 | 23,5 | 24,2 | 24,8 | 25,4 | 26,0 | 26,5 | 27,0 | 27,5 | 28,0 | 28,5 | 28,9 |
| 40 | | 22,5 | 30,7 | 31,5 | 32,2 | 32,8 | 33,4 | 34,0 | 34,5 | 35,0 | 35,5 | 36,0 | 36,5 | 36,9 |
| 50 | | 32,5 | 40,7 | 41,5 | 42,2 | 42,8 | 43,4 | 44,0 | 44,5 | 45,0 | 45,5 | 46,0 | 46,5 | 46,9 |
| 52 | | 34,5 | 42,7 | 43,5 | 44,2 | 44,8 | 45,4 | 46,0 | 46,5 | 47,0 | 47,5 | 48,0 | 48,5 | 48,9 |
| 63 | | 45,5 | 53,7 | 54,5 | 55,2 | 55,8 | 56,4 | 57,0 | 57,5 | 58,0 | 58,5 | 59,0 | 59,5 | 59,9 |
| 66 | | 48,5 | 56,7 | 57,5 | 58,2 | 58,8 | 59,4 | 60,0 | 60,5 | 61,0 | 61,5 | 62,0 | 62,5 | 62,9 |
| 80 | | 62,5 | 70,7 | 71,5 | 72,2 | 72,8 | 73,4 | 74,0 | 74,5 | 75,0 | 75,5 | 76,0 | 76,5 | 76,9 |

| AP | 0,00 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 3,00 | 3,00 | 3,00 | 3,00 | 3,00 | 3,00 | 2,50 | 2,25 | 2,00 | 1,80 | 1,65 | 1,50 |




$$f_z = h_m \sqrt{\frac{2R_{ekv.}}{APMX}} \quad \text{[mm/diente]}$$

Siga las instrucciones proporcionadas para el fresado de superficies planas. Al fresar cerca de superficies verticales, disminuya el avance por diente (fz) en un 50 % para evitar vibraciones y daños en el filo

| DCX | max | FX |
|---|---|---|
| 32 | 10,0 | 0,15 |
| 40 | 10,0 | 0,17 |
| 50 | 10,0 | 0,20 |
| 52 | 10,0 | 0,20 |
| 63 | 10,0 | 0,20 |
| 66 | 10,0 | 0,20 |
| 80 | 10,0 | 0,25 |

| HFC | | |
|---|---|---|
| AP | 0,5 | 1,0 | 1,6 |
| 1 f | 3,00 | 2,00 | 1,50 |

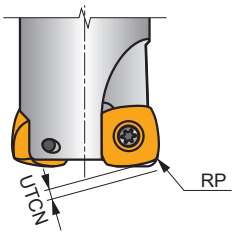
| DCX | RPMX | APMX / l |
|---|---|---|
| 32 | 10 | 1,6/11 |
| 40 | 5,5 | 1,6/18 |
| 50 | 3,3 | 1,6/29 |
| 52 | 3,1 | 1,6/31 |
| 63 | 2,2 | 1,6/43 |
| 66 | 2,0 | 1,6/47 |
| 80 | 1,5 | 1,6/63 |

| HFC | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 32 | 1,2 | 1,60/78 |
| 40 | 0,7 | 1,10/100 |
| 50 | 0,5 | 0,75/100 |
| 52 | 0,5 | 0,75/100 |
| 63 | 0,3 | 0,40/100 |
| 66 | 0,3 | 0,40/100 |
| 80 | 0,2 | 0,20/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ |
|---|---|---|---|---|
| 32 | 44,0 | 64,0 | 0,75 | 1,60 |
| 40 | 60,0 | 80,0 | 0,75 | 1,50 |
| 50 | 80,0 | 100,0 | 0,80 | 1,35 |
| 52 | 84,0 | 104,0 | 0,80 | 1,35 |
| 63 | 106,0 | 126,0 | 0,70 | 1,00 |
| 66 | 112,0 | 132,0 | 0,70 | 1,00 |
| 80 | 140,0 | 160,0 | 0,65 | 0,85 |

| DCX | AP | FX |
|---|---|---|
| 32 | 0,25 | 0,15 |
| 40 | 0,25 | 0,17 |
| 50 | 0,25 | 0,20 |
| 52 | 0,25 | 0,20 |
| 63 | 0,25 | 0,20 |
| 66 | 0,25 | 0,20 |
| 80 | 0,25 | 0,25 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | $f_e$ | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 63 | | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |



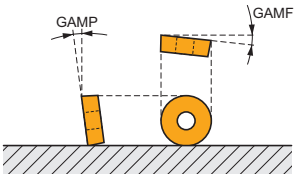

| ZDEW 12 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| **ZDEW 120408** | 3,52 | 0,64 |

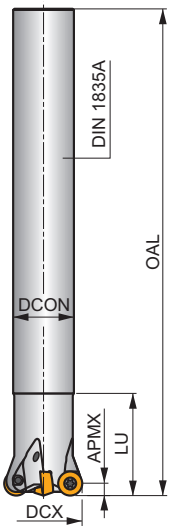
# SRC10

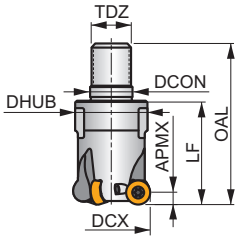
P M K N S H

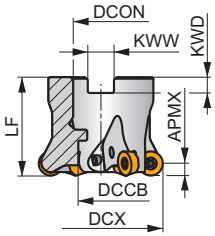
S

| APMX | 5,0 mm |
|---|---|




| | |
|---|---|
| $h_m$ | 0,08-0,15 |
| $h_m$ | 0,05-0,12 |

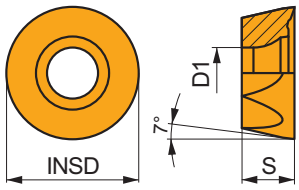
| | ISO | DCX [mm] | DHUB [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 25E2R034A20-SRC10-C | 25 | – | 170 | 20 | – | 34 | – | – | – | – | -7 | -3 | 2 | – | 20900 | ✓ | 0,37 | GI328 | CO010 |
| | 25E3R034A20-SRC10-C | 25 | – | 170 | 20 | – | 34 | – | – | – | – | -7 | -3 | 3 | – | 20900 | ✓ | 0,36 | GI328 | CO010 |
| | 32E3R042A25-SRC10-C | 32 | – | 200 | 25 | – | 42 | – | – | – | – | -7 | -2,6 | 4 | – | 18500 | ✓ | 0,67 | GI328 | CO010 |
| | 32E4R042A25-SRC10-C | 32 | – | 200 | 25 | – | 42 | – | – | – | – | -7 | -2,6 | 3 | – | 18500 | ✓ | 0,67 | GI328 | CO010 |
| MODULAR | 25E2R032M12-SRC10-C | 25 | 21 | 54 | 12,5 | – | – | 32 | M12 | – | – | -7 | -3 | 2 | – | 20900 | ✓ | 0,08 | GI328 | CO010 |
| | 25E3R032M12-SRC10-C | 25 | 21 | 54 | 12,5 | – | – | 32 | M12 | – | – | -7 | -3 | 3 | – | 20900 | ✓ | 0,08 | GI328 | CO010 |
| | 32E3R042M16-SRC10-C | 32 | 29 | 65 | 17 | – | – | 42 | M16 | – | – | -7 | -2,6 | 3 | – | 18500 | ✓ | 0,18 | GI328 | CO010 |
| | 32E4R042M16-SRC10-C | 32 | 29 | 65 | 17 | – | – | 42 | M16 | – | – | -7 | -2,6 | 4 | – | 18500 | ✓ | 0,18 | GI328 | CO010 |
| | 35E4R042M16-SRC10-C | 35 | 29 | 65 | 17 | – | – | 42 | M16 | – | – | -7 | -2,4 | 4 | – | 17700 | ✓ | 0,20 | GI328 | CO010 |
| | 42E4R042M16-SRC10-C | 42 | 29 | 65 | 17 | – | – | 42 | M16 | – | – | -7 | -2,1 | 4 | – | 16100 | ✓ | 0,22 | GI328 | CO010 |
| | 42E5R042M16-SRC10-C | 42 | 29 | 65 | 17 | – | – | 42 | M16 | – | – | -7 | -2,1 | 5 | – | 16100 | ✓ | 0,22 | GI328 | CO010 |
| ISO 6462 DIN 8030 | 40A05R-SMORC10-C | 40 | – | – | 16 | 14 | 40 | – | – | 8,4 | 5,6 | -7 | -2,2 | 5 | – | 16500 | ✓ | 0,14 | GI328 | CO012 |
| | 50A05R-SMORC10-C | 50 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -2 | 5 | – | 14800 | ✓ | 0,25 | GI328 | CO013 |
| | 50A06R-SMORC10-C | 50 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -2 | 6 | – | 14800 | ✓ | 0,24 | GI328 | CO013 |
| | 52A05R-SMORC10-C | 52 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -2 | 5 | – | 14500 | ✓ | 0,26 | GI328 | CO013 |
| | 52A06R-SMORC10-C | 52 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -2 | 6 | – | 14500 | ✓ | 0,26 | GI328 | CO013 |
| | 63A06R-SMORC10-C | 63 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -1,8 | 6 | – | 13200 | ✓ | 0,43 | GI328 | CO013 |
| | 63A07R-SMORC10-C | 63 | – | – | 22 | 18 | 40 | – | – | 10,4 | 6,3 | -7 | -1,8 | 7 | – | 13200 | ✓ | 0,42 | GI328 | CO013 |
| | 66A06R-SMORC10-C | 66 | – | – | 27 | 22 | 50 | – | – | 12,4 | 7 | -7 | -1,4 | 6 | – | 12800 | ✓ | 0,54 | GI328 | CO014 |
| | 66A07R-SMORC10-C | 66 | – | – | 27 | 22 | 50 | – | – | 12,4 | 7 | -7 | -1,4 | 7 | – | 12800 | ✓ | 0,52 | GI328 | CO014 |

| | |
|---|---|
| GI328 | RCMT 10T3MO.. |

| | | Nm | | | | |
|---|---|---|---|---|---|---|
| CO010 | US 63509-T10P | 3,0 | M 3,5 | 9 | Flag T10P | – |
| CO012 | US 63509-T10P | 3,0 | M 3,5 | 9 | Flag T10P | HS 8030C |
| CO013 | US 63509-T10P | 3,0 | M 3,5 | 9 | Flag T10P | HS 1030C |
| CO014 | US 63509-T10P | 3,0 | M 3,5 | 9 | Flag T10P | HS 1230C |

# RCMT 10

| | INSD | D1 | S |
|---|---|---|---|
| 10T3 | 10,000 | 3,90 | 3,97 |

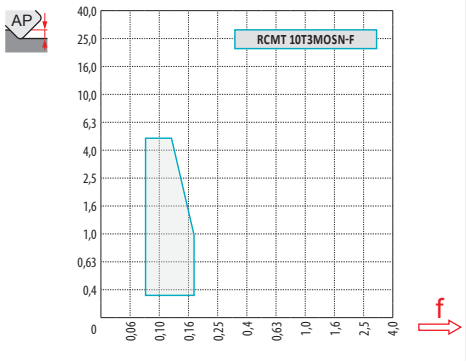


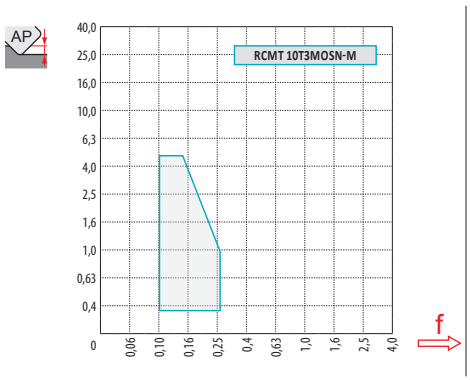

| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT 10T3MOSN-F | M6330 | ◪ | ■ | | | ■ | | ✖ | - | – | 0,08 | 0,18 | 0,3 | 5,0 |
| | M8310 | ■ | ◪ | | | ◪ | | ⚙ | - | – | 0,08 | 0,18 | 0,3 | 5,0 |
| | M8330 | ■ | ◪ | | | | | ⚙ | - | – | 0,08 | 0,18 | 0,3 | 5,0 |
| | M8340 | ■ | ■ | | | ■ | | ✖ | + / - | – | 0,08 | 0,18 | 0,3 | 5,0 |
| RCMT 10T3MOSN-M | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | – | 0,10 | 0,24 | 0,3 | 5,0 |
| | M9340 | ◪ | ■ | | | ■ | | ✖ | - - - | – | 0,10 | 0,24 | 0,3 | 5,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | – | 0,10 | 0,27 | 0,3 | 5,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | – | 0,10 | 0,27 | 0,3 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | | | ✖ | - | – | 0,10 | 0,27 | 0,3 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ■ | | ✖ | + / - | – | 0,10 | 0,27 | 0,3 | 5,0 |
| | M8345 | ■ | ■ | | | ■ | | ✖ | + / - | – | 0,10 | 0,27 | 0,3 | 5,0 |
| RCMT 10T3MOSN-R | M5315 | ◪ | | ■ | | | ■ | ✖ | - - - | – | 0,15 | 0,38 | 0,5 | 5,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | – | 0,15 | 0,38 | 0,5 | 5,0 |
| | M8310 | ■ | ◪ | ■ | | | ■ | ✖ | - | – | 0,15 | 0,40 | 0,5 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | | ◪ | ✖ | - | – | 0,15 | 0,40 | 0,5 | 5,0 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | – | 0,15 | 0,40 | 0,5 | 5,0 |

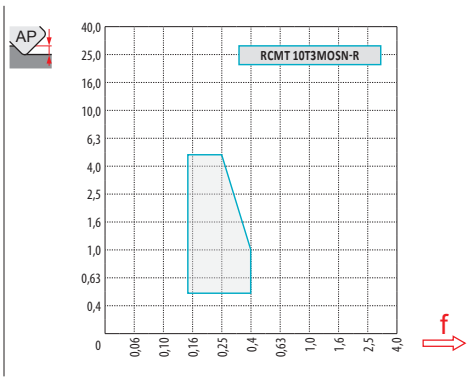
| ISO | | FN | FX | M5315 | M9325 | M9340 | M6330 | M8310 | M8330 | M8340 | M8345 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,35 | 373 | 383 | 380 | 299 | 358 | 322 | 293 | 235 |
| | ⚙ | 0,10 | 0,25 | 335 | 344 | 342 | 269 | 322 | 290 | 257 | 212 |
| | ✖ | 0,10 | 0,15 | 298 | 306 | 304 | 239 | 286 | 257 | 221 | 188 |
| M | ● | 0,10 | 0,25 | - | 193 | 225 | 211 | 179 | 192 | 176 | 138 |
| | ⚙ | 0,10 | 0,20 | - | 173 | 203 | 190 | 161 | 173 | 153 | 124 |
| | ✖ | 0,10 | 0,15 | - | 154 | 180 | 169 | 143 | 153 | 131 | 110 |
| K | ● | 0,10 | 0,35 | 353 | - | - | - | 338 | 303 | 275 | - |
| | ⚙ | 0,10 | 0,25 | 317 | - | - | - | 304 | 272 | 243 | - |
| | ✖ | 0,10 | 0,15 | 282 | - | - | - | 270 | 242 | 212 | - |
| S | ● | 0,10 | 0,25 | - | 84 | 100 | 91 | 78 | 83 | 86 | 60 |
| | ⚙ | 0,10 | 0,20 | - | 75 | 90 | 82 | 71 | 74 | 77 | 54 |
| | ✖ | 0,10 | 0,15 | - | 67 | 80 | 73 | 63 | 66 | 63 | 48 |
| H | ● | 0,10 | 0,20 | 73 | - | - | - | 64 | 59 | - | - |
| | ⚙ | 0,10 | 0,15 | 65 | - | - | - | 57 | 53 | - | - |
| | ✖ | 0,10 | 0,12 | 58 | - | - | - | 51 | 47 | - | - |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RCMT 10-F | RCMT 10-M | RCMT 10-R |
|---|---|---|---|
| RE | 5,0 | 5,0 | 5,0 |
| BS | – | – | – |




| DCX | AP | 0,00 | 0,15 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | | 15,00 | 17,43 | 18,41 | 19,36 | 20,27 | 21,00 | 21,61 | 22,14 | 23,00 | 23,66 | 24,17 | 24,80 | 25,00 |
| 32 | | 22,00 | 24,43 | 25,41 | 26,36 | 27,27 | 28,00 | 28,61 | 29,14 | 30,00 | 30,66 | 31,17 | 31,80 | 32,00 |
| 35 | | 25,00 | 27,43 | 28,41 | 29,36 | 30,27 | 31,00 | 31,61 | 32,14 | 33,00 | 33,66 | 34,17 | 34,80 | 35,00 |
| 40 | | 30,00 | 32,43 | 33,41 | 34,36 | 35,27 | 36,00 | 36,61 | 37,14 | 38,00 | 38,66 | 39,17 | 39,80 | 40,00 |
| 42 | DEF | 32,00 | 34,43 | 35,41 | 36,36 | 37,27 | 38,00 | 38,61 | 39,14 | 40,00 | 40,66 | 41,17 | 41,80 | 42,00 |
| 50 | | 40,00 | 42,43 | 43,41 | 44,36 | 45,27 | 46,00 | 46,61 | 47,14 | 48,00 | 48,66 | 49,17 | 49,80 | 50,00 |
| 52 | | 42,00 | 44,43 | 45,41 | 46,36 | 47,27 | 48,00 | 48,61 | 49,14 | 50,00 | 50,66 | 51,17 | 51,80 | 52,00 |
| 63 | | 53,00 | 55,43 | 56,41 | 57,36 | 58,27 | 59,00 | 59,61 | 60,14 | 61,00 | 61,66 | 62,17 | 62,80 | 63,00 |
| 66 | | 56,00 | 58,43 | 59,41 | 60,36 | 61,27 | 62,00 | 62,61 | 63,14 | 64,00 | 64,66 | 65,17 | 65,80 | 66,00 |

| | AP | – | 0,15 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 ⇨f | – | 0,90 | 0,64 | 0,50 | 0,41 | 0,35 | 0,32 | 0,29 | 0,25 | 0,23 | 0,21 | 0,19 | 0,17 |

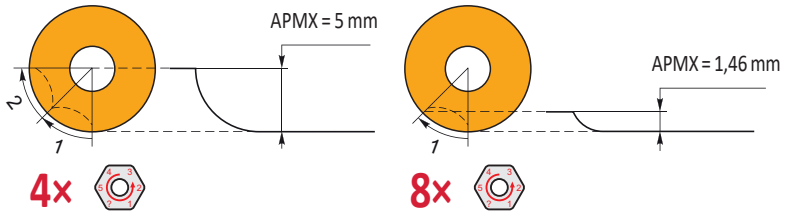
| DCX | RPMX | APMX / l |
|---|---|---|
| 25 | 13,2 | 5/23 |
| 32 | 12,6 | 5/24 |
| 35 | 12,3 | 5/24 |
| 40 | 9,5 | 5/31 |
| 42 | 6,5 | 5/45 |
| 50 | 6,4 | 5/46 |
| 52 | 6,1 | 5/48 |
| 63 | 4,7 | 5/62 |
| 66 | 4,4 | 5/66 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 25 | 32,0 | 50,0 | 3,0 | 3,0 |
| 32 | 45,0 | 64,0 | 3,0 | 3,0 |
| 35 | 51,0 | 70,0 | 3,0 | 3,0 |
| 40 | 61,0 | 80,0 | 3,0 | 3,0 |
| 42 | 65,0 | 84,0 | 3,0 | 3,0 |
| 50 | 81,0 | 100,0 | 3,0 | 3,0 |
| 52 | 85,0 | 104,0 | 3,0 | 3,0 |
| 63 | 107,0 | 126,0 | 3,0 | 3,0 |
| 66 | 113,0 | 132,0 | 3,0 | 3,0 |

| AP |
|---|
| 2,24 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | $f_e$ | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 35 | | 0,648 | 0,837 | 1,183 | 1,449 | 1,673 | 2,049 | 2,366 | 2,646 | 2,898 | 3,347 | 3,742 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 42 | | 0,710 | 0,917 | 1,296 | 1,587 | 1,833 | 2,245 | 2,592 | 2,898 | 3,175 | 3,666 | 4,099 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 63 | | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,0 | $f_e$ | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |

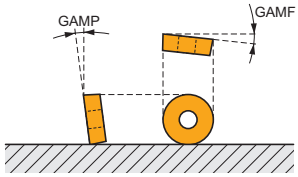


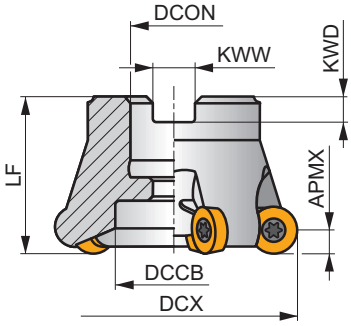
# SRC12

P M K N S H

S

| APMX | 6,0 mm |
|---|---|




$h_m$ 0,1 - 0,2

| | ISO | DCX [mm] | LF [mm] | DCON [mm] | DCCB [mm] | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO 6462 DIN 8030 | **40A03R-SMORC12-C** | 40 | 40 | 16 | 12 | 8,4 | 5,6 | -2,1 | -7 | 3 | – | 14800 | ✓ | 0,29 | GI279 | CO022 | – |
| | **50A04R-SMORC12-C** | 50 | 40 | 22 | 18 | 10,4 | 6,3 | -2 | -7 | 4 | – | 13200 | ✓ | 0,39 | GI279 | CO023 | – |
| | **52A05R-SMORC12-C** | 52 | 40 | 22 | 18 | 10,4 | 6,3 | -2 | -7 | 5 | – | 12900 | ✓ | 0,36 | GI279 | CO029 | – |
| | **63A05R-SMORC12-C** | 63 | 40 | 22 | 30 | 10,4 | 6,3 | -2 | -7 | 5 | – | 11800 | ✓ | 0,51 | GI279 | CO023 | – |
| | **66A06R-SMORC12-C** | 66 | 50 | 27 | 22 | 12,4 | 7 | -1,5 | -7 | 6 | – | 11400 | ✓ | 0,67 | GI279 | CO024 | – |
| | **80A05R-SMORC12-C** | 80 | 50 | 27 | 37 | 12,4 | 7 | -1,7 | -7 | 5 | – | 10400 | ✓ | 1,10 | GI279 | CO024 | – |
| | **100A06R-SMORC12-C** | 100 | 50 | 32 | 45 | 14,4 | 8 | -1,8 | -7 | 6 | – | 9300 | ✓ | 1,83 | GI279 | CO021 | AC002 |

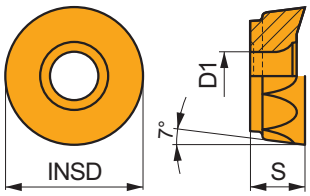
| | |
|---|---|
| GI279 | RCMT 1204MO.. |

| | | Nm | | | | | |
|---|---|---|---|---|---|---|---|
| CO021 | US 63509-T15P | 3,0 | M 3,5 | 10 | D-T08P/T15P | FG-15 | – |
| CO022 | US 63509-T15P | 3,0 | M 3,5 | 10 | D-T08P/T15P | FG-15 | HS 90835 |
| CO023 | US 63509-T15P | 3,0 | M 3,5 | 10 | D-T08P/T15P | FG-15 | HS 1030C |
| CO024 | US 63509-T15P | 3,0 | M 3,5 | 10 | D-T08P/T15P | FG-15 | HS 1230C |

| | | |
|---|---|---|
| AC002 | KS 1635 | K.FMH32 |

# RCMT 12

| | INSD | D1 | S |
|---|---|---|---|
| 1204 | 12,000 | 4,40 | 4,76 |

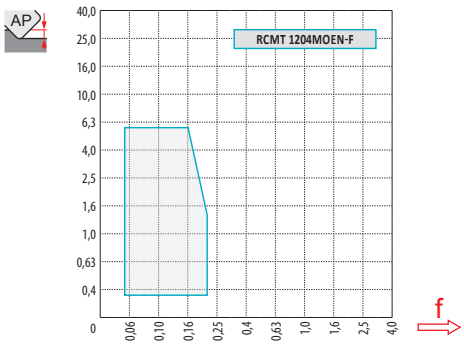


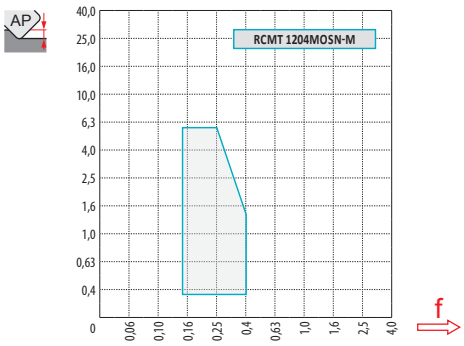

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT 1204MOEN-F | M8310 | ■ | ◪ | | | ◪ | | ✱ | - | – | 0,05 | 0,20 | 0,3 | 6,0 |
| | M8330 | ■ | ◪ | | | ◪ | | ✱ | - | – | 0,05 | 0,20 | 0,3 | 6,0 |
| | 8215 | ◪ | ◪ | | ◪ | | | ✱ | - | – | 0,05 | 0,20 | 0,3 | 6,0 |
| RCMT 1204MOSN-M | M9325 | ■ | ◪ | ■ | | ◪ | | ✖ | - - - | – | 0,15 | 0,34 | 0,3 | 6,0 |
| | M9340 | ◪ | ■ | | | ◪ | | ✖ | - - - | – | 0,15 | 0,34 | 0,3 | 6,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | – | 0,15 | 0,40 | 0,3 | 6,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | – | 0,15 | 0,40 | 0,3 | 6,0 |
| | M8330 | ■ | ◪ | ■ | ◪ | | | ✖ | - | – | 0,15 | 0,40 | 0,3 | 6,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,15 | 0,40 | 0,3 | 6,0 |
| RCMT 1204MOEN-R | M9315 | ■ | | ◪ | | | ◪ | ✱ | - - - | – | 0,20 | 0,43 | 0,3 | 6,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ■ | ✖ | - | – | 0,20 | 0,50 | 0,3 | 6,0 |
| | M8330 | ■ | ◪ | ■ | | | ◪ | ✖ | - | – | 0,20 | 0,50 | 0,3 | 6,0 |
| RCMT 1204MOSN-R | M9315 | ■ | | ◪ | | | ◪ | ✖ | - - - | – | 0,20 | 0,43 | 0,3 | 6,0 |
| | M8345 | ■ | ◪ | | | ◪ | | ✖ | + / - | – | 0,20 | 0,50 | 0,3 | 6,0 |

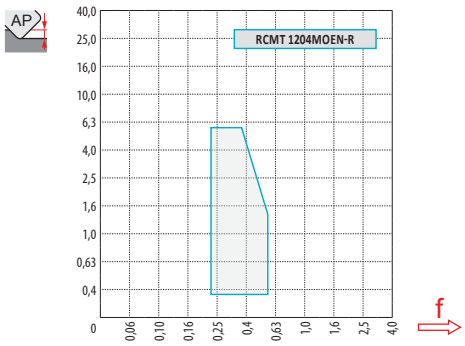
| ISO | | FN | FX | M9315 | M9325 | M9340 | M6330 | M8310 | M8330 | M8345 | 8215 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,40 | 479 | 424 | 380 | 325 | 402 | 363 | 275 | 380 |
| | ⬢ | 0,10 | 0,30 | 435 | 374 | 341 | 292 | 363 | 325 | 242 | 336 |
| | ✖ | 0,10 | 0,18 | 396 | 330 | 303 | 253 | 325 | 281 | 215 | 297 |
| M | ● | 0,10 | 0,30 | – | 215 | 226 | 231 | 204 | 215 | 165 | 226 |
| | ⬢ | 0,10 | 0,25 | – | 193 | 204 | 204 | 182 | 193 | 143 | 204 |
| | ✖ | 0,10 | 0,17 | – | 165 | 182 | 176 | 165 | 171 | 127 | 176 |
| K | ● | 0,10 | 0,40 | 457 | – | – | – | 380 | 347 | – | 358 |
| | ⬢ | 0,10 | 0,30 | 413 | – | – | – | 347 | 308 | – | 319 |
| | ✖ | 0,10 | 0,18 | 374 | – | – | – | 308 | 270 | – | 281 |
| N | ● | 0,10 | 0,40 | – | – | – | – | – | 913 | – | 946 |
| | ⬢ | 0,10 | 0,30 | – | – | – | – | – | 814 | – | 847 |
| | ✖ | 0,10 | 0,18 | – | – | – | – | – | 710 | – | 748 |
| S | ● | 0,10 | 0,30 | – | 105 | 110 | 116 | 99 | 105 | 83 | 110 |
| | ⬢ | 0,10 | 0,25 | – | 94 | 99 | 99 | 88 | 94 | 72 | 99 |
| | ✖ | 0,10 | 0,17 | – | 83 | 88 | 88 | 83 | 83 | 61 | 88 |
| H | ● | 0,10 | 0,25 | 94 | – | – | – | 77 | 72 | – | 72 |
| | ⬢ | 0,10 | 0,20 | 83 | – | – | – | 72 | 61 | – | 66 |
| | ✖ | 0,10 | 0,15 | 77 | – | – | – | 61 | 55 | – | 55 |

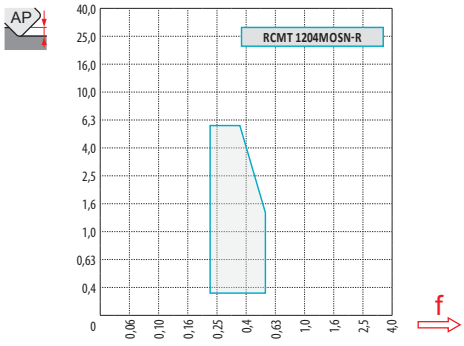
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RCMT 12-F | RCMT 12-M | RCMT 12 EN-R | RCMT 12 SN-R |
|---|---|---|---|---|
| RE | 6,0 | 6,0 | 6,0 | 6,0 |
| BS | – | – | – | – |




| DCX | AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | DEF | 28,0 | 31,7 | 32,8 | 33,8 | 34,6 | 35,3 | 35,9 | 36,9 | 37,7 | 38,4 | 39,3 | 39,8 | 40,0 |
| 50 | | 38,0 | 41,7 | 42,8 | 43,8 | 44,6 | 45,3 | 45,9 | 46,9 | 47,7 | 48,4 | 49,3 | 49,8 | 50,0 |
| 52 | | 40,0 | 43,7 | 44,8 | 45,8 | 46,6 | 47,3 | 47,9 | 48,9 | 49,7 | 50,4 | 51,3 | 51,8 | 52,0 |
| 63 | | 51,0 | 54,7 | 55,8 | 56,8 | 57,6 | 58,3 | 58,9 | 59,9 | 60,7 | 61,4 | 62,3 | 62,8 | 63,0 |
| 66 | | 54,0 | 57,7 | 58,8 | 59,8 | 60,6 | 61,3 | 61,9 | 62,9 | 63,7 | 64,4 | 65,3 | 65,8 | 66,0 |
| 80 | | 68,0 | 71,7 | 72,8 | 73,8 | 74,6 | 75,3 | 75,9 | 76,9 | 77,7 | 78,4 | 79,3 | 79,8 | 80,0 |
| 100 | | 88,0 | 91,7 | 92,8 | 93,8 | 94,6 | 95,3 | 95,9 | 96,9 | 97,7 | 98,4 | 99,3 | 99,8 | 100,0 |

| AP | – | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,95 | 0,74 | 0,61 | 0,53 | 0,47 | 0,43 | 0,38 | 0,34 | 0,31 | 0,28 | 0,25 | 0,24 |

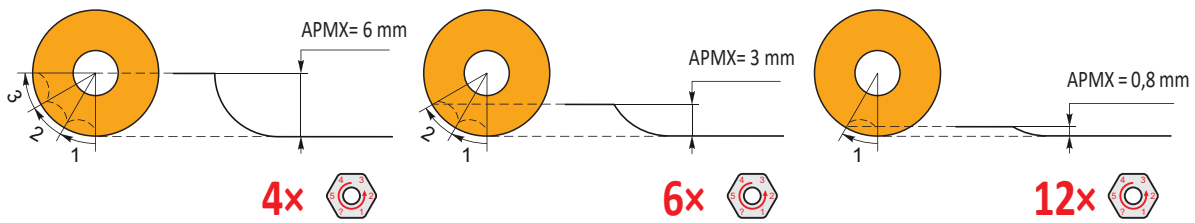
| DCX | RPMX | APMX / l |
|---|---|---|
| 40 | 9,0 | 6,0/39 |
| 50 | 7,0 | 6,0/50 |
| 52 | 6,5 | 6,0/53 |
| 63 | 5,0 | 6,0/70 |
| 66 | 4,5 | 6,0/76 |
| 80 | 3,0 | 5,1/100 |
| 100 | 2,0 | 3,3/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 40 | 56,0 | 80,0 | 6,0 | 6,0 |
| 50 | 76,0 | 100,0 | 6,0 | 6,0 |
| 52 | 80,0 | 104,0 | 6,0 | 6,0 |
| 63 | 102,0 | 126,0 | 6,0 | 6,0 |
| 66 | 108,0 | 132,0 | 6,0 | 6,0 |
| 80 | 136,0 | 160,0 | 6,0 | 6,0 |
| 100 | 176,0 | 200,0 | 6,0 | 6,0 |

| AP |
|---|
| 3,5 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | $f_e$ | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 63 | | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6,0 | $f_e$ | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |

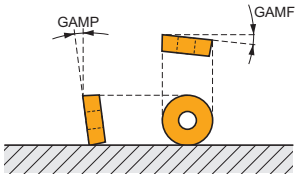


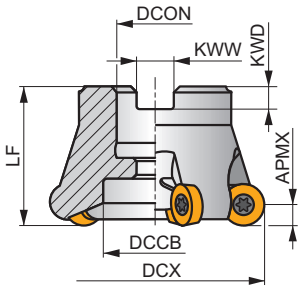
# SRC16

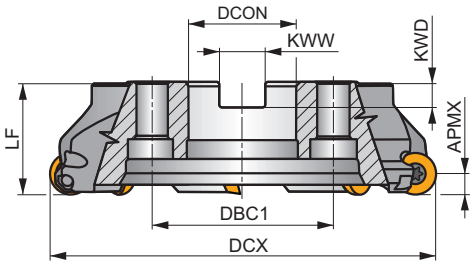
P M K N S H

S

| APMX | 8,0 mm |
|---|---|




$h_m$ 0,1 - 0,25

| | ISO | DCX [mm] | LF [mm] | DCON [mm] | DBC1 [mm] | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO 6462 DIN 8030 | **63A04R-SMORC16-C** | 63 | 50 | 22 | 18 | 10,4 | 6,3 | -2,6 | -7 | 4 | – | 9700 | ✓ | 0,61 | GI280 | CO033 | – |
| | **66A05R-SMORC16-C** | 66 | 50 | 27 | 22 | 12,4 | 7 | -2,5 | -7 | 5 | – | 9200 | ✓ | 0,60 | GI280 | CO030 | – |
| | **80A05R-SMORC16-C** | 80 | 50 | 27 | 37 | 12,4 | 7 | -1,7 | -7 | 5 | – | 8600 | ✓ | 0,88 | GI280 | CO030 | – |
| | **100A06R-SMORC16-C** | 100 | 50 | 32 | 45 | 14,4 | 8 | -1,7 | -7 | 6 | – | 7700 | ✓ | 1,33 | GI280 | CO031 | AC002 |
| | **125A07R-SMORC16-C** | 125 | 63 | 40 | 36 | 16,4 | 9 | -1,2 | -7 | 7 | – | 6500 | ✓ | 3,07 | GI280 | CO032 | – |
| | **160C08R-SMORC16-C** | 160 | 63 | 40 | 66,7 | 16,4 | 9 | -0,9 | -7 | 8 | – | 5400 | ✓ | 5,68 | GI280 | CO034 | – |

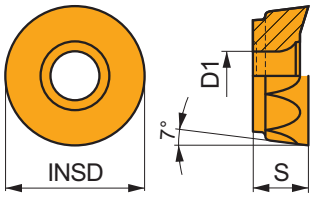
| | |
|---|---|
| GI280 | RCMT 1606MO.. |

| | | Nm | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CO030 | US 65014-T20P | 5,0 | M 5 | 14 | SDR T20P-T | HS 1230C | – | – | – |
| CO031 | US 65014-T20P | 5,0 | M 5 | 14 | SDR T20P-T | – | – | – | – |
| CO032 | US 65014-T20P | 5,0 | M 5 | 14 | SDR T20P-T | HSD 2040 | – | – | – |
| CO033 | US 65014-T20P | 5,0 | M 5 | 14 | SDR T20P-T | HS 1030C | – | – | – |
| CO034 | US 65014-T20P | 5,0 | M 5 | 14 | SDR T20P-T | HS 1240C | CAC 160C | HSD 0825C | HXK 5 |

| | | |
|---|---|---|
| AC002 | KS 1635 | K.FMH32 |

# RCMT 16

| | INSD | D1 | S |
|---|---|---|---|
| 1606 | 16,000 | 5,50 | 6,35 |

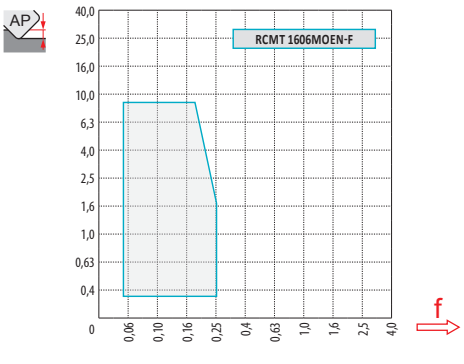


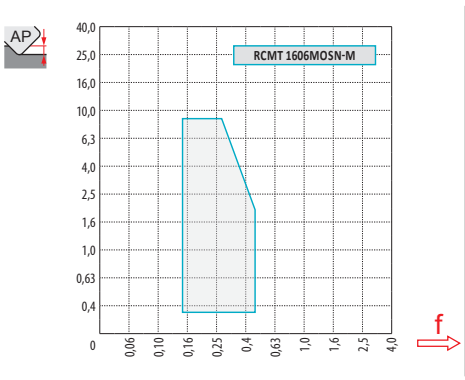

| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT 1606MOEN-F | M8310 | ■ | ◪ | | | ◪ | | ● | - | – | 0,05 | 0,25 | 0,3 | 8,0 |
| | M8330 | ■ | ◪ | | | | | ● | - | – | 0,05 | 0,25 | 0,3 | 8,0 |
| RCMT 1606MOSN-M | M9325 | ■ | ◪ | ■ | | ◪ | | ✖ | - - - | – | 0,15 | 0,38 | 0,3 | 8,0 |
| | M9340 | ◪ | ■ | | | ◪ | | ✖ | - - - | – | 0,15 | 0,38 | 0,3 | 8,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | – | 0,15 | 0,45 | 0,3 | 8,0 |
| | M8330 | ■ | ◪ | ■ | | | | ✖ | - | – | 0,15 | 0,45 | 0,3 | 8,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,15 | 0,45 | 0,3 | 8,0 |
| RCMT 1606MOSN-R | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | – | 0,20 | 0,51 | 0,3 | 8,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ■ | ✖ | - | – | 0,20 | 0,60 | 0,3 | 8,0 |
| | M8330 | ■ | ◪ | ■ | | | ◪ | ✖ | - | – | 0,20 | 0,60 | 0,3 | 8,0 |
| | M8345 | ■ | ◪ | | | ◪ | | ✖ | + / - | – | 0,20 | 0,60 | 0,3 | 8,0 |

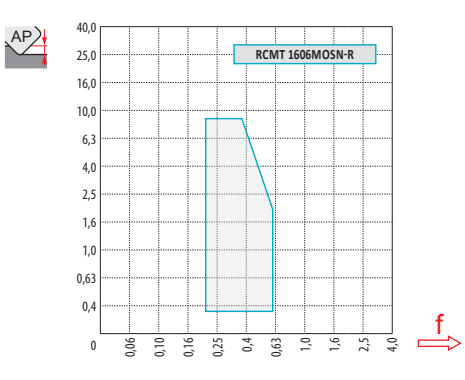
| ISO | | FN | FX | M9325 | M9340 | M6330 | M8310 | M8330 | M8345 |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,45 | 424 | 380 | 325 | 402 | 363 | 275 |
| | ● | 0,10 | 0,35 | 374 | 341 | 292 | 363 | 325 | 242 |
| | ✖ | 0,10 | 0,25 | 330 | 303 | 253 | 325 | 281 | 215 |
| M | ● | 0,10 | 0,45 | 215 | 226 | 231 | 204 | 215 | 165 |
| | ● | 0,10 | 0,35 | 193 | 204 | 204 | 182 | 193 | 143 |
| | ✖ | 0,10 | 0,25 | 165 | 182 | 176 | 165 | 171 | 127 |
| K | ● | 0,10 | 0,45 | – | – | – | 380 | 347 | – |
| | ● | 0,10 | 0,35 | – | – | – | 347 | 308 | – |
| | ✖ | 0,10 | 0,25 | – | – | – | 308 | 270 | – |
| N | ● | 0,10 | 0,45 | – | – | – | – | 913 | – |
| | ● | 0,10 | 0,35 | – | – | – | – | 814 | – |
| | ✖ | 0,10 | 0,25 | – | – | – | – | 710 | – |
| S | ● | 0,10 | 0,40 | 105 | 110 | 116 | 99 | 105 | 83 |
| | ● | 0,10 | 0,30 | 94 | 99 | 99 | 88 | 94 | 72 |
| | ✖ | 0,10 | 0,20 | 83 | 88 | 88 | 83 | 83 | 61 |
| H | ● | 0,10 | 0,30 | – | – | – | 77 | 72 | – |
| | ● | 0,10 | 0,25 | – | – | – | 72 | 61 | – |
| | ✖ | 0,10 | 0,20 | – | – | – | 61 | 55 | – |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RCMT 16-F | RCMT 16-M | RCMT 16-R |
|---|---|---|---|
| RE | 8,0 | 8,0 | 8,0 |
| BS | – | – | – |




| DCX | AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | DEF | 47,0 | 51,3 | 52,6 | 53,8 | 54,7 | 55,6 | 56,3 | 57,6 | 58,6 | 59,5 | 60,9 | 61,8 | 62,5 | 62,9 | 63,0 |
| 66 | | 50,0 | 54,3 | 55,6 | 56,8 | 57,8 | 58,6 | 59,3 | 60,6 | 61,6 | 62,5 | 63,9 | 64,8 | 65,5 | 65,9 | 66,0 |
| 80 | | 64,0 | 68,3 | 69,6 | 70,8 | 71,7 | 72,6 | 73,3 | 74,6 | 75,6 | 76,5 | 77,9 | 78,8 | 79,5 | 79,9 | 80,0 |
| 100 | | 84,0 | 88,3 | 89,6 | 90,8 | 91,7 | 92,6 | 93,3 | 94,6 | 95,6 | 96,5 | 97,9 | 98,8 | 99,5 | 99,9 | 100,0 |

| AP | – | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 1,10 | 0,85 | 0,70 | 0,61 | 0,54 | 0,50 | 0,43 | 0,39 | 0,36 | 0,31 | 0,28 | 0,26 | 0,25 | 0,24 |

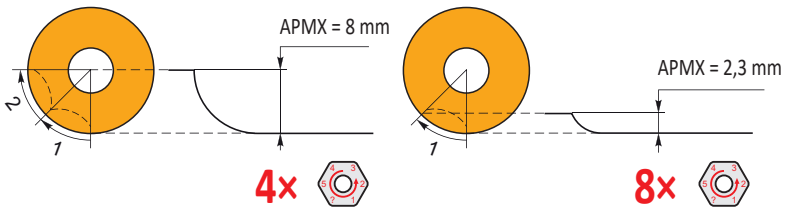
| DCX | RPMX | APMX / l |
|---|---|---|
| 63 | 7,0 | 8,0/67 |
| 66 | 6,5 | 8,0/71 |
| 80 | 5,0 | 8,0/93 |
| 100 | 4,0 | 6,8/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 63 | 94,0 | 126,0 | 8,0 | 8,0 |
| 66 | 100,0 | 132,0 | 8,0 | 8,0 |
| 80 | 128,0 | 160,0 | 8,0 | 8,0 |
| 100 | 168,0 | 200,0 | 8,0 | 8,0 |

| AP |
|---|
| 5,0 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | $f_e$ | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |
| 100 | | 1,095 | 1,414 | 2,000 | 2,449 | 2,828 | 3,464 | 4,000 | 4,472 | 4,899 | 5,657 | 6,325 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,0 | $f_e$ | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |

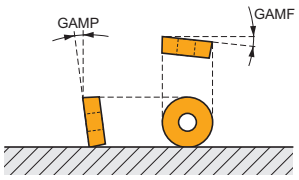


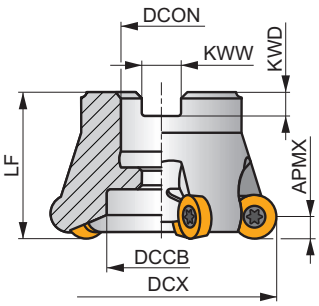
# SRC20

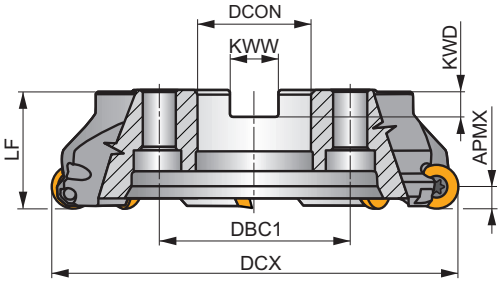
P M K N S H

S

| APMX | 10,0 mm |
|---|---|




$h_m$ 0,11 - 0,32

| | ISO | DCX [mm] | LF [mm] | DCON [mm] | DBC1 [mm] | KWW [mm] | KWD [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO 6462 DIN 8030 | **80A04R-SMORC20-C** | 80 | 50 | 27 | 28 | 12,4 | 7 | -2,7 | -7 | 4 | – | 8500 | ✓ | 0,96 | GI281 | CO040 | – |
| | **100A05R-SMORC20-C** | 100 | 50 | 32 | 45 | 14,4 | 8 | -1,7 | -7 | 5 | – | 7600 | ✓ | 1,26 | GI281 | CO041 | AC002 |
| | **125A06R-SMORC20-C** | 125 | 63 | 40 | 36 | 16,4 | 9 | -1 | -7 | 6 | – | 6500 | ✓ | 2,96 | GI281 | CO042 | – |
| | **160C07R-SMORC20-C** | 160 | 63 | 40 | 66,7 | 16,4 | 9 | -0,9 | -7 | 7 | – | 5400 | ✓ | 5,44 | GI281 | CO046 | – |

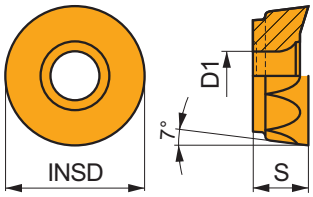
| | |
|---|---|
| GI281 | RCMT 2006MO.. |

| | | Nm | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CO040 | US 66015-T25P | 7,5 | M 6 | 15 | SDR T25P-T | HS 1230C | – | – | – |
| CO041 | US 66015-T25P | 7,5 | M 6 | 15 | SDR T25P-T | – | – | – | – |
| CO042 | US 66015-T25P | 7,5 | M 6 | 15 | SDR T25P-T | HSD 2040 | – | – | – |
| CO046 | US 66015-T25P | 7,5 | M 6 | 15 | SDR T25P-T | HS 1240C | CAC 160C | HSD 0825C | HXK 5 |

| | | |
|---|---|---|
| AC002 | KS 1635 | K.FMH32 |

# RCMT 20

| | INSD | D1 | S |
|---|---|---|---|
| 2006 | 20,000 | 6,50 | 6,35 |

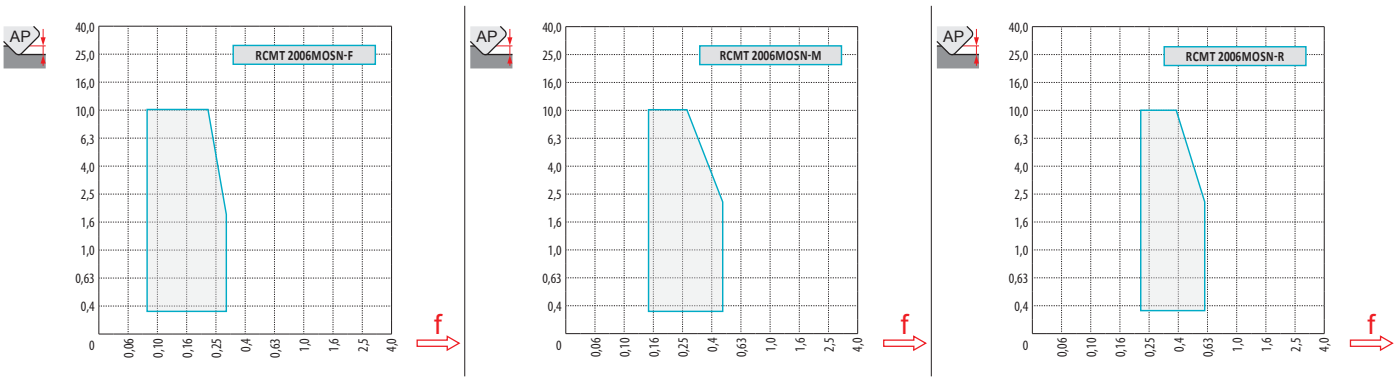



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT 2006MOSN-F | M8330 | ■ | ◪ | | | ◪ | | ✖ | - | – | 0,08 | 0,30 | 0,3 | 10,0 |
| RCMT 2006MOSN-M | M9315 | ■ | | ■ | | | ◪ | ⚙ | - - - | – | 0,15 | 0,38 | 0,3 | 10,0 |
| | M9325 | ■ | ◪ | ■ | | ◪ | | ✖ | - - - | – | 0,15 | 0,38 | 0,3 | 10,0 |
| | M9340 | ◪ | ■ | | | ◪ | | ✖ | - - - | – | 0,15 | 0,38 | 0,3 | 10,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | – | 0,15 | 0,45 | 0,3 | 10,0 |
| | M8330 | ■ | ◪ | ■ | | | | ✖ | - | – | 0,15 | 0,45 | 0,3 | 10,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,15 | 0,45 | 0,3 | 10,0 |
| RCMT 2006MOSN-R | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | – | 0,20 | 0,51 | 0,3 | 10,0 |
| | M8330 | ■ | ◪ | ■ | | | ◪ | ✖ | - | – | 0,20 | 0,60 | 0,3 | 10,0 |
| | M8345 | ■ | ◪ | | | ◪ | | ✖ | + / - | – | 0,20 | 0,60 | 0,3 | 10,0 |

| ISO | | FN | FX | M9315 | M9325 | M9340 | M8330 | M8345 |
|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,50 | 479 | 424 | 380 | 363 | 275 |
| | ⚙ | 0,10 | 0,40 | 435 | 374 | 341 | 325 | 242 |
| | ✖ | 0,10 | 0,30 | 396 | 330 | 303 | 281 | 215 |
| M | ● | 0,10 | 0,50 | – | 215 | 226 | 215 | 165 |
| | ⚙ | 0,10 | 0,40 | – | 193 | 204 | 193 | 143 |
| | ✖ | 0,10 | 0,30 | – | 165 | 182 | 171 | 127 |
| K | ● | 0,10 | 0,50 | 457 | – | – | 347 | – |
| | ⚙ | 0,10 | 0,40 | 413 | – | – | 308 | – |
| | ✖ | 0,10 | 0,30 | 374 | – | – | 270 | – |
| N | ● | 0,10 | 0,50 | – | – | – | 913 | – |
| | ⚙ | 0,10 | 0,40 | – | – | – | 814 | – |
| | ✖ | 0,10 | 0,30 | – | – | – | 710 | – |
| S | ● | 0,10 | 0,45 | – | 105 | 110 | 105 | 83 |
| | ⚙ | 0,10 | 0,40 | – | 94 | 99 | 94 | 72 |
| | ✖ | 0,10 | 0,30 | – | 83 | 88 | 83 | 61 |
| H | ● | 0,10 | 0,35 | 94 | – | – | 72 | – |
| | ⚙ | 0,10 | 0,30 | 83 | – | – | 61 | – |
| | ✖ | 0,10 | 0,25 | 77 | – | – | 55 | – |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RCMT 20-F | RCMT 20-M | RCMT 20-R |
|---|---|---|---|
| RE | 10,0 | 10,0 | 10,0 |
| BS | – | – | – |




| DCX | AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 | 9,00 | 10,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | DEF | 60,0 | 64,9 | 66,2 | 67,6 | 68,7 | 69,7 | 70,5 | 72,0 | 73,2 | 74,3 | 76,0 | 77,3 | 78,3 | 79,1 | 79,6 | 79,9 | 80,0 |
| 100 | | 80,0 | 84,9 | 86,2 | 87,6 | 88,7 | 89,7 | 90,5 | 92,0 | 93,2 | 94,3 | 96,0 | 97,3 | 98,3 | 99,1 | 99,6 | 99,9 | 100,0 |

| AP | - | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 | 9,00 | 10,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | - | 1,23 | 0,95 | 0,78 | 0,68 | 0,61 | 0,55 | 0,48 | 0,43 | 0,40 | 0,35 | 0,31 | 0,29 | 0,27 | 0,26 | 0,25 | 0,24 |

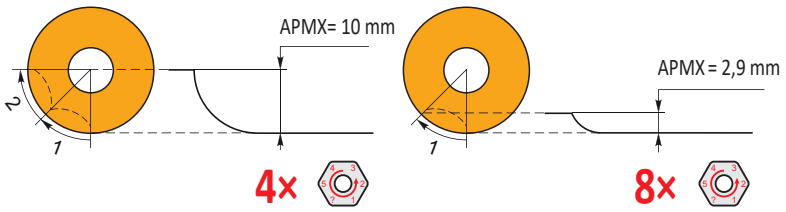
| DCX | RPMX | APMX / l |
|---|---|---|
| 80 | 7,0 | 10,0/83 |
| 100 | 5,0 | 8,6/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 80 | 120,0 | 160,0 | 10,0 | 10,0 |
| 100 | 160,0 | 200,0 | 10,0 | 10,0 |

| AP |
|---|
| 6,0 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | $f_e$ | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |
| 100 | | 1,095 | 1,414 | 2,000 | 2,449 | 2,828 | 3,464 | 4,000 | 4,472 | 4,899 | 5,657 | 6,325 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,0 | $f_e$ | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |

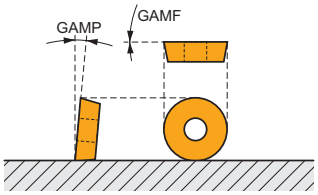


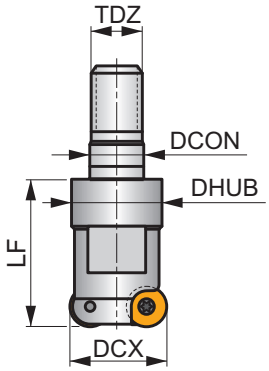
# SRD05

P M K H

S

| APMX | 1,5 mm |
|---|---|




$h_m$ 0,03 - 0,1

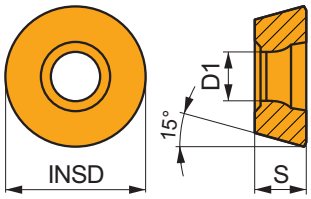
| | ISO | DCX [mm] | DHUB [mm] | DCON [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODULAR | **10E2R020M06-SRD05** | 10 | 9,8 | 6,5 | 20 | M6 | 0 | +3 | 2 | – | – | ✓ | 0,02 | GI117 | CO050 |
| | **12E3R020M06-SRD05** | 12 | 10,0 | 6,5 | 20 | M6 | 0 | +3 | 3 | – | – | ✓ | 0,02 | GI117 | CO050 |
| | **15E4R020M08-SRD05** | 15 | 13,5 | 8,5 | 20 | M8 | 0 | +3 | 4 | ✓ | – | ✓ | 0,03 | GI117 | CO050 |

| | |
|---|---|
| GI117 | RD.. 0501MO.. |

| | | Nm | | | |
|---|---|---|---|---|---|
| CO050 | US 20 | 0,9 | M 2 | 3 | Flag T06 |

# RDHX 05

| | INSD | D1 | S |
|---|---|---|---|
| 0501 | 5,000 | 2,20 | 1,51 |

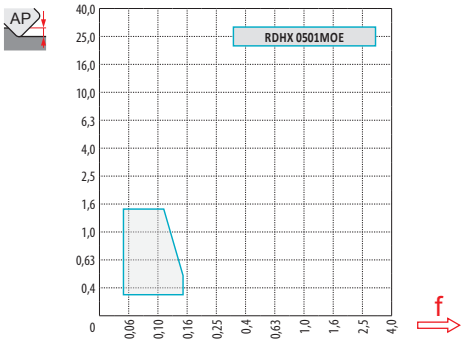



| | ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HFC, E | RDHX 0501MOE | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,05 | 0,15 | 0,3 | 1,5 |

| ISO | | FN | FX | M8310 |
|---|---|---|---|---|
| P | ● | 0,05 | 0,15 | 402 |
| | ⧗ | 0,05 | 0,12 | 363 |
| | ✖ | 0,05 | 0,10 | 325 |
| M | ● | 0,05 | 0,15 | 204 |
| | ⧗ | 0,05 | 0,12 | 182 |
| | ✖ | 0,05 | 0,10 | 165 |
| K | ● | 0,05 | 0,15 | 380 |
| | ⧗ | 0,05 | 0,12 | 347 |
| | ✖ | 0,05 | 0,10 | 308 |
| H | ● | 0,05 | 0,15 | 77 |
| | ⧗ | 0,05 | 0,12 | 72 |
| | ✖ | 0,05 | 0,10 | 61 |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RDHX 05 |
|---|---|
| RE | 2,5 |
| BS | – |




| DCX | AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | DEF | 5,0 | 7,4 | 8,0 | 8,6 | 9,0 | 9,3 | 9,6 | 9,9 | 10,0 |
| 12 | | 7,0 | 9,4 | 10,0 | 10,6 | 11,0 | 11,3 | 11,6 | 11,9 | 12,0 |
| 15 | | 10,0 | 12,4 | 13,0 | 13,6 | 14,0 | 14,3 | 14,6 | 14,9 | 15,0 |

| AP | – | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 |
|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,25 | 0,19 | 0,16 | 0,14 | 0,13 | 0,12 | 0,10 | 0,09 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 10 | 15,0 | 1,3/11 |
| 12 | 11,0 | 1,3/14 |
| 15 | 7,0 | 1,3/22 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 10 | 12,0 | 20,0 | 1,2 | 1,2 |
| 12 | 16,0 | 24,0 | 1,2 | 1,2 |
| 15 | 22,0 | 30,0 | 1,2 | 1,2 |

| AP |
|---|
| 1,0 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | $f_e$ | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| 12 | | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| 15 | | 0,424 | 0,548 | 0,775 | 0,949 | 1,095 | 1,342 | 1,549 | 1,732 | 1,897 | 2,191 | 2,449 |

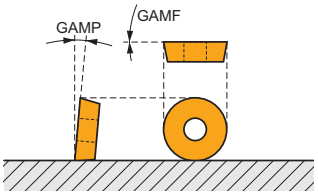
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,5 | $f_e$ | 0,245 | 0,316 | 0,447 | 0,548 | 0,632 | 0,775 | 0,894 | 1,000 | 1,095 | 1,265 | 1,414 |

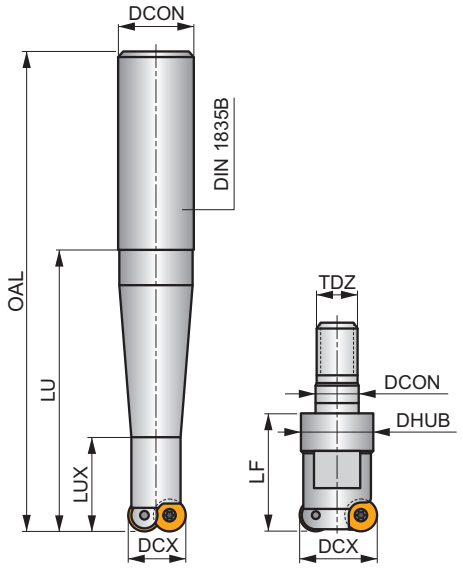
# SRD07

P M K N S H

S

| APMX | 2,0 mm |
|---|---|




$h_m$ 0,065 - 0,13

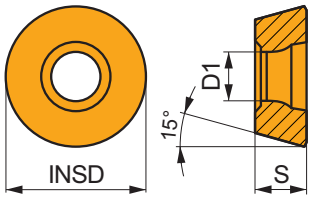
| | ISO | DCX [mm] | DHUB [mm] | OAL [mm] | DCON [mm] | LU [mm] | LUX [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835B | 15E2R040B16-SRD07 | 15 | – | 88 | 16 | 40 | 20 | – | – | 0 | +3 | 2 | – | 44200 | ✓ | 0,10 | GI118 | CO060 |
| | 15E2R060B16-SRD07 | 15 | – | 108 | 16 | 60 | 20 | – | – | 0 | +3 | 2 | – | 44200 | ✓ | 0,22 | GI118 | CO060 |
| | 15E2R080B20-SRD07 | 15 | – | 130 | 20 | 80 | 22 | – | – | 0 | +3 | 2 | – | 44200 | ✓ | 0,22 | GI118 | CO060 |
| | 15E2R100B20-SRD07 | 15 | – | 150 | 20 | 100 | 22 | – | – | 0 | +3 | 2 | – | 44200 | ✓ | 0,27 | GI118 | CO060 |
| | 15E2R120B25-SRD07 | 15 | – | 176 | 25 | 120 | 22 | – | – | 0 | +3 | 2 | – | 44200 | ✓ | 0,45 | GI118 | CO060 |
| MODULAR | 15E2R028M08-SRD07 | 15 | 13,5 | – | 8,5 | – | – | 28 | M8 | 0 | +3 | 2 | – | – | ✓ | 0,04 | GI118 | CO060 |
| | 15E3R028M08-SRD07 | 15 | 13,5 | – | 10,5 | – | – | 28 | M8 | 0 | +3 | 3 | – | – | ✓ | 0,03 | GI118 | CO060 |
| | 20E4R028M10-SRD07 | 20 | 18,0 | – | 12,5 | – | – | 28 | M10 | 0 | +3 | 4 | ✓ | – | ✓ | 0,06 | GI118 | CO060 |
| | 25E5R028M12-SRD07 | 25 | 21,0 | – | 12,5 | – | – | 28 | M12 | 0 | +3 | 5 | ✓ | – | ✓ | 0,10 | GI118 | CO060 |

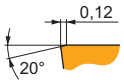
| | | |
|---|---|---|
| GI118 | RD.. 0702MO.. | RD.. 07T1MO.. |

| | | Nm | | | |
|---|---|---|---|---|---|
| CO060 | US 25 | 1,2 | M 2,5 | 5 | Flag T07 |

## RDHX 07

| | INSD | D1 | S |
|---|---|---|---|
| 0702 | 7,000 | 2,80 | 2,38 |
| 07T1 | 7,000 | 2,80 | 1,98 |

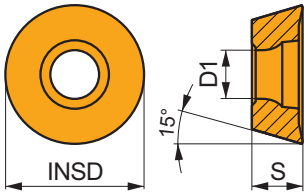


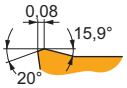




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHX 0702MOT | M4303 | ◪ | | ■ | | | ■ | ✖ | - | – | 0,10 | 0,20 | 0,5 | 2,0 |
| | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,20 | 0,5 | 2,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,20 | 0,5 | 2,0 |
| RDHX 07T1MOT | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,17 | 0,5 | 2,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,17 | 0,5 | 2,0 |

## RDGT 07

| | INSD | D1 | S |
|---|---|---|---|
| 0702 | 7,000 | 2,80 | 2,38 |

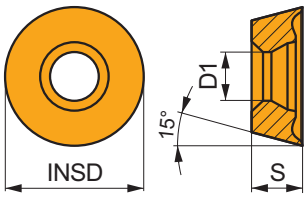


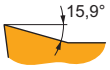

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDGT 0702MOT | M8310 | ■ | ◪ | ◪ | | ◪ | | ✖ | - | – | 0,10 | 0,20 | 0,3 | 2,0 |
| | M8325 | ■ | ◪ | | | | | ✖ | - | – | 0,10 | 0,20 | 0,3 | 2,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,10 | 0,20 | 0,3 | 2,0 |

# RDHT 07-FA

| | INSD | D1 | S |
|---|---|---|---|
| 0702 | 7,000 | 2,80 | 2,38 |
| 07T1 | 7,000 | 2,80 | 1,98 |

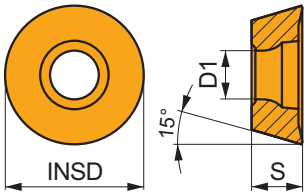



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHT 0702MO-FA | HF7 | | | | ■ | | | ● | + / - | – | 0,10 | 0,20 | 0,3 | 2,0 |
| RDHT 07T1MO-FA | HF7 | | | | ■ | | | ● | + / - | – | 0,10 | 0,20 | 0,3 | 2,0 |

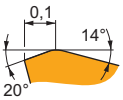



# RDMT 07

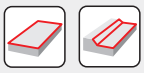
| | INSD | D1 | S |
|---|---|---|---|
| 0702 | 7,000 | 2,8 | 2,38 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMT 0702MOT | M8325 | ■ | ◪ | ◪ | | | | ⬢ | - | – | 0,10 | 0,20 | 0,3 | 2,0 |

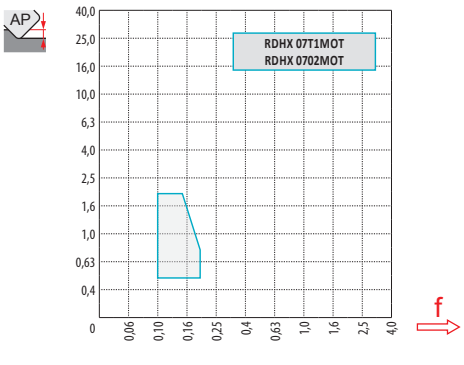


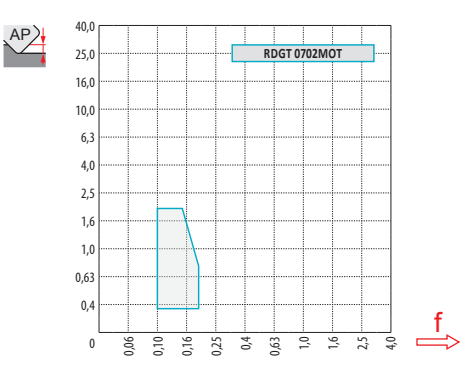
| ISO | | FN | FX | M4303 | M8310 | M8325 | M8345 | HF7 |
|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,20 | 409 | 402 | 308 | 275 | – |
| | ⧗ | 0,10 | 0,17 | 364 | 363 | 275 | 242 | – |
| | ✖ | 0,10 | 0,15 | 324 | 325 | 242 | 215 | – |
| M | ● | 0,10 | 0,20 | 245 | 204 | 149 | 165 | 88 |
| | ⧗ | 0,10 | 0,17 | 218 | 182 | 132 | 143 | 77 |
| | ✖ | 0,10 | 0,15 | 192 | 165 | 116 | 127 | 66 |
| K | ● | 0,10 | 0,20 | 390 | 380 | 292 | – | 143 |
| | ⧗ | 0,10 | 0,17 | 350 | 347 | 259 | – | 127 |
| | ✖ | 0,10 | 0,15 | 304 | 308 | 231 | – | 110 |
| N | ● | 0,10 | 0,20 | 1024 | – | – | – | 374 |
| | ⧗ | 0,10 | 0,17 | 918 | – | – | – | 336 |
| | ✖ | 0,10 | 0,15 | 812 | – | – | – | 292 |
| S | ● | 0,10 | 0,20 | - | 99 | – | 83 | 44 |
| | ⧗ | 0,10 | 0,15 | - | 88 | – | 72 | 39 |
| | ✖ | 0,10 | 0,10 | - | 83 | – | 61 | 33 |
| H | ● | 0,10 | 0,20 | 83 | 77 | – | – | 28 |
| | ⧗ | 0,10 | 0,15 | 76 | 72 | – | – | 22 |
| | ✖ | 0,10 | 0,10 | 63 | 61 | – | – | 22 |

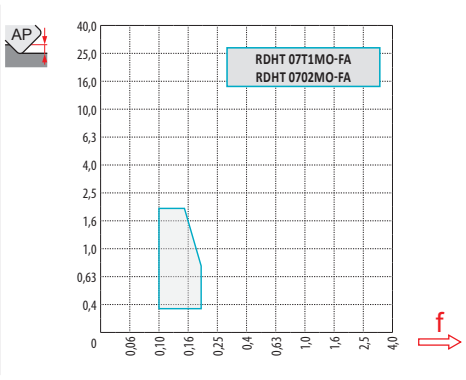


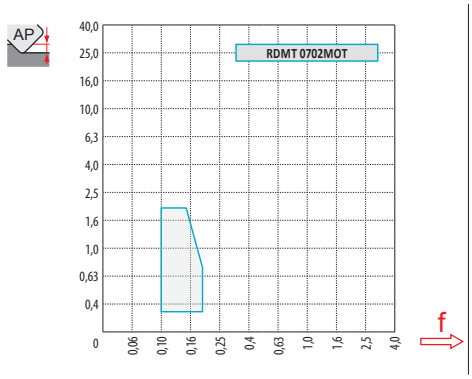
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RDHX 07 | RDGT 07 | RDHT 07-FA |
|---|---|---|---|
| RE | 3,5 | 3,5 | 3,5 |
| BS | – | – | – |






| DCX | AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | DEF | 8,0 | 10,8 | 11,6 | 12,3 | 12,9 | 13,4 | 13,7 | 14,3 | 14,7 | 14,9 | 15,0 |
| 20 | | 13,0 | 15,8 | 16,6 | 17,3 | 17,9 | 18,4 | 18,7 | 19,3 | 19,7 | 19,9 | 20,0 |
| 25 | | 18,0 | 20,8 | 21,6 | 22,3 | 22,9 | 23,4 | 23,7 | 24,3 | 24,7 | 24,9 | 25,0 |

| AP | 0,00 | 0,30 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,29 | 0,23 | 0,19 | 0,16 | 0,15 | 0,13 | 0,12 | 0,11 | 0,10 | 0,09 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 15 | 11,0 | 1,7/20 |
| 20 | 7,0 | 1,7/30 |
| 25 | 6,0 | 1,7/35 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 15 | 17,0 | 30,0 | 0,4 | 1,7 |
| 20 | 28,0 | 40,0 | 1,7 | 1,7 |
| 25 | 38,0 | 50,0 | 1,7 | 1,7 |

| AP |
|---|
| 1,2 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | $f_e$ | 0,424 | 0,548 | 0,775 | 0,949 | 1,095 | 1,342 | 1,549 | 1,732 | 1,897 | 2,191 | 2,449 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |

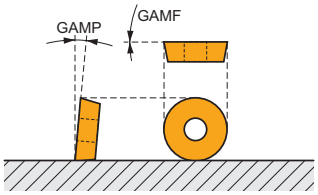
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3,5 | $f_e$ | 0,290 | 0,374 | 0,529 | 0,648 | 0,748 | 0,917 | 1,058 | 1,183 | 1,296 | 1,497 | 1,673 |

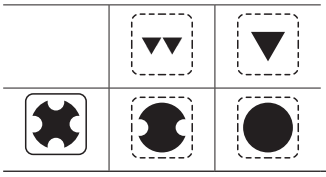
# SRD10

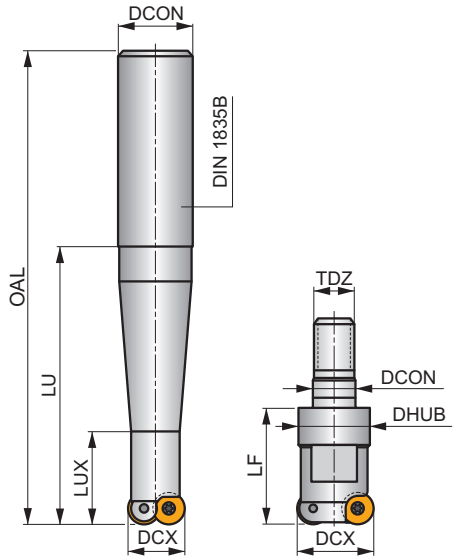
P M K N S H

S

| APMX | 2,5 mm |
|---|---|






$h_m$ 0,065 - 0,19

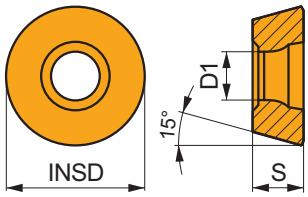
| | ISO | DCX [mm] | DHUB [mm] | OAL [mm] | DCON [mm] | LU [mm] | LUX [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835B | **20E2R040B20-SRD10** | 20 | – | 90 | 20 | 40 | 20 | – | – | 0 | +3 | 2 | – | 30800 | ✓ | 0,19 | GI119 | CO070 |
| | **20E2R060B20-SRD10** | 20 | – | 110 | 20 | 60 | 22 | – | – | 0 | +3 | 2 | – | 30800 | ✓ | 0,20 | GI119 | CO070 |
| | **20E2R080B25-SRD10** | 20 | – | 136 | 25 | 80 | 25 | – | – | 0 | +3 | 2 | – | 30800 | ✓ | 0,39 | GI119 | CO070 |
| | **20E2R100B25-SRD10** | 20 | – | 156 | 25 | 100 | 25 | – | – | 0 | +3 | 2 | – | 30800 | ✓ | 0,45 | GI119 | CO070 |
| | **20E2R120B25-SRD10** | 20 | – | 176 | 25 | 120 | 25 | – | – | 0 | +3 | 2 | – | 30800 | ✓ | 0,50 | GI119 | CO070 |
| MODULAR | **20E2R028M10-SRD10** | 20 | 18,0 | – | 10,5 | – | – | 28 | M10 | 0 | +3 | 2 | – | – | ✓ | 0,06 | GI119 | CO070 |
| | **25E2R032M12-SRD10** | 25 | 21,0 | – | 12,5 | – | – | 32 | M12 | 0 | +3 | 2 | – | – | ✓ | 0,11 | GI119 | CO070 |
| | **25E3R032M12-SRD10** | 25 | 21,0 | – | 12,5 | – | – | 32 | M12 | 0 | +3 | 3 | – | – | ✓ | 0,09 | GI119 | CO070 |
| | **30E4R042M16-SRD10** | 30 | 29,0 | – | 17,0 | – | – | 42 | M16 | 0 | +3 | 4 | ✓ | – | ✓ | 0,21 | GI119 | CO070 |
| | **35E5R042M16-SRD10** | 35 | 29,0 | – | 17,0 | – | – | 42 | M16 | 0 | +3 | 5 | ✓ | – | ✓ | 0,23 | GI119 | CO070 |

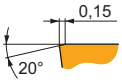
| | | |
|---|---|---|
| GI119 | RD.. 1003MOT | RDHT 1003MO-FA |

| | | | | | |
|---|---|---|---|---|---|
| CO070 | US 3507-T15 | 3,0 | M 3,5 | 7 | Flag T15 |

# RDHX 10

| | INSD | D1 | S |
|---|---|---|---|
| 1003 | 10,000 | 3,90 | 3,18 |

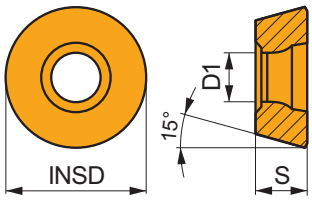


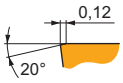




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHX 1003MOT | 5040 | ◪ | ◪ | ◪ | | | ◪ | ✖ | - - - | – | 0,10 | 0,26 | 0,5 | 2,5 |
| | M4303 | ◪ | | ■ | | | ■ | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,10 | 0,30 | 0,5 | 2,5 |

# RDMX 10

| | INSD | D1 | S |
|---|---|---|---|
| 1003 | 10,000 | 3,90 | 3,18 |

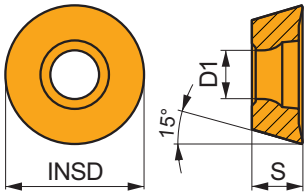


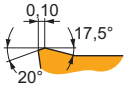




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMX 1003MOT | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,10 | 0,30 | 0,5 | 2,5 |

## RDGT 10

| | INSD | D1 | S |
|---|---|---|---|
| 1003 | 10,000 | 3,90 | 3,18 |

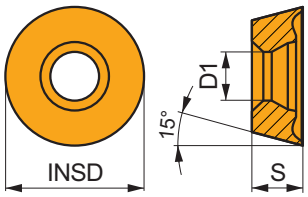


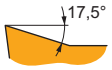




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDGT 1003MOT | M9340 | ◪ | ■ | | | ◪ | | ☻ | - - - | – | 0,10 | 0,23 | 0,5 | 2,5 |
| | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ☻ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8325 | ■ | ◪ | | | | | ☻ | - | – | 0,10 | 0,30 | 0,5 | 2,5 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,10 | 0,30 | 0,5 | 2,5 |

## RDHT 10-FA

| | INSD | D1 | S |
|---|---|---|---|
| 1003 | 10,000 | 3,90 | 3,18 |

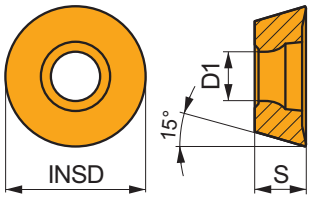



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHT 1003MO-FA | HF7 | | | | ■ | | | ● | + / - | – | 0,10 | 0,30 | 0,3 | 2,5 |

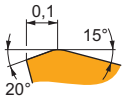
# RDMT 10

| | INSD | D1 | S |
|---|---|---|---|
| 1003 | 10,000 | 3,9 | 3,18 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMT 1003MOT | M8325 | ■ | ◪ | ◪ | | | | ⚙ | - | – | 0,12 | 0,30 | 0,5 | 2,5 |
| | M8345 | ■ | ◪ | | | | | ✖ | + / - | – | 0,12 | 0,30 | 0,5 | 2,5 |

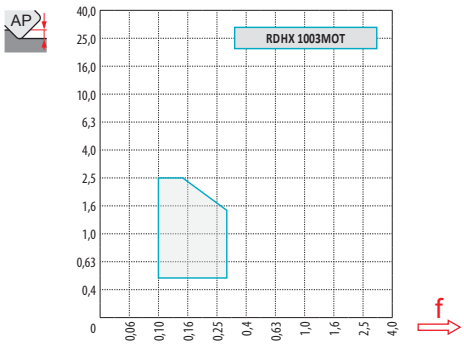
HFC

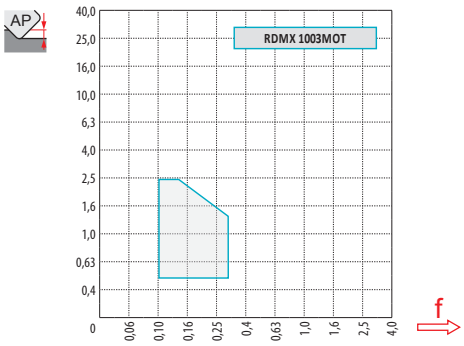


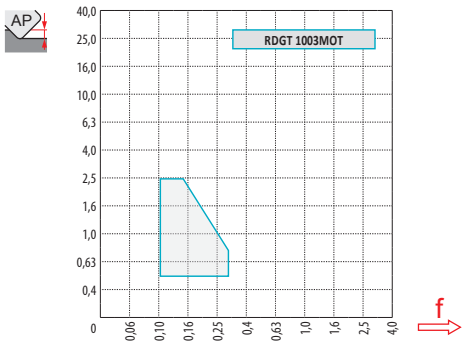

| ISO | | FN | FX | M4303 | M9340 | 5040 | M6330 | M8310 | M8325 | M8345 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,30 | 409 | 380 | 275 | 285 | 402 | 308 | 275 | – |
| | ⚙ | 0,10 | 0,25 | 364 | 341 | 248 | 255 | 363 | 275 | 242 | – |
| | ✖ | 0,10 | 0,15 | 324 | 303 | 220 | 225 | 325 | 242 | 215 | – |
| M | ● | 0,10 | 0,30 | 245 | 226 | 165 | 175 | 204 | 149 | 165 | 88 |
| | ⚙ | 0,10 | 0,25 | 218 | 204 | 149 | 160 | 182 | 132 | 143 | 77 |
| | ✖ | 0,10 | 0,15 | 192 | 182 | 132 | 145 | 165 | 116 | 127 | 66 |
| K | ● | 0,10 | 0,30 | 390 | – | 259 | – | 380 | 292 | – | 143 |
| | ⚙ | 0,10 | 0,25 | 350 | – | 237 | – | 347 | 259 | – | 127 |
| | ✖ | 0,10 | 0,15 | 304 | – | 209 | – | 308 | 231 | – | 110 |
| N | ● | 0,10 | 0,30 | 1024 | – | – | – | – | – | – | 374 |
| | ⚙ | 0,10 | 0,25 | 918 | – | – | – | – | – | – | 336 |
| | ✖ | 0,10 | 0,15 | 812 | – | – | – | – | – | – | 292 |
| S | ● | 0,10 | 0,30 | - | 110 | – | 100 | 99 | – | 83 | 44 |
| | ⚙ | 0,10 | 0,25 | - | 99 | – | 90 | 88 | – | 72 | 39 |
| | ✖ | 0,10 | 0,15 | - | 88 | – | 80 | 83 | – | 61 | 33 |
| H | ● | 0,10 | 0,30 | 83 | – | 55 | – | 77 | – | – | 28 |
| | ⚙ | 0,10 | 0,20 | 76 | – | 50 | – | 72 | – | – | 22 |
| | ✖ | 0,10 | 0,12 | 63 | – | 44 | – | 61 | – | – | 22 |

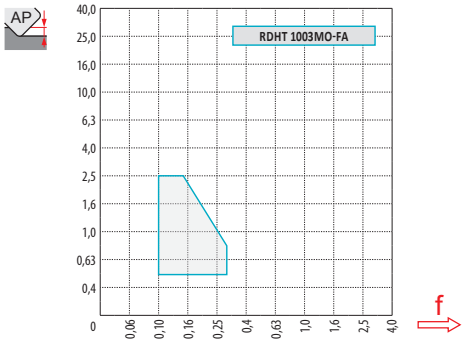
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

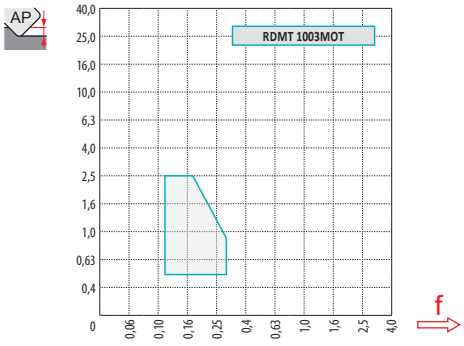
| | RDHX 10 | RDMX 10 | RDGT 10 | RDHT 10-FA |
|---|---|---|---|---|
| RE | 5,0 | 5,0 | 5,0 | 5,0 |
| BS | – | – | – | – |




| DCX | AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | DEF | 10,0 | 14,4 | 15,3 | 16,0 | 16,6 | 17,1 | 18,0 | 18,7 | 19,2 | 19,5 | 19,8 | 20,0 |
| 25 | | 15,0 | 19,4 | 20,3 | 21,0 | 21,6 | 22,1 | 23,0 | 23,7 | 24,2 | 24,5 | 24,8 | 25,0 |
| 30 | | 20,0 | 24,4 | 25,3 | 26,0 | 26,6 | 27,1 | 28,0 | 28,7 | 29,2 | 29,5 | 29,8 | 30,0 |
| 35 | | 25,0 | 29,4 | 30,3 | 31,0 | 31,6 | 32,1 | 33,0 | 33,7 | 34,2 | 34,5 | 34,8 | 35,0 |

| AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,54 | 0,44 | 0,39 | 0,35 | 0,32 | 0,28 | 0,25 | 0,23 | 0,22 | 0,21 | 0,19 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 20 | 20 | 2,5/15 |
| 25 | 12 | 2,5/25 |
| 30 | 8 | 2,5/37 |
| 35 | 7 | 2,5/42 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 20 | 22,0 | 40,0 | 2,5 | 2,5 |
| 25 | 32,0 | 50,0 | 2,5 | 2,5 |
| 30 | 42,0 | 60,0 | 2,5 | 2,5 |
| 35 | 52,0 | 70,0 | 2,5 | 2,5 |

| AP |
|---|
| 2,5 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | $f_e$ | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 30 | | 0,600 | 0,775 | 1,095 | 1,342 | 1,549 | 1,897 | 2,191 | 2,449 | 2,683 | 3,098 | 3,464 |
| 35 | | 0,648 | 0,837 | 1,183 | 1,449 | 1,673 | 2,049 | 2,366 | 2,646 | 2,898 | 3,347 | 3,742 |

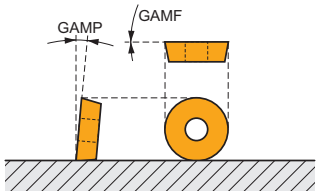
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,0 | $f_e$ | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |

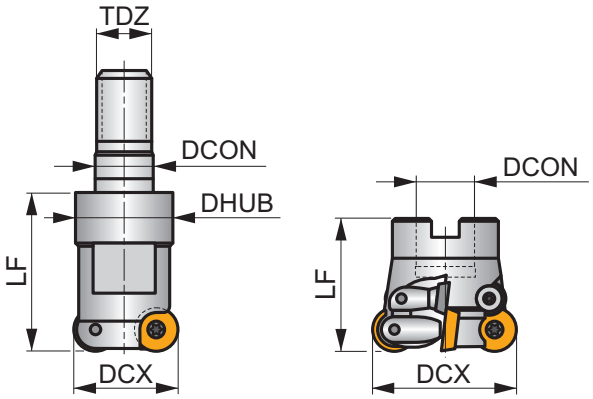
# SRD12

P M K N S H

S(C)

| APMX | 3,0 mm |
|---|---|




| | |
|---|---|
| $h_m$ | 0,065 - 0,25 |
| $h_m$ | 0,065 - 0,22 |

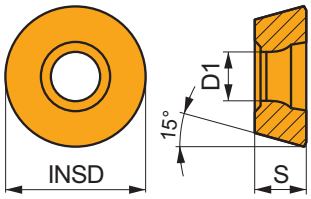
| | ISO | DCX [mm] | DHUB [mm] | DCON [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODULAR | 24E2R032M12-SCRD12 | 24 | 21,0 | 12,5 | 32 | M12 | 0 | +3 | 2 | – | – | ✓ | 0,09 | GI120 | CO081 |
| | 35E3R042M16-SCRD12 | 35 | 29,0 | 17 | 42 | M16 | 0 | +3 | 3 | – | – | ✓ | 0,22 | GI120 | CO081 |
| | 35E4R042M16-SRD12 | 35 | 29,0 | 17 | 42 | M16 | 0 | +3 | 4 | ✓ | – | ✓ | 0,20 | GI120 | CO080 |
| | 42E4R042M16-SCRD12 | 42 | 29,0 | 17 | 42 | M16 | 0 | +3 | 4 | ✓ | – | ✓ | 0,26 | GI120 | CO081 |
| | 42E5R042M16-SRD12 | 42 | 29,0 | 17 | 42 | M16 | 0 | +3 | 5 | ✓ | – | ✓ | 0,25 | GI120 | CO080 |
| ISO 6462 DIN 8030 | 50A05R-SCMORD12 | 50 | – | 22 | 50 | – | 0 | +5 | 5 | ✓ | 15200 | ✓ | 0,34 | GI120 | CO089 |
| | 52A05R-SCMORD12 | 52 | – | 22 | 50 | – | 0 | +5 | 5 | ✓ | 14900 | ✓ | 0,40 | GI120 | CO089 |
| | 66A06R-SCMORD12 | 66 | – | 27 | 50 | – | 0 | +5 | 6 | ✓ | 13200 | ✓ | 0,54 | GI120 | CO089 |
| | 80B07R-SCMORD12 | 80 | – | 27 | 52 | – | 0 | +5 | 7 | ✓ | 12000 | ✓ | 1,04 | GI120 | CO089 |

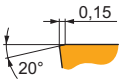
| | | |
|---|---|---|
| GI120 | RD.. 12T3MOT | RDHT 12T3MO-FA |

| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO081 | US 3507-T15 | 3,0 | M 3,5 | 7 | – | – | Flag T15 | CS12 |
| CO080 | US 3507-T15 | 3,0 | M 3,5 | 7 | – | – | Flag T15 | – |
| CO089 | US 3507-T15 | 3,0 | M 3,5 | 7 | D-T07/T15 | FG-15 | – | CS12 |

# RDHX 12

| | INSD | D1 | S |
|---|---|---|---|
| 12T3 | 12,000 | 3,90 | 3,97 |

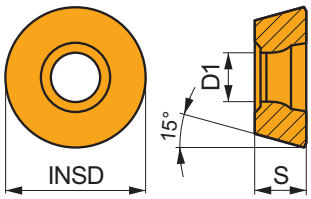


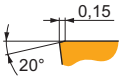




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHX 12T3MOT | M4303 | ◪ | | ■ | | | ■ | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,10 | 0,35 | 1,0 | 3,0 |

# RDMX 12

| | INSD | D1 | S |
|---|---|---|---|
| 12T3 | 12,000 | 3,90 | 3,97 |

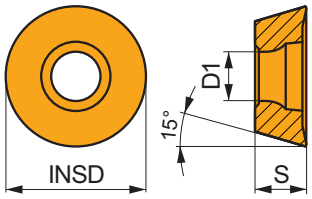


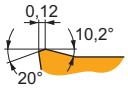




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMX 12T3MOT | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,10 | 0,35 | 1,0 | 3,0 |

## RDGT 12

| | INSD | D1 | S |
|---|---|---|---|
| 12T3 | 12,000 | 3,90 | 3,97 |

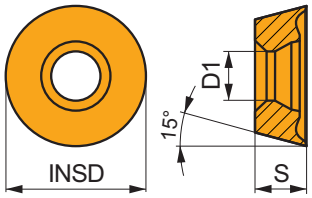


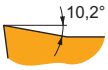




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDGT 12T3MOT | M9340 | ◪ | ■ | | | ◪ | | ☻ | - - - | – | 0,10 | 0,26 | 1,0 | 3,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ☻ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8325 | ■ | ◪ | | | | | ☻ | - | – | 0,10 | 0,35 | 1,0 | 3,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,10 | 0,35 | 1,0 | 3,0 |

## RDHT 12-FA

| | INSD | D1 | S |
|---|---|---|---|
| 12T3 | 12,000 | 3,90 | 3,97 |

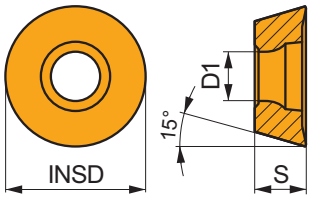



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHT 12T3MO-FA | HF7 | | | | ■ | | | ● | + / - | – | 0,10 | 0,30 | 0,3 | 3,0 |

# RDMT 12

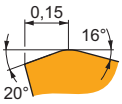
| | INSD | D1 | S |
|---|---|---|---|
| 12T3 | 12,000 | 3,9 | 3,97 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMT 12T3MOT | M8325 | ■ | ◪ | ◪ | | | | ⚙ | - | – | 0,15 | 0,35 | 1,0 | 3,0 |
| | M8345 | ■ | ◪ | | | | | ✖ | + / - | – | 0,15 | 0,35 | 1,0 | 3,0 |

HFC

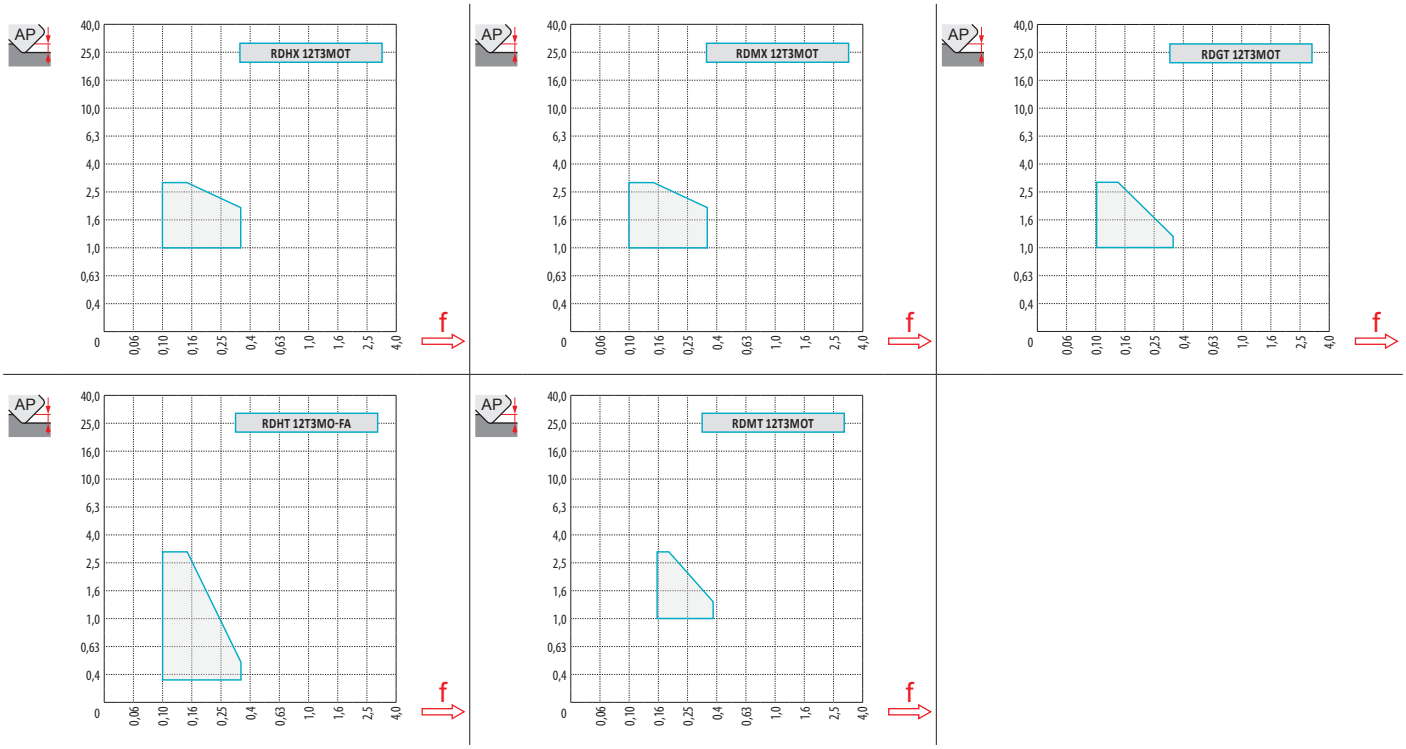
S




| ISO | | FN | FX | M4303 | M9340 | M6330 | M8310 | M8325 | M8345 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,35 | 409 | 380 | 285 | 402 | 308 | 275 | – |
| | ⚙ | 0,10 | 0,30 | 364 | 341 | 255 | 363 | 275 | 242 | – |
| | ✖ | 0,10 | 0,20 | 324 | 303 | 225 | 325 | 242 | 215 | – |
| M | ● | 0,10 | 0,35 | 245 | 226 | 175 | 204 | 149 | 165 | 88 |
| | ⚙ | 0,10 | 0,30 | 218 | 204 | 160 | 182 | 132 | 143 | 77 |
| | ✖ | 0,10 | 0,20 | 192 | 182 | 145 | 165 | 116 | 127 | 66 |
| K | ● | 0,10 | 0,35 | 390 | – | – | 380 | 292 | – | 143 |
| | ⚙ | 0,10 | 0,30 | 350 | – | – | 347 | 259 | – | 127 |
| | ✖ | 0,10 | 0,20 | 304 | – | – | 308 | 231 | – | 110 |
| N | ● | 0,10 | 0,35 | 1024 | – | – | – | – | – | 374 |
| | ⚙ | 0,10 | 0,30 | 918 | – | – | – | – | – | 336 |
| | ✖ | 0,10 | 0,20 | 812 | – | – | – | – | – | 292 |
| S | ● | 0,10 | 0,30 | - | 110 | 100 | 99 | – | 83 | 44 |
| | ⚙ | 0,10 | 0,25 | - | 99 | 90 | 88 | – | 72 | 39 |
| | ✖ | 0,10 | 0,15 | - | 88 | 80 | 83 | – | 61 | 33 |
| H | ● | 0,10 | 0,30 | 83 | – | – | 77 | – | – | 28 |
| | ⚙ | 0,10 | 0,20 | 76 | – | – | 72 | – | – | 22 |
| | ✖ | 0,10 | 0,15 | 63 | – | – | 61 | – | – | 22 |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | RDHX 12 | RDMX 12 | RDGT 12 | RDHT 12-FA |
|---|---|---|---|---|
| RE | 6,0 | 6,0 | 6,0 | 6,0 |
| BS | – | – | – | – |




| DCX | AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 | 6,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | | 12,0 | 16,8 | 17,8 | 18,6 | 19,3 | 19,9 | 20,9 | 21,7 | 22,4 | 22,9 | 23,3 | 23,8 | 24,0 |
| 35 | | 23,0 | 27,8 | 28,8 | 29,6 | 30,3 | 30,9 | 31,9 | 32,7 | 33,4 | 33,9 | 34,3 | 34,8 | 35,0 |
| 42 | | 30,0 | 34,8 | 35,8 | 36,6 | 37,3 | 37,9 | 38,9 | 39,7 | 40,4 | 40,9 | 41,3 | 41,8 | 42,0 |
| 50 | DEF | 38,0 | 42,8 | 43,8 | 44,6 | 45,3 | 45,9 | 46,9 | 47,7 | 48,4 | 48,9 | 49,3 | 49,8 | 50,0 |
| 52 | | 40,0 | 44,8 | 45,8 | 46,6 | 47,3 | 47,9 | 48,9 | 49,7 | 50,4 | 50,9 | 51,3 | 51,8 | 52,0 |
| 66 | | 54,0 | 58,8 | 59,8 | 60,6 | 61,3 | 61,9 | 62,9 | 63,7 | 64,4 | 64,9 | 65,3 | 65,8 | 66,0 |
| 80 | | 68,0 | 72,8 | 73,8 | 74,6 | 75,3 | 75,9 | 76,9 | 77,7 | 78,4 | 78,9 | 79,3 | 79,8 | 80,0 |

| AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 | 6,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,49 | 0,40 | 0,35 | 0,32 | 0,29 | 0,25 | 0,23 | 0,21 | 0,20 | 0,18 | 0,17 | 0,16 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 24 | 25,0 | 3,0/14 |
| 35 | 9,0 | 3,0/39 |
| 42 | 8,0 | 3,0/44 |
| 50 | 4,0 | 3,0/87 |
| 52 | 4,0 | 3,0/87 |
| 66 | 3,0 | 3,0/100 |
| 80 | 2,2 | 3,0/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 24 | 26,0 | 48,0 | 3,0 | 3,0 |
| 35 | 46,0 | 70,0 | 3,0 | 3,0 |
| 42 | 62,0 | 84,0 | 3,0 | 3,0 |
| 50 | 78,0 | 100,0 | 2,8 | 2,8 |
| 52 | 82,0 | 104,0 | 2,8 | 2,8 |
| 66 | 110,0 | 132,0 | 2,8 | 2,8 |
| 80 | 136,0 | 160,0 | 2,8 | 2,8 |

| AP |
|---|
| 2,8 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | $f_e$ | 0,537 | 0,693 | 0,980 | 1,200 | 1,386 | 1,697 | 1,960 | 2,191 | 2,400 | 2,771 | 3,098 |
| 35 | | 0,648 | 0,837 | 1,183 | 1,449 | 1,673 | 2,049 | 2,366 | 2,646 | 2,898 | 3,347 | 3,742 |
| 42 | | 0,710 | 0,917 | 1,296 | 1,587 | 1,833 | 2,245 | 2,592 | 2,898 | 3,175 | 3,666 | 4,099 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |

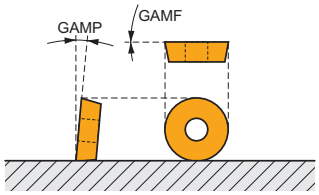
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6,0 | $f_e$ | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |

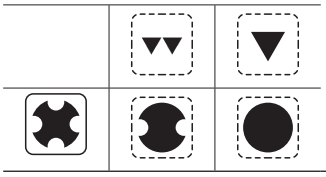
# SRD16

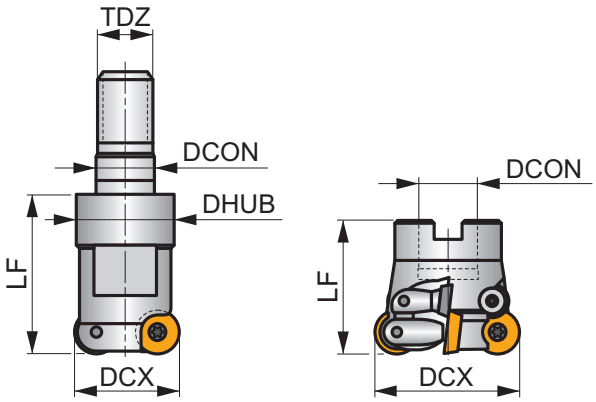
P M K N S H

S(C)

| APKX | 4,0 mm |
|---|---|






$h_m$ 0,11 - 0,25

$h_m$ 0,1 - 0,2

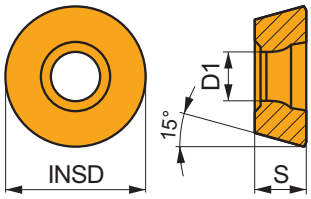
| | ISO | DCX [mm] | DHUB [mm] | LF [mm] | DCON [mm] | TDZ | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODULAR | **32E2R042M16-SCRD16** | 32 | 29,0 | 42 | 17 | M16 | 0 | +3 | 2 | – | – | ✓ | 0,20 | GI121 | CO090 |
| ISO 6462 DIN 8030 | **52A04R-SCMORD16** | 52 | – | 50 | 22 | – | 0 | +5 | 4 | ✓ | 9900 | ✓ | 0,30 | GI121 | CO099 |
| | **66A05R-SCMORD16** | 66 | – | 50 | 27 | – | 0 | +5 | 5 | ✓ | 8800 | ✓ | 0,55 | GI121 | CO099 |
| | **80A06R-SCMORD16** | 80 | – | 52 | 27 | – | 0 | +5 | 6 | ✓ | 8000 | ✓ | 1,05 | GI121 | CO099 |
| | **100A07R-SCMORD16** | 100 | – | 52 | 32 | – | 0 | +5 | 7 | ✓ | 7200 | – | 1,50 | GI121 | CO099 |

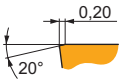
| | | |
|---|---|---|
| GI121 | RD.. 1604MOT | RDHT 1604MO-FA |

| | | Nm | | | | | |
|---|---|---|---|---|---|---|---|
| CO090 | US 4511-T20 | 5,0 | M 4,5 | 11 | Flag T20 | LA 12T3 | – |
| CO099 | US 4511-T20 | 5,0 | M 4,5 | 11 | – | – | SDR T20-T |

# RDHX 16

| | INSD | D1 | S |
|---|---|---|---|
| 1604 | 16,000 | 5,20 | 4,76 |

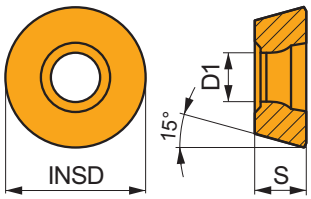


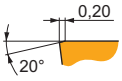




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHX 1604MOT | M9325 | ◪ | ◪ | | | | | ✖ | - - - | – | 0,20 | 0,40 | 1,0 | 4,0 |
| | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,20 | 0,40 | 1,0 | 4,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,20 | 0,40 | 1,0 | 4,0 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,20 | 0,40 | 1,0 | 4,0 |

# RDMX 16

| | INSD | D1 | S |
|---|---|---|---|
| 1604 | 16,000 | 5,20 | 4,76 |

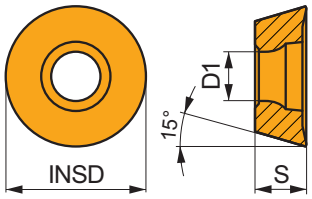


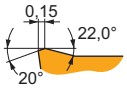




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMX 1604MOT | M8310 | ◪ | ◪ | ■ | | | ■ | ✖ | - | – | 0,20 | 0,40 | 1,0 | 4,0 |
| | M8325 | ◪ | ◪ | ◪ | | | | ✖ | - | – | 0,20 | 0,40 | 1,0 | 4,0 |
| | M8345 | ◪ | ◪ | | | | | ✖ | + / - | – | 0,20 | 0,40 | 1,0 | 4,0 |

## RDGT 16

| | INSD | D1 | S |
|---|---|---|---|
| 1604 | 16,000 | 5,20 | 4,76 |

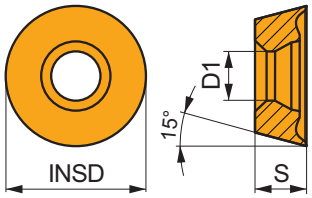


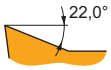




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDGT 1604MOT | M9340 | ◪ | ■ | | | ◪ | | ☻ | - - - | – | 0,10 | 0,30 | 1,0 | 4,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | – | 0,10 | 0,40 | 1,0 | 4,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ☻ | - | – | 0,10 | 0,40 | 1,0 | 4,0 |
| | M8325 | ■ | ◪ | | | | | ☻ | - | – | 0,10 | 0,40 | 1,0 | 4,0 |
| | M8345 | ■ | ■ | | | ◪ | | ✖ | + / - | – | 0,10 | 0,40 | 1,0 | 4,0 |

## RDHT 16-FA

| | INSD | D1 | S |
|---|---|---|---|
| 1604 | 16,000 | 5,20 | 4,76 |

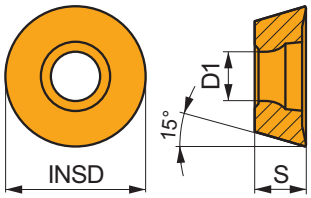



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDHT 1604MO-FA | HF7 | | | | ■ | | | ● | + / - | – | 0,10 | 0,40 | 0,3 | 4,0 |

# RDMT 16

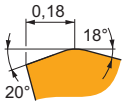
| | INSD | D1 | S |
|---|---|---|---|
| 1604 | 16,000 | 5,2 | 4,76 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RDMT 1604MOT | M8325 | ■ | ◪ | ◪ | | | | ● | - | – | 0,18 | 0,40 | 1,0 | 4,0 |
| | M8345 | ■ | ◪ | | | | | ✖ | + / - | – | 0,18 | 0,40 | 1,0 | 4,0 |

HFC

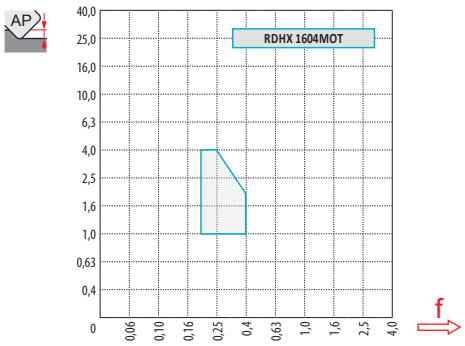
S

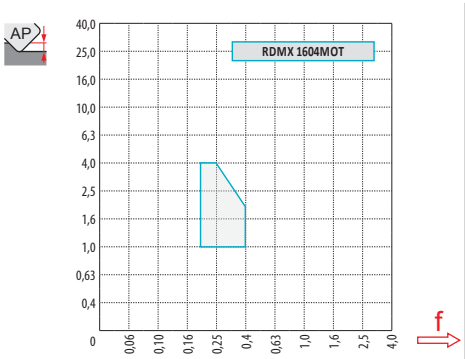


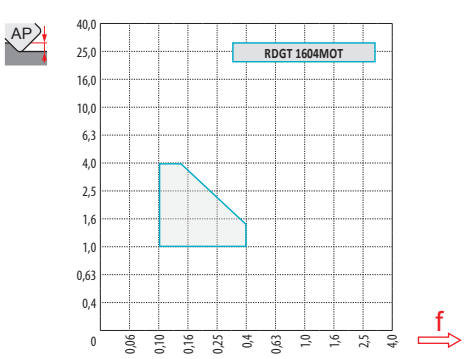

| ISO | | FN | FX | M9340 | M6330 | M8310 | M8325 | M8345 | HF7 |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,40 | 380 | 285 | 402 | 308 | 275 | – |
| | ● | 0,10 | 0,30 | 341 | 255 | 363 | 275 | 242 | – |
| | ✖ | 0,10 | 0,18 | 303 | 225 | 325 | 242 | 215 | – |
| M | ● | 0,10 | 0,30 | 226 | 175 | 204 | 149 | 165 | 88 |
| | ● | 0,10 | 0,25 | 204 | 160 | 182 | 132 | 143 | 77 |
| | ✖ | 0,10 | 0,17 | 182 | 145 | 165 | 116 | 127 | 66 |
| K | ● | 0,10 | 0,40 | – | – | 380 | 292 | – | 143 |
| | ● | 0,10 | 0,30 | – | – | 347 | 259 | – | 127 |
| | ✖ | 0,10 | 0,18 | – | – | 308 | 231 | – | 110 |
| N | ● | 0,10 | 0,40 | – | – | – | – | – | 374 |
| | ● | 0,10 | 0,30 | – | – | – | – | – | 336 |
| | ✖ | 0,10 | 0,18 | – | – | – | – | – | 292 |
| S | ● | 0,10 | 0,30 | 110 | 100 | 99 | – | 83 | 44 |
| | ● | 0,10 | 0,25 | 99 | 90 | 88 | – | 72 | 39 |
| | ✖ | 0,10 | 0,17 | 88 | 80 | 83 | – | 61 | 33 |
| H | ● | 0,10 | 0,25 | – | – | 77 | – | – | 28 |
| | ● | 0,10 | 0,20 | – | – | 72 | – | – | 22 |
| | ✖ | 0,10 | 0,15 | – | – | 61 | – | – | 22 |

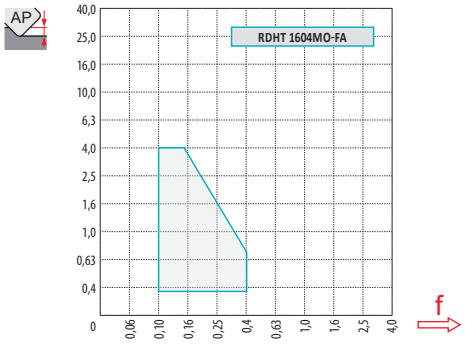
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

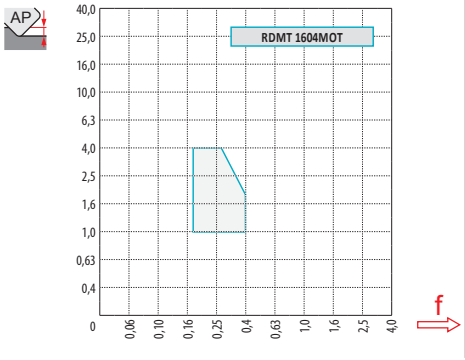
| | RDHX 16 | RDMX 16 | RDGT 16 | RDHT 16-FA |
|---|---|---|---|---|
| RE | 8,0 | 8,0 | 8,0 | 8,0 |
| BS | – | – | – | – |




| DCX | AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | DEF | 16,0 | 21,6 | 22,8 | 23,7 | 24,6 | 25,3 | 26,6 | 27,6 | 28,5 | 29,2 | 29,9 | 30,8 | 31,5 | 31,9 | 32,0 |
| 52 | | 36,0 | 41,6 | 42,8 | 43,7 | 44,6 | 45,3 | 46,6 | 47,6 | 48,5 | 49,2 | 49,9 | 50,8 | 51,5 | 51,9 | 52,0 |
| 66 | | 50,0 | 55,6 | 56,8 | 57,7 | 58,6 | 59,3 | 60,6 | 61,6 | 62,5 | 63,2 | 63,9 | 64,8 | 65,5 | 65,9 | 66,0 |
| 80 | | 64,0 | 69,6 | 70,8 | 71,7 | 72,6 | 73,3 | 74,6 | 75,6 | 76,5 | 77,2 | 77,9 | 78,8 | 79,5 | 79,9 | 80,0 |
| 100 | | 84,0 | 89,6 | 90,8 | 91,7 | 92,6 | 93,3 | 94,6 | 95,6 | 96,5 | 97,2 | 97,9 | 98,8 | 99,5 | 99,9 | 100,0 |

| AP | 0,00 | 0,50 | 0,75 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 3,50 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 f | – | 0,91 | 0,74 | 0,65 | 0,58 | 0,53 | 0,46 | 0,42 | 0,38 | 0,36 | 0,34 | 0,30 | 0,28 | 0,26 | 0,25 |

| DCX | RPMX | APMX / l |
|---|---|---|
| 32 | 25,0 | 4,0/19 |
| 52 | 8,0 | 4,0/58 |
| 66 | 6,0 | 4,0/78 |
| 80 | 4,0 | 4,0/100 |
| 100 | 3,0 | 4,0/100 |

| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 32 | 34,0 | 64,0 | 4,0 | 4,0 |
| 52 | 74,0 | 104,0 | 4,0 | 4,0 |
| 66 | 102,0 | 132,0 | 4,0 | 4,0 |
| 80 | 130,0 | 160,0 | 4,0 | 4,0 |
| 100 | 170,0 | 200,0 | 4,0 | 4,0 |

| AP |
|---|
| 4,0 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | $f_e$ | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 52 | | 0,790 | 1,020 | 1,442 | 1,766 | 2,040 | 2,498 | 2,884 | 3,225 | 3,533 | 4,079 | 4,561 |
| 66 | | 0,890 | 1,149 | 1,625 | 1,990 | 2,298 | 2,814 | 3,250 | 3,633 | 3,980 | 4,596 | 5,138 |
| 80 | | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |
| 100 | | 1,095 | 1,414 | 2,000 | 2,449 | 2,828 | 3,464 | 4,000 | 4,472 | 4,899 | 5,657 | 6,325 |

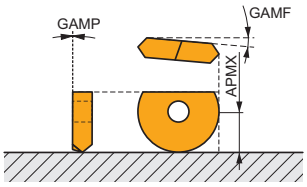
| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,0 | $f_e$ | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |

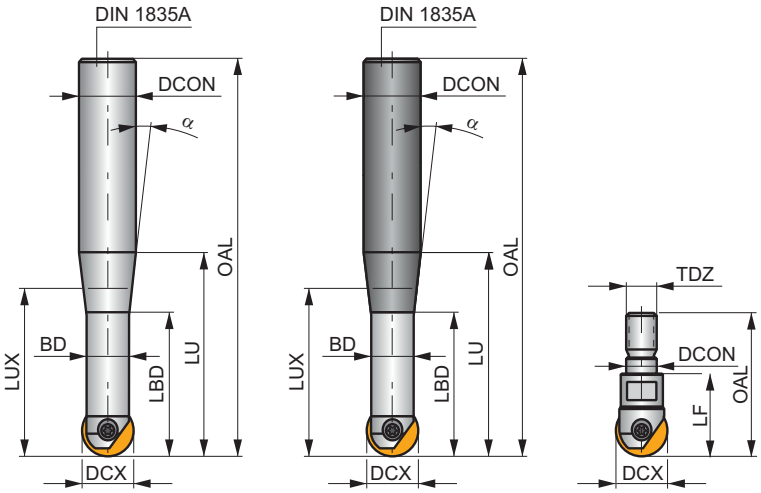
# K2-PPH

P M K N S H

S

| APMX | 0,3 - 4,0 mm |
|---|---|




$h_m$ 0,07 - 0,14

| ISO | DCX [mm] | OAL [mm] | DCON [mm] | BD [mm] | LBD [mm] | LU [mm] | LUX [mm] | LF [mm] | TDZ | α [°] | Carbide | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPH-08/02-QC12-092 | 8 | 92 | 12 | 6,5 | 19 | 35 | 23,1 | – | – | 9°30´ | – | – | – | 40000 | – | 0,14 | GI284 | CO540 |
| PPH-08/02-QC12-110 | 8 | 110 | 12 | 6,5 | 33,5 | 53 | 41,5 | – | – | 5°00´ | – | – | – | 33600 | – | 0,15 | GI284 | CO540 |
| PPH-08/02-QC12-132 | 8 | 132 | 12 | 6,5 | 19 | 75 | 41,8 | – | – | 1°45´ | – | – | – | 16800 | – | 0,16 | GI284 | CO540 |
| PPH-10/02-QC12-092 | 10 | 92 | 12 | 8 | 22,4 | 38 | 30 | – | – | 7°00´ | – | – | – | 40000 | – | 0,12 | GI285 | CO541 |
| PPH-10/02-QC12-110 | 10 | 110 | 12 | 8 | 38,7 | 53 | 51,9 | – | – | 3°45´ | – | – | – | 40000 | – | 0,15 | GI285 | CO541 |
| PPH-10/02-QC12-132 | 10 | 132 | 12 | 8 | 21,8 | 75 | 73,6 | – | – | 1°00´ | – | – | – | 20300 | – | 0,17 | GI285 | CO541 |
| PPH-12/02-QC16-145 | 12 | 145 | 16 | 10 | 22,5 | 85 | 63,3 | – | – | 1°20´ | – | – | – | 19800 | – | 0,25 | GI286 | CO542 |
| PPH-16/02-QC20-166 | 16 | 166 | 20 | 14 | 29,5 | 100 | 75,5 | – | – | 1°10´ | – | – | – | 20000 | – | 0,38 | GI287 | CO543 |
| PPH-20/02-QC25-191 | 20 | 191 | 25 | 17 | 35 | 115 | 82,2 | – | – | 1°45´ | – | – | – | 18400 | – | 0,64 | GI288 | CO544 |
| PPH-25/02-QC32-215 | 25 | 215 | 32 | 21 | 42,5 | 135 | 97 | – | – | 2°00´ | – | – | – | 16500 | – | 1,07 | GI289 | CO545 |
| PPH-12/02-QC12-083 | 12 | 83 | 12 | 10 | – | 26 | – | – | – | – | – | – | – | 40000 | – | 0,15 | GI286 | CO542 |
| PPH-12/02-QC12-110 | 12 | 110 | 12 | 10 | – | 53 | – | – | – | – | – | – | – | 40000 | – | 0,17 | GI286 | CO542 |
| PPH-12/02-QC12-145 | 12 | 145 | 12 | 10 | – | 45 | – | – | – | – | – | – | – | 40000 | – | 0,20 | GI286 | CO542 |
| PPH-16/02-QC16-092 | 16 | 92 | 16 | 14 | – | 92 | – | – | – | – | – | – | – | 36000 | – | 0,21 | GI287 | CO543 |
| PPH-16/02-QC16-123 | 16 | 123 | 16 | 14 | – | 63 | – | – | – | – | – | – | – | 36000 | – | 0,24 | GI287 | CO543 |
| PPH-16/02-QC16-166 | 16 | 166 | 16 | 14 | – | 55 | – | – | – | – | – | – | – | 36000 | – | 0,31 | GI287 | CO543 |
| DIN 1835A PPH-20/02-QC20-104 | 20 | 104 | 20 | 17 | – | 38 | – | – | – | – | – | – | – | 40000 | – | 0,35 | GI288 | CO544 |
| PPH-20/02-QC20-141 | 20 | 141 | 20 | 17 | – | 75 | – | – | – | – | – | – | – | 40000 | – | 0,41 | GI288 | CO544 |
| PPH-20/02-QC20-191 | 20 | 191 | 20 | 17 | – | 65 | – | – | – | – | – | – | – | 40000 | – | 0,54 | GI288 | CO544 |
| PPH-25/02-QC25-121 | 25 | 121 | 25 | 21 | – | 45 | – | – | – | – | – | – | – | 40000 | – | 0,53 | GI289 | CO545 |
| PPH-25/02-QC25-166 | 25 | 166 | 25 | 21 | – | 90 | – | – | – | – | – | – | – | 37100 | – | 0,57 | GI289 | CO545 |
| PPH-32/02-QC32-186 | 32 | 186 | 32 | 26 | – | 107 | – | – | – | – | – | – | – | 32500 | – | 1,09 | GI290 | CO546 |
| PPH-32/02-QC32-240 | 32 | 240 | 32 | 26 | – | 160 | – | – | – | – | – | – | – | 14500 | – | 1,37 | GI290 | CO546 |
| PPH-08/02-QC12-110HSCW | 8 | 110 | 12 | 6,5 | 19 | 53 | 30,1 | – | – | 4°00´ | ✓ | – | – | 40000 | – | 0,21 | GI284 | CO540 |
| PPH-08/02-QC12-132HSCW | 8 | 132 | 12 | 6,5 | 19 | 75 | 37,1 | – | – | 2°30´ | ✓ | – | – | 23400 | – | 0,24 | GI284 | CO540 |
| PPH-10/02-QC12-092HSCW | 10 | 92 | 12 | 8 | 21,9 | 38,1 | 90,9 | – | – | 6°30´ | ✓ | – | – | 40000 | – | 0,20 | GI285 | CO541 |
| PPH-10/02-QC12-110HSCW | 10 | 110 | 12 | 8 | 21,8 | 53,1 | 41,4 | – | – | 3°00´ | ✓ | – | – | 40000 | – | 0,22 | GI285 | CO541 |
| PPH-10/02-QC12-132HSCW | 10 | 132 | 12 | 8 | 21,8 | 75,1 | 51,1 | – | – | 2°00´ | ✓ | – | – | 23400 | – | 0,27 | GI285 | CO541 |
| PPH-12/02-QC16-145HSCW | 12 | 145 | 16 | 10 | 21,5 | 85 | 65,6 | – | – | 1°20´ | ✓ | – | – | 21000 | – | 0,28 | GI286 | CO542 |
| PPH-16/02-QC20-166HSCW | 16 | 166 | 20 | 14 | 28,5 | 100 | 87,2 | – | – | 1°00´ | ✓ | – | – | 25500 | – | 0,66 | GI287 | CO543 |
| PPH-20/02-QC25-191HSCW | 20 | 191 | 25 | 17 | 35 | 115 | 75,6 | – | – | 2°00´ | ✓ | – | – | 18500 | – | 1,09 | GI288 | CO544 |
| PPH-08/02-QC08-130HSCW | 8 | 130 | 8 | 6,5 | – | 20 | – | – | – | – | ✓ | – | – | 40000 | – | 0,17 | GI284 | CO540 |
| PPH-10/02-QC10-140HSCW | 10 | 140 | 10 | 8 | – | 25 | – | – | – | – | ✓ | – | – | 40000 | – | 0,25 | GI285 | CO541 |
| PPH-12/02-QC12-083HSCW | 12 | 83 | 12 | 10 | – | 26 | – | – | – | – | ✓ | – | – | 40000 | – | 0,23 | GI286 | CO542 |

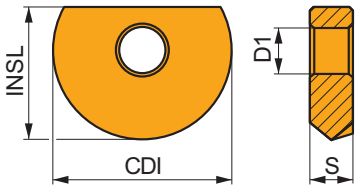
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | BD [mm] | LBD [mm] | LU [mm] | LUX [mm] | LF [mm] | TDZ | a [°] | Carbide | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | **PPH-12/02-QC12-110HSCW** | 12 | 110 | 12 | 10 | – | 53 | – | – | – | – | ✓ | – | – | 40000 | – | 0,26 | GI286 | CO542 |
| | **PPH-16/02-QC16-092HSCW** | 16 | 92 | 16 | 14 | – | 32 | – | – | – | – | ✓ | – | – | 43000 | – | 0,32 | GI287 | CO543 |
| | **PPH-16/02-QC16-123HSCW** | 16 | 123 | 16 | 14 | – | 63 | – | – | – | – | ✓ | – | – | 43000 | – | 0,36 | GI287 | CO543 |
| | **PPH-20/02-QC20-104HSCW** | 20 | 104 | 20 | 17 | – | 38 | – | – | – | – | ✓ | – | – | 40000 | – | 0,50 | GI288 | CO544 |
| | **PPH-20/02-QC20-141HSCW** | 20 | 141 | 20 | 17 | – | 75 | – | – | – | – | ✓ | – | – | 40000 | – | 0,62 | GI288 | CO544 |
| MODULAR | **PPH-16/02-025-P08** | 16 | 42,5 | 8,5 | – | – | – | – | 25 | M8 | – | – | – | – | – | – | 0,14 | GI287 | CO543 |
| | **PPH-20/02-030-P10** | 20 | 49,5 | 10,5 | – | – | – | – | 30 | M10 | – | – | – | – | – | – | 0,18 | GI288 | CO544 |

| | | | | |
|---|---|---|---|---|
| GI284 | PPH 08.. | – | PPHT 08.. | PPHF 08.. |
| GI285 | PPH 10.. | PPHE 10.. | PPHT 10.. | PPHF 10.. |
| GI286 | PPH 12.. | PPHE 12.. | PPHT 12.. | PPHF 12.. |
| GI287 | PPH 16.. | PPHE 16.. | PPHT 16.. | PPHF 16.. |
| GI288 | PPH 20.. | PPHE 20.. | PPHT 20.. | PPHF 20.. |
| GI289 | PPH 25.. | – | PPHT 25.. | PPHF 25.. |
| GI290 | PPH 32.. | – | – | – |

| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO540 | CS 42506-T07P | 1,0 | M 2,5 | 6 | D-T07P/T09P | FG-15 | – | – |
| CO541 | CS 43008-T08P | 1,2 | M 3 | 8 | D-T08P/T15P | FG-15 | – | – |
| CO542 | CS 43509-T10P | 2,0 | M 3,5 | 9 | – | – | SDR T10P | – |
| CO543 | CS 44013-T15P | 3,0 | M 4 | 13 | D-T08P/T15P | FG-15 | – | – |
| CO544 | CS 45016-T20P | 5,0 | M 5 | 16 | – | – | SDR T20P | – |
| CO545 | CS 46020-T25P | 7,5 | M 6 | 20 | – | – | – | SDR T25P-T |
| CO546 | CS 48025-T40P | 15,0 | M 8 | 25 | – | – | – | SDR T40P-T |

## PPH

| | CDI | D1 | INSL | S |
|---|---|---|---|---|
| 0800 | 8,000 | 2,50 | 7,0 | 2,40 |
| 1000 | 10,000 | 3,00 | 8,5 | 2,60 |
| 1200 | 12,000 | 3,50 | 10,0 | 3,00 |
| 1600 | 16,000 | 4,00 | 12,0 | 4,00 |
| 2000 | 20,000 | 5,00 | 15,0 | 5,00 |
| 2500 | 25,000 | 6,00 | 18,5 | 6,00 |
| 3000 | 30,000 | 8,00 | 22,5 | 7,00 |
| 3200 | 32,000 | 8,00 | 23,5 | 7,00 |

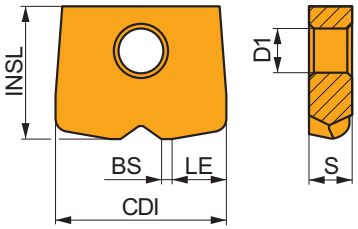



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PPH 0800-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 0,8 |
| **PPH 1000-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 1,0 |
| **PPH 1200-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 1,2 |
| **PPH 1600-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 1,6 |
| **PPH 2000-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 2,0 |
| **PPH 2500-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 2,5 |
| **PPH 3000-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 3,0 |
| **PPH 3200-CL1** | **2003** | ■ | ◪ | ■ | | ◪ | ■ | | - | – | 0,05 | 0,20 | 0,1 | 3,2 |

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPH 0800-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 0,8 |
| PPH 1000-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,0 |
| PPH 1200-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,2 |
| PPH 1600-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,6 |
| PPH 2000-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 2,0 |
| PPH 2500-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 2,5 |
| PPH 3000-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 3,0 |
| PPH 3200-CL4 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 3,2 |
| PPHE 1000-SM1 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHE 1200-SM1 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,2 |
| PPHE 1600-SM1 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 1,6 |
| PPHE 2000-SM1 | 8215 | ■ | ◪ | ■ | ◪ | ◪ | ■ | ● | - | – | 0,05 | 0,20 | 0,1 | 2,0 |

## PPHF

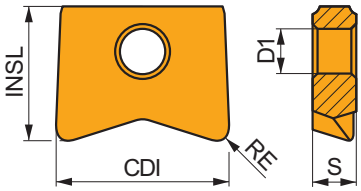
| | BS | LE | CDI | D1 | INSL | S |
|---|---|---|---|---|---|---|
| 0800 | 0,40 | 2,60 | 8,000 | 2,50 | 7,0 | 2,40 |
| 1000 | 0,50 | 3,20 | 10,000 | 3,00 | 8,5 | 2,60 |
| 1200 | 0,60 | 3,90 | 12,000 | 3,50 | 10,0 | 3,00 |
| 1600 | 0,80 | 5,20 | 16,000 | 4,00 | 12,0 | 4,00 |
| 2000 | 1,00 | 6,40 | 20,000 | 5,00 | 15,0 | 5,00 |
| 2500 | 1,20 | 7,90 | 25,000 | 6,00 | 18,5 | 6,00 |

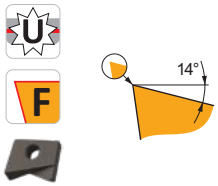



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPHF 080004-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,20 | 0,40 | 0,1 | 0,4 |
| PPHF 100005-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,20 | 0,50 | 0,1 | 0,5 |
| PPHF 120006-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,30 | 0,60 | 0,1 | 0,6 |
| PPHF 160008-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,40 | 0,80 | 0,1 | 0,8 |
| PPHF 200010-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,50 | 1,00 | 0,1 | 1,0 |
| PPHF 250012-CE1 | M8330 | ■ | ◪ | ■ | ◪ | ◪ | ◪ | ● | - | – | 0,60 | 1,50 | 0,2 | 1,2 |

# PPHT

| | CDI | D1 | INSL | S |
|---|---|---|---|---|
| 0800 | 8,000 | 2,50 | 7,0 | 2,40 |
| 1000 | 10,000 | 3,00 | 8,5 | 2,60 |
| 1200 | 12,000 | 3,50 | 10,0 | 3,00 |
| 1600 | 16,000 | 4,00 | 12,0 | 4,00 |
| 2000 | 20,000 | 5,00 | 15,0 | 5,00 |
| 2500 | 25,000 | 6,00 | 18,5 | 6,00 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPHT 080003-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ● | - | 0,3 | 0,05 | 0,20 | 0,1 | 0,3 |
| PPHT 080005-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ● | - | 0,5 | 0,05 | 0,20 | 0,1 | 0,5 |
| PPHT 080008-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 0,8 | 0,05 | 0,20 | 0,1 | 0,8 |
| PPHT 080010-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,0 | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHT 100005-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ● | - | 0,5 | 0,05 | 0,20 | 0,1 | 0,5 |
| PPHT 100008-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 0,8 | 0,05 | 0,20 | 0,1 | 0,8 |
| PPHT 100010-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,0 | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHT 120005-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ● | - | 0,5 | 0,05 | 0,20 | 0,1 | 0,5 |
| PPHT 120010-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,0 | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHT 120020-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 2,0 | 0,05 | 0,20 | 0,1 | 2,0 |
| PPHT 160010-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,0 | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHT 160013-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,3 | 0,05 | 0,20 | 0,1 | 1,2 |
| PPHT 160020-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 2,0 | 0,05 | 0,20 | 0,1 | 2,0 |
| PPHT 160030-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 3,0 | 0,05 | 0,20 | 0,1 | 3,0 |
| PPHT 200010-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,0 | 0,05 | 0,20 | 0,1 | 1,0 |
| PPHT 200016-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 1,6 | 0,05 | 0,20 | 0,1 | 1,6 |
| PPHT 200030-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 3,0 | 0,05 | 0,20 | 0,1 | 3,0 |
| PPHT 200040-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 4,0 | 0,05 | 0,20 | 0,1 | 4,0 |
| PPHT 250020-A2 | 2003 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 2,0 | 0,05 | 0,20 | 0,1 | 2,0 |

| ISO | | FN | FX | 2003 | 8215 |
|---|---|---|---|---|---|
| P | ● | 0,05 | 0,17 | 329 | 311 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | 297 | 275 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | 266 | 243 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |
| M | ● | 0,05 | 0,17 | 167 | 185 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | 149 | 167 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | 135 | 144 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |
| K | ● | 0,05 | 0,17 | 311 | 293 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | 284 | 261 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | 252 | 230 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |
| N | ● | 0,05 | 0,17 | - | 774 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | - | 693 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | - | 612 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |
| S | ● | 0,05 | 0,17 | 81 | 90 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | 72 | 81 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | 68 | 72 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |
| H | ● | 0,05 | 0,17 | 63 | 59 |
| | | 0,05 | 0,20 | | |
| | | 0,05 | 0,25 | | |
| | ⬢ | 0,05 | 0,15 | 59 | 54 |
| | | 0,05 | 0,18 | | |
| | | 0,05 | 0,23 | | |
| | ✖ | 0,05 | 0,12 | 50 | 45 |
| | | 0,05 | 0,15 | | |
| | | 0,05 | 0,20 | | |

| HFC | | FN | FX | M8330 |
|---|---|---|---|---|
| P | ● | 0,20 | 0,50 | 248 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 221 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 191 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |
| M | ● | 0,20 | 0,50 | 146 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 131 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 116 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |
| K | ● | 0,20 | 0,50 | 236 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 210 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 184 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |
| N | ● | 0,20 | 0,50 | 623 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 555 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 484 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |
| S | ● | 0,20 | 0,50 | 71 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 64 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 56 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |
| H | ● | 0,20 | 0,50 | 49 |
| | | 0,30 | 0,60 | |
| | | 0,50 | 1,50 | |
| | ⬢ | 0,20 | 0,45 | 41 |
| | | 0,30 | 0,55 | |
| | | 0,50 | 1,35 | |
| | ✖ | 0,20 | 0,40 | 38 |
| | | 0,30 | 0,50 | |
| | | 0,50 | 1,20 | |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | PPH 08-CL1 | PPH 10-CL1 | PPH 12-CL1 | PPH 16-CL1 | PPH 20-CL1 | PPH 25-CL1 | PPH 30-CL1 | PPH 32-CL1 |
|---|---|---|---|---|---|---|---|---|
| RE | 4,0 | 5,0 | 6,0 | 8,0 | 10,0 | 12,5 | 15,0 | 16,0 |
| BS | – | – | – | – | – | – | – | – |

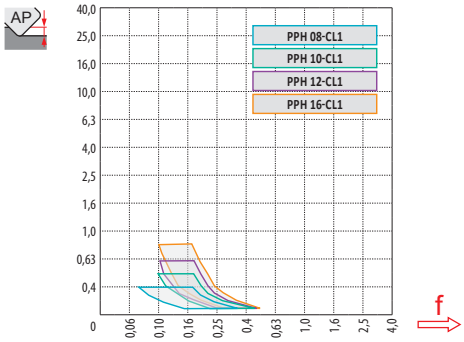
| | PPH 08-CL4 | PPH 10-CL4 | PPH 12-CL4 | PPH 16-CL4 | PPH 20-CL4 | PPH 25-CL4 | PPH 30-CL4 | PPH 32-CL4 |
|---|---|---|---|---|---|---|---|---|
| RE | 4,0 | 5,0 | 6,0 | 8,0 | 10,0 | 12,5 | 15,0 | 16,0 |
| BS | – | – | – | – | – | – | – | – |

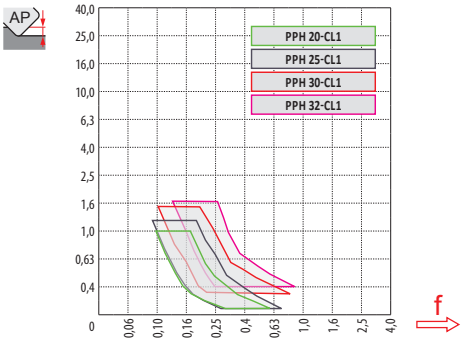
| | PPHE 10-SM1 | PPHE 12-SM1 | PPHE 16-SM1 | PPHE 20-SM1 |
|---|---|---|---|---|
| RE | 5,0 | 6,0 | 8,0 | 10,0 |
| BS | – | – | – | – |

| | PPHF 08-CE1 | PPHF 10-CE1 | PPHF 12-CE1 | PPHF 16-CE1 | PPHF 20-CE1 | PPHF 25-CE1 |
|---|---|---|---|---|---|---|
| RE | 0,6 | 0,8 | 1,0 | 1,3 | 1,6 | 1,9 |
| BS | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,20 |

| | PPHT 08-A2 | PPHT 08-A2 | PPHT 08-A2 | PPHT 08-A2 | PPHT 10-A2 | PPHT 10-A2 | PPHT 10-A2 | PPHT 12-A2 | PPHT 12-A2 | PPHT 12-A2 | PPHT 16-A2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,3 | 0,5 | 0,8 | 1,0 | 0,5 | 0,8 | 1,0 | 0,5 | 1,0 | 2,0 | 1,0 |
| BS | – | – | – | – | – | – | – | – | – | – | – |

| | PPHT 16-A2 | PPHT 16-A2 | PPHT 16-A2 | PPHT 20-A2 | PPHT 20-A2 | PPHT 20-A2 | PPHT 20-A2 | PPHT 25-A2 |
|---|---|---|---|---|---|---|---|---|
| RE | 1,3 | 2,0 | 3,0 | 1,0 | 1,6 | 3,0 | 4,0 | 2,0 |
| BS | – | – | – | – | – | – | – | – |


AP
PPH 08-CL1
PPH 10-CL1
PPH 12-CL1
PPH 16-CL1
f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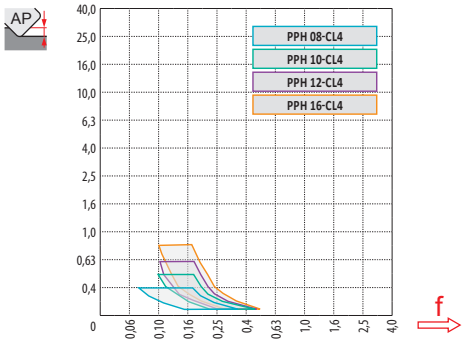
PPH 20-CL1
PPH 25-CL1
PPH 30-CL1
PPH 32-CL1
f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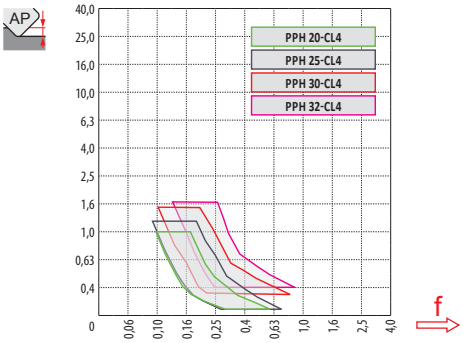
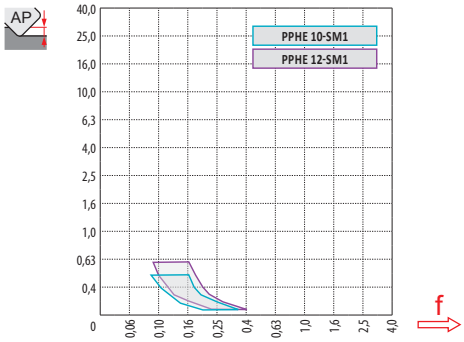
PPH 08-CL4
PPH 10-CL4
PPH 12-CL4
PPH 16-CL4
f


AP
PPH 20-CL4
PPH 25-CL4
PPH 30-CL4
PPH 32-CL4
f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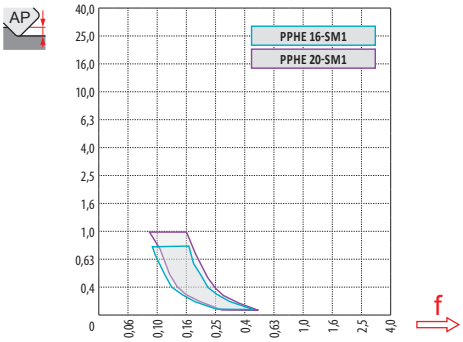
PPHE 12-SM1
f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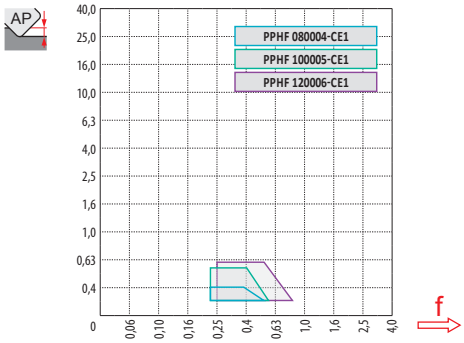
PPHE 20-SM1
f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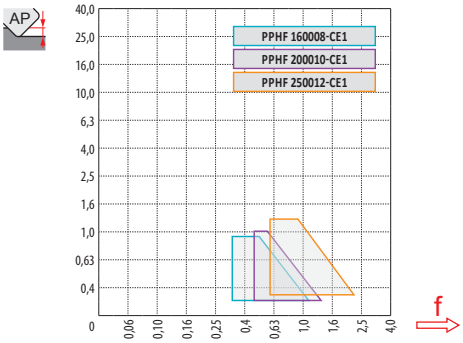
PPHF 120006-CE1
f


AP
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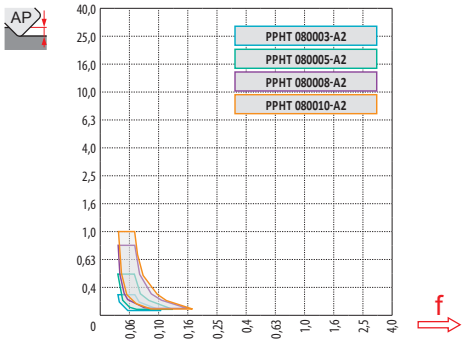
PPHF 200010-CE1
PPHF 250012-CE1
f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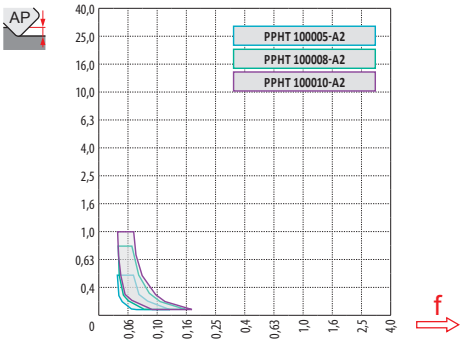
PPHT 080003-A2
PPHT 080005-A2
PPHT 080008-A2
PPHT 080010-A2
f


AP
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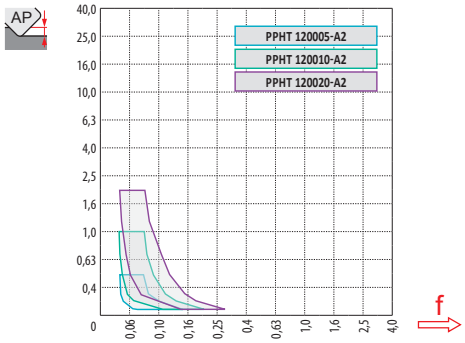
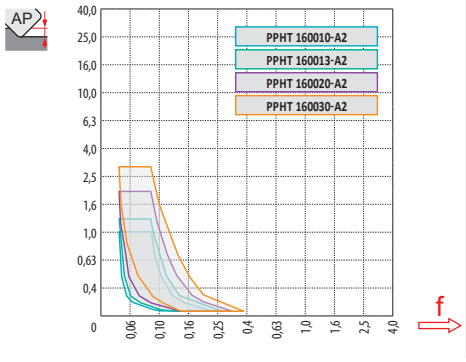
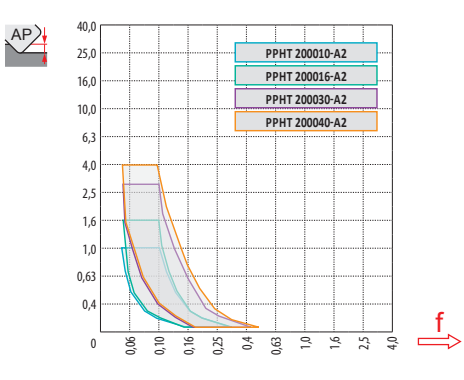
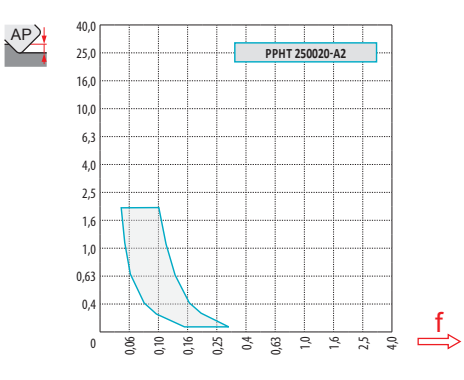
PPHT 100008-A2
PPHT 100010-A2
f


AP
PPHT 120005-A2
PPHT 120010-A2
PPHT 120020-A2
f




| | DCX | AP | 0,30 | 0,40 | 0,50 | 0,70 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 15,00 | 16,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PPH 08** | 8 | | 3,0 | 3,5 | 3,9 | 4,5 | 5,3 | 5,8 | 6,2 | 6,9 | 7,4 | 7,7 | 8,0 | – | – | – | – | – | – | – |
| **PPH 10** | 10 | | 3,4 | 3,9 | 4,4 | 5,1 | 6,0 | 6,6 | 7,1 | 8,0 | 8,7 | 9,2 | 9,8 | 10,0 | – | – | – | – | – | – |
| **PPH 12** | 12 | | 3,7 | 4,3 | 4,8 | 5,6 | 6,6 | 7,3 | 7,9 | 8,9 | 9,7 | 10,4 | 11,3 | 11,8 | 12,0 | – | – | – | – | – |
| **PPH 16** | 16 | DEF | 4,3 | 5,0 | 5,6 | 6,5 | 7,7 | 8,6 | 9,3 | 10,6 | 11,6 | 12,5 | 13,9 | 14,8 | 15,5 | 16,0 | – | – | – | – |
| **PPH 20** | 20 | | 4,9 | 5,6 | 6,2 | 7,4 | 8,7 | 9,7 | 10,5 | 12,0 | 13,2 | 14,3 | 16,0 | 17,3 | 18,3 | 19,6 | 20,0 | – | – | – |
| **PPH 25** | 25 | | 5,4 | 6,3 | 7,0 | 8,2 | 9,8 | 10,9 | 11,9 | 13,6 | 15,0 | 16,2 | 18,3 | 20,0 | 21,4 | 23,3 | 24,5 | 25,0 | – | – |
| **PPH 30** | 30 | | 5,97 | 6,88 | 7,68 | 9,06 | 10,77 | 11,99 | 13,08 | 14,97 | 16,58 | 18,00 | 20,40 | 22,36 | 24,00 | 26,53 | 28,28 | 29,39 | 30,00 | – |
| **PPH 32** | 32 | | 6,17 | 7,11 | 7,94 | 9,36 | 11,14 | 12,40 | 13,53 | 15,49 | 17,18 | 18,65 | 21,17 | 23,24 | 24,98 | 27,71 | 29,66 | 30,98 | 31,94 | 32,00 |

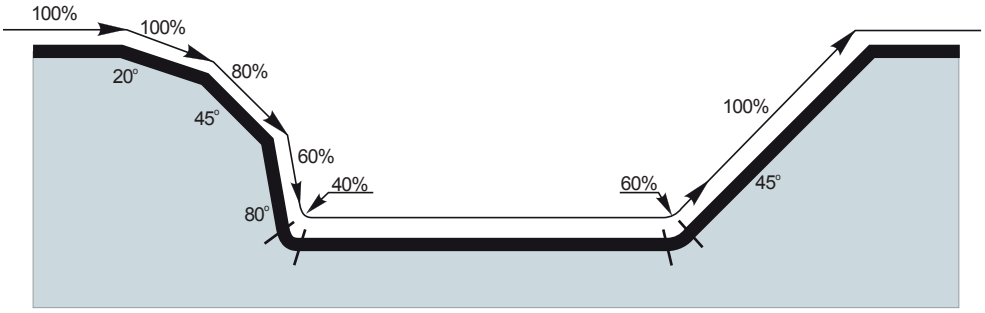
| | DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PPH 08** | 8 | | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |
| **PPH 10** | 10 | | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| **PPH 12** | 12 | $f_e$ | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| **PPH 16** | 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| **PPH 20** | 20 | $f_e$ | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| **PPH 25** | 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| **PPH 30** | 30 | | 0,600 | 0,775 | 1,095 | 1,342 | 1,549 | 1,897 | 2,191 | 2,449 | 2,683 | 3,098 | 3,464 |
| **PPH 32** | 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |

| DEF | $a_e$ | 1,0% | 2,5% | 5,0% | 7,5% | 10,0% | 15,0% | 20,0% | 25,0% | 30,0% | 35,0% | 40,0% | 45,0% | 50,0% | 60,0% | 70,0% | 75,0% | 80,0% | 90,0% | 100,0% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $a_p$ | | | | | | | | | | ⇨x.f | | | | | | | | | |
| 19,9 % | 1,0 % | 2,86 | 1,84 | 1,33 | 1,12 | 1,00 | 0,89 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 31,2 % | 2,5 % | 3,58 | 2,28 | 1,64 | 1,36 | 1,20 | 1,01 | 0,92 | 0,88 | 0,91 | – | – | – | – | – | – | – | – | – | – |
| 43,6 % | 5,0 % | 4,22 | 2,68 | 1,92 | 1,58 | 1,39 | 1,16 | 1,03 | 0,95 | 0,90 | 0,88 | 0,89 | – | – | – | – | – | – | – | – |
| 52,7% | 7,5 % | 4,63 | 2,95 | 2,10 | 1,73 | 1,51 | 1,26 | 1,11 | 1,02 | 0,96 | 0,91 | 0,89 | 0,88 | 0,90 | – | – | – | – | – | – |
| 60,0 % | 10,0% | 4,94 | 3,14 | 2,24 | 1,84 | 1,61 | 1,33 | 1,18 | 1,07 | 1,00 | 0,95 | 0,91 | 0,89 | 0,88 | 1,00 | – | – | – | – | – |
| 71,4 % | 15,0 % | 5,39 | 3,42 | 2,43 | 2,00 | 1,74 | 1,44 | 1,27 | 1,15 | 1,07 | 1,01 | 0,96 | 0,93 | 0,90 | 0,88 | 0,93 | – | – | – | – |
| 80,0 % | 20,0 % | 5,70 | 3,62 | 2,57 | 2,11 | 1,84 | 1,52 | 1,33 | 1,21 | 1,12 | 1,05 | 1,00 | 0,96 | 0,93 | 0,89 | 0,88 | 0,89 | 1,00 | – | – |
| 86,6 % | 25,0 % | 5,93 | 3,76 | 2,67 | 2,20 | 1,91 | 1,58 | 1,38 | 1,25 | 1,16 | 1,08 | 1,03 | 0,99 | 0,95 | 0,90 | 0,88 | 0,88 | 0,89 | – | – |
| 91,7% | 30,0 % | 6,10 | 3,87 | 2,75 | 2,26 | 1,96 | 1,62 | 1,42 | 1,28 | 1,18 | 1,11 | 1,05 | 1,01 | 0,97 | 0,92 | 0,89 | 0,88 | 0,88 | 0,93 | – |
| 95,4% | 35,0 % | 6,23 | 3,95 | 2,80 | 2,30 | 2,00 | 1,65 | 1,44 | 1,31 | 1,20 | 1,13 | 1,07 | 1,02 | 0,98 | 0,93 | 0,89 | 0,88 | 0,88 | 0,90 | – |
| 98,0% | 40,0 % | 6,31 | 4,00 | 2,84 | 2,33 | 2,03 | 1,67 | 1,46 | 1,32 | 1,22 | 1,14 | 1,08 | 1,03 | 0,99 | 0,93 | 0,90 | 0,89 | 0,88 | 0,89 | – |
| 99,5 % | 45,0 % | 6,36 | 4,03 | 2,86 | 2,35 | 2,04 | 1,68 | 1,47 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | – |
| 100,0 % | 50,0 % | 6,38 | 4,04 | 2,87 | 2,35 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |

| | DCX | RE | AP 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PPHT 08-A2** | 8 | 0,3 | 7,4 | 8,0 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| **PPHT 08-A2** | | 0,5 | 7,0 | 7,9 | 8,0 | 8,0 | – | – | – | – | – | – | – | – | – | – | – |
| **PPHT 08-A2** | | 0,8 | 6,4 | 7,6 | 7,8 | 7,9 | 7,9 | 8,0 | 8,0 | – | – | – | – | – | – | – | – |
| **PPHT 08-A2** | | 1,0 | 6,0 | 7,4 | 7,6 | 7,7 | 7,8 | 7,9 | 8,0 | 8,0 | 8,0 | – | – | – | – | – | – |
| **PPHT 10-A2** | 10 | 0,5 | 9,0 | 9,9 | 10,0 | 10,0 | – | – | – | – | – | – | – | – | – | – | – |
| **PPHT 10-A2** | | 0,8 | 8,4 | 9,6 | 9,8 | 9,9 | 9,9 | 10,0 | 10,0 | – | – | – | – | – | – | – | – |
| **PPHT 10-A2** | | 1,0 | 8,0 | 9,4 | 9,6 | 9,7 | 9,8 | 9,9 | 10,0 | 10,0 | 10,0 | – | – | – | – | – | – |
| **PPHT 12-A2** | 12 | 0,5 | 11,0 | 11,9 | 12,0 | 12,0 | – | – | – | – | – | – | – | – | – | – | – |
| **PPHT 12-A2** | | 1,0 | 10,0 | 11,4 | 11,6 | 11,7 | 11,8 | 11,9 | 12,0 | 12,0 | 12,0 | – | – | – | – | – | – |
| **PPHT 12-A2** | | 2,0 | 8,0 | 10,1 | 10,4 | 10,6 | 10,9 | 11,0 | 11,2 | 11,3 | 11,5 | 11,7 | 11,9 | 12,0 | – | – | – |
| **PPHT 16-A2** | 16 | 1,0 | 14,0 | 15,4 | 15,6 | 15,7 | 15,8 | 15,9 | 16,0 | 16,0 | 16,0 | – | – | – | – | – | – |
| **PPHT 16-A2** | | 1,3 | 13,4 | 15,1 | 15,3 | 15,4 | 15,6 | 15,7 | 15,8 | 15,9 | 15,9 | 16,0 | – | – | – | – | – |
| **PPHT 16-A2** | | 2,0 | 12,0 | 14,1 | 14,4 | 14,6 | 14,9 | 15,0 | 15,2 | 15,3 | 15,5 | 15,7 | 15,9 | 16,0 | – | – | – |
| **PPHT 16-A2** | | 3,0 | 10,0 | 12,6 | 13,0 | 13,3 | 13,6 | 13,9 | 14,1 | 14,3 | 14,5 | 14,9 | 15,2 | 15,7 | 15,9 | 16,0 | – |
| **PPHT 20-A2** | 20 | 1,0 | 18,0 | 19,4 | 19,6 | 19,7 | 19,8 | 19,9 | 20,0 | 20,0 | 20,0 | – | – | – | – | – | – |
| **PPHT 20-A2** | | 1,6 | 16,8 | 18,7 | 18,9 | 19,1 | 19,3 | 19,4 | 19,6 | 19,7 | 19,8 | 19,9 | 20,0 | – | – | – | – |
| **PPHT 20-A2** | | 3,0 | 14,0 | 16,6 | 17,0 | 17,3 | 17,6 | 17,9 | 18,1 | 18,3 | 18,5 | 18,9 | 19,2 | 19,7 | 19,9 | 20,0 | – |
| **PPHT 20-A2** | | 4,0 | 12,0 | 15,0 | 15,5 | 15,9 | 16,2 | 16,5 | 16,8 | 17,1 | 17,3 | 17,8 | 18,2 | 18,9 | 19,4 | 19,7 | 20,0 |
| **PPHT 25-A2** | 25 | 2,0 | 21,0 | 23,1 | 23,4 | 23,6 | 23,9 | 24,0 | 24,2 | 24,3 | 24,5 | 24,7 | 24,9 | 25,0 | – | – | – |
| **PPHF 08-CE1** | 8 | 0,6 | 2,8 | 6,0 | 7,1 | – | – | – | – | – | – | – | – | – | – | – | – |
| **PPHF 10-CE1** | 10 | 0,8 | 3,6 | 6,8 | 7,9 | 9,0 | – | – | – | – | – | – | – | – | – | – | – |
| **PPHF 12-CE1** | 12 | 1,0 | 4,2 | 7,4 | 8,5 | 9,6 | 10,7 | 11,8 | – | – | – | – | – | – | – | – | – |
| **PPHF 16-CE1** | 16 | 1,3 | 5,6 | 8,8 | 9,9 | 11,0 | 12,1 | 13,2 | 14,2 | 15,3 | – | – | – | – | – | – | – |
| **PPHF 20-CE1** | 20 | 1,6 | 7,2 | 10,4 | 11,5 | 12,6 | 13,7 | 14,8 | 15,8 | 16,9 | 18,0 | – | – | – | – | – | – |
| **PPHF 25-CE1** | 25 | 1,9 | 9,2 | 12,4 | 13,5 | 14,6 | 15,7 | 16,8 | 17,8 | 18,9 | 20,0 | 22,7 | – | – | – | – | – |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |
| 10 | | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| 12 | | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3 | | 0,177 | 0,228 | 0,322 | 0,395 | 0,456 | 0,559 | 0,645 | 0,721 | 0,790 | 0,912 | 1,020 |
| 1,6 | | 0,196 | 0,253 | 0,358 | 0,438 | 0,506 | 0,620 | 0,716 | 0,800 | 0,876 | 1,012 | 1,131 |
| 1,9 | | 0,214 | 0,276 | 0,390 | 0,477 | 0,551 | 0,675 | 0,780 | 0,872 | 0,955 | 1,103 | 1,233 |
| 2,0 | | 0,219 | 0,283 | 0,400 | 0,490 | 0,566 | 0,693 | 0,800 | 0,894 | 0,980 | 1,131 | 1,265 |
| 3,0 | | 0,268 | 0,346 | 0,490 | 0,600 | 0,693 | 0,849 | 0,980 | 1,095 | 1,200 | 1,386 | 1,549 |
| 4,0 | | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |




| | DCX | RE | max |
|---|---|---|---|
| PPHT 08-A2 | 8 | 0,3 | 2,4 |
| PPHT 08-A2 | | 0,5 | 2,4 |
| PPHT 08-A2 | | 0,8 | 2,5 |
| PPHT 08-A2 | | 1,0 | 2,7 |
| PPHT 10-A2 | 10 | 0,5 | 3,2 |
| PPHT 10-A2 | | 0,8 | 3,3 |
| PPHT 10-A2 | | 1,0 | 3,4 |
| PPHT 12-A2 | 12 | 0,5 | 4,0 |
| PPHT 12-A2 | | 1,0 | 4,2 |
| PPHT 12-A2 | | 2,0 | 4,6 |
| PPHT 16-A2 | 16 | 1,0 | 5,7 |
| PPHT 16-A2 | | 1,3 | 5,8 |
| PPHT 16-A2 | | 2,0 | 6,0 |
| PPHT 16-A2 | | 3,0 | 6,4 |
| PPHT 20-A2 | 20 | 1,0 | 7,2 |
| PPHT 20-A2 | | 1,6 | 7,4 |
| PPHT 20-A2 | | 3,0 | 7,8 |
| PPHT 20-A2 | | 4,0 | 8,2 |
| PPHT 25-A2 | 25 | 2,0 | 9,3 |

| | DCX | RE | max |
|---|---|---|---|
| PPHF 08-CE1 | 8 | 0,6 | 2,0 |
| PPHF 10-CE1 | 10 | 0,8 | 2,5 |
| PPHF 12-CE1 | 12 | 1,0 | 3,0 |
| PPHF 16-CE1 | 16 | 1,3 | 4,0 |
| PPHF 20-CE1 | 20 | 1,6 | 5,0 |
| PPHF 25-CE1 | 25 | 1,9 | 6,0 |

| | DCX | RE | RPMX | APMX / l |
|---|---|---|---|---|
| **PPHT 08-A2** | 8 | 0,3 | 6,3 | 1,2/11 |
| **PPHT 08-A2** | | 0,5 | 6,1 | 1,2/12 |
| **PPHT 08-A2** | | 0,8 | 5,7 | 1,2/12 |
| **PPHT 08-A2** | | 1,0 | 6,8 | 1,2/11 |
| **PPHT 10-A2** | 10 | 0,5 | 6,9 | 1,5/13 |
| **PPHT 10-A2** | | 0,8 | 6,6 | 1,5/13 |
| **PPHT 10-A2** | | 1,0 | 7,5 | 1,5/12 |
| **PPHT 12-A2** | 12 | 0,5 | 7,9 | 1,8/13 |
| **PPHT 12-A2** | | 1,0 | 7,5 | 1,8/14 |
| **PPHT 12-A2** | | 2,0 | 9,0 | 1,8/12 |
| **PPHT 16-A2** | 16 | 1,0 | 8,9 | 2,4/16 |
| **PPHT 16-A2** | | 1,3 | 8,9 | 2,4/16 |
| **PPHT 16-A2** | | 2,0 | 8,5 | 2,4/17 |
| **PPHT 16-A2** | | 3,0 | 12,3 | 2,4/11 |
| **PPHT 20-A2** | 20 | 1,0 | 9,3 | 3/19 |
| **PPHT 20-A2** | | 1,6 | 9,1 | 3/19 |
| **PPHT 20-A2** | | 3,0 | 8,8 | 3/20 |
| **PPHT 20-A2** | | 4,0 | 11,4 | 3/15 |
| **PPHT 25-A2** | 25 | 2,0 | 8,3 | 3,7/26 |

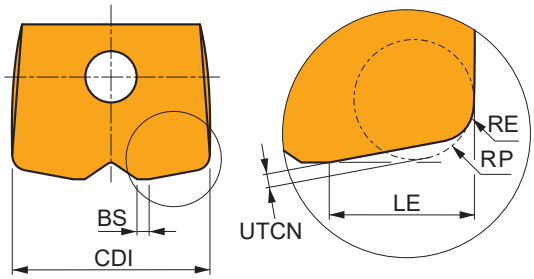
| | DCX | RE | RPMX | APMX / l |
|---|---|---|---|---|
| **PPHF 08-CE1** | 8 | 0,6 | 8,0 | 0,4/3 |
| **PPHF 10-CE1** | 10 | 0,8 | 8,0 | 0,5/4 |
| **PPHF 12-CE1** | 12 | 1,0 | 8,0 | 0,6/5 |
| **PPHF 16-CE1** | 16 | 1,3 | 8,0 | 0,8/6 |
| **PPHF 20-CE1** | 20 | 1,6 | 8,0 | 1,0/8 |
| **PPHF 25-CE1** | 25 | 1,9 | 8,0 | 1,2/9 |

| | DCX | RE | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|---|---|
| **PPHT 08-A2** | 8 | 0,3 | 11,0 | 15,9 | 0,5 | 0,5 |
| **PPHT 08-A2** | | 0,5 | 10,9 | 15,9 | 0,5 | 0,5 |
| **PPHT 08-A2** | | 0,8 | 10,7 | 15,9 | 0,4 | 0,4 |
| **PPHT 08-A2** | | 1,0 | 10,3 | 15,9 | 0,4 | 0,4 |
| **PPHT 10-A2** | 10 | 0,5 | 13,4 | 19,9 | 0,7 | 0,7 |
| **PPHT 10-A2** | | 0,8 | 13,2 | 19,9 | 0,6 | 0,6 |
| **PPHT 10-A2** | | 1,0 | 12,9 | 19,9 | 0,6 | 0,6 |
| **PPHT 12-A2** | 12 | 0,5 | 15,8 | 23,9 | 1,0 | 1,0 |
| **PPHT 12-A2** | | 1,0 | 15,4 | 23,9 | 0,8 | 0,8 |
| **PPHT 12-A2** | | 2,0 | 14,6 | 23,9 | 0,7 | 0,7 |
| **PPHT 16-A2** | 16 | 1,0 | 20,4 | 31,9 | 1,3 | 1,3 |
| **PPHT 16-A2** | | 1,3 | 20,2 | 31,9 | 1,3 | 1,3 |
| **PPHT 16-A2** | | 2,0 | 19,7 | 31,9 | 1,0 | 1,0 |
| **PPHT 16-A2** | | 3,0 | 18,9 | 31,9 | 1,2 | 1,2 |
| **PPHT 20-A2** | 20 | 1,0 | 25,4 | 39,9 | 1,8 | 1,8 |
| **PPHT 20-A2** | | 1,6 | 24,9 | 39,9 | 1,6 | 1,6 |
| **PPHT 20-A2** | | 3,0 | 24,1 | 39,9 | 1,2 | 1,2 |
| **PPHT 20-A2** | | 4,0 | 23,3 | 39,9 | 1,3 | 1,3 |
| **PPHT 25-A2** | 25 | 2,0 | 31,1 | 49,9 | 1,8 | 1,8 |

| | DCX | RE | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|---|---|
| **PPHF 08-CE1** | 8 | 0,6 | 10,0 | 14,7 | 0,40 | 0,40 |
| **PPHF 10-CE1** | 10 | 0,8 | 13,0 | 18,4 | 0,50 | 0,50 |
| **PPHF 12-CE1** | 12 | 1,0 | 15,7 | 22,0 | 0,60 | 0,60 |
| **PPHF 16-CE1** | 16 | 1,3 | 20,9 | 29,4 | 0,80 | 0,80 |
| **PPHF 20-CE1** | 20 | 1,6 | 26,2 | 36,7 | 1,00 | 1,00 |
| **PPHF 25-CE1** | 25 | 1,9 | 33,0 | 46,1 | 1,20 | 1,20 |

| | DCX | RE | AP |
|---|---|---|---|
| **PPHT 08-A2** | 8 | 0,3 | 0,52 |
| **PPHT 08-A2** | | 0,5 | 0,47 |
| **PPHT 08-A2** | | 0,8 | 0,39 |
| **PPHT 08-A2** | | 1,0 | 0,40 |
| **PPHT 10-A2** | 10 | 0,5 | 0,69 |
| **PPHT 10-A2** | | 0,8 | 0,61 |
| **PPHT 10-A2** | | 1,0 | 0,62 |
| **PPHT 12-A2** | 12 | 0,5 | 0,97 |
| **PPHT 12-A2** | | 1,0 | 0,79 |
| **PPHT 12-A2** | | 2,0 | 0,68 |
| **PPHT 16-A2** | 16 | 1,0 | 1,33 |
| **PPHT 16-A2** | | 1,3 | 1,26 |
| **PPHT 16-A2** | | 2,0 | 1,03 |
| **PPHT 16-A2** | | 3,0 | 1,15 |
| **PPHT 20-A2** | 20 | 1,0 | 1,80 |
| **PPHT 20-A2** | | 1,6 | 1,59 |
| **PPHT 20-A2** | | 3,0 | 1,21 |
| **PPHT 20-A2** | | 4,0 | 1,27 |
| **PPHT 25-A2** | 25 | 2,0 | 1,83 |

| | DCX | RE | AP |
|---|---|---|---|
| **PPHF 08-CE1** | 8 | 0,6 | 0,40 |
| **PPHF 10-CE1** | 10 | 0,8 | 0,50 |
| **PPHF 12-CE1** | 12 | 1,0 | 0,60 |
| **PPHF 16-CE1** | 16 | 1,3 | 0,80 |
| **PPHF 20-CE1** | 20 | 1,6 | 1,00 |
| **PPHF 25-CE1** | 25 | 1,9 | 1,20 |




| CDI | RE | RP | LE | UTCN |
|---|---|---|---|---|
| 08 | 0,6 | 1,0 | 2,6 | 0,3 |
| 10 | 0,8 | 1,2 | 3,2 | 0,4 |
| 12 | 1,0 | 1,5 | 3,9 | 0,4 |
| 16 | 1,3 | 2,0 | 5,2 | 0,6 |
| 20 | 1,6 | 2,5 | 6,4 | 0,7 |
| 25 | 1,9 | 3,0 | 7,9 | 0,9 |

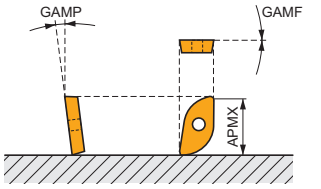
| **Voladizo (múltiplo del diámetro DCDX)** | **<3** | **3 – 3,5** | **3,6 – 4** | **4,1 – 4,5** | **>4,6** |
|---|---|---|---|---|---|
| Factor multiplicacion de velocidad | 1 | 0,9 | 0,8 | 0,7 | 0,5 |

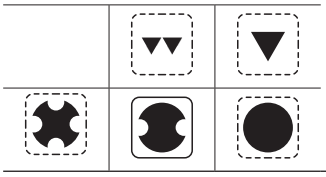
# L2-SZP

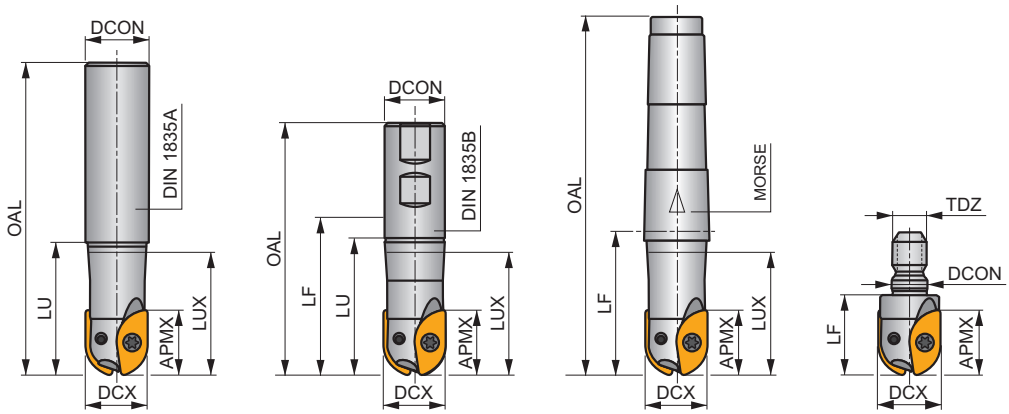
P M K S H

S

| APMX | 8,9 - 44,7 mm |
|---|---|






$h_m$ 0,05 - 0,19

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | LUX [mm] | TDZ | Morse [mm] | APMX [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 10L2R030A10-SZP10 | 10 | 130 | 10 | 30 | – | 30 | – | – | 8,9 | 0 | -10 | 2 | – | 35800 | – | 0,11 | GI255 | CO510 |
| | 10L2R050A16-SZP10 | 10 | 160 | 16 | 50 | – | 22,3 | – | – | 8,9 | 0 | -10 | 2 | – | 35800 | – | 0,26 | GI255 | CO510 |
| | 12L2R035A12-SZP12 | 12 | 140 | 12 | 35 | – | 35 | – | – | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,15 | GI253 | CO510 |
| | 12L2R045A20-SZP12 | 12 | 200 | 20 | – | – | 22 | – | – | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,51 | GI253 | CO511 |
| | 16L2R040A16-SZP16-C | 16 | 160 | 16 | 40 | – | 40 | – | – | 14,4 | 0 | -10 | 2 | – | 20000 | ✓ | 0,24 | GI256 | CO510 |
| | 16L2R045A20-SZP16-C | 16 | 200 | 20 | – | – | 29,4 | – | – | 14,4 | 0 | -10 | 2 | – | 20000 | ✓ | 1,48 | GI256 | CO512 |
| | 20L2R050A20-SZP20-C | 20 | 250 | 20 | 50 | – | – | – | – | 17,9 | 0 | -10 | 2 | – | 24000 | ✓ | 0,56 | GI254 | CO513 |
| | 20L2R055A25-SZP20-C | 20 | 200 | 25 | – | – | 36,1 | – | – | 17,9 | 0 | -10 | 2 | – | 24000 | ✓ | 0,68 | GI254 | CO513 |
| | 20L2R055A32-SZP20-C | 20 | 250 | 32 | – | – | 34,5 | – | – | 17,9 | 0 | -10 | 2 | – | 24000 | ✓ | 1,34 | GI254 | CO513 |
| | 25L2R060A25-SZP25-C | 25 | 250 | 25 | 60 | – | – | – | – | 22,3 | 0 | -10 | 2 | – | 24000 | ✓ | 0,86 | GI257 | CO514 |
| | 25L2R065A32-SZP25-C | 25 | 250 | 32 | – | – | 43 | – | – | 22,3 | 0 | -10 | 2 | – | 24000 | ✓ | 1,34 | GI257 | CO514 |
| | 32L2R070A32-SZP32-C | 32 | 250 | 32 | – | – | – | – | – | 28,6 | 0 | -10 | 2 | – | 18500 | ✓ | 1,43 | GI258 | CO515 |
| DIN 1835B | 12L2R040B20-SZP12 | 12 | 91 | 20 | 40 | 66,5 | 21,5 | – | – | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,19 | GI253 | CO511 |
| | 12L2R060B20-SZP12 | 12 | 111 | 20 | 60 | 86,5 | 23,8 | – | – | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,23 | GI253 | CO511 |
| | 16L2R040B20-SZP16-C | 16 | 91 | 20 | 40 | 66,5 | 28,3 | – | – | 14,4 | 0 | -10 | 2 | – | 20000 | ✓ | 0,15 | GI256 | CO512 |
| | 16L2R060B20-SZP16-C | 16 | 111 | 20 | 60 | 86,5 | 32,9 | – | – | 14,4 | 0 | -10 | 2 | – | 20000 | ✓ | 0,21 | GI256 | CO512 |
| | 20L2R050B25-SZP20-C | 20 | 107 | 25 | 50 | 75,5 | 35,1 | – | – | 17,9 | 0 | -10 | 2 | – | 24000 | ✓ | 0,31 | GI254 | CO513 |
| | 20L2R070B25-SZP20-C | 20 | 127 | 25 | 70 | 95,5 | 39,5 | – | – | 17,9 | 0 | -10 | 2 | – | 24000 | ✓ | 0,36 | GI254 | CO513 |
| | 25L2R060B25-SZP25-C | 25 | 117 | 25 | 60 | 85,5 | – | – | – | 22,3 | 0 | -10 | 2 | – | 24000 | ✓ | 0,36 | GI257 | CO514 |
| | 25L2R080B25-SZP25-C | 25 | 137 | 25 | 80 | 105 | – | – | – | 22,3 | 0 | -10 | 2 | – | 24000 | ✓ | 0,43 | GI257 | CO514 |
| | 32L2R070B32-SZP32-C | 32 | 131 | 32 | 70 | 95,5 | – | – | – | 28,6 | 0 | -10 | 2 | – | 18500 | ✓ | 0,72 | GI258 | CO515 |
| | 32L2R100B32-SZP32-C | 32 | 161 | 32 | 100 | 125,5 | – | – | – | 28,6 | 0 | -10 | 2 | – | 18500 | ✓ | 0,85 | GI258 | CO515 |
| | 40L2R070B32-SZP40-C | 40 | 131 | 32 | 70 | 95,5 | – | – | – | 35,7 | 0 | -10 | 2 | – | 8000 | ✓ | 0,81 | GI259 | CO516 |
| | 40L2R100B40-SZP40-C | 40 | 171 | 40 | 100 | 131 | – | – | – | 35,7 | 0 | -10 | 2 | – | 8000 | ✓ | 1,40 | GI259 | CO516 |
| | 50L2R100B50-SZP50-C | 50 | 181 | 50 | 100 | 136,5 | – | – | – | 44,7 | 0 | -10 | 2 | – | 7000 | ✓ | 2,25 | GI260 | CO517 |
| DIN 228A | 10L2R050E02-SZP10 | 10 | 114 | – | – | 50 | 21,9 | – | 2 | 8,9 | 0 | -10 | 2 | – | 35800 | – | 0,13 | GI255 | CO510 |
| | 12L2R040E02-SZP12 | 12 | 104 | – | – | 40 | 22,5 | – | 2 | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,14 | GI253 | CO511 |
| | 12L2R060E02-SZP12 | 12 | 124 | – | – | 60 | 25,8 | – | 2 | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,18 | GI253 | CO511 |
| | 12L2R090E02-SZP12 | 12 | 154 | – | – | 90 | 25,8 | – | 2 | 10,7 | 0 | -10 | 2 | – | 21000 | – | 0,23 | GI253 | CO511 |
| | 16L2R040E02-SZP16 | 16 | 104 | – | – | 40 | 31,3 | – | 2 | 14,4 | 0 | -10 | 2 | – | 20000 | – | - | GI256 | CO512 |
| | 16L2R060E02-SZP16 | 16 | 124 | – | – | 60 | 42,2 | – | 2 | 14,4 | 0 | -10 | 2 | – | 20000 | – | 0,19 | GI256 | CO512 |
| | 16L2R090E02-SZP16 | 16 | 154 | – | – | 90 | 75,9 | – | 2 | 14,4 | 0 | -10 | 2 | – | 20000 | – | 0,23 | GI256 | CO512 |
| | 20L2R050E03-SZP20 | 20 | 131 | – | – | 50 | 36,6 | – | 3 | 17,9 | 0 | -10 | 2 | – | 24000 | – | - | GI254 | CO513 |
| | 20L2R070E03-SZP20 | 20 | 151 | – | – | 70 | – | – | 3 | 17,9 | 0 | -10 | 2 | – | 24000 | – | 0,39 | GI254 | CO513 |

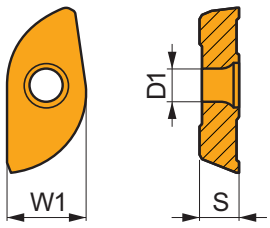
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | LUX [mm] | TDZ | Morse [mm] | APMX [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20L2R100E03-SZP20** | 20 | 181 | – | – | 100 | 77,4 | – | 3 | 17,9 | 0 | -10 | 2 | – | 24000 | – | 0,42 | GI254 | CO513 |
| DIN 228A | **25L2R080E03-SZP25** | 25 | 161 | – | – | 80 | – | – | 3 | 22,3 | 0 | -10 | 2 | – | 24000 | – | 0,46 | GI257 | CO514 |
| | **25L2R110E04-SZP25** | 25 | 213 | – | – | 110 | 92,7 | – | 4 | 22,3 | 0 | -10 | 2 | – | 24000 | – | 0,84 | GI257 | CO514 |
| | **32L2R100E04-SZP32** | 32 | 203 | – | – | 100 | – | – | 4 | 28,6 | 0 | -10 | 2 | – | 18500 | – | 0,90 | GI258 | CO515 |
| | **32L2R150E04-SZP32** | 32 | 253 | – | – | 150 | – | – | 4 | 28,6 | 0 | -10 | 2 | – | 18500 | – | 1,10 | GI258 | CO515 |
| | **50L2R100E05-SZP50** | 50 | 230 | – | – | 100 | – | – | 5 | 44,7 | 0 | -10 | 2 | – | 7000 | – | - | GI260 | CO517 |
| MODULAR | **10L2R025M08-SZP10** | 10 | – | 8,5 | – | 25 | – | M8 | – | 8,9 | 0 | -10 | 2 | – | – | – | - | GI255 | CO510 |
| | **12L2R025M06-SZP12** | 12 | – | 6,5 | – | 25 | – | M6 | – | 10,7 | 0 | -10 | 2 | – | – | – | 0,05 | GI253 | CO510 |
| | **12L2R025M08-SZP12** | 12 | – | 8,5 | – | 25 | – | M8 | – | 10,7 | 0 | -10 | 2 | – | – | – | 0,05 | GI253 | CO511 |
| | **16L2R025M08-SZP16** | 16 | – | 8,5 | – | 25 | – | M8 | – | 14,4 | 0 | -10 | 2 | – | – | – | 0,05 | GI256 | CO512 |
| | **20L2R030M10-SZP20-C** | 20 | – | 10,5 | – | 30 | – | M10 | – | 17,9 | 0 | -10 | 2 | – | – | ✓ | 0,07 | GI254 | CO513 |
| | **25L2R035M12-SZP25-C** | 25 | – | 12,5 | – | 35 | – | M12 | – | 22,3 | 0 | -10 | 2 | – | – | ✓ | 0,09 | GI257 | CO514 |
| | **32L2R045M16-SZP32-C** | 32 | – | 17 | – | 45 | – | M16 | – | 27,9 | 0 | -10 | 2 | – | – | ✓ | 0,15 | GI258 | CO515 |

| | |
|---|---|
| GI253 | ZP 12.. |
| GI254 | ZP 20.. |
| GI255 | ZP 10.. |
| GI256 | ZP 16.. |
| GI257 | ZP 25.. |
| GI258 | ZP 32.. |
| GI259 | ZP 40.. |
| GI260 | ZP 50.. |

| | | | | | Nm | | | |
|---|---|---|---|---|---|---|---|---|
| CO510 | – | – | Flag T06P | US 62004-T06P | 0,6 | M 2 | 4 | – |
| CO511 | – | – | Flag T08P | US 62506-T08P | 1,2 | M 2,5 | 6 | – |
| CO512 | – | – | Flag T08P | US 62508-T08P | 1,2 | M 2,5 | 7 | – |
| CO513 | – | – | Flag T10P | US 63510-T10P | 2,0 | M 3,5 | 9 | – |
| CO514 | – | – | Flag T15P | US 4011A-T15P | 3,5 | M 4 | 11 | – |
| CO515 | – | – | – | US 65013-T20 | 5,0 | M 5 | 13 | SDR T20 |
| CO516 | – | – | – | US 66015-T25P | 7,5 | M 6 | 15 | SDR T25P |
| CO517 | SZN 400322 | US 3508-T15P | Flag T15P | US 68020-T30P | 15,0 | M 8 | 20 | SDR T30P |

# ZP

| | W1 | D1 | S |
|---|---|---|---|
| 10 | 10 | 2,20 | 1,70 |
| 12 | 12 | 2,90 | 2,38 |
| 16 | 16 | 2,90 | 3,18 |
| 20 | 20 | 4,00 | 3,97 |
| 25 | 25 | 4,70 | 4,76 |
| 32 | 32 | 5,90 | 6,35 |
| 40 | 40 | 7,00 | 7,94 |
| 50 | 50 | 9,60 | 7,94 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZP 20ER-F | M8310 | ◪ | ◪ | | | ◪ | | ● | - | – | 0,04 | 0,09 | 0,3 | 17,9 |
| ZP 50ER-F | M8310 | ◪ | ◪ | | | ◪ | | ● | - | – | 0,07 | 0,18 | 0,3 | 44,7 |
| ZP 10ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,05 | 0,10 | 0,3 | 8,9 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,05 | 0,10 | 0,3 | 8,9 |
| ZP 12ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,05 | 0,11 | 0,3 | 10,7 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,05 | 0,11 | 0,3 | 10,7 |
| ZP 16ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,06 | 0,14 | 0,3 | 15,0 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,06 | 0,14 | 0,3 | 15,0 |
| ZP 20ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,06 | 0,16 | 0,3 | 17,9 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,06 | 0,16 | 0,3 | 17,9 |
| ZP 25ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,08 | 0,21 | 0,3 | 22,3 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,08 | 0,21 | 0,3 | 22,3 |
| ZP 32ER-FM | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ● | - | – | 0,08 | 0,21 | 0,3 | 28,6 |
| | M8345 | ■ | ◪ | | | ◪ | | ⬢ | + / - | – | 0,08 | 0,21 | 0,3 | 28,6 |
| ZP 12ER-M | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | – | 0,06 | 0,13 | 0,3 | 10,7 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | – | 0,06 | 0,13 | 0,3 | 10,7 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,06 | 0,13 | 0,3 | 10,7 |
| ZP 16ER-M | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | – | 0,07 | 0,16 | 0,3 | 15,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | – | 0,07 | 0,16 | 0,3 | 15,0 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,07 | 0,16 | 0,3 | 15,0 |
| ZP 20ER-M | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | – | 0,07 | 0,16 | 0,3 | 17,9 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,07 | 0,16 | 0,3 | 17,9 |
| ZP 25ER-M | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | – | 0,08 | 0,20 | 0,3 | 22,3 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,08 | 0,20 | 0,3 | 22,3 |
| ZP 32ER-M | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | – | 0,10 | 0,25 | 0,3 | 28,6 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,10 | 0,25 | 0,3 | 28,6 |
| ZP 16ER-R | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,09 | 0,21 | 0,3 | 15,0 |
| ZP 20ER-R | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,09 | 0,21 | 0,3 | 17,9 |
| ZP 25ER-R | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,12 | 0,30 | 0,3 | 22,3 |
| ZP 32ER-R | M8330 | ■ | ◪ | ◪ | | ◪ | ◪ | ⬢ | - | – | 0,12 | 0,31 | 0,3 | 28,6 |
| | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,12 | 0,31 | 0,3 | 28,6 |
| ZP 40ER-R | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,12 | 0,33 | 0,3 | 35,7 |
| ZP 50ER-R | M8345 | ■ | ■ | | | ◪ | | ⬢ | + / - | – | 0,15 | 0,33 | 0,3 | 44,7 |

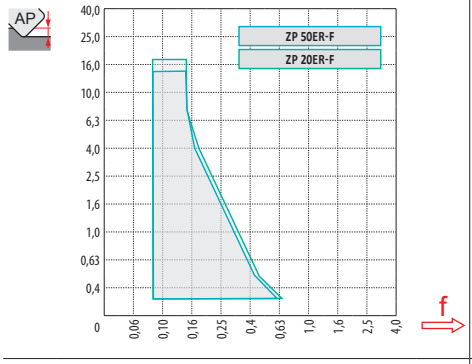
| ISO | | FN | FX | M8310 | M8330 | M8340 | M8345 |
|---|---|---|---|---|---|---|---|
| P | ● | 0,06 | 0,10 | 329 | 333 | 284 | 225 |
| | | 0,09 | 0,20 | | | | |
| | | 0,12 | 0,30 | | | | |
| | | 0,06 | 0,09 | 297 | 298 | 252 | 198 |
| | | 0,09 | 0,18 | | | | |
| | | 0,12 | 0,27 | | | | |
| | ✖ | 0,05 | 0,07 | 266 | 258 | 221 | 176 |
| | | 0,10 | 0,14 | | | | |
| | | 0,15 | 0,20 | | | | |
| M | ● | 0,05 | 0,10 | 167 | 194 | 167 | 135 |
| | | 0,10 | 0,20 | | | | |
| | | 0,15 | 0,30 | | | | |
| | | 0,05 | 0,09 | 149 | 174 | 149 | 117 |
| | | 0,10 | 0,18 | | | | |
| | | 0,15 | 0,27 | | | | |
| | ✖ | 0,05 | 0,07 | 135 | 154 | 131 | 104 |
| | | 0,10 | 0,14 | | | | |
| | | 0,15 | 0,20 | | | | |
| K | ● | 0,05 | 0,10 | 311 | 327 | 270 | – |
| | | 0,10 | 0,20 | | | | |
| | | 0,15 | 0,30 | | | | |
| | | 0,05 | 0,09 | 284 | 290 | 239 | – |
| | | 0,10 | 0,18 | | | | |
| | | 0,15 | 0,27 | | | | |
| | ✖ | 0,05 | 0,07 | 252 | 254 | 207 | – |
| | | 0,10 | 0,14 | | | | |
| | | 0,15 | 0,20 | | | | |
| S | ● | 0,05 | 0,10 | 81 | 95 | 81 | 68 |
| | | 0,10 | 0,20 | | | | |
| | | 0,15 | 0,30 | | | | |
| | | 0,05 | 0,09 | 72 | 85 | 72 | 59 |
| | | 0,10 | 0,18 | | | | |
| | | 0,15 | 0,27 | | | | |
| | ✖ | 0,05 | 0,07 | 68 | 75 | 63 | 50 |
| | | 0,10 | 0,14 | | | | |
| | | 0,15 | 0,20 | | | | |
| H | ● | 0,05 | 0,10 | 63 | 68 | – | – |
| | | 0,10 | 0,20 | | | | |
| | | 0,15 | 0,30 | | | | |
| | | 0,05 | 0,09 | 59 | 58 | – | – |
| | | 0,10 | 0,18 | | | | |
| | | 0,15 | 0,27 | | | | |
| | ✖ | 0,05 | 0,07 | 50 | 52 | – | – |
| | | 0,10 | 0,14 | | | | |
| | | 0,15 | 0,20 | | | | |

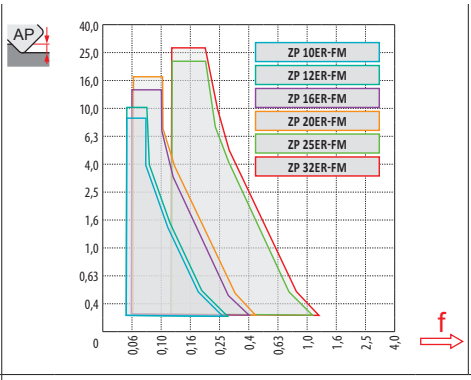
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

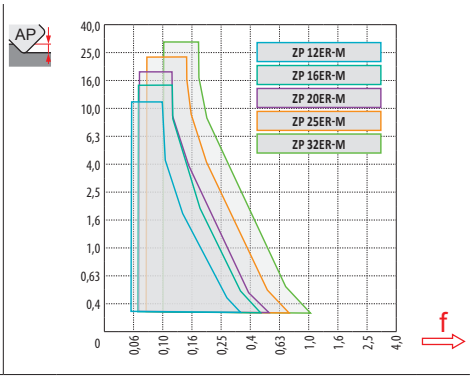
| | ZP 20-F | ZP 50-F | ZP 10-FM | ZP 12-FM | ZP 16-FM | ZP 20-FM | ZP 25-FM | ZP 32-FM |
|---|---|---|---|---|---|---|---|---|
| RE | 10,0 | 25,0 | 5,0 | 6,0 | 8,0 | 10,0 | 12,5 | 16,0 |
| BS | – | – | – | – | – | – | – | – |

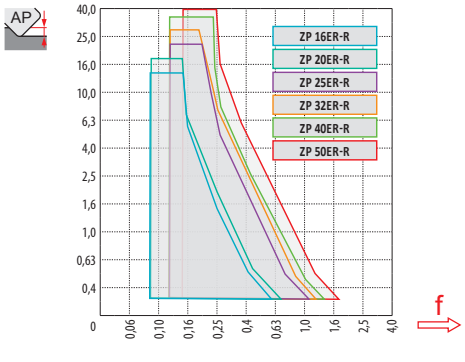
| | ZP 12-M | ZP 16-M | ZP 20-M | ZP 25-M | ZP 32-M |
|---|---|---|---|---|---|
| RE | 6,0 | 8,0 | 10,0 | 12,5 | 16,0 |
| BS | – | – | – | – | – |

| | ZP 16-R | ZP 20-R | ZP 25-R | ZP 32-R | ZP 40-R | ZP 50-R |
|---|---|---|---|---|---|---|
| RE | 8,0 | 10,0 | 12,5 | 16,0 | 20,0 | 25,0 |
| BS | – | – | – | – | – | – |

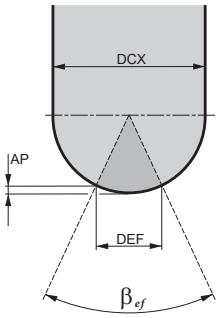


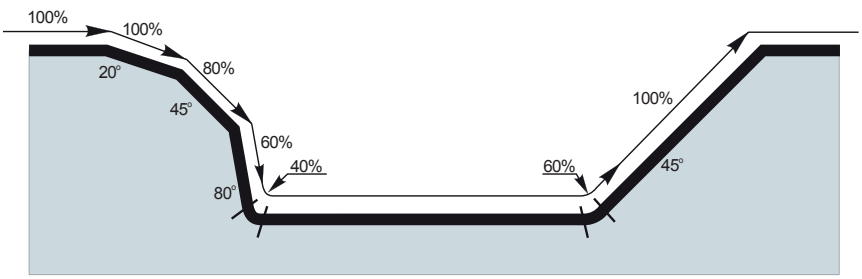
| DCX | AP | 0,30 | 0,40 | 0,50 | 0,70 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 15,00 | 16,00 | 20,00 | 22,50 | 25,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | DEF | 3,4 | 3,9 | 4,4 | 5,1 | 6,0 | 6,6 | 7,1 | 8,0 | 8,7 | 9,2 | 9,8 | 10,0 | – | – | – | – | – | – | – | – | – |
| 12 | | 3,7 | 4,3 | 4,8 | 5,6 | 6,6 | 7,3 | 7,9 | 8,9 | 9,7 | 10,4 | 11,3 | 11,8 | 12,0 | – | – | – | – | – | – | – | – |
| 16 | | 4,3 | 5,0 | 5,6 | 6,5 | 7,7 | 8,6 | 9,3 | 10,6 | 11,6 | 12,5 | 13,9 | 14,8 | 15,5 | 16,0 | – | – | – | – | – | – | – |
| 20 | | 4,9 | 5,6 | 6,2 | 7,4 | 8,7 | 9,7 | 10,5 | 12,0 | 13,2 | 14,3 | 16,0 | 17,3 | 18,3 | 19,6 | 20,0 | – | – | – | – | – | – |
| 25 | | 5,4 | 6,3 | 7,0 | 8,2 | 9,8 | 10,9 | 11,9 | 13,6 | 15,0 | 16,2 | 18,3 | 20,0 | 21,4 | 23,3 | 24,5 | 25,0 | – | – | – | – | – |
| 32 | | 6,2 | 7,1 | 7,9 | 9,4 | 11,1 | 12,4 | 13,5 | 15,5 | 17,2 | 18,7 | 21,2 | 23,2 | 25,0 | 27,7 | 29,7 | 31,2 | 31,9 | 32,0 | – | – | – |
| 40 | | 6,9 | 8,0 | 8,9 | 10,5 | 12,5 | 13,9 | 15,2 | 17,4 | 19,4 | 21,1 | 24,0 | 26,5 | 28,6 | 32,0 | 34,6 | 37,1 | 38,7 | 39,2 | 40,0 | – | – |
| 50 | | 7,7 | 8,9 | 9,9 | 11,7 | 14,0 | 15,6 | 17,1 | 19,6 | 21,8 | 23,7 | 27,1 | 30,0 | 32,5 | 36,7 | 40,0 | 43,3 | 45,8 | 46,6 | 49,0 | 49,7 | 50,0 |




| DCX [mm] | | $\beta_{ef}$ | DEF [mm] | AP [mm] |
|---|---|---|---|---|
| 10 | FM | 41° | 3,496 | 0,322 |
| 12 | FM | 41° | 4,194 | 0,381 |
| 16 | FM | 42° | 5,660 | 0,520 |
| 20 | FM | 42° | 7,100 | 0,650 |
| 25 | FM | 41° | 8,756 | 0,794 |
| 35 | FM | 41° | 11,113 | 0,998 |
| 40 | R | 41° | 14,108 | 1,298 |
| 50 | R | 45° | 19,176 | 1,915 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| 12 | | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| 16 | $f_e$ | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | $f_e$ | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 50 | | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |

| DEF | $a_e$ | 1 % | 2,5 % | 5 % | 7,5 % | 10 % | 15 % | 20 % | 25 % | 30 % | 35 % | 40 % | 45 % | 50 % | 60 % | 70 % | 75 % | 80 % | 90 % | 100 % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AP | | | | | | | | | | ⇨x.f | | | | | | | | | |
| 19,9 % | 1,0 % | 2,86 | 1,84 | 1,33 | 1,12 | 1,00 | 0,89 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 31,2 % | 2,5 % | 3,58 | 2,28 | 1,64 | 1,36 | 1,20 | 1,01 | 0,92 | 0,88 | 0,91 | – | – | – | – | – | – | – | – | – | – |
| 43,6 % | 5,0 % | 4,22 | 2,68 | 1,92 | 1,58 | 1,39 | 1,16 | 1,03 | 0,95 | 0,90 | 0,88 | 0,89 | – | – | – | – | – | – | – | – |
| 52,7 % | 7,5 % | 4,63 | 2,95 | 2,10 | 1,73 | 1,51 | 1,26 | 1,11 | 1,02 | 0,96 | 0,91 | 0,89 | 0,88 | 0,90 | – | – | – | – | – | – |
| 60,0 % | 10,0 % | 4,94 | 3,14 | 2,24 | 1,84 | 1,61 | 1,33 | 1,18 | 1,07 | 1,00 | 0,95 | 0,91 | 0,89 | 0,88 | 1,00 | – | – | – | – | – |
| 71,4 % | 15,0 % | 5,39 | 3,42 | 2,43 | 2,00 | 1,74 | 1,44 | 1,27 | 1,15 | 1,07 | 1,01 | 0,96 | 0,93 | 0,90 | 0,88 | 0,93 | – | – | – | – |
| 80,0 % | 20,0 % | 5,70 | 3,62 | 2,57 | 2,11 | 1,84 | 1,52 | 1,33 | 1,21 | 1,12 | 1,05 | 1,00 | 0,96 | 0,93 | 0,89 | 0,88 | 0,89 | 1,00 | – | – |
| 86,6 % | 25,0 % | 5,93 | 3,76 | 2,67 | 2,20 | 1,91 | 1,58 | 1,38 | 1,25 | 1,16 | 1,08 | 1,03 | 0,99 | 0,95 | 0,90 | 0,88 | 0,88 | 0,89 | – | – |
| 91,7 % | 30,0 % | 6,10 | 3,87 | 2,75 | 2,26 | 1,96 | 1,62 | 1,42 | 1,28 | 1,18 | 1,11 | 1,05 | 1,01 | 0,97 | 0,92 | 0,89 | 0,88 | 0,88 | 0,93 | – |
| 95,4 % | 35,0 % | 6,23 | 3,95 | 2,80 | 2,30 | 2,00 | 1,65 | 1,44 | 1,31 | 1,20 | 1,13 | 1,07 | 1,02 | 0,98 | 0,93 | 0,89 | 0,88 | 0,88 | 0,90 | – |
| 98,0 % | 40,0 % | 6,31 | 4,00 | 2,84 | 2,33 | 2,03 | 1,67 | 1,46 | 1,32 | 1,22 | 1,14 | 1,08 | 1,03 | 0,99 | 0,93 | 0,90 | 0,89 | 0,88 | 0,89 | – |
| 99,5% | 45,0 % | 6,36 | 4,03 | 2,86 | 2,35 | 2,04 | 1,68 | 1,47 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | – |
| 100,0 % | 50,0 % | 6,38 | 4,04 | 2,87 | 2,35 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |

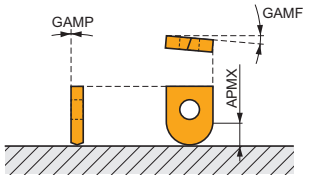


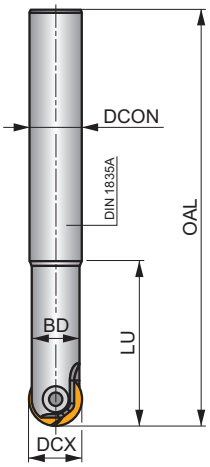

| Voladizo (múltiplo del diámetro DCDX) | <3 | 3 – 3,5 | 3,6 – 4 | 4,1 – 4,5 | >4,6 |
|---|---|---|---|---|---|
| Factor multiplicacion de velocidad | 1 | 0,9 | 0,8 | 0,7 | 0,5 |

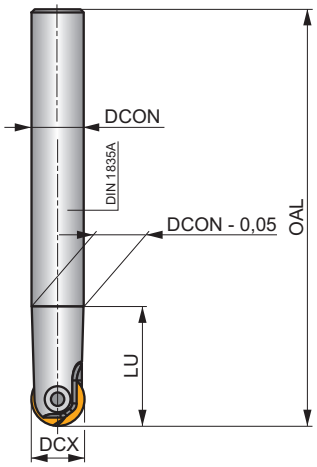
# K2-SRC

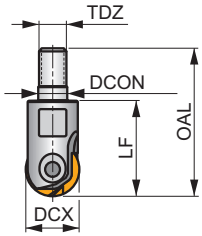
P K H S

| APMX | 0,6 - 3,2 mm |
|---|---|




$h_m$ 0,07 - 0,14

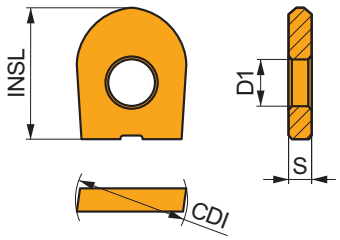
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | BD [mm] | LU [mm] | LF [mm] | TDZ | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 08K2R025A10-SRC08-A | 8 | 110 | 10 | 7,5 | 25 | – | – | 2 | – | 56000 | – | 0,08 | GI030 | CO530 |
| | 08K2R050A12-SRC08-A | 8 | 140 | 12 | – | 13,5 | – | – | 2 | – | 56000 | – | 0,11 | GI030 | CO530 |
| | 10K2R030A12-SRC10-A | 10 | 130 | 12 | 9,0 | 30 | – | – | 2 | – | 42000 | – | 0,11 | GI031 | CO531 |
| | 10K2R060A16-SRC10-A | 10 | 150 | 16 | – | 19,5 | – | – | 2 | – | 42000 | – | 0,18 | GI031 | CO531 |
| | 12K2R030A12-SRC12-A | 12 | 130 | 12 | 10,5 | 30 | – | – | 2 | – | 35000 | – | 0,11 | GI032 | CO532 |
| | 16K2R035A16-SRC16-A | 16 | 140 | 16 | 14,0 | 35 | – | – | 2 | – | 22000 | – | 0,23 | GI033 | CO533 |
| | 20K2R045A20-SRC20-A | 20 | 160 | 20 | 18,0 | 45 | – | – | 2 | – | 16000 | – | 0,40 | GI034 | CO534 |
| | 25K2R045A25-SRC25-A | 25 | 160 | 25 | 22,4 | 45 | – | – | 2 | – | 10000 | – | 0,59 | GI035 | CO535 |
| | 32K2R060A32-SRC32-A | 32 | 180 | 32 | 28,6 | 60 | – | – | 2 | – | 6000 | – | 1,10 | GI036 | CO536 |
| | 12K2R060A16-SRC12-A | 12 | 160 | 16 | – | 24,5 | – | – | 2 | – | 35000 | – | 0,14 | GI032 | CO532 |
| | 16K2R065A20-SRC16-A | 16 | 175 | 20 | – | 31,5 | – | – | 2 | – | 22000 | – | 0,41 | GI033 | CO533 |
| | 20K2R080A25-SRC20-A | 20 | 190 | 25 | – | 33,5 | – | – | 2 | – | 16000 | – | 0,66 | GI034 | CO534 |
| MODULAR | 08K2R30M06-SRC08-A | 8 | 45 | 6,5 | – | – | 30 | M6 | 2 | – | – | – | 0,02 | GI123 | CO530 |
| | 10K2R30M06-SRC10-A | 10 | 45 | 6,5 | – | – | 30 | M6 | 2 | – | – | – | 0,03 | GI124 | CO531 |
| | 12K2R30M06-SRC12-A | 12 | 45 | 6,5 | – | – | 30 | M6 | 2 | – | – | – | 0,16 | GI125 | CO530 |
| | 12K2R30M08-SRC12-A | 12 | 48 | 8,5 | – | – | 30 | M8 | 2 | – | – | – | 0,04 | GI125 | CO532 |
| | 16K2R35M08-SRC16-A | 16 | 53 | 8,5 | – | – | 35 | M8 | 2 | – | – | – | 0,05 | GI033 | CO533 |
| | 20K2R35M10-SRC20-A | 20 | 54 | 10,5 | – | – | 35 | M10 | 2 | – | – | – | 0,08 | GI034 | CO534 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GI030 | RC 08 | RC 08-F | LC 08-KP | LC 08-KPF | – | – |
| GI031 | RC 10 | RC 10-F | LC 10-KP | LC 10-KPF | – | – |
| GI032 | RC 12 | RC 12-F | – | – | LC 12..-CH | LC 12..-RE |
| GI033 | RC 16 | RC 16-F | – | – | – | – |
| GI034 | RC 20 | RC 20-F | – | – | – | – |
| GI035 | RC 25 | – | – | – | – | – |
| GI036 | RC 32 | – | – | – | – | – |
| GI123 | RC 08 | RC 08-F | – | – | – | – |
| GI124 | RC 10 | RC 10-F | – | – | – | – |
| GI125 | RC 12 | RC 12-F | – | – | – | – |

| | | Nm | | | | | |
|---|---|---|---|---|---|---|---|
| CO530 | CS 3007-T08P | 1,2 | M 3 | 7 | – | – | Flag T08P |
| CO531 | CS 4008-T15P | 3,0 | M 4 | 8 | D-T08P/T15P | FG-15 | – |
| CO532 | CS 5009-T20P | 5,0 | M 5 | 9 | – | – | SDR T20P |
| CO533 | CS 5013-T20P | 5,0 | M 5 | 13 | – | – | SDR T20P |
| CO534 | CS 5015-T20P | 5,0 | M 5 | 15 | – | – | SDR T20P |
| CO535 | CS 6020-T20P | 7,5 | M 6 | 20 | – | – | SDR T20P |
| CO536 | CS 8025-T30P | 15 | M 8 | 25 | – | – | SDR T30P |

## RC

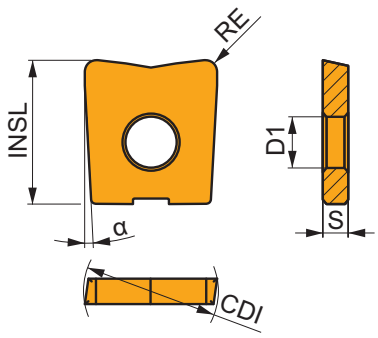
| | CDI | D1 | INSL | S |
|---|---|---|---|---|
| 08 | 8,000 | 3,00 | 9,50 | 2,00 |
| 10 | 10,000 | 4,00 | 11,50 | 2,50 |
| 12 | 12,000 | 5,00 | 12,00 | 2,50 |
| 16 | 16,000 | 5,00 | 14,00 | 3,00 |
| 20 | 20,000 | 5,00 | 16,00 | 3,00 |
| 25 | 25,000 | 6,00 | 21,50 | 4,00 |
| 32 | 32,000 | 8,00 | 25,80 | 5,00 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC 08 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,30 | 0,3 | 0,8 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,30 | 0,3 | 0,8 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,30 | 0,3 | 0,8 |
| RC 10 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,33 | 0,3 | 1,0 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,33 | 0,3 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,33 | 0,3 | 1,0 |
| RC 12 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,35 | 0,4 | 1,2 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,35 | 0,4 | 1,2 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,35 | 0,4 | 1,2 |
| RC 16 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,40 | 0,5 | 1,6 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,40 | 0,5 | 1,6 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,40 | 0,5 | 1,6 |
| RC 20 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,50 | 0,6 | 2,0 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,50 | 0,6 | 2,0 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,50 | 0,6 | 2,0 |
| RC 25 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,55 | 0,6 | 2,5 |
| | M8310 | ■ | | ■ | | | ■ | | - | – | 0,10 | 0,55 | 0,6 | 2,5 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,55 | 0,6 | 2,5 |
| RC 32 | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,10 | 0,60 | 0,6 | 3,2 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,10 | 0,60 | 0,6 | 3,2 |
| RC 08-F | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,05 | 0,30 | 0,3 | 0,8 |
| RC 10-F | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,05 | 0,33 | 0,3 | 1,0 |
| RC 12-F | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,05 | 0,35 | 0,4 | 1,2 |
| RC 16-F | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,05 | 0,40 | 0,5 | 1,6 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,05 | 0,40 | 0,5 | 1,6 |
| RC 20-F | M4310 | ◪ | | ■ | | | ■ | | - | – | 0,05 | 0,50 | 0,5 | 2,0 |
| | M8330 | ■ | | ■ | | | ◪ | | - | – | 0,05 | 0,50 | 0,5 | 2,0 |

# LC

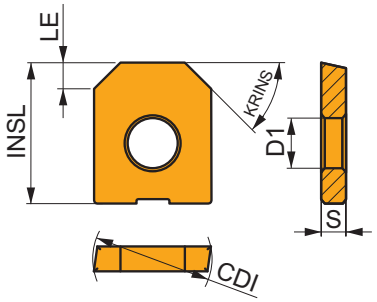
| | α | CDI | D1 | INSL | S |
|---|---|---|---|---|---|
| 08 | 3° | 8,000 | 3,00 | 9,50 | 2,00 |
| 10 | 3° | 10,000 | 4,00 | 11,50 | 2,50 |




| | ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LC 0806-KP | M4310 | ◪ | | ■ | | | ■ | ● | - | 0,6 | 0,08 | 0,20 | 0,1 | 0,6 |
| | | M8310 | ■ | | ■ | | | ■ | ● | - | 0,6 | 0,08 | 0,20 | 0,1 | 0,6 |
| | | M8330 | ■ | | ■ | | | ◪ | ⬌ | - | 0,6 | 0,08 | 0,20 | 0,1 | 0,6 |
| | LC 0810-KP | M4310 | ◪ | | ■ | | | ■ | ⬌ | - | 1,0 | 0,08 | 0,20 | 0,1 | 1,0 |
| | | M8310 | ■ | | ■ | | | ■ | ⬌ | - | 1,0 | 0,08 | 0,20 | 0,1 | 1,0 |
| | LC 1008-KP | M4310 | ◪ | | ■ | | | ■ | ⬌ | - | 0,8 | 0,08 | 0,25 | 0,1 | 0,8 |
| | | M8310 | ■ | | ■ | | | ■ | ⬌ | - | 0,8 | 0,08 | 0,25 | 0,1 | 0,8 |
| | | M8330 | ■ | | ■ | | | ◪ | ⬌ | - | 0,8 | 0,08 | 0,25 | 0,1 | 0,8 |
| | LC 1010-KP | M4310 | ◪ | | ■ | | | ■ | ⬌ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| | | M8310 | ■ | | ■ | | | ■ | ⬌ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| | | M8330 | ■ | | ■ | | | ◪ | ⬌ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| | LC 0806-KPF | M4310 | ◪ | | ■ | | | ■ | ● | - | 0,6 | 0,05 | 0,15 | 0,1 | 0,6 |
| | LC 1008-KPF | M4310 | ◪ | | ■ | | | ■ | ⬌ | - | 0,8 | 0,05 | 0,20 | 0,1 | 0,8 |

## LC 12-CH

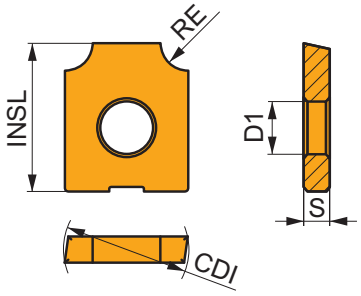
| | KRINS | CDI | D1 | LE | INSL | S |
|---|---|---|---|---|---|---|
| 1245 | 45° | 12,000 | 5,00 | 3,0 | 14,00 | 2,50 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LC 1245-CH** | **M4310** | ◪ | | ■ | | | ■ | | - | – | 0,08 | 0,25 | 0,1 | 2,0 |

## LC 12-RE

| | CDI | D1 | INSL | S |
|---|---|---|---|---|
| 12 | 12,000 | 5,00 | 14,00 | 2,50 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LC 1220-RE** | **M4310** | ◪ | | ■ | | | ■ | | - | 2,0 | 0,08 | 0,25 | 0,1 | 2,0 |
| **LC 1230-RE** | **M4310** | ◪ | | ■ | | | ■ | | - | 3,0 | 0,08 | 0,25 | 0,1 | 3,0 |

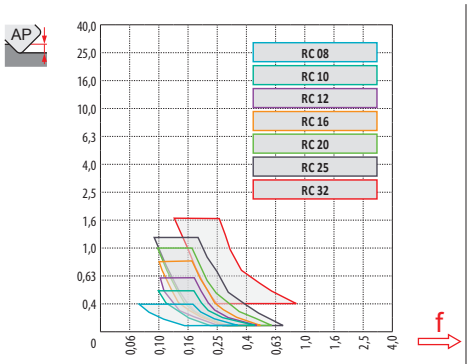
| ISO | | FN | FX | M4310 | M8310 | M8330 |
|---|---|---|---|---|---|---|
| P | ● | 0,05 | 0,30 | 280 | 329 | 296 |
| | | 0,05 | 0,45 | | | |
| | | 0,05 | 0,60 | | | |
| | | 0,05 | 0,25 | 252 | 297 | 267 |
| | | 0,05 | 0,40 | | | |
| | | 0,05 | 0,55 | | | |
| | ✖ | 0,05 | 0,20 | 226 | 266 | 239 |
| | | 0,05 | 0,35 | | | |
| | | 0,05 | 0,50 | | | |
| K | ● | 0,05 | 0,30 | 264 | 311 | 280 |
| | | 0,05 | 0,45 | | | |
| | | 0,05 | 0,60 | | | |
| | | 0,05 | 0,25 | 241 | 284 | 256 |
| | | 0,05 | 0,40 | | | |
| | | 0,05 | 0,55 | | | |
| | ✖ | 0,05 | 0,20 | 214 | 252 | 227 |
| | | 0,05 | 0,35 | | | |
| | | 0,05 | 0,50 | | | |
| H | ● | 0,05 | 0,30 | 52 | 63 | 57 |
| | | 0,05 | 0,45 | | | |
| | | 0,05 | 0,60 | | | |
| | | 0,05 | 0,25 | 48 | 59 | 53 |
| | | 0,05 | 0,40 | | | |
| | | 0,05 | 0,55 | | | |
| | ✖ | 0,05 | 0,20 | 41 | 50 | 45 |
| | | 0,05 | 0,30 | | | |
| | | 0,05 | 0,40 | | | |

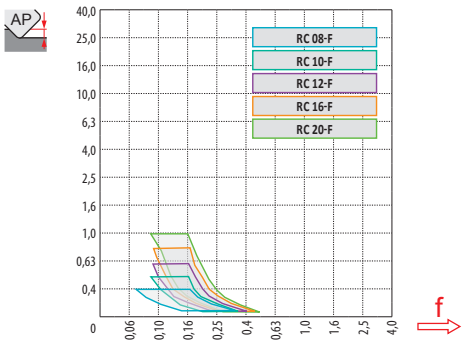
| | RC 08 | RC 10 | RC 12 | RC 16 | RC 20 | RC 25 | RC 32 |
|---|---|---|---|---|---|---|---|
| RE | 4,0 | 5,0 | 6,0 | 8,0 | 10,0 | 12,5 | 16,0 |
| BS | – | – | – | – | – | – | – |

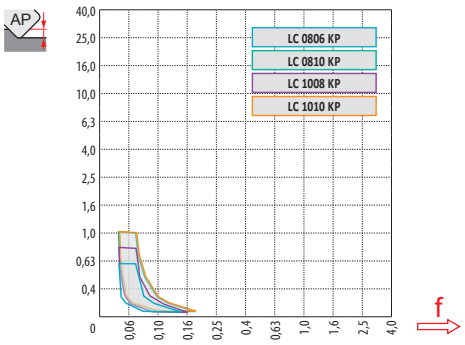
| | RC 08-F | RC 10-F | RC 12-F | RC 16-F | RC 20-F |
|---|---|---|---|---|---|
| RE | 4,0 | 5,0 | 6,0 | 8,0 | 10,0 |
| BS | – | – | – | – | – |

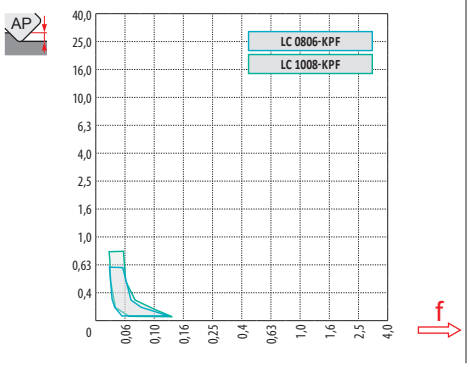
| | LC 08-KP | LC 08-KP | LC 10-KP | LC 10-KP | LC 08-KPF | LC 10-KPF |
|---|---|---|---|---|---|---|
| RE | 0,6 | 1,0 | 0,8 | 1,0 | 0,6 | 0,8 |
| BS | – | – | – | – | – | – |

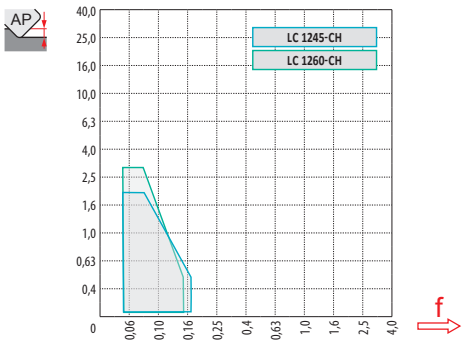
| | LC 1245-CH | LC 1260-CH | LC 1210-RE | LC 1220-RE | LC 1230-RE |
|---|---|---|---|---|---|
| RE | 3×45 | 5×60 | 1,0 | 2,0 | 3,0 |
| BS | – | – | – | – | – |

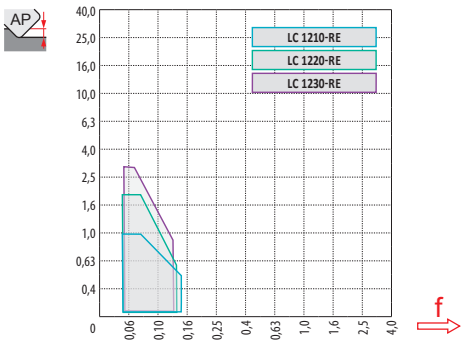


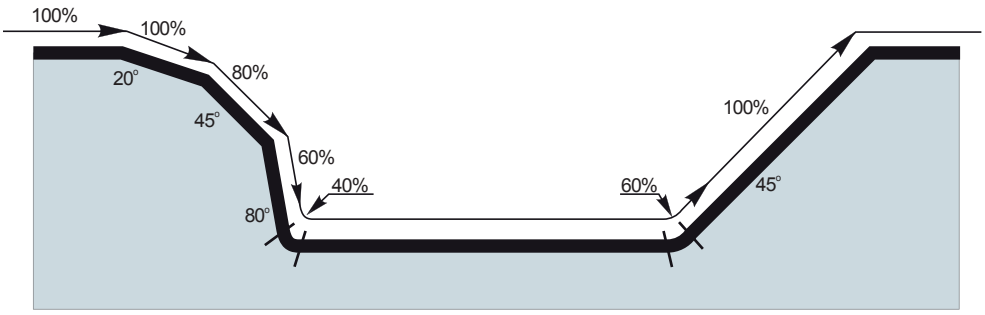



| | DCX | AP | 0,30 | 0,40 | 0,50 | 0,70 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 15,00 | 16,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC 08 / RC 08-F | 8 | DEF | 3,0 | 3,5 | 3,9 | 4,5 | 5,3 | 5,8 | 6,2 | 6,9 | 7,4 | 7,7 | 8,0 | – | – | – | – | – | – | – |
| RC 10 / RC 10-F | 10 | | 3,4 | 3,9 | 4,4 | 5,1 | 6,0 | 6,6 | 7,1 | 8,0 | 8,7 | 9,2 | 9,8 | 10,0 | – | – | – | – | – | – |
| RC 12 / RC 12-F | 12 | | 3,7 | 4,3 | 4,8 | 5,6 | 6,6 | 7,3 | 7,9 | 8,9 | 9,7 | 10,4 | 11,3 | 11,8 | 12,0 | – | – | – | – | – |
| RC 16 / RC 16-F | 16 | | 4,3 | 5,0 | 5,6 | 6,5 | 7,7 | 8,6 | 9,3 | 10,6 | 11,6 | 12,5 | 13,9 | 14,8 | 15,5 | 16,0 | – | – | – | – |
| RC 20 / RC 20-F | 20 | | 4,9 | 5,6 | 6,2 | 7,4 | 8,7 | 9,7 | 10,5 | 12,0 | 13,2 | 14,3 | 16,0 | 17,3 | 18,3 | 19,6 | 20,0 | – | – | – |
| RC 25 / RC 25-F | 25 | | 5,4 | 6,3 | 7,0 | 8,2 | 9,8 | 10,9 | 11,9 | 13,6 | 15,0 | 16,2 | 18,3 | 20,0 | 21,4 | 23,3 | 24,5 | 25,0 | – | – |
| RC 32 / RC 32-F | 32 | | 6,17 | 7,11 | 7,94 | 9,36 | 11,14 | 12,40 | 13,53 | 15,49 | 17,18 | 18,65 | 21,17 | 23,24 | 24,98 | 27,71 | 29,66 | 30,98 | 31,94 | 32,00 |

| | DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC 08 / RC 08-F | 8 | $f_e$ | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |
| RC 10 / RC 10-F | 10 | | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| RC 12 / RC 12-F | 12 | | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| RC 16 / RC 16-F | 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| RC 20 / RC 20-F | 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| RC 25 / RC 25-F | 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| RC 32 / RC 32-F | 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |

| DEF | $a_e$ | 1,0% | 2,5% | 5,0% | 7,5% | 10,0% | 15,0% | 20,0% | 25,0% | 30,0% | 35,0% | 40,0% | 45,0% | 50,0% | 60,0% | 70,0% | 75,0% | 80,0% | 90,0% | 100,0% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AP | | | | | | | | | | ⇨x.f | | | | | | | | | |
| 19,9% | 1,0% | 2,86 | 1,84 | 1,33 | 1,12 | 1,00 | 0,89 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 31,2% | 2,5% | 3,58 | 2,28 | 1,64 | 1,36 | 1,20 | 1,01 | 0,92 | 0,88 | 0,91 | – | – | – | – | – | – | – | – | – | – |
| 43,6% | 5,0% | 4,22 | 2,68 | 1,92 | 1,58 | 1,39 | 1,16 | 1,03 | 0,95 | 0,90 | 0,88 | 0,89 | – | – | – | – | – | – | – | – |
| 52,7% | 7,5% | 4,63 | 2,95 | 2,10 | 1,73 | 1,51 | 1,26 | 1,11 | 1,02 | 0,96 | 0,91 | 0,89 | 0,88 | 0,90 | – | – | – | – | – | – |
| 60,0% | 10,0% | 4,94 | 3,14 | 2,24 | 1,84 | 1,61 | 1,33 | 1,18 | 1,07 | 1,00 | 0,95 | 0,91 | 0,89 | 0,88 | 1,00 | – | – | – | – | – |
| 71,4% | 15,0% | 5,39 | 3,42 | 2,43 | 2,00 | 1,74 | 1,44 | 1,27 | 1,15 | 1,07 | 1,01 | 0,96 | 0,93 | 0,90 | 0,88 | 0,93 | – | – | – | – |
| 80,0% | 20,0% | 5,70 | 3,62 | 2,57 | 2,11 | 1,84 | 1,52 | 1,33 | 1,21 | 1,12 | 1,05 | 1,00 | 0,96 | 0,93 | 0,89 | 0,88 | 0,89 | 1,00 | – | – |
| 86,6% | 25,0% | 5,93 | 3,76 | 2,67 | 2,20 | 1,91 | 1,58 | 1,38 | 1,25 | 1,16 | 1,08 | 1,03 | 0,99 | 0,95 | 0,90 | 0,88 | 0,88 | 0,89 | – | – |
| 91,7% | 30,0% | 6,10 | 3,87 | 2,75 | 2,26 | 1,96 | 1,62 | 1,42 | 1,28 | 1,18 | 1,11 | 1,05 | 1,01 | 0,97 | 0,92 | 0,89 | 0,88 | 0,88 | 0,93 | – |
| 95,4% | 35,0% | 6,23 | 3,95 | 2,80 | 2,30 | 2,00 | 1,65 | 1,44 | 1,31 | 1,20 | 1,13 | 1,07 | 1,02 | 0,98 | 0,93 | 0,89 | 0,88 | 0,88 | 0,90 | – |
| 98,0% | 40,0% | 6,31 | 4,00 | 2,84 | 2,33 | 2,03 | 1,67 | 1,46 | 1,32 | 1,22 | 1,14 | 1,08 | 1,03 | 0,99 | 0,93 | 0,90 | 0,89 | 0,88 | 0,89 | – |
| 99,5% | 45,0% | 6,36 | 4,03 | 2,86 | 2,35 | 2,04 | 1,68 | 1,47 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | – |
| 100,0% | 50,0% | 6,38 | 4,04 | 2,87 | 2,35 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,15 | 1,09 | 1,04 | 1,00 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |



| | DCX | RE | AP 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LC 0806-KP | | 0,6 | 6,8 | 7,8 | 7,9 | 8,0 | 8,0 | – | – | – | – | – | – | – | – | – | – |
| LC 0806-KPF | 8 | 0,6 | 6,8 | 7,8 | 7,9 | 8,0 | 8,0 | – | – | – | – | – | – | – | – | – | – |
| LC 0810-KP | | 1,0 | 6,0 | 7,4 | 7,6 | 7,7 | 7,8 | 7,9 | 8,0 | 8,0 | 8,0 | – | – | – | – | – | – |
| LC 1008-KP | | 0,8 | 8,4 | 9,6 | 9,8 | 9,9 | 9,9 | 10,0 | 10,0 | – | – | – | – | – | – | – | – |
| LC 1008-KPF | 10 | 0,8 | 8,4 | 9,6 | 9,8 | 9,9 | 9,9 | 10,0 | 10,0 | – | – | – | – | – | – | – | – |
| LC 1010-KP | | 1,0 | 8,0 | 9,4 | 9,6 | 9,7 | 9,8 | 9,9 | 10,0 | 10,0 | 10,0 | – | – | – | – | – | – |
| LC 1245-CH | | 3x45 | 8,0 | 8,6 | 8,8 | 9,0 | 9,2 | 9,4 | 9,6 | 9,8 | 10,0 | 10,5 | 11,0 | 12,0 | – | – | – |
| LC 1260-CH | | 5x60 | 9,7 | 10,0 | 10,2 | 10,3 | 10,4 | 10,5 | 10,6 | 10,7 | 10,8 | 11,1 | 11,4 | 12,0 | – | – | – |
| LC 1210-RE | 12 | 1,0 | 10,0 | 10,1 | 10,2 | 10,3 | 10,4 | 10,6 | 10,8 | 11,1 | 12,0 | – | – | – | – | – | – |
| LC 1220-RE | | 2,0 | 8,0 | 8,0 | 8,1 | 8,1 | 8,2 | 8,3 | 8,3 | 8,4 | 8,5 | 8,9 | 9,4 | 12,0 | – | – | – |
| LC 1230-RE | | 3,0 | 6,0 | 6,0 | 6,1 | 6,1 | 6,1 | 6,2 | 6,2 | 6,3 | 6,3 | 6,5 | 6,8 | 7,5 | 8,7 | 12,0 | – |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | $f_e$ | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |
| 10 | | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0,6 | $f_e$ | 0,120 | 0,155 | 0,219 | 0,268 | 0,310 | 0,379 | 0,438 | 0,490 | 0,537 | 0,620 | 0,693 |
| 0,8 | | 0,139 | 0,179 | 0,253 | 0,310 | 0,358 | 0,438 | 0,506 | 0,566 | 0,620 | 0,716 | 0,800 |
| 1,0 | | 0,155 | 0,200 | 0,283 | 0,346 | 0,400 | 0,490 | 0,566 | 0,632 | 0,693 | 0,800 | 0,89 |

| | DCX | RE | max |
|---|---|---|---|
| LC 0806-KP | | 0,6 | 3,0 |
| LC 0806-KPF | 8 | 0,6 | 2,8 |
| LC 0810-KP | | 1,0 | 3,0 |
| LC 1008-KP | | 0,8 | 3,8 |
| LC 1008-KPF | 10 | 0,8 | 3,6 |
| LC 1010-KP | | 1,0 | 3,8 |
| LC 1245-CH | | 3x45 | – |
| LC 1260-CH | | 5x60 | – |
| LC 1210-RE | 12 | 1,0 | – |
| LC 1220-RE | | 2,0 | – |
| LC 1230-RE | | 3,0 | – |

| | DCX | RE | RPMX | APMX / l |
|---|---|---|---|---|
| LC 0806-KP | | 0,6 | 2,5 | 1,5/35 |
| LC 0806-KPF | 8 | 0,6 | 2,2 | 1,5/39 |
| LC 0810-KP | | 1,0 | 2,4 | 1,5/36 |
| LC 1008-KP | | 0,8 | 2,6 | 1,5/33 |
| LC 1008-KPF | 10 | 0,8 | 2,3 | 1,5/38 |
| LC 1010-KP | | 1,0 | 2,6 | 1,5/33 |
| LC 1245-CH | | 3×45 | – | – |
| LC 1260-CH | | 5×60 | – | – |
| LC 1210-RE | 12 | 1,0 | – | – |
| LC 1220-RE | | 2,0 | – | – |
| LC 1230-RE | | 3,0 | – | – |

| | DCX | RE | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ |
|---|---|---|---|---|---|---|
| **LC 0806-KP** | | 0,6 | 9,8 | 15,9 | 0,8 | 1,0 |
| **LC 0806-KPF** | 8 | 0,6 | 10,2 | 15,9 | 0,1 | 0,1 |
| **LC 0810-KP** | | 1,0 | 9,9 | 15,9 | 0,1 | 0,1 |
| **LC 1008-KP** | | 0,8 | 12,2 | 19,9 | 0,9 | 1,1 |
| **LC 1008-KPF** | 10 | 0,8 | 12,6 | 19,9 | 0,2 | 0,2 |
| **LC 1010-KP** | | 1,0 | 12,2 | 19,9 | 0,2 | 0,2 |
| **LC 1245-CH** | | 3×45 | – | – | – | – |
| **LC 1260-CH** | | 5×60 | – | – | – | – |
| **LC 1210-RE** | 12 | 1,0 | – | – | – | – |
| **LC 1220-RE** | | 2,0 | – | – | – | – |
| **LC 1230-RE** | | 3,0 | – | – | – | – |

| | DCX | RE | AP |
|---|---|---|---|
| **LC 0806-KP** | | 0,6 | 0,15 |
| **LC 0806-KPF** | 8 | 0,6 | 0,13 |
| **LC 0810-KP** | | 1,0 | 0,13 |
| **LC 1008-KP** | | 0,8 | 0,2 |
| **LC 1008-KPF** | 10 | 0,8 | 0,18 |
| **LC 1010-KP** | | 1,0 | 0,19 |
| **LC 1245-CH** | | 3×45 | – |
| **LC 1260-CH** | | 5×60 | – |
| **LC 1210-RE** | 12 | 1,0 | – |
| **LC 1220-RE** | | 2,0 | – |
| **LC 1230-RE** | | 3,0 | – |

| | DCX | | | |
|---|---|---|---|---|
| **LC 1245-CH** | 12 | 3×45° | 1,26 | 0,21 |

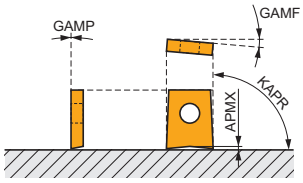
| **Voladizo (múltiplo del diámetro DCDX)** | **<3** | **3 – 3,5** | **3,6 – 4** | **4,1 – 4,5** | **>4,6** |
|---|---|---|---|---|---|
| Factor multiplicacion de velocidad | 1 | 0,9 | 0,8 | 0,7 | 0,5 |

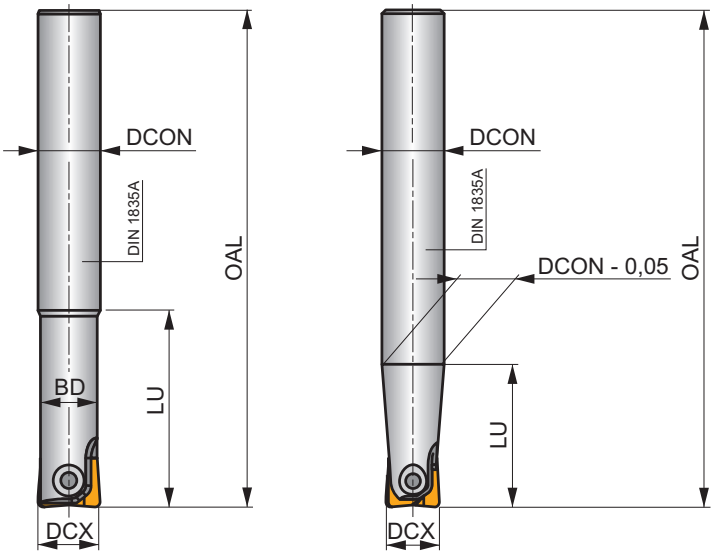
# K2-SLC

P K H

S

| APMX | 1,0 - 4,0 mm |
|---|---|




$h_m$ 0,03 - 0,10

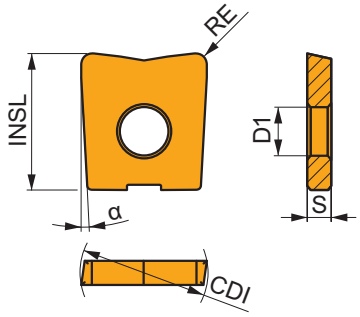
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | BD [mm] | LU [mm] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | **12K2R030A12-SLC12-A** | 12 | 130 | 12 | 10,5 | 30 | 2 | – | 35000 | – | 0,11 | GI037 | CO532 |
| | **16K2R035A16-SLC16-A** | 16 | 140 | 16 | 14,0 | 35 | 2 | – | 22000 | – | 0,20 | GI038 | CO533 |
| | **20K2R045A20-SLC20-A** | 20 | 160 | 20 | 18,0 | 45 | 2 | – | 16000 | – | 0,38 | GI039 | CO534 |

| | | |
|---|---|---|
| GI037 | LC 12-KP | LC 12-KPF |
| GI038 | LC 16-KP | LC 16-KPF |
| GI039 | LC 20-KP | LC 20-KPF |

| | | Nm | | | |
|---|---|---|---|---|---|
| CO532 | CS 5009-T20P | 5,0 | M 5 | 9 | SDR T20P |
| CO533 | CS 5013-T20P | 5,0 | M 5 | 13 | SDR T20P |
| CO534 | CS 5015-T20P | 5,0 | M 5 | 15 | SDR T20P |

# LC

| | α | CDI | D1 | INSL | S |
|---|---|---|---|---|---|
| 12 | 7° | 12,000 | 5,00 | 14,00 | 2,50 |
| 16 | 7° | 16,000 | 5,00 | 16,00 | 3,00 |
| 20 | 7° | 20,000 | 5,00 | 18,00 | 3,00 |



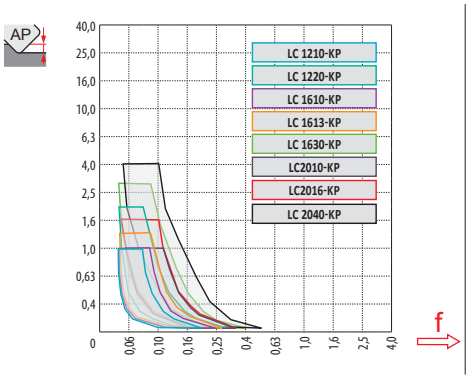

| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LC 1210-KP | M4310 | ◪ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| | M8310 | ■ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | - | 1,0 | 0,08 | 0,25 | 0,1 | 1,0 |
| LC 1220-KP | M4310 | ◪ | | ■ | | | ■ | - | 2,0 | 0,08 | 0,25 | 0,1 | 2,0 |
| LC 1610-KP | M4310 | ◪ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,30 | 0,1 | 1,0 |
| | M8310 | ■ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,30 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | - | 1,0 | 0,08 | 0,30 | 0,1 | 1,0 |
| LC 1613-KP | M4310 | ◪ | | ■ | | | ■ | - | 1,3 | 0,08 | 0,30 | 0,1 | 1,3 |
| | M8310 | ■ | | ■ | | | ■ | - | 1,3 | 0,08 | 0,30 | 0,1 | 1,3 |
| LC 1630-KP | M4310 | ◪ | | ■ | | | ■ | - | 3,0 | 0,08 | 0,30 | 0,1 | 3,0 |
| LC 2010-KP | M4310 | ◪ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,35 | 0,1 | 1,0 |
| | M8310 | ■ | | ■ | | | ■ | - | 1,0 | 0,08 | 0,35 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | - | 1,0 | 0,08 | 0,35 | 0,1 | 1,0 |
| LC 2016-KP | M4310 | ◪ | | ■ | | | ■ | - | 1,6 | 0,08 | 0,35 | 0,1 | 1,6 |
| | M8310 | ■ | | ■ | | | ■ | - | 1,6 | 0,08 | 0,35 | 0,1 | 1,6 |
| LC 2040-KP | M8330 | ■ | | ■ | | | ◪ | - | 4,0 | 0,08 | 0,35 | 0,1 | 4,0 |
| LC 1210-KPF | M4310 | ◪ | | ■ | | | ■ | - | 1,0 | 0,05 | 0,15 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | - | 1,0 | 0,05 | 0,15 | 0,1 | 1,0 |
| LC 1613-KPF | M4310 | ◪ | | ■ | | | ■ | - | 1,3 | 0,05 | 0,15 | 0,1 | 1,3 |
| LC 2016-KPF | M4310 | ◪ | | ■ | | | ■ | - | 1,6 | 0,05 | 0,15 | 0,1 | 1,6 |

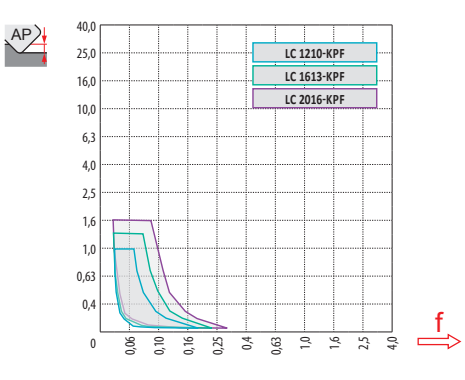
| ISO | | FN | FX | M4310 | M8310 | M8330 |
|---|---|---|---|---|---|---|
| P | ● | 0,05 | 0,10 | 264 | 310 | 279 |
| | | 0,10 | 0,20 | | | |
| | | 0,15 | 0,30 | | | |
| | | 0,05 | 0,09 | 239 | 281 | 253 |
| | | 0,10 | 0,18 | | | |
| | | 0,15 | 0,27 | | | |
| | ✖ | 0,05 | 0,07 | 213 | 251 | 226 |
| | | 0,10 | 0,14 | | | |
| | | 0,15 | 0,20 | | | |
| K | ● | 0,05 | 0,10 | 249 | 293 | 264 |
| | | 0,10 | 0,20 | | | |
| | | 0,15 | 0,30 | | | |
| | | 0,05 | 0,09 | 228 | 268 | 241 |
| | | 0,10 | 0,18 | | | |
| | | 0,15 | 0,27 | | | |
| | ✖ | 0,05 | 0,07 | 202 | 238 | 214 |
| | | 0,10 | 0,14 | | | |
| | | 0,15 | 0,20 | | | |
| H | ● | 0,05 | 0,10 | 49 | 60 | 54 |
| | | 0,10 | 0,20 | | | |
| | | 0,15 | 0,30 | | | |
| | | 0,05 | 0,09 | 45 | 55 | 50 |
| | | 0,10 | 0,18 | | | |
| | | 0,15 | 0,27 | | | |
| | ✖ | 0,05 | 0,07 | 39 | 47 | 42 |
| | | 0,10 | 0,14 | | | |
| | | 0,15 | 0,20 | | | |

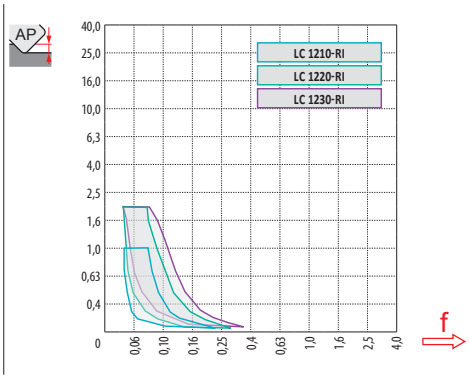
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,20 | 0,90 | 0,70 | 0,85 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | LC 12-KP | LC 12-KP | LC 16-KP | LC 16-KP | LC 16-KP | LC 20-KP | LC 20-KP | LC 20-KP |
|---|---|---|---|---|---|---|---|---|
| RE | 1,0 | 2,0 | 1,0 | 1,3 | 3,0 | 1,0 | 1,6 | 4,0 |
| BS | – | – | – | – | – | – | – | – |

| | LC 12-KPF | LC 16-KPF | LC 20-KP | LC 1215-RI | LC 1220-RI | LC 1230-RI |
|---|---|---|---|---|---|---|
| RE | 1,0 | 1,3 | 1,6 | 1,5 | 2,0 | 3,0 |
| BS | – | – | – | – | – | – |




| | DCX | RE | 0,00 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,25 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AP | | | | | | | | | | | | | | |
| LC 1210-KP | 12 | 1,0 | 10,0 | 11,4 | 11,6 | 11,7 | 11,8 | 11,9 | 12,0 | 12,0 | 12,0 | – | – | – | – | – | – |
| LC 1210-KPF | | 1,0 | 10,0 | 11,4 | 11,6 | 11,7 | 11,8 | 11,9 | 12,0 | 12,0 | 12,0 | – | – | – | – | – | – |
| LC 1220-KP | | 2,0 | 8,0 | 10,1 | 10,4 | 10,6 | 10,9 | 11,0 | 11,2 | 11,3 | 11,5 | 11,7 | 11,9 | 12,0 | – | – | – |
| LC 1210-RI | | 1,0 | 10,0 | 11,4 | 11,6 | 11,7 | 11,8 | 11,9 | 12,0 | 12,0 | 12,0 | – | – | – | – | – | – |
| LC 1220-RI | | 2,0 | 8,0 | 10,1 | 10,4 | 10,6 | 10,9 | 11,0 | 11,2 | 11,3 | 11,5 | 11,7 | 11,9 | 12,0 | – | – | – |
| LC 1230-RI | | 3,0 | 6,0 | 8,6 | 9,0 | 9,3 | 9,6 | 9,9 | 10,1 | 10,3 | 10,5 | 10,9 | 11,2 | 11,7 | 11,9 | – | – |
| LC 1610-KP | 16 | 1,0 | 14,0 | 15,4 | 15,6 | 15,7 | 15,8 | 15,9 | 16,0 | 16,0 | 16,0 | – | – | – | – | – | – |
| LC 1613-KP | | 1,3 | 13,4 | 15,1 | 15,3 | 15,4 | 15,6 | 15,7 | 15,8 | 15,9 | 15,9 | 16,0 | – | – | – | – | – |
| LC 1613-KPF | | 1,3 | 13,4 | 15,1 | 15,3 | 15,4 | 15,6 | 15,7 | 15,8 | 15,9 | 15,9 | 16,0 | – | – | – | – | – |
| LC 1630-KP | | 3,0 | 10,0 | 12,6 | 13,0 | 13,3 | 13,6 | 13,9 | 14,1 | 14,3 | 14,5 | 14,9 | 15,2 | 15,7 | 15,9 | – | – |
| LC 2010-KP | 20 | 1,0 | 18,0 | 19,4 | 19,6 | 19,7 | 19,8 | 19,9 | 20,0 | 20,0 | 20,0 | – | – | – | – | – | – |
| LC 2016-KP | | 1,6 | 16,8 | 18,7 | 18,9 | 19,1 | 19,3 | 19,4 | 19,6 | 19,7 | 19,8 | 19,9 | 20,0 | – | – | – | – |
| LC 2016-KPF | | 1,6 | 16,8 | 18,7 | 18,9 | 19,1 | 19,3 | 19,4 | 19,6 | 19,7 | 19,8 | 19,9 | 20,0 | – | – | – | – |
| LC 2040-KP | | 4,0 | 12,0 | 15,0 | 15,5 | 15,9 | 16,2 | 16,5 | 16,8 | 17,1 | 17,3 | 17,8 | 18,2 | 18,9 | 19,4 | – | – |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | $f_e$ | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |

| RE | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3 | $f_e$ | 0,177 | 0,228 | 0,322 | 0,395 | 0,456 | 0,559 | 0,645 | 0,721 | 0,790 | 0,912 | 1,020 |
| 1,6 | | 0,196 | 0,253 | 0,358 | 0,438 | 0,506 | 0,620 | 0,716 | 0,800 | 0,876 | 1,012 | 1,131 |
| 2,0 | | 0,219 | 0,283 | 0,400 | 0,490 | 0,566 | 0,693 | 0,800 | 0,894 | 0,980 | 1,131 | 1,265 |
| 3,0 | | 0,268 | 0,346 | 0,490 | 0,600 | 0,693 | 0,849 | 0,980 | 1,095 | 1,200 | 1,386 | 1,549 |
| 4,0 | | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |

| | DCX | RE | max |
|---|---|---|---|
| LC 1210-KP | 12 | 1,0 | 4,8 |
| LC 1210-KPF | | 1,0 | 4,4 |
| LC 1220-KP | | 2,0 | 4,8 |
| LC 1210-RI | | 1,0 | – |
| LC 1220-RI | | 2,0 | – |
| LC 1230-RI | | 3,0 | – |
| LC 1610-KP | 16 | 1,0 | 6,6 |
| LC 1613-KP | | 1,3 | 6,6 |
| LC 1613-KPF | | 1,3 | 5,9 |
| LC 1630-KP | | 3,0 | 6,6 |
| LC 2010-KP | 20 | 1,0 | 8,5 |
| LC 2016-KP | | 1,6 | 8,5 |
| LC 2016-KPF | | 1,6 | 7,5 |
| LC 2040-KP | | 4,0 | 8,5 |

| | DCX | RE | RPMX | APMX / l |
|---|---|---|---|---|
| LC 1210-KP | 12 | 1,0 | 4,7 | 1,5/19 |
| LC 1210-KPF | | 1,0 | 3,8 | 1,5/23 |
| LC 1220-KP | | 2,0 | 4,4 | 2,0/26 |
| LC 1210-RI | | 1,0 | – | – |
| LC 1220-RI | | 2,0 | – | – |
| LC 1230-RI | | 3,0 | – | – |
| LC 1610-KP | 16 | 1,0 | 4,8 | 1,5/18 |
| LC 1613-KP | | 1,3 | 4,8 | 1,5/18 |
| LC 1613-KPF | | 1,3 | 3,8 | 1,5/23 |
| LC 1630-KP | | 3,0 | 4,4 | 3,0/39 |
| LC 2010-KP | 20 | 1,0 | 5,0 | 1,5/18 |
| LC 2016-KP | | 1,6 | 4,9 | 1,6/19 |
| LC 2016-KPF | | 1,6 | 3,8 | 1,6/25 |
| LC 2040-KP | | 4,0 | 4,5 | 4,0/51 |

| | DCX | RE | $d_{min}$ | $d_{max}$ | $S_{max}$ / $d_{min}$ | $S_{max}$ / $d_{max}$ |
|---|---|---|---|---|---|---|
| LC 1210-KP | 12 | 1,0 | 14,1 | 23,9 | 1,0 | 1,2 |
| LC 1210-KPF | | 1,0 | 15,0 | 23,9 | 0,4 | 0,4 |
| LC 1220-KP | | 2,0 | 14,1 | 23,9 | 0,3 | 0,3 |
| LC 1210-RI | | 1,0 | – | – | – | – |
| LC 1220-RI | | 2,0 | – | – | – | – |
| LC 1230-RI | | 3,0 | – | – | – | – |
| LC 1610-KP | 16 | 1,0 | 18,6 | 31,9 | 1,1 | 1,4 |
| LC 1613-KP | | 1,3 | 18,6 | 31,9 | 0,6 | 0,6 |
| LC 1613-KPF | | 1,3 | 19,9 | 31,9 | 0,5 | 0,5 |
| LC 1630-KP | | 3,0 | 18,6 | 31,9 | 0,4 | 0,4 |
| LC 2010-KP | 20 | 1,0 | 22,8 | 39,9 | 1,3 | 1,5 |
| LC 2016-KP | | 1,6 | 22,8 | 39,9 | 0,8 | 0,8 |
| LC 2016-KPF | | 1,6 | 24,8 | 39,9 | 0,7 | 0,7 |
| LC 2040-KP | | 4,0 | 22,8 | 39,9 | 0,5 | 0,5 |

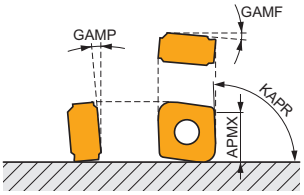
| | DCX | RE | AP |
|---|---|---|---|
| LC 1210-KP | 12 | 1,0 | 0,44 |
| LC 1210-KPF | | 1,0 | 0,9 |
| LC 1220-KP | | 2,0 | 0,4 |
| LC 1210-RI | | 1,0 | – |
| LC 1220-RI | | 2,0 | – |
| LC 1230-RI | | 3,0 | – |
| LC 1610-KP | 16 | 1,0 | 0,65 |
| LC 1613-KP | | 1,3 | 0,62 |
| LC 1613-KPF | | 1,3 | 0,53 |
| LC 1630-KP | | 3,0 | 0,44 |
| LC 2010-KP | 20 | 1,0 | 0,85 |
| LC 2016-KP | | 1,6 | 0,79 |
| LC 2016-KPF | | 1,6 | 0,67 |
| LC 2040-KP | | 4,0 | 0,54 |

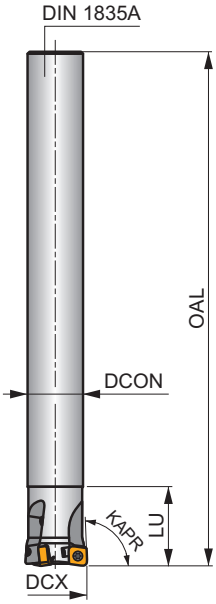
| Voladizo (múltiplo del diámetro DCDX) | <3 | 3 – 3,5 | 3,6 – 4 | 4,1 – 4,5 | >4,6 |
|---|---|---|---|---|---|
| Factor multiplicacion de velocidad | 1 | 0,9 | 0,8 | 0,7 | 0,5 |

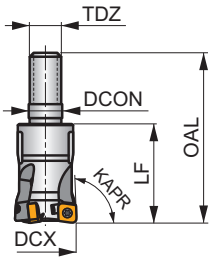
# SCN05C

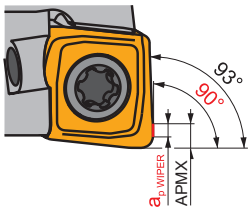
P K H S

| | |
|---|---|
| KAPR | 93° |
| APMX($a_{p\ WIPER}$) | 1,0 (0,5 mm) |




$h_m$ 0,02 - 0,07

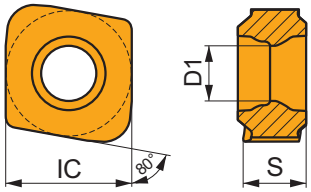
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | M [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | **12A2R020A10-SCN05C-C** | 12 | 100 | 10 | 20 | – | – | -15 | -8 | 2 | – | 48700 | ✓ | 0,05 | GI330 | CO601 |
| | **16A3R020A14-SCN05C-C** | 16 | 130 | 14 | 20 | – | – | -13,5 | -7,8 | 3 | – | 42200 | ✓ | 0,13 | GI330 | CO601 |
| | **20A5R020A18-SCN05C-C** | 20 | 160 | 18 | 20 | – | – | -12,7 | -7,5 | 5 | ✓ | 37700 | ✓ | 0,28 | GI330 | CO601 |
| MODULAR | **12A2R020M06-SCN05C-C** | 12 | 35 | – | – | 20 | M6 | -15 | -8 | 2 | – | – | ✓ | 0,01 | GI330 | CO601 |
| | **16A3R025M08-SCN05C-C** | 16 | 43 | – | – | 25 | M8 | -13,5 | -7,8 | 3 | – | – | ✓ | 0,03 | GI330 | CO601 |
| | **20A5R030M10-SCN05C-C** | 20 | 49 | – | – | 30 | M10 | -12,7 | -7,5 | 5 | ✓ | – | ✓ | 0,05 | GI330 | CO601 |

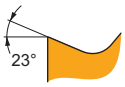
| | |
|---|---|
| GI330 | CNHX 0502.. |

| | | Nm | | | |
|---|---|---|---|---|---|
| CO601 | US 62005-T06P | 0,9 | M 2 | 4,9 | Flag T06P |

# CNHX 05

| | IC | D1 | S |
|---|---|---|---|
| 0502 | 4,800 | 2,10 | 2,40 |



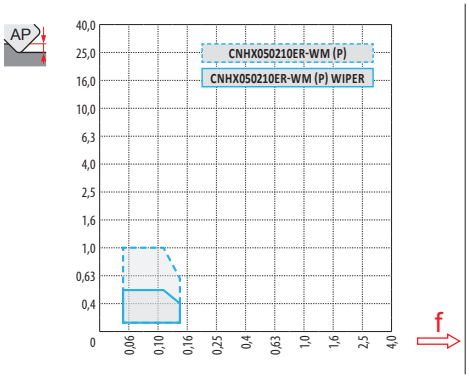

| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNHX 050205ER-WM | M4310 | ◪ | | ■ | | | ■ | ● | - | 0,5 | 0,05 | 0,15 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | ⬢ | - | 0,5 | 0,05 | 0,15 | 0,1 | 1,0 |
| CNHX 050210ER-WM | M4310 | ◪ | | ■ | | | ■ | ⬢ | - | 1,0 | 0,05 | 0,15 | 0,1 | 1,0 |
| | M8330 | ■ | | ■ | | | ◪ | ⬢ | - | 1,0 | 0,05 | 0,15 | 0,1 | 1,0 |

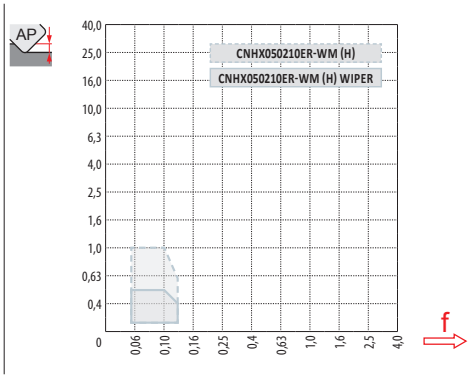
| ISO | | FN | FX | M4310 | M8330 |
|---|---|---|---|---|---|
| P | ● | 0,05 | 0,15 | 350 | 365 |
| | ⬢ | 0,05 | 0,12 | 315 | 329 |
| | ✖ | 0,05 | 0,10 | 280 | 292 |
| K | ● | 0,05 | 0,15 | 330 | 345 |
| | ⬢ | 0,20 | 0,12 | 297 | 311 |
| | ✖ | 0,20 | 0,10 | 264 | 276 |
| H | ● | 0,05 | 0,15 | 71 | 68 |
| | ⬢ | 0,05 | 0,12 | 64 | 61 |
| | ✖ | 0,05 | 0,10 | 57 | 54 |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |

| $a_e$ / DCX | 0,005 | 0,01 | 0,02 | 0,03 | 0,04 | 0,05 |
|---|---|---|---|---|---|---|
| X.V | 2,04 | 1,85 | 1,68 | 1,59 | 1,53 | 1,48 |

| | CNHX 05-WM | |
|---|---|---|
| RE | 0,5 | 1,0 |
| BS | 0,50 | 0,50 |




| DCX | max. |
|---|---|
| 12 | 0,4 |
| 16 | 0,4 |
| 20 | 0,5 |

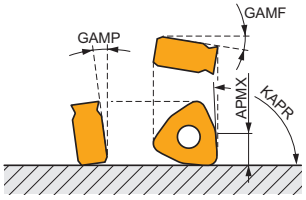
| DCX | RPMX | APMX / l |
|---|---|---|
| 12 | 2,4 | 1/25 |
| 14 | 1,5 | 1/40 |
| 16 | 1,1 | 1/54 |

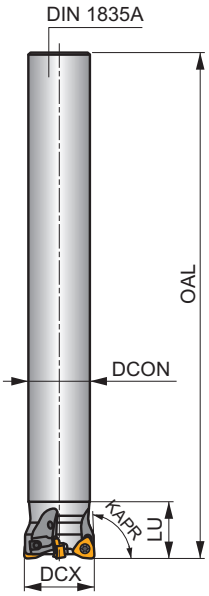
# SWN04C

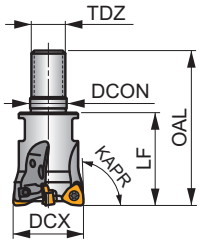
P K H

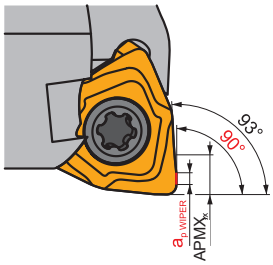
S

| | |
|---|---|
| KAPR | 93° |
| APMX($a_{p\,WIPER}$) | 2,0 (0,5 mm) |




$h_m$ 0,02 - 0,07

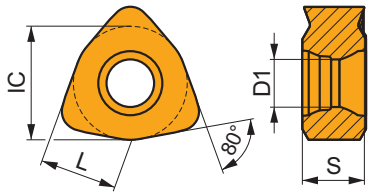
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | TDZ [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | **20A3R020A18-SWN04C-C** | 20 | 160 | 18 | 20 | – | – | -12 | -8 | 3 | – | 19700 | ✓ | 0,27 | GI331 | CO602 |
| | **25A4R020A22-SWN04C-C** | 25 | 180 | 22 | 20 | – | – | -11,5 | -8 | 4 | ✓ | 26600 | ✓ | 0,45 | GI331 | CO602 |
| | **32A6R020A25-SWN04C-C** | 32 | 200 | 25 | 20 | – | – | -11,2 | -8 | 6 | ✓ | 23500 | ✓ | 0,69 | GI331 | CO602 |
| MODULAR | **20A3R030M10-SWN04C-C** | 20 | 49 | – | – | 30 | M10 | -12 | -8 | 3 | – | – | ✓ | 0,05 | GI331 | CO602 |
| | **25A4R033M12-SWN04C-C** | 25 | 55 | – | – | 33 | M12 | -11,5 | -8 | 4 | ✓ | – | ✓ | 0,08 | GI331 | CO602 |
| | **32A6R040M16-SWN04C-C** | 32 | 63 | – | – | 40 | M16 | -11,2 | -8 | 6 | ✓ | – | ✓ | 0,19 | GI331 | CO602 |
| | **35A6R043M16-SWN04C-C** | 35 | 66 | – | – | 43 | M16 | -11,1 | -8 | 6 | ✓ | – | ✓ | 0,22 | GI331 | CO602 |

| | |
|---|---|
| GI331 | WNHX 0403.. |

| | | Nm | | | |
|---|---|---|---|---|---|
| CO602 | US 42507-T07P | 1,2 | M 2,5 | 7 | Flag T07P |

# WNHX 04

| | IC | D1 | S |
|---|---|---|---|
| 0403 | 6,200 | 2,60 | 3,38 |




| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNHX 040305ER-WM | M4310 | ◪ | | ■ | | | ■ | ● | - | 0,5 | 0,05 | 0,25 | 0,1 | 2,0 |
| | M8330 | ■ | | ■ | | | ◪ | ⬢ | - | 0,5 | 0,05 | 0,25 | 0,1 | 2,0 |
| WNHX 040310ER-WM | M4310 | ◪ | | ■ | | | ■ | ⬢ | - | 1,0 | 0,05 | 0,25 | 0,1 | 2,0 |
| | M8330 | ■ | | ■ | | | ◪ | ⬢ | - | 1,0 | 0,05 | 0,25 | 0,1 | 2,0 |
| WNHX 040315ER-WM | M4310 | ◪ | | ■ | | | ■ | ⬢ | - | 1,5 | 0,05 | 0,25 | 0,1 | 2,0 |
| | M8330 | ■ | | ■ | | | ◪ | ⬢ | - | 1,5 | 0,05 | 0,25 | 0,1 | 2,0 |

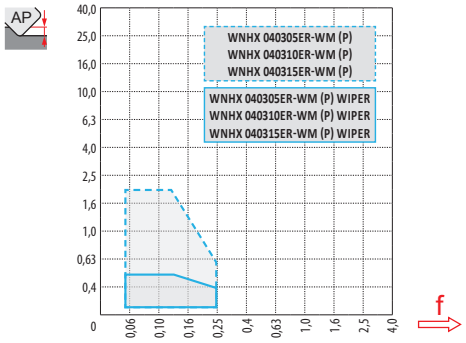
15°

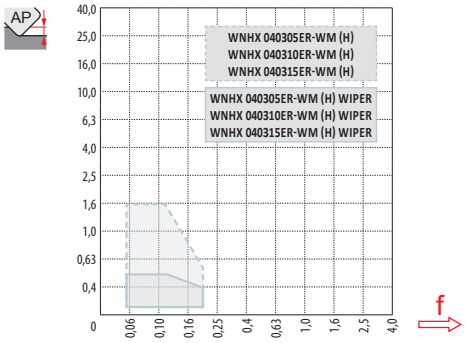
| ISO | | FN | FX | M4310 | M8330 |
|---|---|---|---|---|---|
| P | ● | 0,05 | 0,15 | 327 | 345 |
| | ⬢ | 0,05 | 0,12 | 294 | 311 |
| | ✖ | 0,05 | 0,10 | 261 | 276 |
| K | ● | 0,05 | 0,15 | 308 | 326 |
| | ⬢ | 0,20 | 0,12 | 278 | 293 |
| | ✖ | 0,20 | 0,10 | 247 | 261 |
| H | ● | 0,05 | 0,15 | 68 | 64 |
| | ⬢ | 0,05 | 0,12 | 61 | 58 |
| | ✖ | 0,05 | 0,10 | 54 | 51 |

| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |

| $a_e$ / DCX | 0,005 | 0,01 | 0,02 | 0,03 | 0,04 | 0,05 |
|---|---|---|---|---|---|---|
| X.V | 2,04 | 1,85 | 1,68 | 1,59 | 1,53 | 1,48 |

| | WNHX 04-WM | | |
|---|---|---|---|
| RE | 0,5 | 1,0 | 1,5 |
| BS | 0,50 | 0,50 | 0,50 |




| DCX | max |
|---|---|
| 20 | 0,4 |
| 25 | 0,5 |
| 32 | 0,5 |
| 35 | 0,5 |

| DCX | RPMX | APMX / I |
|---|---|---|
| 20 | 0,7 | 1,1/100 |
| 25 | 0,5 | 0,75/100 |
| 32 | 03 | 0,4/100 |
| 35 | 0,3 | 0,4/100 |

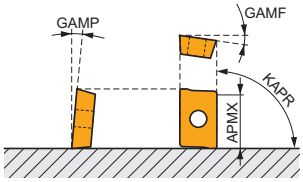
# SAD07D

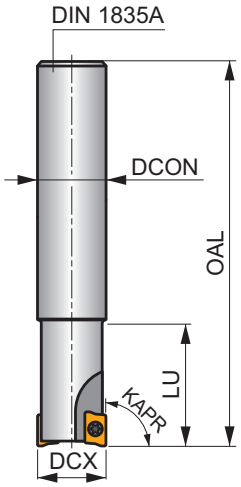
P M K N S

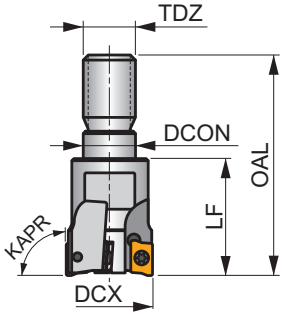
S

**FORCE** *AD*

| | |
|---|---|
| KAPR | 90° |
| APMX | 5,0 mm |




$h_m$ 0,03 - 0,08

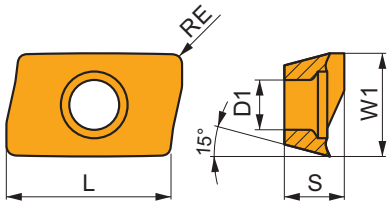
| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | LU [mm] | LF [mm] | TDZ [mm] | GAMF [°] | GAMP [°] | | | max. | | kg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 10A2R016A08-SAD07D-C | 10 | 100 | 8 | 16 | – | – | -12 | +8 | 2 | – | 61600 | ✓ | 0,07 | GI276 | SQ010 |
| | 10A2R016A10-SAD07D-C | 10 | 80 | 10 | 16 | – | – | -12 | +8 | 2 | – | 61600 | ✓ | 0,07 | GI276 | SQ010 |
| | 10A2R018A08-SAD07D-CF | 10 | 100 | 8 | 18 | – | – | -12 | +8 | 2 | – | 61600 | ✓ | 0,03 | GI276 | SQ010 |
| | 10A2R018A10-SAD07D-CF | 10 | 80 | 10 | 18 | – | – | -12 | +8 | 2 | – | 61600 | ✓ | 0,04 | GI276 | SQ010 |
| | 12A2R018A10-SAD07D-C | 12 | 120 | 10 | 18 | – | – | -10 | +8 | 2 | – | 56300 | ✓ | 0,09 | GI276 | SQ010 |
| | 12A2R018A12-SAD07D-C | 12 | 90 | 12 | 18 | – | – | -10 | +8 | 2 | – | 56300 | ✓ | 0,10 | GI276 | SQ010 |
| | 12A3R018A12-SAD07D-C | 12 | 90 | 12 | 18 | – | – | -10 | +8 | 3 | – | 56200 | ✓ | 0,10 | GI276 | SQ010 |
| | 12A3R020A12-SAD07D-CF | 12 | 90 | 12 | 20 | – | – | -10 | +8 | 3 | – | 56200 | ✓ | 0,07 | GI276 | SQ010 |
| | 14A3R018A12-SAD07D-C | 14 | 140 | 12 | 18 | – | – | -9 | +8 | 3 | – | 52100 | ✓ | 0,15 | GI276 | SQ010 |
| | 14A3R018A14-SAD07D-C | 14 | 90 | 14 | 18 | – | – | -9 | +8 | 3 | – | 52100 | ✓ | 0,12 | GI276 | SQ010 |
| | 14A3R020A12-SAD07D-CF | 14 | 140 | 12 | 20 | – | – | -9 | +8 | 3 | – | 52100 | ✓ | 0,10 | GI276 | SQ010 |
| | 14A3R020A14-SAD07D-CF | 14 | 90 | 14 | 20 | – | – | -9 | +8 | 3 | – | 52100 | ✓ | 0,09 | GI276 | SQ010 |
| | 16A3R019A14-SAD07D-C | 16 | 160 | 14 | 19 | – | – | -8 | +8 | 3 | – | 48700 | ✓ | 0,21 | GI276 | SQ011 |
| | 16A3R019A16-SAD07D-C | 16 | 110 | 16 | 19 | – | – | -8 | +8 | 3 | – | 48700 | ✓ | 0,18 | GI276 | SQ011 |
| | 16A4R019A16-SAD07D-C | 16 | 110 | 16 | 19 | – | – | -8 | +8 | 4 | – | 48700 | ✓ | 0,18 | GI276 | SQ011 |
| | 18A4R019A16-SAD07D-C | 18 | 180 | 16 | 19 | – | – | -7,5 | +8 | 4 | ✓ | 45900 | ✓ | 0,29 | GI276 | SQ011 |
| | 18A4R019A18-SAD07D-C | 18 | 110 | 18 | 19 | – | – | -7,5 | +8 | 4 | ✓ | 45900 | ✓ | 0,22 | GI276 | SQ011 |
| | 20A4R020A18-SAD07D-C | 20 | 200 | 18 | 20 | – | – | -7 | +8 | 4 | ✓ | 43600 | ✓ | 0,38 | GI276 | SQ011 |
| | 20A4R020A20-SAD07D-C | 20 | 125 | 20 | 20 | – | – | -7 | +8 | 4 | ✓ | 43600 | ✓ | 0,30 | GI276 | SQ011 |
| | 20A5R020A20-SAD07D-C | 20 | 125 | 20 | 20 | – | – | -7 | +8 | 5 | ✓ | 43600 | ✓ | 0,30 | GI276 | SQ011 |
| | 25A5R024A25-SAD07D-C | 25 | 140 | 25 | 24 | – | – | -6,5 | +8 | 5 | ✓ | 39000 | ✓ | 0,52 | GI276 | SQ011 |
| | 25A6R024A25-SAD07D-C | 25 | 140 | 25 | 24 | – | – | -6,5 | +8 | 6 | ✓ | 39000 | ✓ | 0,52 | GI276 | SQ011 |
| MODULAR | 12A2R020M06-SAD07D-C | 12 | 35 | 6,5 | – | 20 | M6 | -10 | +8 | 2 | – | – | ✓ | 0,05 | GI276 | SQ010 |
| | 14A3R020M08-SAD07D-C | 14 | 38 | 8,5 | – | 20 | M8 | -9 | +8 | 3 | – | – | ✓ | 0,05 | GI276 | SQ010 |
| | 14A3R023M08-SAD07D-CF | 14 | 41 | 8,5 | – | 23 | M8 | -9 | +8 | 3 | – | – | ✓ | 0,02 | GI276 | SQ010 |
| | 16A4R023M08-SAD07D-C | 16 | 41 | 8,5 | – | 23 | M8 | -8 | +8 | 4 | ✓ | – | ✓ | 0,06 | GI276 | SQ011 |
| | 20A5R030M10-SAD07D-C | 20 | 49 | 10,5 | – | 30 | M10 | -7 | +8 | 5 | ✓ | – | ✓ | 0,09 | GI276 | SQ011 |
| | 25A6R035M12-SAD07D-C | 25 | 57 | 12,5 | – | 35 | M12 | -6,5 | +8 | 6 | ✓ | – | ✓ | 0,13 | GI276 | SQ011 |
| | 32A8R043M16-SAD07D-C | 32 | 66 | 17 | – | 43 | M16 | -6 | +8 | 8 | ✓ | – | ✓ | 0,25 | GI276 | SQ011 |

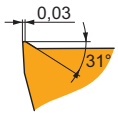
| | | |
|---|---|---|
| GI276 | ADMX 0702.. | ADEX 0702.. |

| | | Nm | | | |
|---|---|---|---|---|---|
| SQ010 | US 62003A-T06P | 0,6 | M 2 | 3 | Flag T06P |
| SQ011 | US 62004A-T06P | 0,6 | M 2 | 4 | Flag T06P |

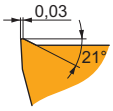
## ADMX 07

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 0702 | 4,482 | 2,20 | 6,95 | 2,48 |



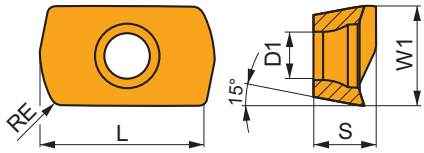



| ISO | | P | M | K | N | S | H | ? | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 070202SR-F | M8330 | ■ | ◪ | ◪ | ◪ | ◪ | | ● | - | 0,2 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ● | +/- | 0,2 | 0,02 | 0,10 | 0,1 | 5,0 |
| ADMX 070204SR-F | M9340 | ◪ | ■ | | | ◪ | | ● | --- | 0,4 | 0,02 | 0,08 | 0,1 | 5,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ⚙ | - | 0,4 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ● | - | 0,4 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ◪ | ◪ | ◪ | | ⚙ | - | 0,4 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⚙ | +/- | 0,4 | 0,02 | 0,10 | 0,1 | 5,0 |
| ADMX 070208SR-F | M6330 | ◪ | ■ | | | ◪ | | ⚙ | - | 0,8 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ⚙ | - | 0,8 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ◪ | ◪ | ◪ | | ⚙ | - | 0,8 | 0,02 | 0,10 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⚙ | +/- | 0,8 | 0,02 | 0,10 | 0,1 | 5,0 |
| ADMX 070202SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,2 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ● | + / - | 0,2 | 0,03 | 0,12 | 0,1 | 5,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,2 | 0,03 | 0,12 | 0,1 | 5,0 |
| ADMX 070204SR-M | M9340 | ◪ | ■ | | | ◪ | | ● | - - - | 0,4 | 0,03 | 0,10 | 0,1 | 5,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ⚙ | - | 0,4 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,4 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 0,4 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⚙ | + / - | 0,4 | 0,03 | 0,12 | 0,1 | 5,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,4 | 0,03 | 0,12 | 0,1 | 5,0 |
| ADMX 070208SR-M | M9340 | ◪ | ■ | | | ◪ | | ⚙ | - - - | 0,8 | 0,03 | 0,10 | 0,1 | 5,0 |
| | M6330 | ◪ | ■ | | | ◪ | | ⚙ | - | 0,8 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 0,8 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 0,8 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⚙ | + / - | 0,8 | 0,03 | 0,12 | 0,1 | 5,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 0,8 | 0,03 | 0,12 | 0,1 | 5,0 |
| ADMX 070212SR-M | M8340 | ■ | ■ | ◪ | | ◪ | | ⚙ | +/- | 1,2 | 0,03 | 0,12 | 0,1 | 5,0 |
| ADMX 070216SR-M | M8310 | ■ | ◪ | ◪ | | ◪ | | ⚙ | - | 1,6 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 1,6 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | +/- | 1,6 | 0,03 | 0,12 | 0,1 | 5,0 |
| ADMX 070220SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 2,0 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 2,0 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 2,0 | 0,03 | 0,12 | 0,1 | 5,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 2,0 | 0,03 | 0,12 | 0,1 | 5,0 |

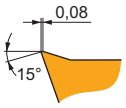


# ADEX 07-HF

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 0702 | 4,439 | 2,20 | 6,45 | 2,48 |

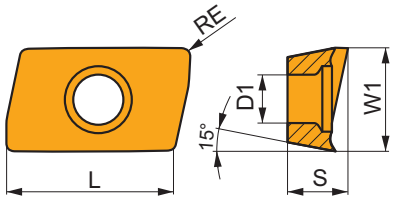



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 070206SR-HF | M6330 | ◪ | ■ | | | ◪ | | ● | - | 0,6 | 0,20 | 0,90 | 0,1 | 0,3 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | ◪ | ● | - | 0,6 | 0,20 | 0,90 | 0,1 | 0,3 |
| | M8340 | ■ | ■ | | | ◪ | | ● | + / - | 0,6 | 0,20 | 0,90 | 0,1 | 0,3 |

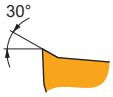



# ADEX 07-FA

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 0702 | 4,497 | 2,20 | 6,95 | 2,48 |

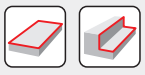



| ISO | | P | M | K | N | S | H | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 070204FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,4 | 0,03 | 0,20 | 0,1 | 5,0 |
| | HF7 | | | | ■ | | | ● | + / - | 0,4 | 0,03 | 0,20 | 0,1 | 5,0 |
| ADEX 070208FR-FA | HF7 | | | | ■ | | | ● | + / - | 0,8 | 0,03 | 0,20 | 0,1 | 5,0 |



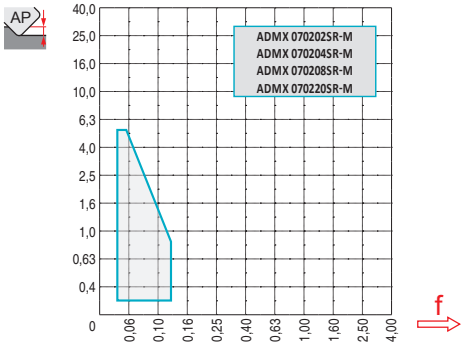
| ISO | | FN | FX | M0315 | M9340 | M6330 | M8310 | M8330 | M8340 | 8215 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,03 | 0,12 | – | 276 | 236 | 292 | 296 | 252 | 276 | – |
| | ⧗ | 0,03 | 0,08 | – | 248 | 212 | 264 | 264 | 224 | 244 | – |
| | ✖ | 0,03 | 0,05 | – | 220 | 184 | 236 | 228 | 196 | 216 | – |
| M | ● | 0,03 | 0,12 | – | 164 | 168 | 148 | 168 | 148 | 164 | – |
| | ⧗ | 0,03 | 0,08 | – | 148 | 148 | 132 | 151 | 132 | 148 | – |
| | ✖ | 0,03 | 0,05 | – | 132 | 128 | 120 | 134 | 116 | 128 | – |
| K | ● | 0,03 | 0,12 | – | – | – | 276 | 282 | 240 | 260 | – |
| | ⧗ | 0,03 | 0,08 | – | – | – | 252 | 251 | 212 | 232 | – |
| | ✖ | 0,03 | 0,05 | – | – | – | 224 | 220 | 184 | 204 | – |
| N | ● | 0,03 | 0,20 | 684 | – | – | – | - | – | – | 306 |
| | ⧗ | 0,03 | 0,16 | 612 | – | – | – | - | – | – | 275 |
| | ✖ | 0,03 | 0,12 | 536 | – | – | – | - | – | – | 239 |
| S | ● | 0,03 | 0,12 | – | 80 | 84 | 72 | 82 | 72 | 80 | – |
| | ⧗ | 0,03 | 0,08 | – | 72 | 72 | 64 | 73 | 64 | 72 | – |
| | ✖ | 0,03 | 0,05 | – | 64 | 64 | 60 | 65 | 56 | 64 | – |
| H | ● | 0,03 | 0,12 | – | – | 80 | – | - | 75 | – | – |
| | ⧗ | 0,03 | 0,08 | – | – | 70 | – | - | 65 | – | – |
| | ✖ | 0,03 | 0,05 | – | – | 60 | – | - | 55 | – | – |

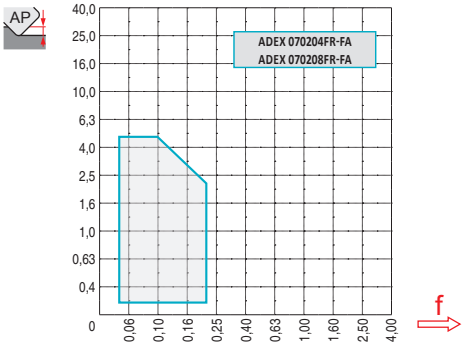
| HFC | | FN | FX | M8330 | M8340 | M6330 |
|---|---|---|---|---|---|---|
| P | ● | 0,20 | 0,90 | 265 | 250 | 235 |
| | ⧗ | 0,20 | 0,70 | 235 | 220 | 210 |
| | ✖ | 0,20 | 0,50 | 205 | 190 | 180 |
| M | ● | 0,20 | 0,90 | 160 | 150 | 165 |
| | ⧗ | 0,20 | 0,70 | 140 | 130 | 145 |
| | ✖ | 0,20 | 0,50 | 125 | 115 | 127 |
| K | ● | 0,20 | 0,90 | 250 | 235 | – |
| | ⧗ | 0,20 | 0,70 | 220 | 205 | – |
| | ✖ | 0,20 | 0,50 | 190 | 180 | – |
| S | ● | 0,20 | 0,70 | 70 | 65 | 73 |
| | ⧗ | 0,20 | 0,60 | 60 | 55 | 65 |
| | ✖ | 0,20 | 0,50 | 55 | 50 | 56 |
| H | ● | 0,10 | 0,20 | 52 | – | – |
| | ⧗ | 0,10 | 0,20 | 42 | – | – |
| | ✖ | 0,10 | 0,20 | 40 | – | – |

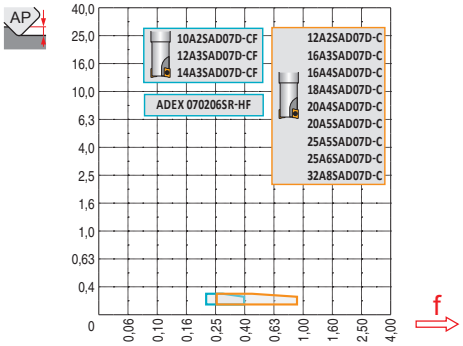


| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

| | ADMX 07-F | | | ADMX 07-M | | | | | | ADEX 07-HF | ADEX 07-FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,2 | 0,4 | 0,8 | 0,2 | 0,4 | 0,8 | 1,2 | 1,6 | 2,0 | 0,6 | 0,4 | 0,8 |
| BS | 1,38 | 0,89 | 0,54 | 1,38 | 0,89 | 0,54 | 1,13 | 0,73 | 0,33 | – | 0,94 | 0,55 |




| ADEX 07-HF | | | | | |
|---|---|---|---|---|---|
| DCX | AP | 0 | 0,1 | 0,2 | 0,3 |
| 10 | | 5,6 | 7,8 | 8,7 | 9,4 |
| 12 | | 7,6 | 9,8 | 10,7 | 11,4 |
| 14 | | 9,6 | 11,8 | 12,7 | 13,4 |
| 16 | DEF | 11,6 | 13,8 | 14,7 | 15,4 |
| 18 | | 13,6 | 15,8 | 16,7 | 17,4 |
| 20 | | 15,6 | 17,8 | 18,7 | 19,4 |
| 25 | | 20,6 | 22,8 | 23,7 | 24,4 |
| 32 | | 27,6 | 29,8 | 30,7 | 31,4 |

| HFC | | | |
|---|---|---|---|
| AP | 0,1 | 0,2 | 0,3 |
| 1 f | 0,9 | 0,8 | 0,6 |

max.

3,9

| | | | |
|---|---|---|---|
| AP | 1,0 | 3,0 | 5,0 |
| 1 f | 0,13 | 0,08 | 0,05 |

| HFC | | | |
|---|---|---|---|
| AP | 0,1 | 0,2 | 0,3 |
| 1 f | 0,7 | 0,6 | 0,4 |

| | | |
|---|---|---|
| DCX | RPMX | APMX / l |
| 10 | 5,2 | 5,0/56 |
| 12 | 3,4 | 5,0/86 |
| 14 | 2,5 | 4,2/100 |
| 16 | 1,9 | 3,2/100 |
| 18 | 1,7 | 2,8/100 |
| 20 | 1,5 | 2,5/100 |
| 25 | 1,1 | 1,8/100 |
| 32 | 0,8 | 1,2/100 |

| HFC | | |
|---|---|---|
| RPMX | RPMX | APMX / l |
| 3,5 | 3,5 | 0,3/6 |
| 2,2 | 2,2 | 0,3/9 |
| 1,6 | 1,6 | 0,3/12 |
| 1,3 | 1,3 | 0,3/15 |
| 1,1 | 1,1 | 0,3/17 |
| 0,9 | 0,9 | 0,3/21 |
| 0,7 | 0,7 | 0,3/26 |
| 0,5 | 0,5 | 0,3/36 |

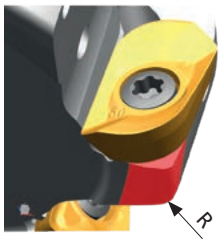
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
|---|---|---|---|---|
| 10 | 12,0 | 20,0 | 0,5 | 2,8 |
| 12 | 16,0 | 24,0 | 0,7 | 2,2 |
| 14 | 20,0 | 28,0 | 0,8 | 1,9 |
| 16 | 24,0 | 32,0 | 0,8 | 1,6 |
| 18 | 28,0 | 36,0 | 0,9 | 1,6 |
| 20 | 32,0 | 40,0 | 0,9 | 1,6 |
| 25 | 42,0 | 50,0 | 1,0 | 1,5 |
| 32 | 56,0 | 64,0 | 1,0 | 1,4 |

| HFC | | | | |
|---|---|---|---|---|
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ / $d_{min}$ | $s_{max}$ / $d_{max}$ |
| 10 | 12 | 20 | 0,30 | 0,30 |
| 12 | 16 | 24 | 0,30 | 0,30 |
| 14 | 20 | 28 | 0,30 | 0,30 |
| 16 | 24 | 32 | 0,30 | 0,30 |
| 18 | 28 | 36 | 0,30 | 0,30 |
| 20 | 32 | 40 | 0,30 | 0,30 |
| 25 | 42 | 50 | 0,30 | 0,30 |
| 32 | 56 | 64 | 0,30 | 0,30 |

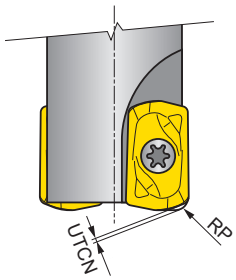
| AP | HFC |
|---|---|
| 0,9 | 0,3 |

| max |
|---|
| 3,9 |

| DCX | µm | 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | $f_e$ | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |
| 12 | | 0,379 | 0,490 | 0,693 | 0,849 | 0,980 | 1,200 | 1,386 | 1,549 | 1,697 | 1,960 | 2,191 |
| 14 | | 0,410 | 0,529 | 0,748 | 0,917 | 1,058 | 1,296 | 1,497 | 1,673 | 1,833 | 2,117 | 2,366 |
| 16 | | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 18 | | 0,465 | 0,600 | 0,849 | 1,039 | 1,200 | 1,470 | 1,697 | 1,897 | 2,078 | 2,400 | 2,683 |
| 20 | | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |




| ADMX 07 | R |
|---|---|
| ADMX 070216SR-M | 1 |
| ADMX 070220SR-M | 1,5 |




| ADEX 07 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| ADEX 070206SR-HF | 0,8 | 0,18 |

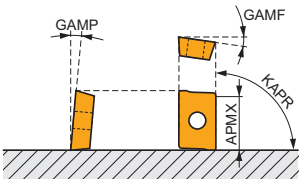
# SAD11E

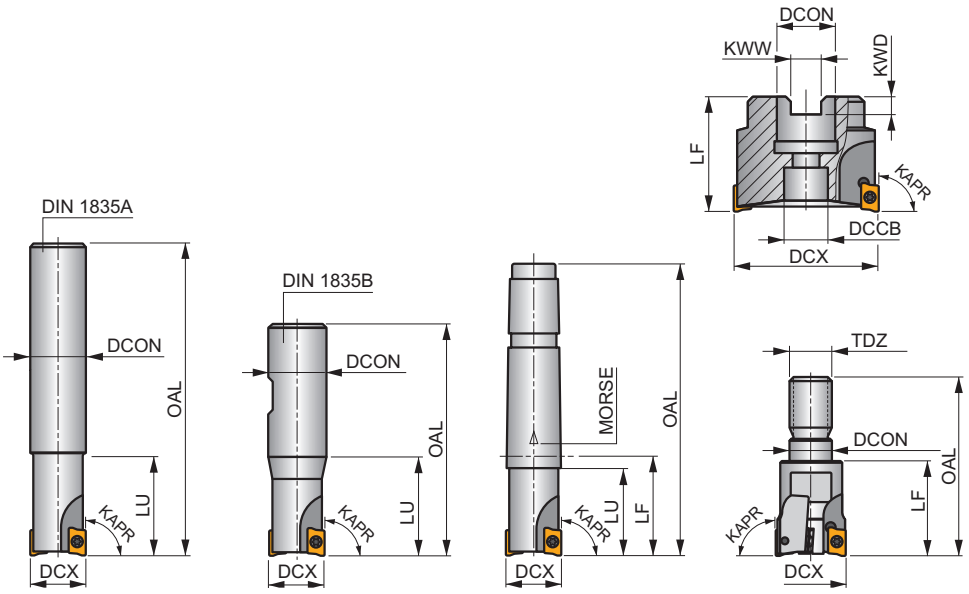
P M K N S H

S

**FORCE** *AD*

| | |
|---|---|
| KAPR | 90° |
| APMX | 9,0 mm |




$h_m$ 0,08 - 0,16

$h_m$ 0,06 - 0,13

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | Morse | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 16A2R024A14-SAD11E-C | 16 | 160 | 14 | – | 24 | – | – | -12,8 | +4 | – | 2 | – | 30100 | ✓ | 0,21 | GI169 | SQ025 | – |
| | 16A2R024A16-SAD11E-C | 16 | 135 | 16 | – | 24 | – | – | -12,8 | +4 | – | 2 | – | 30100 | ✓ | 0,09 | GI169 | SQ025 | – |
| | 16A2R050A16-SAD11E-C | 16 | 135 | 16 | – | 50 | – | – | -12,8 | +4 | – | 2 | – | 30100 | ✓ | 0,21 | GI169 | SQ025 | – |
| | 18A2R029A20-SAD11E-C | 18 | 150 | 20 | – | 29 | – | – | -12 | +4,5 | – | 2 | – | 28400 | ✓ | 0,35 | GI169 | SQ025 | – |
| | 20A2R029A20-SAD11E-C | 20 | 150 | 20 | – | 29 | – | – | -11,5 | +5 | – | 2 | – | 27000 | ✓ | 0,13 | GI169 | SQ020 | – |
| | 20A2R070A20-SAD11E-C | 20 | 150 | 20 | – | 70 | – | – | -11,5 | +5 | – | 2 | – | 27000 | ✓ | 0,32 | GI169 | SQ020 | – |
| | 20A3R029A18-SAD11E-C | 20 | 200 | 18 | – | 29 | – | – | -11,5 | +5 | – | 3 | – | 27000 | ✓ | 0,38 | GI169 | SQ025 | – |
| | 20A3R029A20-SAD11E-C | 20 | 150 | 20 | – | 29 | – | – | -11,5 | +5 | – | 3 | – | 27000 | ✓ | 0,13 | GI169 | SQ025 | – |
| | 22A3R029A20-SAD11E-C | 22 | 200 | 20 | – | 29 | – | – | -11,5 | +5 | – | 3 | – | 25600 | ✓ | 0,49 | GI169 | SQ025 | – |
| | 25A3R034A25-SAD11E-C | 25 | 170 | 25 | – | 34 | – | – | -10,2 | +5 | – | 3 | – | 24100 | ✓ | 0,42 | GI169 | SQ020 | – |
| | 25A3R080A25-SAD11E-C | 25 | 170 | 25 | – | 80 | – | – | -10,2 | +5 | – | 3 | – | 24100 | ✓ | 0,55 | GI169 | SQ020 | – |
| | 25A4R034A25-SAD11E-C | 25 | 170 | 25 | – | 34 | – | – | -10,2 | +5 | – | 4 | – | 24100 | ✓ | 0,42 | GI169 | SQ025 | – |
| | 25A4R040A25-SAD11E-C | 25 | 250 | 25 | – | 40 | – | – | -10,2 | +5 | – | 4 | – | 24100 | ✓ | 0,86 | GI169 | SQ025 | – |
| | 30A3R080A32-SAD11E-C | 30 | 200 | 32 | – | 80 | – | – | -9,3 | +7 | – | 3 | – | 22000 | ✓ | 1,02 | GI169 | SQ020 | – |
| | 32A3R090A32-SAD11E-C | 32 | 195 | 32 | – | 90 | – | – | -9 | +5 | – | 3 | – | 21300 | ✓ | 1,01 | GI169 | SQ020 | – |
| | 32A5R034A32-SAD11E-C | 32 | 195 | 32 | – | 34 | – | – | -9 | +8 | – | 5 | – | 21300 | ✓ | 1,03 | GI169 | SQ025 | – |
| | 35A5R025A32-SAD11E-C | 35 | 200 | 32 | – | 25 | – | – | -9 | +8 | – | 5 | – | 20300 | ✓ | 1,16 | GI169 | SQ020 | – |
| DIN 1835B | 16A2R027B16-SAD11E-C | 16 | 75 | 16 | – | 27 | – | – | -12,8 | +4 | – | 2 | – | 30100 | ✓ | 0,09 | GI169 | SQ025 | – |
| | 20A2R032B20-SAD11E-C | 20 | 82 | 20 | – | 32 | – | – | -11,5 | +5 | – | 2 | – | 27000 | ✓ | 0,13 | GI169 | SQ020 | – |
| | 20A3R032B20-SAD11E-C | 20 | 82 | 20 | – | 32 | – | – | -11,5 | +5 | – | 3 | – | 27000 | ✓ | 0,13 | GI169 | SQ025 | – |
| | 25A3R042B25-SAD11E-C | 25 | 98 | 25 | – | 42 | – | – | -10,2 | +5 | – | 3 | – | 24100 | ✓ | 0,50 | GI169 | SQ020 | – |
| | 25A4R042B25-SAD11E-C | 25 | 98 | 25 | – | 42 | – | – | -10,2 | +5 | – | 4 | – | 24100 | ✓ | 0,31 | GI169 | SQ025 | – |
| | 32A4R042B32-SAD11E-C | 32 | 102 | 32 | – | 42 | – | – | -9 | +8 | – | 4 | – | 21300 | ✓ | 0,27 | GI169 | SQ020 | – |
| | 32A5R042B32-SAD11E-C | 32 | 102 | 32 | – | 42 | – | – | -9 | +8 | – | 5 | – | 21300 | ✓ | 0,52 | GI169 | SQ025 | – |
| DIN 228A | 16A2R030E02-SAD11E-C | 16 | 94 | – | – | 25 | 30 | – | -12,8 | +4 | 2 | 2 | – | 30100 | ✓ | 0,15 | GI169 | SQ025 | – |
| | 20A3R035E03-SAD11E-C | 20 | 116 | – | – | 30 | 35 | – | -11,5 | +5 | 3 | 3 | – | 27000 | ✓ | 0,28 | GI169 | SQ025 | – |
| | 25A4R043E03-SAD11E-C | 25 | 124 | – | – | 38 | 43 | – | -10,2 | +5 | 3 | 4 | – | 24100 | ✓ | 0,32 | GI169 | SQ025 | – |
| MODULAR | 16A2R024M08-SAD11E-C | 16 | 38 | 8,5 | – | – | 24 | M8 | -12,8 | +4 | – | 2 | – | – | ✓ | 0,10 | GI169 | SQ025 | – |
| | 20A2R026M10-SAD11E-C | 20 | 45 | 11 | – | – | 26 | M10 | -11,5 | +5 | – | 2 | – | – | ✓ | 0,09 | GI169 | SQ020 | – |
| | 20A3R026M10-SAD11E-C | 20 | 45 | 10,5 | – | – | 26 | M10 | -11,5 | +5 | – | 3 | – | – | ✓ | 0,11 | GI169 | SQ025 | – |
| | 25A3R033M12-SAD11E-C | 25 | 55 | 12,5 | – | – | 33 | M12 | -10,2 | +5 | – | 3 | – | – | ✓ | 0,15 | GI169 | SQ020 | – |
| | 25A4R033M12-SAD11E-C | 25 | 55 | 12,5 | – | – | 33 | M12 | -10,2 | +5 | – | 4 | – | – | ✓ | 0,09 | GI169 | SQ025 | – |

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | Morse | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODULAR | 32A4R043M16-SAD11E-C | 32 | 66 | 17 | – | – | 43 | M16 | -9 | +8 | – | 4 | – | – | ✓ | 0,26 | GI169 | SQ020 | – |
| | 32A5R043M16-SAD11E-C | 32 | 66 | 17 | – | – | 43 | M16 | -9 | +8 | – | 5 | – | – | ✓ | 0,21 | GI169 | SQ025 | – |
| | 40A4R043M16-SAD11E-C | 40 | 66 | 17 | – | – | 43 | M16 | -8,1 | +11 | – | 4 | – | – | ✓ | 0,31 | GI169 | SQ020 | – |
| | 40A6R043M16-SAD11E-C | 40 | 66 | 17 | – | – | 43 | M16 | -8,1 | +11 | – | 6 | – | – | ✓ | 0,21 | GI169 | SQ020 | – |
| ISO 6462 DIN 8030 | 40A04R-S90AD11E-C | 40 | – | 16 | 14 | 40 | – | – | -8,1 | +11 | – | 4 | ✓ | 19100 | ✓ | 0,16 | GI169 | SQ022 | – |
| | 40A05R-S90AD11E-C | 40 | – | 16 | 14 | 40 | – | – | -8,1 | +11 | – | 5 | ✓ | 19000 | ✓ | 0,32 | GI169 | SQ022 | – |
| | 40A06R-S90AD11E-C | 40 | – | 16 | 14 | 40 | – | – | -8,1 | +11 | – | 6 | ✓ | 19100 | ✓ | 0,16 | GI169 | SQ022 | – |
| | 50A05R-S90AD11E-C | 50 | – | 22 | 18 | 40 | – | – | -7,2 | +12 | – | 5 | ✓ | 17000 | ✓ | 0,31 | GI169 | SQ023 | – |
| | 50A07R-S90AD11E-C | 50 | – | 22 | 18 | 40 | – | – | -7,2 | +12 | – | 7 | ✓ | 17000 | ✓ | 0,45 | GI169 | SQ023 | – |
| | 63A06R-S90AD11E-C | 63 | – | 22 | 18 | 40 | – | – | -6,5 | +12 | – | 6 | ✓ | 15200 | ✓ | 0,54 | GI169 | SQ023 | – |
| | 63A09R-S90AD11E-C | 63 | – | 22 | 18 | 40 | – | – | -6,5 | +12 | – | 9 | ✓ | 15200 | ✓ | 0,63 | GI169 | SQ023 | – |
| | 80A10R-S90AD11E-C | 80 | – | 27 | 38 | 50 | – | – | -6 | +12 | – | 10 | ✓ | 13500 | ✓ | 1,06 | GI169 | SQ021 | AC001 |
| | 100A11R-S90AD11E-C | 100 | – | 32 | 45 | 50 | – | – | -5,5 | +12 | – | 11 | ✓ | 12100 | ✓ | 1,89 | GI169 | SQ021 | AC002 |
| | 125A12R-S90AD11E-C | 125 | – | 40 | 56 | 63 | – | – | -5,2 | +12 | – | 12 | ✓ | 10800 | ✓ | 2,97 | GI169 | SQ021 | AC003 |

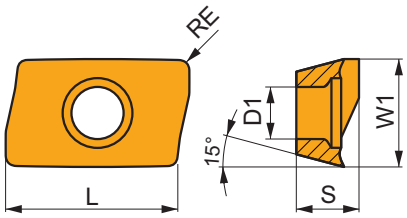
| | | |
|---|---|---|
| GI169 | ADMX 11T3.. | ADEX 11T3.. |

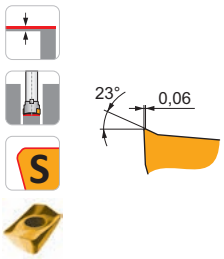
| | | Nm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SQ020 | US 62506-T07P | 1,2 | M 2,5 | 6 | – | – | Flag T07P | – |
| SQ021 | US 62506-T07P | 1,2 | M 2,5 | 6 | D-T07P/T09P | FG-15 | – | – |
| SQ022 | US 62506-T07P | 1,2 | M 2,5 | 6 | D-T07P/T09P | FG-15 | – | HS 0830C |
| SQ023 | US 62506-T07P | 1,2 | M 2,5 | 6 | D-T07P/T09P | FG-15 | – | HS 1030C |
| SQ025 | US 62505-T07P | 1,2 | M 2,5 | 5 | – | – | Flag T07P | – |

| | | |
|---|---|---|
| AC001 | KS 1230 | K.FMH27 |
| AC002 | KS 1635 | K.FMH32 |
| AC003 | KS 2040 | K.FMH40 |

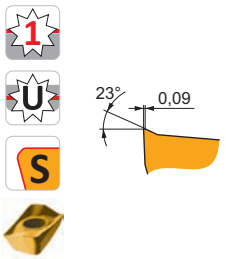
## ADMX 11

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 11T3 | 6,530 | 2,90 | 11,00 | 3,97 |

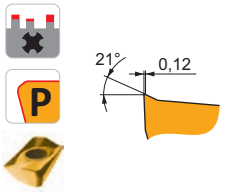


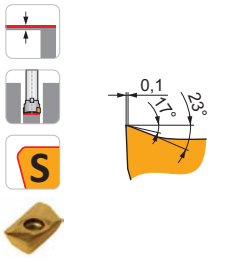

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T304SR-F | M9340 | ◪ | ■ | | | ◪ | | ● | - - - | 0,4 | 0,07 | 0,10 | 0,2 | 9,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ● | - | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | | ● | - | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ● | + / - | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ◪ | ■ | ◪ | | ● | - | 0,4 | 0,07 | 0,12 | 0,2 | 9,0 |
| ADMX 11T308SR-F | M9340 | ◪ | ■ | | | ◪ | | ⬢ | - - - | 0,8 | 0,07 | 0,10 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | 0,8 | 0,07 | 0,12 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,8 | 0,07 | 0,12 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ◪ | ■ | ◪ | | ⬢ | - | 0,8 | 0,07 | 0,12 | 0,2 | 9,0 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T302SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,2 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ● | + / - | 0,2 | 0,10 | 0,14 | 0,2 | 9,0 |
| ADMX 11T304SR-M | M9325 | ■ | ◪ | | | ◪ | | ● | - - - | 0,4 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M9340 | ◪ | ■ | | | ◪ | | ● | - - - | 0,4 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| ADMX 11T308SR-M | M5315 | ◪ | | ■ | | | | ⬢ | - - - | 0,8 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M9315 | ■ | | ◪ | | | | ⬢ | - - - | 0,8 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ⬢ | - - - | 0,8 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M9340 | ◪ | ■ | | | ◪ | | ⬢ | - - - | 0,8 | 0,10 | 0,14 | 0,2 | 9,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| ADMX 11T310SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 1,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 1,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| ADMX 11T312SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 1,2 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 1,2 | 0,10 | 0,22 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 1,2 | 0,10 | 0,22 | 0,2 | 9,0 |
| ADMX 11T316SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 1,6 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 1,6 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 1,6 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 1,6 | 0,10 | 0,22 | 0,2 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 1,6 | 0,10 | 0,22 | 0,2 | 9,0 |
| ADMX 11T320SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 2,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 2,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 2,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| ADMX 11T325SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 2,5 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 2,5 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 2,5 | 0,10 | 0,22 | 0,2 | 9,0 |
| ADMX 11T330SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 3,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 3,0 | 0,10 | 0,22 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 3,0 | 0,10 | 0,22 | 0,2 | 9,0 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T308PR-R | M5315 | ◪ | | ■ | | | ◪ | ⬢ | - - - | 0,8 | 0,15 | 0,20 | 0,8 | 9,0 |
| | M9315 | ■ | | ◪ | | | ◪ | ⬢ | - - - | 0,8 | 0,15 | 0,20 | 0,8 | 9,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | 0,8 | 0,15 | 0,20 | 0,8 | 9,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,15 | 0,25 | 0,8 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,15 | 0,25 | 0,8 | 9,0 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | 0,8 | 0,15 | 0,25 | 0,8 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,15 | 0,25 | 0,8 | 9,0 |
| ADMX 11T316PR-R | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | 1,6 | 0,15 | 0,20 | 0,8 | 9,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 1,6 | 0,15 | 0,25 | 0,8 | 9,0 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | 1,6 | 0,15 | 0,25 | 0,8 | 9,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 1,6 | 0,15 | 0,25 | 0,8 | 9,0 |

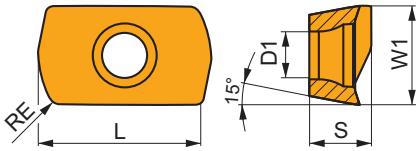



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T304SR-MF | M9340 | ◪ | ■ | | | ■ | | ● | - - - | 0,4 | 0,05 | 0,12 | 0,2 | 9,0 |
| | M6330 | ◪ | ■ | | | ■ | | ● | - | 0,4 | 0,05 | 0,14 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | | | ■ | | ● | + / - | 0,4 | 0,05 | 0,14 | 0,2 | 9,0 |
| ADMX 11T308SR-MF | M9340 | ◪ | ■ | | | ■ | | ⬢ | - - - | 0,8 | 0,05 | 0,12 | 0,2 | 9,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⬢ | - | 0,8 | 0,05 | 0,14 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | | | ■ | | ⬢ | + / - | 0,8 | 0,05 | 0,14 | 0,2 | 9,0 |

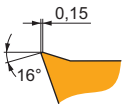
| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 11T304SR-MM | M9340 | ◪ | ■ | | | ■ | | ● | - - - | 0,4 | 0,10 | 0,15 | 0,2 | 9,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⬢ | - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | | | ■ | | ⬢ | + / - | 0,4 | 0,10 | 0,18 | 0,2 | 9,0 |
| ADMX 11T308SR-MM | M9340 | ◪ | ■ | | | ■ | | ⬢ | - - - | 0,8 | 0,10 | 0,15 | 0,2 | 9,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⬢ | - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | | | ■ | | ⬢ | + / - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8345 | ■ | ■ | | | ■ | | ⬢ | + / - | 0,8 | 0,10 | 0,18 | 0,2 | 9,0 |
| ADMX 11T312SR-MM | M9340 | ◪ | ■ | | | ■ | | ⬢ | - - - | 1,2 | 0,10 | 0,15 | 0,2 | 9,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | 1,2 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8340 | ■ | ■ | | | ■ | | ✖ | + / - | 1,2 | 0,10 | 0,18 | 0,2 | 9,0 |
| | M8345 | ■ | ■ | | | ■ | | ✖ | + / - | 1,2 | 0,10 | 0,18 | 0,2 | 9,0 |

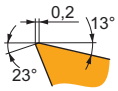
## ADEX 11-HF

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 11T3 | 6,450 | 2,90 | 10,67 | 3,82 |



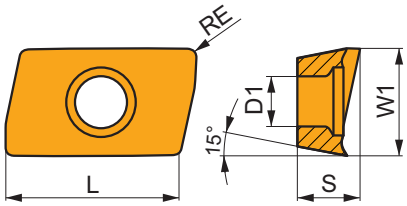

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 11T308SR-HF | M9340 | ◪ | ■ | | | ◪ | | ⬢ | - - - | 0,8 | 0,40 | 1,11 | 0,1 | 0,6 |
| | M6330 | ◪ | ■ | | | ◪ | | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,1 | 0,6 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | ◪ | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,1 | 0,6 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | ◪ | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,1 | 0,6 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,8 | 0,40 | 1,30 | 0,1 | 0,6 |
| | 8215 | ■ | ◪ | ◪ | | ◪ | ◪ | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,1 | 0,6 |
| ADEX 11T308SR-HF2 | M9325 | ■ | ◪ | | | ◪ | | ⬢ | - - - | 0,8 | 0,40 | 1,17 | 0,2 | 0,6 |
| | M9340 | ◪ | ◪ | | | ◪ | | ⬢ | - - - | 0,8 | 0,40 | 1,17 | 0,2 | 0,6 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ■ | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,2 | 0,6 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | ⬢ | - | 0,8 | 0,40 | 1,30 | 0,2 | 0,6 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | 0,8 | 0,40 | 1,30 | 0,2 | 0,6 |

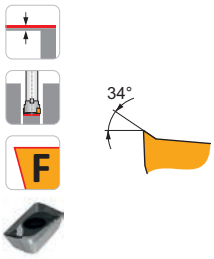


# ADEX 11-FA

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 11T3 | 6,450 | 2,90 | 9,70 | 3,91 |




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 11T304FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,4 | 0,03 | 0,30 | 0,4 | 9,0 |
| | HF7 | | | | ■ | | | ● | + / - | 0,4 | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T308FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,8 | 0,03 | 0,30 | 0,2 | 9,0 |
| | HF7 | | | | ■ | | | ● | + / - | 0,8 | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T312FR-FA | M0315 | | | | ■ | | | ● | ++ | 1,2 | 0,03 | 0,30 | 0,2 | 9,0 |
| | HF7 | | | | ■ | | | ● | + / - | 1,2 | 0,03 | 0,30 | 0,2 | 9,0 |
| ADEX 11T316FR-FA | HF7 | | | | ■ | | | ● | + / - | 1,6 | 0,03 | 0,30 | 0,2 | 9,0 |

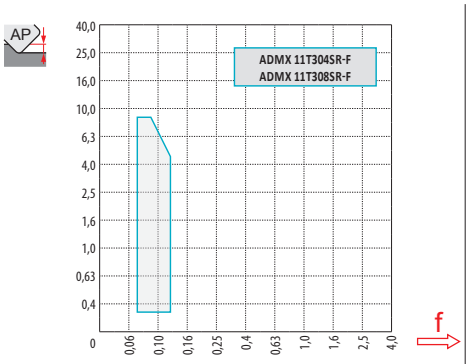
| ISO | | FN | FX | M5315 | M9315 | M9325 | M9340 | M0315 | M6330 | M8310 | M8330 | M8340 | M8345 | 8215 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,07 | 0,18 | 392 | 392 | 347 | 311 | – | 266 | 329 | 333 | 284 | 225 | 311 | – |
| | ⧗ | 0,07 | 0,15 | 365 | 356 | 306 | 279 | – | 239 | 297 | 298 | 252 | 198 | 275 | – |
| | ✖ | 0,07 | 0,10 | 333 | 324 | 270 | 248 | – | 207 | 266 | 258 | 221 | 176 | 243 | – |
| M | ● | 0,07 | 0,18 | – | – | 176 | 185 | – | 189 | 167 | 190 | 167 | 135 | 185 | 72 |
| | ⧗ | 0,07 | 0,15 | – | – | 158 | 167 | – | 167 | 149 | 171 | 149 | 117 | 167 | 63 |
| | ✖ | 0,07 | 0,10 | – | – | 135 | 149 | – | 144 | 135 | 151 | 131 | 104 | 144 | 54 |
| K | ● | 0,07 | 0,18 | 374 | 374 | – | – | – | – | 311 | 318 | 270 | – | 293 | 117 |
| | ⧗ | 0,07 | 0,15 | 347 | 338 | – | – | – | – | 284 | 282 | 239 | – | 261 | 104 |
| | ✖ | 0,07 | 0,10 | 320 | 306 | – | – | – | – | 252 | 248 | 207 | – | 230 | 90 |
| N | ● | 0,07 | 0,18 | – | – | – | – | 684 | – | – | 837 | – | – | 774 | 306 |
| | ⧗ | 0,07 | 0,15 | – | – | – | – | 612 | – | – | 746 | – | – | 693 | 275 |
| | ✖ | 0,07 | 0,10 | – | – | – | – | 536 | – | – | 651 | – | – | 612 | 239 |
| S | ● | 0,07 | 0,18 | – | – | 86 | 90 | – | 95 | 81 | 93 | 81 | 68 | 90 | 36 |
| | ⧗ | 0,07 | 0,15 | – | – | 77 | 81 | – | 81 | 72 | 83 | 72 | 59 | 81 | 32 |
| | ✖ | 0,07 | 0,10 | – | – | 68 | 72 | – | 72 | 68 | 73 | 63 | 50 | 72 | 27 |
| H | ● | 0,07 | 0,18 | 77 | 77 | – | – | – | – | 63 | 59 | – | – | 59 | 23 |
| | ⧗ | 0,07 | 0,15 | 72 | 68 | – | – | – | – | 59 | 50 | – | – | 54 | 18 |
| | ✖ | 0,07 | 0,10 | 63 | 63 | – | – | – | – | 50 | 45 | – | – | 45 | 18 |

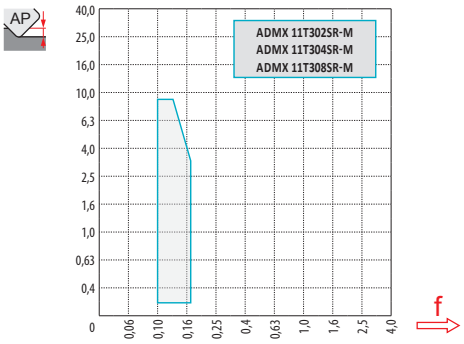
| HFC | | FN | FX | M9325 | M9340 | M8310 | M8330 | M8340 | 8215 |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,45 | 1,25 | 308 | 276 | 292 | 296 | 252 | 276 |
| | ⧗ | 0,45 | 1,00 | 272 | 248 | 264 | 264 | 224 | 244 |
| | ✖ | 0,45 | 0,80 | 240 | 220 | 236 | 228 | 196 | 216 |
| M | ● | 0,45 | 1,25 | 156 | 164 | 148 | 168 | 148 | 164 |
| | ⧗ | 0,45 | 1,00 | 140 | 148 | 132 | 151 | 132 | 148 |
| | ✖ | 0,45 | 0,80 | 120 | 132 | 120 | 134 | 116 | 128 |
| K | ● | 0,45 | 1,25 | – | – | 276 | 282 | 240 | 260 |
| | ⧗ | 0,45 | 1,00 | – | – | 252 | 251 | 212 | 232 |
| | ✖ | 0,45 | 0,80 | – | – | 224 | 220 | 184 | 204 |
| N | ● | 0,45 | 1,25 | – | – | – | 744 | – | 688 |
| | ⧗ | 0,45 | 1,00 | – | – | – | 663 | – | 616 |
| | ✖ | 0,45 | 0,80 | – | – | – | 578 | – | 544 |
| S | ● | 0,45 | 1,20 | 76 | 80 | 72 | 82 | 72 | 80 |
| | ⧗ | 0,45 | 1,00 | 68 | 72 | 64 | 73 | 64 | 72 |
| | ✖ | 0,45 | 0,80 | 60 | 64 | 60 | 65 | 56 | 64 |
| H | ● | 0,40 | 1,00 | – | – | 56 | 52 | – | 52 |
| | ⧗ | 0,40 | 0,80 | – | – | 52 | 44 | – | 48 |
| | ✖ | 0,40 | 0,60 | – | – | 44 | 40 | – | 40 |

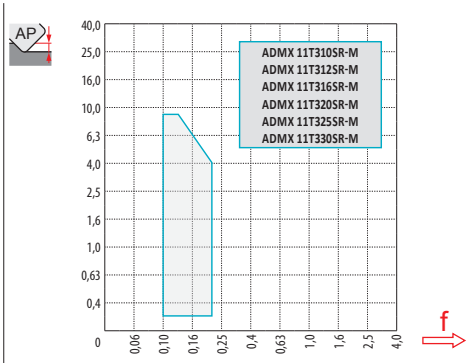
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

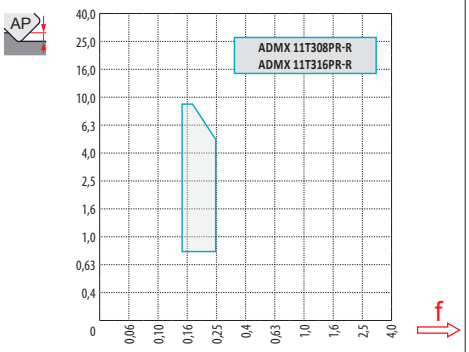
| | ADMX 11-F | | ADMX 11-M | | | | | | | | | ADMX 11-R | | ADMX 11-MF | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,4 | 0,8 | 0,2 | 0,4 | 0,8 | 1,0 | 1,2 | 1,6 | 2,0 | 2,5 | 3,0 | 0,8 | 1,6 | 0,4 | 0,8 |
| BS | 1,89 | 1,48 | 2,09 | 1,89 | 1,48 | 1,27 | 1,08 | 0,68 | 1,61 | 1,13 | 0,66 | 1,48 | 0,68 | 1,89 | 1,48 |

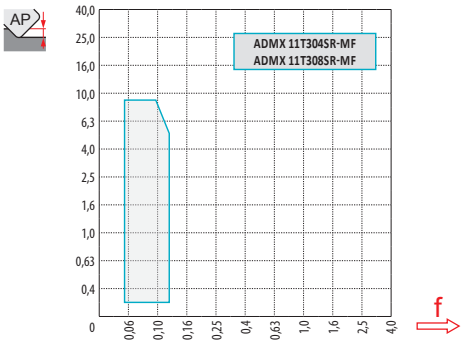
| | ADMX 11-MM | | | | ADEX 11-HF | ADEX 11-HF2 | ADEX 11-FA | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,4 | 0,8 | 1,2 | 1,6 | 0,8 | 0,8 | 0,4 | 0,8 | 1,2 | 1,6 |
| BS | 1,89 | 1,48 | 1,08 | 0,61 | 0,17 | 0,17 | 1,77 | 1,39 | 1,0 | 0,62 |

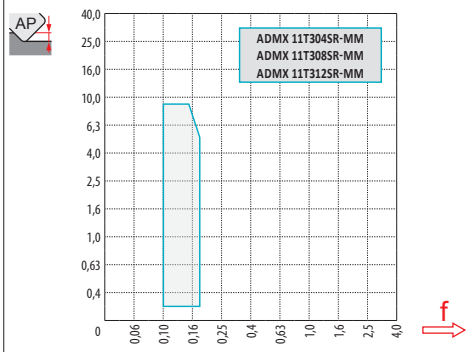


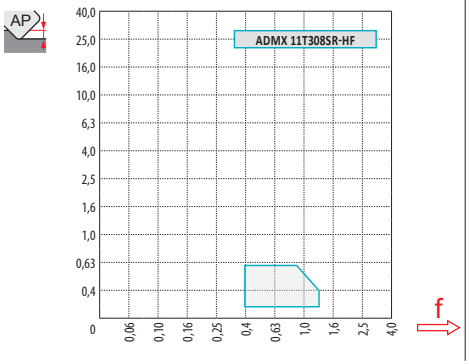



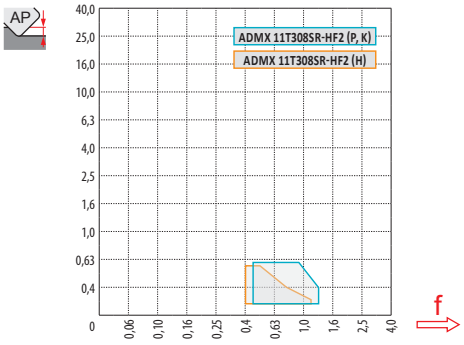



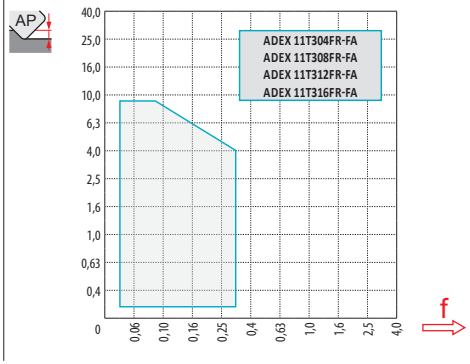



4,5

| | | | |
|---|---|---|---|
| AP | 1,0 | 5,0 | 9,0 |
| 1 f | 0,20 | 0,13 | 0,10 |

| | | | HFC | | |
|---|---|---|---|---|---|
| DCX | RPMX | APMX / I | DCX | RPMX | APMX / I |
| 16 | 13,5 | 9,0/40 | 4,1 | 5,7 | 0,6/8 |
| 18 | 10,0 | 9,0/53 | 2,8 | 4,5 | 0,6/12 |
| 20 | 9,0 | 9,0/59 | 2,3 | 4,3 | 0,6/15 |
| 25 | 6,0 | 9,0/87 | 1,3 | 6,7 | 0,6/26 |
| 32 | 5,3 | 9,0/99 | 0,7 | 4,3 | 0,6/49 |
| 40 | 3,8 | 6,5/100 | 0,3 | 2,9 | 0,6/100 |
| 50 | 2,8 | 4,7/100 | 0,1 | 2,1 | 0,6/100 |
| 63 | 1,8 | 3,0/100 | – | – | – |
| 80 | 1,6 | 2,6/100 | – | – | – |

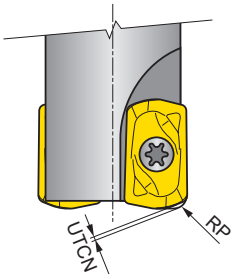
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ | HFC $d_{min}$ | HFC $d_{max}$ | HFC $s_{max}$ $d_{min}$ | HFC $s_{max}$ $d_{max}$ |
|---|---|---|---|---|---|---|---|---|
| 16 | 27,0 | 32,0 | 8,3 | 9,0 | 21,0 | 32,0 | 0,6 | 0,6 |
| 18 | 32,0 | 36,0 | 7,5 | 9,0 | 29,0 | 36,0 | 0,6 | 0,6 |
| 20 | 35,0 | 40,0 | 7,5 | 9,0 | 29,0 | 40,0 | 0,6 | 0,6 |
| 25 | 45,0 | 50,0 | 6,5 | 7,5 | 39,0 | 50,0 | 0,6 | 0,6 |
| 32 | 59,0 | 64,0 | 4,0 | 4,5 | 53,0 | 64,0 | 0,6 | 0,6 |
| 40 | 75,0 | 80,0 | 1,5 | 2,0 | 68,5 | 80,0 | 0,6 | 0,6 |
| 50 | – | – | – | – | 88,5 | 100,0 | 0,6 | 0,6 |

| AP |
|---|
| 1,7 |

| DCX | µm 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 0,438 | 0,566 | 0,800 | 0,980 | 1,131 | 1,386 | 1,600 | 1,789 | 1,960 | 2,263 | 2,530 |
| 18 | 0,465 | 0,600 | 0,849 | 1,039 | 1,200 | 1,470 | 1,697 | 1,897 | 2,078 | 2,400 | 2,683 |
| 20 | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 20 | 0,490 | 0,632 | 0,894 | 1,095 | 1,265 | 1,549 | 1,789 | 2,000 | 2,191 | 2,530 | 2,828 |
| 25 | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 50 | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 63 | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 80 | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |

| RE | µm 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,0 | 0,155 | 0,200 | 0,283 | 0,346 | 0,400 | 0,490 | 0,566 | 0,632 | 0,693 | 0,800 | 0,894 |
| 1,2 | 0,170 | 0,219 | 0,310 | 0,379 | 0,438 | 0,537 | 0,620 | 0,693 | 0,759 | 0,876 | 0,980 |
| 1,6 | 0,196 | 0,253 | 0,358 | 0,438 | 0,506 | 0,620 | 0,716 | 0,800 | 0,876 | 1,012 | 1,131 |
| 2,0 | 0,219 | 0,283 | 0,400 | 0,490 | 0,566 | 0,693 | 0,800 | 0,894 | 0,980 | 1,131 | 1,265 |
| 2,5 | 0,245 | 0,316 | 0,447 | 0,548 | 0,632 | 0,775 | 0,894 | 1,000 | 1,095 | 1,265 | 1,414 |
| 3,0 | 0,268 | 0,346 | 0,490 | 0,600 | 0,693 | 0,849 | 0,980 | 1,095 | 1,200 | 1,386 | 1,549 |

| ADMX/ADEX 11 | R |
|---|---|
| ADMX 11T320SR-M | 1,0 |
| ADMX 11T325SR-M | 1,8 |
| ADMX 11T330SR-M | 1,8 |
| ADEX 11T308SR-HF | 1,4 |
| ADEX 11T308SR-HF2 | 1,4 |




| ADEX 11 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| ADEX 11T308SR-HF | 1,42 | 0,35 |
| ADEX 11T308SR-HF2 | 1,34 | 0,38 |

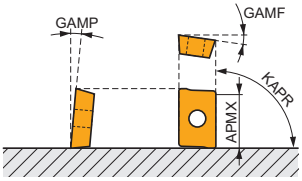
# SAD16E

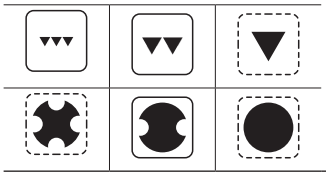
P M K N S H

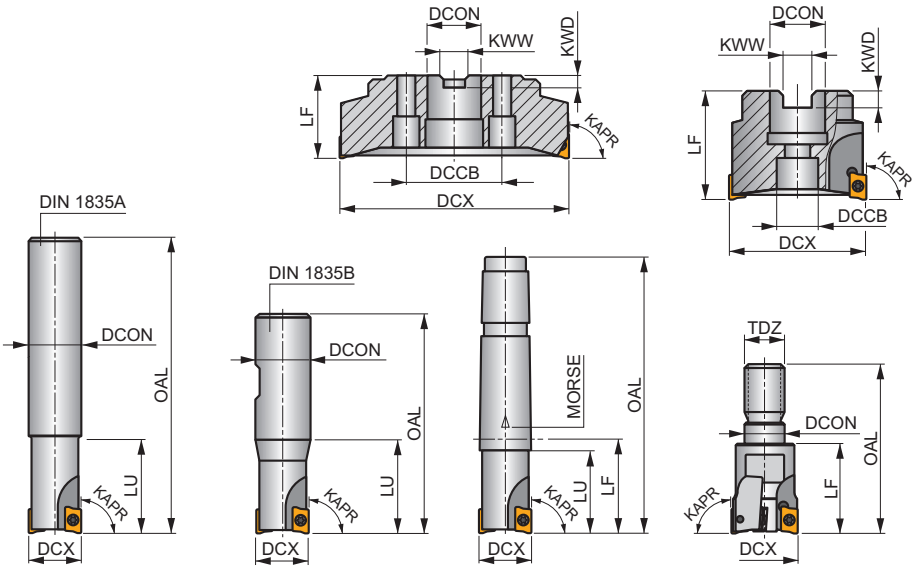
S

**FORCE** *AD*

| | |
|---|---|
| KAPR | 90° |
| APMX | 13,0 mm |






$h_m$ 0,08 - 0,22

$h_m$ 0,06 - 0,18

| | ISO | DCX [mm] | OAL [mm] | DCON [mm] | DCCB [mm] | LU [mm] | LF [mm] | TDZ | GAMF [°] | GAMP [°] | Morse | | | max. | | kg | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN 1835A | 25A2R033A25-SAD16E-C | 25 | 165 | 25 | – | 33 | – | – | -13 | +5 | – | 2 | – | 18700 | ✓ | 0,52 | GI165 | SQ030 | – |
| | 25A2R038A25-SAD16E-C | 25 | 200 | 25 | – | 38 | – | – | -13 | +5 | – | 2 | – | 18700 | ✓ | 0,71 | GI165 | SQ030 | – |
| | 32A3R033A32-SAD16E-C | 32 | 195 | 32 | – | 33 | – | – | -12 | +7 | – | 3 | – | 16500 | ✓ | 1,03 | GI165 | SQ030 | – |
| | 32A3R048A32-SAD16E-C | 32 | 250 | 32 | – | 48 | – | – | -12 | +7 | – | 3 | – | 16500 | ✓ | 1,37 | GI165 | SQ030 | – |
| DIN 1835B | 25A2R042B25-SAD16E-C | 25 | 98 | 25 | – | 42 | – | – | -13 | +5 | – | 2 | – | 18700 | ✓ | 0,29 | GI165 | SQ030 | – |
| | 32A3R040B32-SAD16E-C | 32 | 100 | 32 | – | 40 | – | – | -12 | +7 | – | 3 | – | 16500 | ✓ | 0,59 | GI165 | SQ030 | – |
| | 40A3R050B32-SAD16E-C | 40 | 110 | 32 | – | 50 | – | – | -8,2 | +10,5 | – | 3 | – | 14800 | ✓ | 0,59 | GI165 | SQ030 | – |
| | 40A4R050B32-SAD16E-C | 40 | 110 | 32 | – | 50 | – | – | -8,2 | +10,5 | – | 4 | – | 14800 | ✓ | 0,65 | GI165 | SQ030 | – |
| DIN 228A | 25A2R043E03-SAD16E-C | 25 | 98 | – | – | 38 | 43 | – | -13 | +5 | 3 | 2 | – | 18600 | ✓ | 0,31 | GI165 | SQ030 | – |
| | 32A3R043E03-SAD16E-C | 32 | 100 | – | – | 38 | 43 | – | -12 | +7 | 3 | 3 | – | 16500 | ✓ | 0,33 | GI165 | SQ030 | – |
| | 40A3R054E04-SAD16E-C | 40 | 110 | – | – | 48 | 54 | – | -8,2 | +10,5 | 4 | 3 | – | 14700 | ✓ | 0,74 | GI165 | SQ030 | – |
| | 40A4R054E04-SAD16E-C | 40 | 110 | – | – | 48 | 54 | – | -8,2 | +10,5 | 4 | 4 | – | 14700 | ✓ | 0,70 | GI165 | SQ030 | – |
| MODULAR | 32A3R043M16-SAD16E-C | 32 | 66 | 17 | – | – | 43 | M16 | -12 | +7 | – | 3 | – | – | ✓ | 0,21 | GI165 | SQ030 | – |
| | 40A4R043M16-SAD16E-C | 40 | 66 | 17 | – | – | 43 | M16 | -8,2 | +10,5 | – | 4 | – | – | ✓ | 0,27 | GI165 | SQ030 | – |
| ISO 6462 DIN 8030 | 40A04R-S90AD16E-C | 40 | 40 | 16 | 14 | – | – | – | -8,2 | +10,5 | – | 4 | – | 14700 | ✓ | 0,16 | GI165 | SQ032 | – |
| | 50A03R-S90AD16E-C | 50 | 40 | 22 | 18 | – | – | – | -7 | +11 | – | 3 | – | 13200 | ✓ | 0,43 | GI165 | SQ033 | – |
| | 50A05R-S90AD16E-C | 50 | 40 | 22 | 18 | – | – | – | -7 | +11 | – | 5 | ✓ | 13200 | ✓ | 0,59 | GI165 | SQ033 | – |
| | 63A04R-S90AD16E-C | 63 | 40 | 22 | 18 | – | – | – | -6 | +12 | – | 4 | ✓ | 11800 | ✓ | 0,62 | GI165 | SQ033 | – |
| | 63A06R-S90AD16E-C | 63 | 40 | 22 | 18 | – | – | – | -6 | +12 | – | 6 | ✓ | 11800 | ✓ | 0,46 | GI165 | SQ033 | – |
| | 80A05R-S90AD16E-C | 80 | 50 | 27 | 38 | – | – | – | -5 | +12 | – | 5 | ✓ | 10400 | ✓ | 1,01 | GI165 | SQ031 | AC001 |
| | 80A07R-S90AD16E-C | 80 | 50 | 27 | 38 | – | – | – | -5 | +13 | – | 7 | ✓ | 10400 | ✓ | 0,97 | GI165 | SQ031 | AC001 |
| | 100A06R-S90AD16E-C | 100 | 50 | 32 | 45 | – | – | – | -4 | +12 | – | 6 | ✓ | 9300 | ✓ | 1,89 | GI165 | SQ031 | AC002 |
| | 100A08R-S90AD16E-C | 100 | 50 | 32 | 45 | – | – | – | -4 | +12 | – | 8 | ✓ | 9300 | ✓ | 1,69 | GI165 | SQ031 | AC002 |
| | 125A09R-S90AD16E-C | 125 | 63 | 40 | 56 | – | – | – | -3,8 | +12 | – | 9 | ✓ | 8400 | ✓ | 3,46 | GI165 | SQ031 | AC003 |
| | 140A08R-S90AD16E-C | 140 | 63 | 40 | 56 | – | – | – | -3,8 | +12 | – | 8 | ✓ | 7900 | ✓ | 4,06 | GI165 | SQ031 | – |
| | 160C10R-S90AD16E-C | 160 | 63 | 40 | 66,7 | – | – | – | -3,8 | +10 | – | 10 | ✓ | 7300 | ✓ | 6,04 | GI165 | SQ036 | – |
| | 175C10R-S90AD16E-C | 175 | 63 | 40 | 66,7 | – | – | – | -3,8 | +12 | – | 10 | ✓ | 7000 | ✓ | 7,00 | GI165 | SQ036 | – |

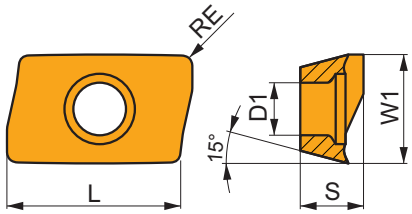
| | | |
|---|---|---|
| GI165 | ADMX 1606.. | ADEX 1606.. |

| | | Nm | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SQ030 | US 4008-T15P | 3,5 | M 4 | 8 | – | – | Flag T15P | – | – | – | – |
| SQ031 | US 4011-T15P | 3,5 | M 4 | 11 | D-T08P/T15P | FG-15 | – | – | – | – | – |
| SQ032 | US 4008-T15P | 3,5 | M 4 | 8 | D-T08P/T15P | FG-15 | – | HS 0830C | – | – | – |
| SQ033 | US 4011-T15P | 3,5 | M 4 | 11 | D-T08P/T15P | FG-15 | – | HS 1030C | – | – | – |
| SQ036 | US 4011-T15P | 3,5 | M 4 | 11 | D-T08P/T15P | FG-15 | – | HS 1240C | CAC 160C | HSD 0825C | HXK 5 |

| | | |
|---|---|---|
| AC001 | KS 1230 | K.FMH27 |
| AC002 | KS 1635 | K.FMH32 |
| AC003 | KS 2040 | K.FMH40 |

## ADMX 16

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 1606 | 9,950 | 4,50 | 16,00 | 6,25 |

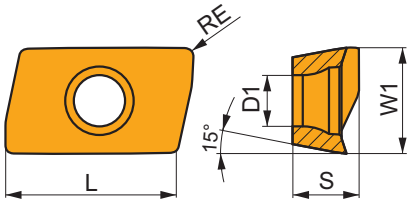


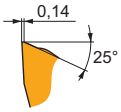

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 160608SR-F | M9340 | ◪ | ■ | | | | | ⬢ | - - - | 0,8 | 0,07 | 0,12 | 0,3 | 13,0 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | 0,8 | 0,07 | 0,15 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | | ⬢ | - | 0,8 | 0,07 | 0,15 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,8 | 0,07 | 0,15 | 0,3 | 13,0 |
| | 8215 | ◪ | ◪ | ◪ | ■ | ◪ | | ⬢ | - | 0,8 | 0,07 | 0,15 | 0,3 | 13,0 |
| ADMX 160604SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,4 | 0,10 | 0,25 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,4 | 0,10 | 0,25 | 0,3 | 13,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ● | - | 0,4 | 0,10 | 0,25 | 0,3 | 13,0 |
| ADMX 160608SR-M | M5315 | | | ■ | | | | ⬢ | - - - | 0,8 | 0,10 | 0,20 | 0,3 | 13,0 |
| | M9315 | ■ | | ◪ | | | | ⬢ | - - - | 0,8 | 0,10 | 0,20 | 0,3 | 13,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ⬢ | - - - | 0,8 | 0,10 | 0,20 | 0,3 | 13,0 |
| | M9340 | ◪ | ■ | | | | | ⬢ | - - - | 0,8 | 0,10 | 0,20 | 0,3 | 13,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ⬢ | + / - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⬢ | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMX 160616SR-M | M9325 | ■ | ◪ | | | ◪ | | ⚙ | - - - | 1,6 | 0,10 | 0,24 | 0,3 | 13,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 1,6 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 1,6 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 1,6 | 0,10 | 0,30 | 0,3 | 13,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | ⚙ | - | 1,6 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160620SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 2,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 2,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 2,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160630SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 3,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 3,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160632SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 3,2 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ⚙ | - - - | 3,2 | 0,10 | 0,24 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 3,2 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 3,2 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160640SR-M | M6330 | ◪ | ■ | | | ◪ | | ✖ | - | 4,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 4,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 4,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160650SR-M | M8330 | ■ | ◪ | ■ | | ◪ | | ✖ | - | 5,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | ✖ | + / - | 5,0 | 0,10 | 0,30 | 0,3 | 13,0 |
| ADMX 160608PR-R | M5315 | | | ■ | | | | ✖ | - - - | 0,8 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M9315 | ■ | | ◪ | | | ◪ | ✖ | - - - | 0,8 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | 0,8 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,17 | 0,35 | 1,0 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,17 | 0,35 | 1,0 | 13,0 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | 0,8 | 0,17 | 0,35 | 1,0 | 13,0 |
| | 8215 | ◪ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 0,8 | 0,17 | 0,35 | 1,0 | 13,0 |
| ADMX 160616PR-R | M5315 | | | ■ | | | | ✖ | - - - | 1,6 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M9315 | ■ | | ◪ | | | ◪ | ✖ | - - - | 1,6 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M9325 | ■ | ◪ | | | ◪ | | ✖ | - - - | 1,6 | 0,17 | 0,28 | 1,0 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | ✖ | - | 1,6 | 0,17 | 0,35 | 1,0 | 13,0 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | ✖ | + / - | 1,6 | 0,17 | 0,35 | 1,0 | 13,0 |
| ADMX 160608SR-MF | M9340 | ◪ | ■ | | | ■ | | ⚙ | - - - | 0,8 | 0,05 | 0,14 | 0,3 | 13,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⚙ | - | 0,8 | 0,05 | 0,16 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | | | ■ | | ⚙ | + / - | 0,8 | 0,05 | 0,16 | 0,3 | 13,0 |
| ADMX 160604SR-MM | M9340 | ◪ | ■ | | | ■ | | ● | - - - | 0,4 | 0,14 | 0,19 | 0,3 | 13,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⚙ | - | 0,4 | 0,14 | 0,22 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | | | ■ | | ⚙ | + / - | 0,4 | 0,14 | 0,22 | 0,3 | 13,0 |
| ADMX 160608SR-MM | M9340 | ◪ | ■ | | | ■ | | ⚙ | - - - | 0,8 | 0,14 | 0,19 | 0,3 | 13,0 |
| | M6330 | ◪ | ■ | | | ■ | | ⚙ | - | 0,8 | 0,14 | 0,22 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | | | ■ | | ⚙ | + / - | 0,8 | 0,14 | 0,22 | 0,3 | 13,0 |
| | M8345 | ■ | ■ | | | ■ | | ⚙ | + / - | 0,8 | 0,14 | 0,22 | 0,3 | 13,0 |
| ADMX 160616SR-MM | M9340 | ◪ | ■ | | | ■ | | ⚙ | - - - | 1,6 | 0,14 | 0,19 | 0,3 | 13,0 |
| | M6330 | ◪ | ■ | | | ■ | | ✖ | - | 1,6 | 0,14 | 0,22 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | | | ■ | | ✖ | + / - | 1,6 | 0,14 | 0,22 | 0,3 | 13,0 |
| | M8345 | ■ | ■ | | | ■ | | ✖ | + / - | 1,6 | 0,14 | 0,22 | 0,3 | 13,0 |

# ADEX 16

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 1606 | 9,950 | 4,50 | 16,00 | 6,25 |

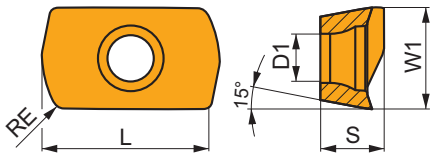


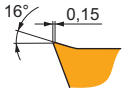




| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 160608SR-FM | M8310 | ■ | ◪ | ■ | | ◪ | | | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | M8330 | ■ | ◪ | ■ | | ◪ | | | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | | + / - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |
| | 8215 | ■ | ◪ | ■ | | ◪ | | | - | 0,8 | 0,10 | 0,25 | 0,3 | 13,0 |

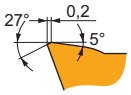
# ADEX 16-HF

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 1606 | 9,950 | 4,50 | 16,00 | 5,88 |



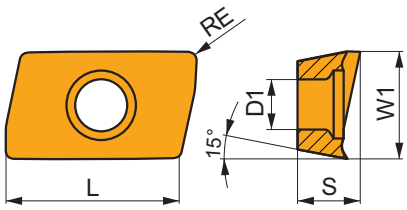

| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 160612SR-HF | M9340 | ◪ | ■ | | | ◪ | | | - - - | 1,2 | 0,60 | 1,11 | 0,3 | 1,3 |
| | M8310 | ■ | ◪ | ◪ | | ◪ | ◪ | | - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |
| | M8330 | ■ | ◪ | ◪ | | ◪ | ◪ | | - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |
| | M8340 | ■ | ■ | ◪ | | ◪ | | | + / - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |
| | 8215 | ■ | ◪ | ◪ | | ◪ | ◪ | | - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |

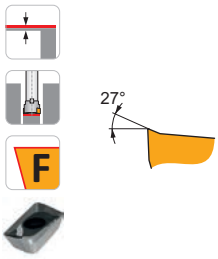



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 160612SR-HF2 | M9325 | ■ | ◪ | | | ◪ | | | - - - | 1,2 | 0,60 | 1,17 | 0,3 | 1,3 |
| | M9340 | ◪ | ◪ | | | ◪ | | | - - - | 1,2 | 0,60 | 1,17 | 0,3 | 1,3 |
| | M8310 | ■ | ◪ | ■ | | ◪ | ■ | | - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |
| | M8330 | ■ | ◪ | ■ | | ◪ | ◪ | | - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |
| | M8340 | ■ | ◪ | ◪ | | ◪ | | | + / - | 1,2 | 0,60 | 1,30 | 0,3 | 1,3 |

# ADEX 16-FA

| | W1 | D1 | L | S |
|---|---|---|---|---|
| 1606 | 9,950 | 4,50 | 16,00 | 6,17 |

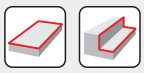



| ISO | | P | M | K | N | S | H | | | RE | FN | FX | APMN | APMX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADEX 160604FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,4 | 0,05 | 0,35 | 0,3 | 13,0 |
| | HF7 | | | | ■ | | | ● | + / - | 0,4 | 0,05 | 0,35 | 0,3 | 13,0 |
| ADEX 160608FR-FA | M0315 | | | | ■ | | | ● | ++ | 0,8 | 0,05 | 0,35 | 0,3 | 13,0 |
| | HF7 | | | | ■ | | | ● | + / - | 0,8 | 0,05 | 0,35 | 0,3 | 13,0 |
| ADEX 160616FR-FA | M0315 | | | | ■ | | | ● | ++ | 1,6 | 0,05 | 0,35 | 0,3 | 13,0 |
| | HF7 | | | | ■ | | | ● | + / - | 1,6 | 0,05 | 0,35 | 0,3 | 13,0 |
| ADEX 160630FR-FA | HF7 | | | | ■ | | | ● | + / - | 3,0 | 0,05 | 0,35 | 0,3 | 13,0 |

| ISO | | FN | FX | M5315 | M9315 | M9325 | M9340 | M0315 | M6330 | M8310 | M8330 | M8340 | M8345 | 8215 | HF7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,10 | 0,30 | 435 | 435 | 385 | 345 | – | 295 | 365 | 337 | 315 | 250 | 345 | – |
| | ⧗ | 0,10 | 0,25 | 405 | 395 | 340 | 310 | – | 265 | 330 | 301 | 280 | 220 | 305 | – |
| | ✖ | 0,10 | 0,15 | 370 | 360 | 300 | 275 | – | 230 | 295 | 260 | 245 | 195 | 270 | – |
| M | ● | 0,10 | 0,25 | – | – | 195 | 205 | – | 210 | 185 | 199 | 185 | 150 | 205 | 80 |
| | ⧗ | 0,10 | 0,20 | – | – | 175 | 185 | – | 185 | 165 | 179 | 165 | 130 | 185 | 70 |
| | ✖ | 0,10 | 0,12 | – | – | 150 | 165 | – | 160 | 150 | 158 | 145 | 115 | 160 | 60 |
| K | ● | 0,10 | 0,30 | 415 | 415 | – | – | – | – | 345 | 321 | 300 | – | 325 | 130 |
| | ⧗ | 0,10 | 0,25 | 385 | 375 | – | – | – | – | 315 | 286 | 265 | – | 290 | 115 |
| | ✖ | 0,10 | 0,15 | 355 | 340 | – | – | – | – | 280 | 250 | 230 | – | 255 | 100 |
| N | ● | 0,10 | 0,30 | – | – | – | – | 760 | – | – | 847 | – | – | 860 | 340 |
| | ⧗ | 0,10 | 0,25 | – | – | – | – | 680 | – | – | 755 | – | – | 770 | 305 |
| | ✖ | 0,10 | 0,15 | – | – | – | – | 595 | – | – | 658 | – | – | 680 | 265 |
| S | ● | 0,10 | 0,25 | – | – | 95 | 100 | – | 105 | 90 | 97 | 90 | 75 | 100 | 40 |
| | ⧗ | 0,10 | 0,20 | – | – | 85 | 90 | – | 90 | 80 | 87 | 80 | 65 | 90 | 35 |
| | ✖ | 0,10 | 0,12 | – | – | 75 | 80 | – | 80 | 75 | 77 | 70 | 55 | 80 | 30 |
| H | ● | 0,10 | 0,25 | 85 | 85 | – | – | – | – | 70 | 66 | – | – | 65 | 25 |
| | ⧗ | 0,10 | 0,20 | 80 | 75 | – | – | – | – | 65 | 56 | – | – | 60 | 20 |
| | ✖ | 0,10 | 0,12 | 70 | 70 | – | – | – | – | 55 | 51 | – | – | 50 | 20 |

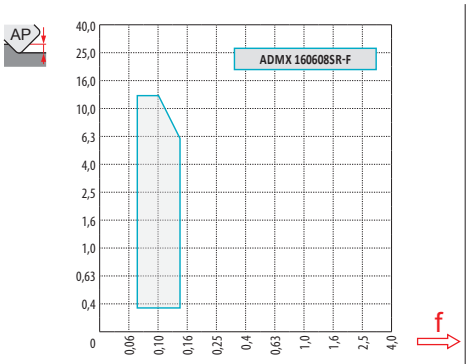
| HFC | | FN | FX | M9325 | M9340 | M8310 | M8330 | M8340 | 8215 |
|---|---|---|---|---|---|---|---|---|---|
| P | ● | 0,55 | 1,25 | 327 | 293 | 310 | 315 | 268 | 293 |
| | ⧗ | 0,55 | 1,00 | 289 | 264 | 281 | 281 | 238 | 259 |
| | ✖ | 0,55 | 0,80 | 255 | 234 | 251 | 243 | 208 | 230 |
| M | ● | 0,55 | 1,25 | 166 | 174 | 157 | 178 | 157 | 174 |
| | ⧗ | 0,55 | 1,00 | 149 | 157 | 140 | 159 | 140 | 157 |
| | ✖ | 0,55 | 0,80 | 128 | 140 | 128 | 141 | 123 | 136 |
| K | ● | 0,55 | 1,25 | – | – | 293 | 300 | 255 | 276 |
| | ⧗ | 0,55 | 1,00 | – | – | 268 | 267 | 225 | 247 |
| | ✖ | 0,55 | 0,80 | – | – | 238 | 233 | 196 | 217 |
| N | ● | 0,55 | 1,25 | – | – | – | 791 | – | 731 |
| | ⧗ | 0,55 | 1,00 | – | – | – | 705 | – | 655 |
| | ✖ | 0,55 | 0,80 | – | – | – | 614 | – | 578 |
| S | ● | 0,55 | 1,20 | 81 | 85 | 77 | 87 | 77 | 85 |
| | ⧗ | 0,55 | 1,00 | 72 | 77 | 68 | 77 | 68 | 77 |
| | ✖ | 0,55 | 0,80 | 64 | 68 | 64 | 68 | 60 | 68 |
| H | ● | 0,50 | 1,00 | – | – | 60 | 55 | – | 55 |
| | ⧗ | 0,50 | 0,80 | – | – | 55 | 47 | – | 51 |
| | ✖ | 0,50 | 0,60 | – | – | 47 | 43 | – | 43 |

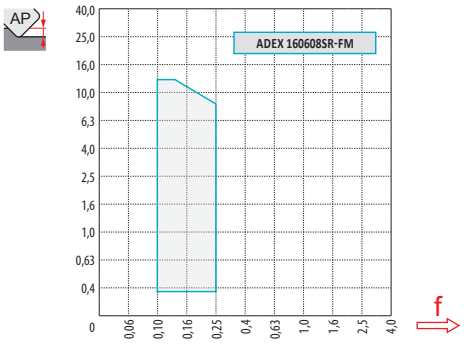


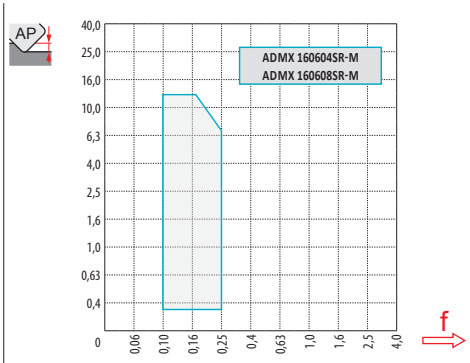
| $a_e$ / DCX | 0,05 | 0,10 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,75 | 0,80 | 0,90 | 1,00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X.V | 1,48 | 1,35 | 1,27 | 1,22 | 1,19 | 1,16 | 1,11 | 1,08 | 1,05 | 1,03 | 1,00 | 1,00 | 1,00 | 1,00 |
| ⇨X.f | 2,87 | 2,05 | 1,69 | 1,48 | 1,33 | 1,23 | 1,09 | 0,75 | 0,94 | 0,90 | 0,89 | 0,88 | 0,88 | 1,00 |
| ⇨X.f | 0,64 | 0,64 | 0,64 | 0,64 | 0,64 | 0,65 | 0,65 | 0,67 | 0,68 | 0,71 | 0,72 | 0,74 | 0,79 | 1,00 |

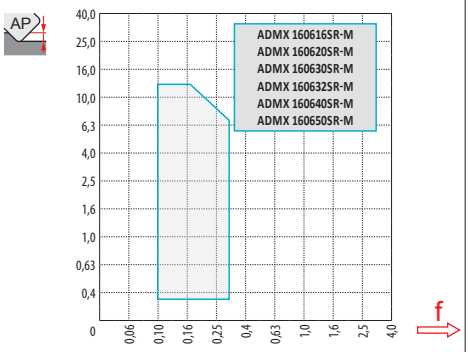
| | ADMX 16-F | ADEX 16-FM | ADMX 16-M | | | | | | | | ADMX 16-R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,8 | 0,8 | 0,4 | 0,8 | 1,6 | 2,0 | 3,0 | 3,2 | 4,0 | 5,0 | 0,8 | 1,6 |
| BS | 2,99 | 2,18 | 3,39 | 2,99 | 1,62 | 1,23 | 0,28 | 0,09 | 2,69 | 1,52 | 2,99 | 1,62 |

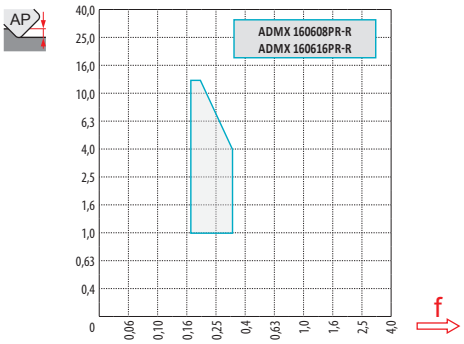
| | ADMX 16-MF | ADMX 16-MM | | | ADEX 16-HF | ADEX 16-HF2 | ADEX 16-FA | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RE | 0,8 | 0,4 | 0,8 | 1,6 | 1,2 | 1,2 | 0,4 | 0,8 | 1,6 | 3,0 |
| BS | 2,99 | 3,39 | 2,99 | 1,62 | 0,52 | 0,52 | 2,84 | 2,44 | 1,65 | 0,69 |

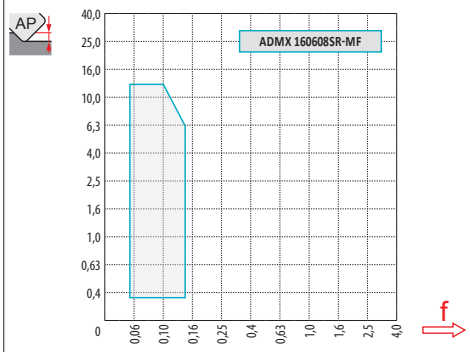


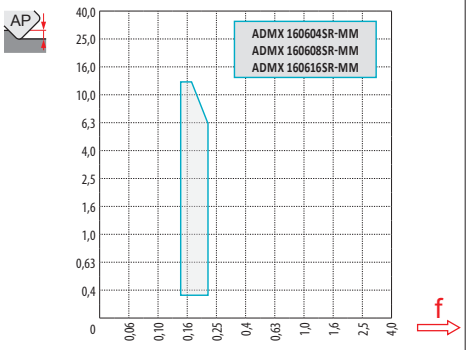



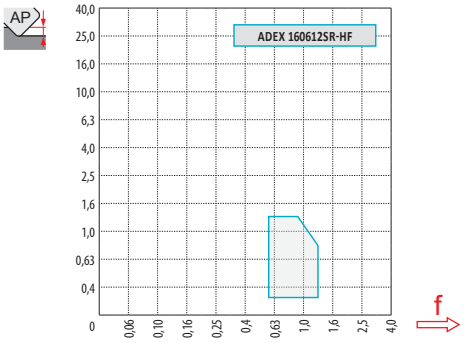



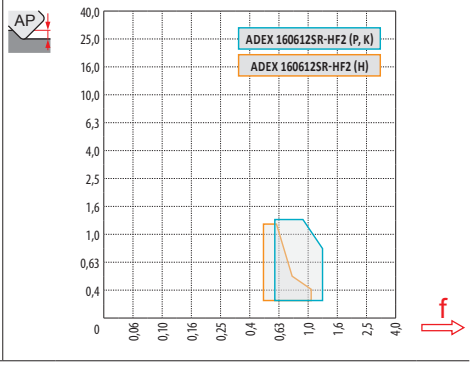



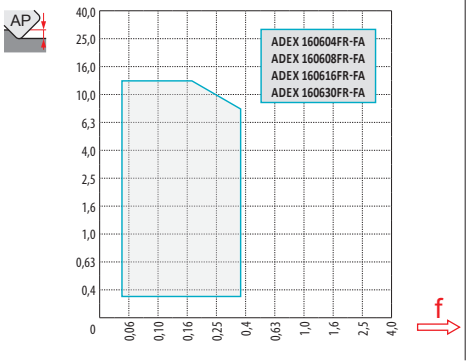



7,5

| | | | |
|---|---|---|---|
| AP | 1,0 | 6,0 | 13,0 |
| 1 f | 0,28 | 0,19 | 0,10 |

| DCX | RPMX | APMX / I |
|---|---|---|
| 25 | 12,5 | 13,0/60 |
| 32 | 7,5 | 13,0/100 |
| 40 | 5,0 | 8,6/100 |
| 50 | 3,5 | 6,0/100 |
| 63 | 2,5 | 4,2/100 |
| 80 | 2,0 | 3,3/100 |

| HFC | | |
|---|---|---|
| RPMX | RPMX | APMX / I |
| 4,0 | 8,0 | 1,3/19 |
| 2,0 | 7,5 | 1,3/38 |
| 1,2 | 4,5 | 1,3/65 |
| 0,8 | 3,0 | 1,3/100 |
| 0,5 | 2,0 | 0,8/100 |
| 0,4 | 1,5 | 0,6/100 |

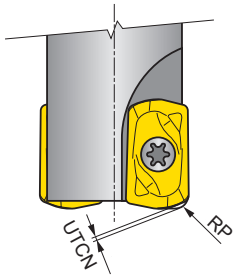
| DCX | $d_{min}$ | $d_{max}$ | $s_{max}$ $d_{min}$ | $s_{max}$ $d_{max}$ | HFC $d_{min}$ | HFC $d_{max}$ | HFC $s_{max}$ $d_{min}$ | HFC $s_{max}$ $d_{max}$ |
|---|---|---|---|---|---|---|---|---|
| 25 | 42,0 | 50,0 | 10,0 | 12,5 | 42,0 | 50,0 | 1,3 | 1,3 |
| 32 | 55,0 | 64,0 | 6,5 | 9,0 | 55,0 | 64,0 | 1,3 | 1,3 |
| 40 | 72,0 | 80,0 | 5,0 | 8,0 | 72,0 | 80,0 | 1,3 | 1,3 |
| 50 | 92,0 | 100,0 | 4,5 | 6,0 | 92,0 | 100,0 | 1,3 | 1,3 |
| 63 | 118,0 | 126,0 | 4,0 | 5,0 | 118,0 | 126,0 | 1,3 | 1,3 |
| 80 | 136,0 | 160,0 | 1,5 | 2,0 | 136,0 | 160,0 | 1,3 | 1,3 |

| AP |
|---|
| 2,5 |

| DCX | µm 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 0,548 | 0,707 | 1,000 | 1,225 | 1,414 | 1,732 | 2,000 | 2,236 | 2,449 | 2,828 | 3,162 |
| 32 | 0,620 | 0,800 | 1,131 | 1,386 | 1,600 | 1,960 | 2,263 | 2,530 | 2,771 | 3,200 | 3,578 |
| 40 | 0,693 | 0,894 | 1,265 | 1,549 | 1,789 | 2,191 | 2,530 | 2,828 | 3,098 | 3,578 | 4,000 |
| 50 | 0,775 | 1,000 | 1,414 | 1,732 | 2,000 | 2,449 | 2,828 | 3,162 | 3,464 | 4,000 | 4,472 |
| 63 | 0,869 | 1,122 | 1,587 | 1,944 | 2,245 | 2,750 | 3,175 | 3,550 | 3,888 | 4,490 | 5,020 |
| 80 | 0,980 | 1,265 | 1,789 | 2,191 | 2,530 | 3,098 | 3,578 | 4,000 | 4,382 | 5,060 | 5,657 |

| RE | µm 3 | 5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,6 | 0,196 | 0,253 | 0,358 | 0,438 | 0,506 | 0,620 | 0,716 | 0,800 | 0,876 | 1,012 | 1,131 |
| 2,0 | 0,219 | 0,283 | 0,400 | 0,490 | 0,566 | 0,693 | 0,800 | 0,894 | 0,980 | 1,131 | 1,265 |
| 3,0 | 0,268 | 0,346 | 0,490 | 0,600 | 0,693 | 0,849 | 0,980 | 1,095 | 1,200 | 1,386 | 1,549 |
| 3,2 | 0,277 | 0,358 | 0,506 | 0,620 | 0,716 | 0,876 | 1,012 | 1,131 | 1,239 | 1,431 | 1,600 |
| 4,0 | 0,310 | 0,400 | 0,566 | 0,693 | 0,800 | 0,980 | 1,131 | 1,265 | 1,386 | 1,600 | 1,789 |
| 5,0 | 0,346 | 0,447 | 0,632 | 0,775 | 0,894 | 1,095 | 1,265 | 1,414 | 1,549 | 1,789 | 2,000 |

| ADMX/ADEX 16 | R |
|---|---|
| ADMX 160630SR-M | 2,5 |
| ADMX 160632SR-M | 2,5 |
| ADMX 160640SR-M | 4,0 |
| ADMX 160650SR-M | 4,5 |
| ADEX 160612SR-HF | 3,0 |
| ADEX 160612SR-HF2 | 3,0 |




| ADEX 16 | RP | UTCN |
|---|---|---|
| | [mm] | [mm] |
| ADEX 160612SR-HF | 2,59 | 0,56 |
| ADEX 160612SR-HF2 | 2,48 | 0,57 |

# FRESADO METAL DURO INTEGRAL

# DESCRIPCION DE ICONOS

## ICONOS COMUNES

Material

Metal Duro

Tratamento Superficial

Nitruro de Aluminio al Cromo

Nitruro de Titanio de Silicio

X-CEED

Nitruro de Aluminio al Titanio

Alcrona

## ICONOS FRESADO

Tipo

Cuchillas para aceros de baja a alta resistencia

Rompevirutas de perfil grueso redondeado

Aplicaciones

Ranurado P9

Ranurado

Super-acabado

Finishing

Acabado

Fresas radiales

Con radios en el extremo

Alto avance

Multi

Dirección

Ranurar, fresado lateral, penetración

Ranurar, fresado lateral

Acabado

Fresado

Longitud de corte

Extra corta

Mediana

Extra larga

Tolerancia del diámetro

Ángulo de hélice
Ángulo de salida

Dientes (z)

Dientes 4 - Espacio irregular

Mango

Estándar

| | | S767 | S262 | S523 | S521 | S524 | S536 | S501 | S229 | S231 | S233 | S529 | S531 | S533 | S511 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM |
| | | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| | | Z 4 ≠ | Z 4 ≠ | Z 4 | Z 4 | Z 4 | Z 4-6 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 4 |
| | | λ≠ γ10° | λ40° γ4° | λ40° γ-6° | λ45° γ-10° | λ40° γ-6° | λ25° γ0° | λ30° γ10° | λ30° γ3° | λ30° γ3° | λ30° γ3° | λ30° γ-10° | λ30° γ-10° | λ30° γ-10° | λ30° γ10° |
| | | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA |
| | | TiSiN | AlCrN | TiSiN | TiSiN | TiSiN | TiSiN | X-CEED | TiSiN | TiSiN | TiSiN | TiSiN | TiSiN | TiSiN | X-CEED |
| | | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 |
| | | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER |
| | | | | | | | | | | | | | | | |
| ISO 513 | | 156 | 158 | 160 | 162 | 164 | 166 | 168 | 170 | 172 | 174 | 176 | 178 | 180 | 182 |
| | | 4.00 - 20.00 | 3.00 - 20.00 | 1.50 - 16.00 | 3.00 - 16.00 | 3.00 - 16.00 | 6.00 - 12.00 | 1.00 - 16.00 | 1.50 - 16.00 | 1.50 - 16.00 | 2.00 - 16.00 | 1.50 - 16.00 | 1.50 - 16.00 | 2.00 - 16.00 | 3.00 - 16.00 |
| P | P1 | ■ | | | | | | ■ | | | | | | | ■ |
| | P2 | ■ | | | | | | ■ | | | | | | | ■ |
| | P3 | ■ | | | | | | ■ | | | | | | | ■ |
| | P4 | ■ | ◪ | | | | | ■ | ◪ | ◪ | ◪ | | | | ■ |
| M | M1 | ■ | | | | | | ■ | | | | | | | ■ |
| | M2 | ■ | ■ | | | | | ■ | ■ | ■ | ■ | | | | ■ |
| | M3 | ■ | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| | M4 | | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| K | K1 | ■ | | | | | | ■ | | | | | | | ■ |
| | K2 | ■ | | | | | | ■ | | | | | | | ■ |
| | K3 | ■ | | | | | | ■ | | | | | | | ■ |
| | K4 | ■ | | | | | | ■ | | | | | | | ■ |
| | K5 | ■ | | | | | | ■ | | | | | | | ■ |
| N | N1 | | | | | | | ◪ | | | | | | | ◪ |
| | N2 | | | | | | | ◪ | | | | | | | ◪ |
| | N3 | | | | | | | ■ | | | | | | | ■ |
| | N4 | | | | | | | ◪ | | | | | | | ◪ |
| | N5 | | | | | | | | | | | | | | |
| S | S1 | ■ | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| | S2 | ■ | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| | S3 | ■ | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| | S4 | ■ | ■ | | | | | ◪ | ■ | ■ | ■ | | | | ◪ |
| H | H1 | | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | |
| | H2 | | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | |
| | H3 | | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | |
| | H4 | | | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | |

■ Main application ◪ Secondary application

| | | S534 | S535 | S765 | S264 | S766 | S216 | S761 | S260 | S717 | S217 | S718 | S218 | S219 | S813HA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM |
| | | | | | | | | | | | | | | | P9 |
| | | N | N | NR | NR | N | N | N | N | N | N | N | N | N | N |
| | | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 3 |
| | | λ30° γ-10° | λ30° γ-10° | λ40° γ10° | λ40° γ4° | λ≠ γ10° | λ40° γ3° | λ40° γ10° | λ40° γ4° | λ40° γ10° | λ40° γ3° | λ40° γ10° | λ40° γ3° | λ40° γ3° | λ28° γ9° |
| | | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HB | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA |
| | | TiSiN | TiSiN | AlCrN | AlCrN | TiSiN | AlTiN | AlCrN | AlCrN | AlCrN | AlTiN | AlCrN | AlTiN | AlTiN | Alcrona |
| | | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | h9 | |
| | | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DIN 6527L |
| | | 3.00 - 16.00 | 3.00 - 16.00 | 6.00 - 20.00 | 6.00 - 20.00 | 4.00 - 20.00 | 2.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 2.00 - 20.00 |
| ISO 513 | | 184 | 186 | 188 | 190 | 192 | 194 | 196 | 198 | 200 | 200 | 202 | 202 | 204 | 206 |
| P | P1 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | P2 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | P3 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | P4 | | | ■ | | ■ | ◪ | ■ | | ■ | ◪ | ■ | ◪ | ◪ | ■ |
| M | M1 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | M2 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | M3 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ◪ |
| | M4 | | | | ■ | | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | ◪ |
| K | K1 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | K2 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | K3 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | K4 | | | ■ | | ■ | | ■ | | ■ | | ■ | | | ■ |
| | K5 | | | ■ | | ■ | | ■ | | | | | | | ■ |
| N | N1 | | | | | | | | | ◪ | | ◪ | | | ◪ |
| | N2 | | | | | | | | | ◪ | | ◪ | | | ■ |
| | N3 | | | | | | | | | ◪ | | ◪ | | | ■ |
| | N4 | | | | | | | | | | | | | | ◪ |
| | N5 | | | | | | | | | | | | | | |
| S | S1 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ◪ |
| | S2 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ◪ |
| | S3 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ◪ |
| | S4 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ◪ |
| H | H1 | ■ | ■ | | ■ | | | | ■ | | | | | | |
| | H2 | ■ | ■ | | ■ | | | | ■ | | | | | | |
| | H3 | ■ | ■ | | ■ | | | | ■ | | | | | | |
| | H4 | ■ | ■ | | | | | | | | | | | | |



■ Main application ◪ Secondary application

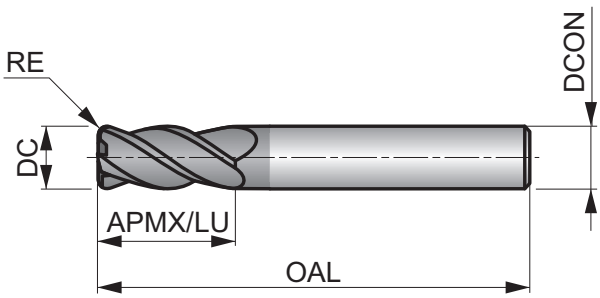
| | | S813HB | S823 | S812HA | S812HB | S822 | S225 | S525 | S226 | S526 | S227 | S527 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM |
| | | P9 | P9 | P9 | P9 | P9 | | | | | | |
| | | N | N | N | N | N | N | N | N | N | N | N |
| | | Z 3 | Z 3 | Z 2 | Z 2 | Z 2 | Z 6-8 | Z 6-8 | Z 6-8 | Z 6-8 | Z 6-8 | Z 6-8 |
| | | λ 28° γ 9° | λ 28° γ 9° | λ 28° γ 9° | λ 28° γ 9° | λ 28° γ 9° | λ 50° γ 3° | λ 50° γ -26° | λ 50° γ 3° | λ 50° γ -26° | λ 50° γ 3° | λ 50° γ -26° |
| | | DIN 6535HB | DIN 6535HA | DIN 6535HA | DIN 6535HB | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA |
| | | Alcrona | Alcrona | Alcrona | Alcrona | Alcrona | AlTiN | TiSiN | AlTiN | TiSiN | AlTiN | TiSiN |
| | | | | | | | h9 | h9 | h9 | h9 | h9 | h9 |
| | | DIN 6527L | DORMER | DIN 6527L | DIN 6527L | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER | DORMER |
| | | 2.00 - 20.00 | 2.00 - 20.00 | 2.00 - 20.00 | 2.00 - 20.00 | 2.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 6.00 - 20.00 | 3.00 - 20.00 |
| ISO 513 | | 206 | 208 | 210 | 210 | 212 | 214 | 214 | 216 | 216 | 218 | 218 |
| P | P1 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | P2 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | P3 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | P4 | ■ | ■ | ■ | ■ | ■ | ◪ | | ◪ | | ◪ | |
| M | M1 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | M2 | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| | M3 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| | M4 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| K | K1 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | K2 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | K3 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | K4 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | K5 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| N | N1 | ◪ | ◪ | ■ | ■ | ■ | | | | | | |
| | N2 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | N3 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | N4 | ◪ | ◪ | ◪ | ◪ | ◪ | | | | | | |
| | N5 | | | | | | | | | | | |
| S | S1 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| | S2 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| | S3 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| | S4 | ◪ | ◪ | ■ | ■ | ■ | ■ | | ■ | | ■ | |
| H | H1 | | | | | | | ■ | | ■ | | ■ |
| | H2 | | | | | | | ■ | | ■ | | ■ |
| | H3 | | | | | | | ■ | | ■ | | ■ |
| | H4 | | | | | | | ■ | | ■ | | ■ |

■ Main application ◪ Secondary application

# S767 • Fresas con radio

| S767 | P1.1 | P1.2 | P1.3 | P2.1 | P2.2 | P2.3 | P3.1 | P3.2 | P3.3 | P4.1 | P4.2 | M1.1 | M1.2 | M2.1 | M2.2 | M3.1 | M3.2 | K1.1 | K1.2 | K1.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | K2.1 | K2.2 | K2.3 | K3.1 | K3.2 | K3.3 | K4.1 | K4.2 | K4.3 | K4.4 | K4.5 | K5.1 | K5.2 | K5.3 | S1.2 | S2.1 | S3.1 | S4.1 | | |

S767 HM N Z 4 λ≠ γ10° DIN 6535HA TiSiN h9 DORMER

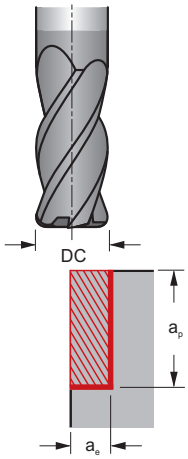



S767

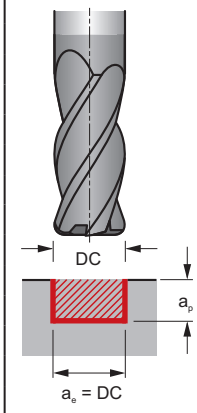
4.00 - 20.00

| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S767 |
|---|---|---|---|---|---|---|
| 4.0 | 0.30 | 6.0 | 11.0 | 57.0 | 4 | S7674.0XR0.3 |
| 4.0 | 0.50 | 6.0 | 11.0 | 57.0 | 4 | S7674.0XR0.5 |
| 5.0 | 0.30 | 6.0 | 13.0 | 57.0 | 4 | S7675.0XR0.3 |
| 5.0 | 0.50 | 6.0 | 13.0 | 57.0 | 4 | S7675.0XR0.5 |
| 6.0 | 0.30 | 6.0 | 13.0 | 57.0 | 4 | S7676.0XR0.3 |
| 6.0 | 0.50 | 6.0 | 13.0 | 57.0 | 4 | S7676.0XR0.5 |
| 6.0 | 1.00 | 6.0 | 13.0 | 57.0 | 4 | S7676.0XR1.0 |
| 8.0 | 0.30 | 8.0 | 20.0 | 64.0 | 4 | S7678.0XR0.3 |
| 8.0 | 0.50 | 8.0 | 20.0 | 64.0 | 4 | S7678.0XR0.5 |
| 8.0 | 1.00 | 8.0 | 20.0 | 64.0 | 4 | S7678.0XR1.0 |
| 10.0 | 0.30 | 10.0 | 22.0 | 72.0 | 4 | S76710.0XR0.3 |
| 10.0 | 0.50 | 10.0 | 22.0 | 72.0 | 4 | S76710.0XR0.5 |
| 10.0 | 1.00 | 10.0 | 22.0 | 72.0 | 4 | S76710.0XR1.0 |
| 12.0 | 0.30 | 12.0 | 26.0 | 83.0 | 4 | S76712.0XR0.3 |
| 12.0 | 0.50 | 12.0 | 26.0 | 83.0 | 4 | S76712.0XR0.5 |
| 12.0 | 1.00 | 12.0 | 26.0 | 83.0 | 4 | S76712.0XR1.0 |
| 12.0 | 2.00 | 12.0 | 26.0 | 83.0 | 4 | S76712.0XR2.0 |
| 16.0 | 0.30 | 16.0 | 32.0 | 92.0 | 4 | S76716.0XR0.3 |
| 16.0 | 0.50 | 16.0 | 32.0 | 92.0 | 4 | S76716.0XR0.5 |
| 16.0 | 1.00 | 16.0 | 32.0 | 92.0 | 4 | S76716.0XR1.0 |
| 16.0 | 2.00 | 16.0 | 32.0 | 92.0 | 4 | S76716.0XR2.0 |
| 20.0 | 0.30 | 20.0 | 38.0 | 104.0 | 4 | S76720.0XR0.3 |
| 20.0 | 0.50 | 20.0 | 38.0 | 104.0 | 4 | S76720.0XR0.5 |
| 20.0 | 1.00 | 20.0 | 38.0 | 104.0 | 4 | S76720.0XR1.0 |
| 20.0 | 2.00 | 20.0 | 38.0 | 104.0 | 4 | S76720.0XR2.0 |

Condiciones de corte iniciales




| S767 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 235 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 150 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 110 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 230 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 215 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |



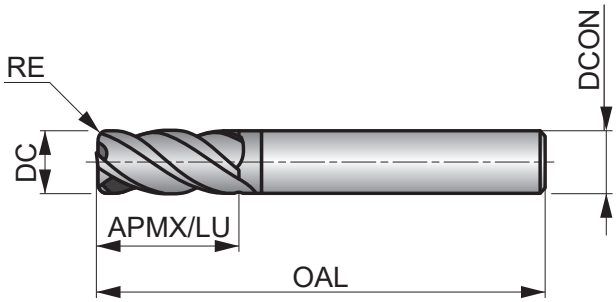

| S767 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 75 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 60 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 110 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S262 • Fresas con radio

**S262** ■ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 H1.1 H2.1 H3.1 H3.2

**S262** HM N Z 4 λ40° γ4° DIN 6535HA AlCrN h9 DORMER

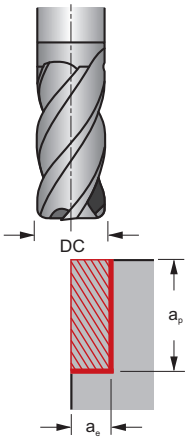



S262

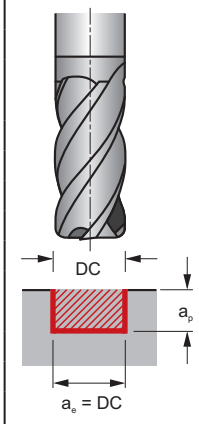
3.00 - 20.00

| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S262 |
|---|---|---|---|---|---|---|
| 3.0 | 0.30 | 6.0 | 9.0 | 50.0 | 4 | S2623.0XR0.3 |
| 3.0 | 0.50 | 6.0 | 9.0 | 50.0 | 4 | S2623.0XR0.5 |
| 4.0 | 0.30 | 6.0 | 12.0 | 57.0 | 4 | S2624.0XR0.3 |
| 4.0 | 0.50 | 6.0 | 12.0 | 57.0 | 4 | S2624.0XR0.5 |
| 4.0 | 1.00 | 6.0 | 12.0 | 57.0 | 4 | S2624.0XR1.0 |
| 5.0 | 0.30 | 6.0 | 15.0 | 57.0 | 4 | S2625.0XR0.3 |
| 5.0 | 0.50 | 6.0 | 15.0 | 57.0 | 4 | S2625.0XR0.5 |
| 6.0 | 0.30 | 6.0 | 16.0 | 57.0 | 4 | S2626.0XR0.3 |
| 6.0 | 0.50 | 6.0 | 16.0 | 57.0 | 4 | S2626.0XR0.5 |
| 6.0 | 1.00 | 6.0 | 16.0 | 57.0 | 4 | S2626.0XR1.0 |
| 8.0 | 0.30 | 8.0 | 20.0 | 64.0 | 4 | S2628.0XR0.3 |
| 8.0 | 0.50 | 8.0 | 20.0 | 64.0 | 4 | S2628.0XR0.5 |
| 8.0 | 1.00 | 8.0 | 20.0 | 64.0 | 4 | S2628.0XR1.0 |
| 8.0 | 1.50 | 8.0 | 20.0 | 64.0 | 4 | S2628.0XR1.5 |
| 8.0 | 2.00 | 8.0 | 20.0 | 64.0 | 4 | S2628.0XR2.0 |
| 10.0 | 0.30 | 10.0 | 22.0 | 72.0 | 4 | S26210.0XR0.3 |
| 10.0 | 0.50 | 10.0 | 22.0 | 72.0 | 4 | S26210.0XR0.5 |
| 10.0 | 1.00 | 10.0 | 22.0 | 72.0 | 4 | S26210.0XR1.0 |
| 10.0 | 1.50 | 10.0 | 22.0 | 72.0 | 4 | S26210.0XR1.5 |
| 10.0 | 2.00 | 10.0 | 22.0 | 72.0 | 4 | S26210.0XR2.0 |
| 12.0 | 0.30 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR0.3 |
| 12.0 | 0.50 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR0.5 |
| 12.0 | 1.00 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR1.0 |
| 12.0 | 2.00 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR2.0 |
| 12.0 | 2.50 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR2.5 |
| 12.0 | 3.00 | 12.0 | 26.0 | 83.0 | 4 | S26212.0XR3.0 |
| 14.0 | 0.30 | 14.0 | 32.0 | 83.0 | 4 | S26214.0XR0.3 |
| 14.0 | 0.50 | 14.0 | 32.0 | 83.0 | 4 | S26214.0XR0.5 |
| 14.0 | 1.00 | 14.0 | 32.0 | 83.0 | 4 | S26214.0XR1.0 |
| 14.0 | 2.00 | 14.0 | 32.0 | 83.0 | 4 | S26214.0XR2.0 |
| 14.0 | 3.00 | 14.0 | 32.0 | 83.0 | 4 | S26214.0XR3.0 |
| 16.0 | 0.30 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR0.3 |
| 16.0 | 0.50 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR0.5 |
| 16.0 | 1.00 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR1.0 |
| 16.0 | 2.00 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR2.0 |
| 16.0 | 2.50 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR2.5 |
| 16.0 | 3.00 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR3.0 |
| 16.0 | 4.00 | 16.0 | 32.0 | 92.0 | 4 | S26216.0XR4.0 |
| 18.0 | 0.30 | 18.0 | 38.0 | 92.0 | 4 | S26218.0XR0.3 |
| 18.0 | 0.50 | 18.0 | 38.0 | 92.0 | 4 | S26218.0XR0.5 |

Condiciones de corte iniciales




| S262 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 145 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 265 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 145 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



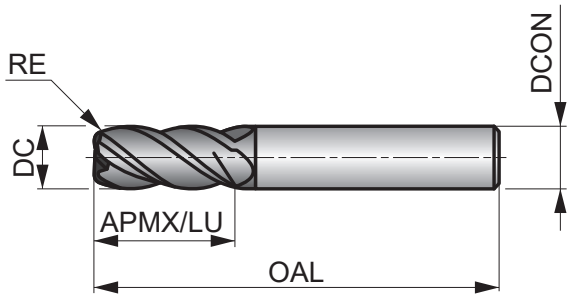

| S262 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 70 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 130 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 70 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S523 • Fresas con radio

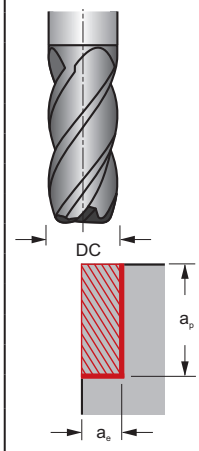
**S523** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S523** HM N Z 4 λ40° γ-6° DIN 6535HA TiSiN h9 DORMER

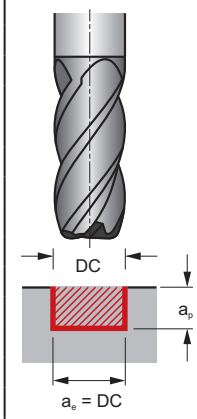


| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S523 |
|---|---|---|---|---|---|---|
| 1.5 | 0.20 | 6.0 | 4.5 | 50.0 | 4 | S5231.5XR0.2 |
| 2.0 | 0.20 | 6.0 | 6.5 | 50.0 | 4 | S5232.0XR0.2 |
| 3.0 | 0.20 | 3.0 | 9.0 | 50.0 | 4 | S5233.0XR0.2XD3 |
| 3.0 | 0.30 | 3.0 | 9.0 | 50.0 | 4 | S5233.0XR0.3XD3 |
| 3.0 | 0.20 | 6.0 | 9.0 | 50.0 | 4 | S5233.0XR0.2XD6 |
| 3.0 | 0.30 | 6.0 | 9.0 | 50.0 | 4 | S5233.0XR0.3XD6 |
| 3.0 | 0.50 | 6.0 | 9.0 | 50.0 | 4 | S5233.0XR0.5XD6 |
| 4.0 | 0.30 | 4.0 | 12.0 | 50.0 | 4 | S5234.0XR0.3XD4 |
| 4.0 | 0.50 | 4.0 | 12.0 | 50.0 | 4 | S5234.0XR0.5XD4 |
| 4.0 | 0.30 | 6.0 | 12.0 | 50.0 | 4 | S5234.0XR0.3XD6 |
| 4.0 | 0.50 | 6.0 | 12.0 | 50.0 | 4 | S5234.0XR0.5XD6 |
| 5.0 | 0.30 | 5.0 | 15.0 | 50.0 | 4 | S5235.0XR0.3XD5 |
| 5.0 | 0.50 | 5.0 | 15.0 | 50.0 | 4 | S5235.0XR0.5XD5 |
| 5.0 | 0.30 | 6.0 | 15.0 | 50.0 | 4 | S5235.0XR0.3XD6 |
| 5.0 | 0.50 | 6.0 | 15.0 | 50.0 | 4 | S5235.0XR0.5XD6 |
| 6.0 | 0.30 | 6.0 | 16.0 | 50.0 | 4 | S5236.0XR0.3 |
| 6.0 | 0.50 | 6.0 | 16.0 | 50.0 | 4 | S5236.0XR0.5 |
| 6.0 | 1.00 | 6.0 | 16.0 | 50.0 | 4 | S5236.0XR1.0 |
| 8.0 | 0.30 | 8.0 | 20.0 | 64.0 | 4 | S5238.0XR0.3 |
| 8.0 | 0.50 | 8.0 | 20.0 | 64.0 | 4 | S5238.0XR0.5 |
| 8.0 | 1.00 | 8.0 | 20.0 | 64.0 | 4 | S5238.0XR1.0 |
| 8.0 | 2.00 | 8.0 | 20.0 | 64.0 | 4 | S5238.0XR2.0 |
| 10.0 | 0.50 | 10.0 | 22.0 | 70.0 | 4 | S52310.0XR0.5 |
| 10.0 | 1.00 | 10.0 | 22.0 | 70.0 | 4 | S52310.0XR1.0 |
| 10.0 | 1.50 | 10.0 | 22.0 | 70.0 | 4 | S52310.0XR1.5 |
| 10.0 | 2.00 | 10.0 | 22.0 | 70.0 | 4 | S52310.0XR2.0 |
| 12.0 | 0.50 | 12.0 | 25.0 | 75.0 | 4 | S52312.0XR0.5 |
| 12.0 | 1.00 | 12.0 | 25.0 | 75.0 | 4 | S52312.0XR1.0 |
| 12.0 | 2.00 | 12.0 | 25.0 | 75.0 | 4 | S52312.0XR2.0 |
| 12.0 | 3.00 | 12.0 | 25.0 | 75.0 | 4 | S52312.0XR3.0 |
| 16.0 | 0.50 | 16.0 | 32.0 | 90.0 | 4 | S52316.0XR0.5 |
| 16.0 | 1.00 | 16.0 | 32.0 | 90.0 | 4 | S52316.0XR1.0 |
| 16.0 | 2.00 | 16.0 | 32.0 | 90.0 | 4 | S52316.0XR2.0 |
| 16.0 | 3.00 | 16.0 | 32.0 | 90.0 | 4 | S52316.0XR3.0 |

Condiciones de corte iniciales




| S523 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 175 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 95 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,60 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | max | 0,05 | 60 | | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



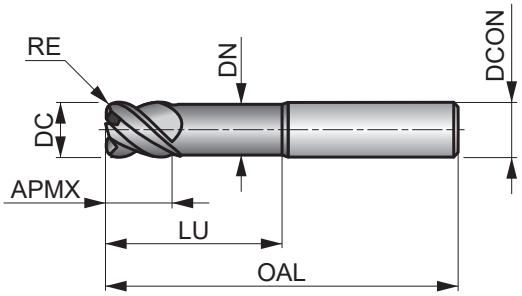

| S523 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 90 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 50 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,50 | 1,00 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | 1,00 | | 30 | | 0,002 | 0,003 | 0,004 | 0,005 | 0,005 | 0,007 | 0,008 | 0,011 | 0,011 | 0,013 | 0,014 | 0,016 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S521 • Fresas con radio

**S521** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S521** HM N Z 4 λ45° γ-10° DIN 6535HA TiSiN h9 DORMER

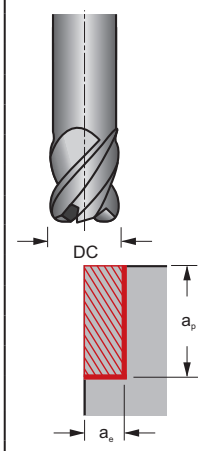



S521

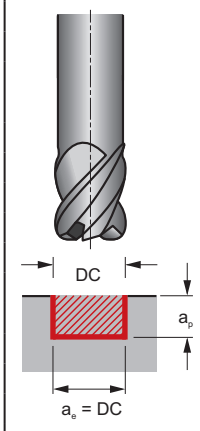
3.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S521 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 0.30 | 6.0 | 4.0 | 60.0 | 4 | 14.0 | 2.8 | S5213.0XR0.3 |
| 4.0 | 0.30 | 6.0 | 5.0 | 60.0 | 4 | 16.0 | 3.7 | S5214.0XR0.3 |
| 4.0 | 0.50 | 6.0 | 5.0 | 60.0 | 4 | 16.0 | 3.7 | S5214.0XR0.5 |
| 5.0 | 0.30 | 6.0 | 6.0 | 60.0 | 4 | 18.0 | 4.6 | S5215.0XR0.3 |
| 5.0 | 0.50 | 6.0 | 6.0 | 60.0 | 4 | 18.0 | 4.6 | S5215.0XR0.5 |
| 6.0 | 0.50 | 6.0 | 7.0 | 60.0 | 4 | 20.0 | 5.5 | S5216.0XR0.5 |
| 6.0 | 1.00 | 6.0 | 7.0 | 60.0 | 4 | 20.0 | 5.5 | S5216.0XR1.0 |
| 8.0 | 0.50 | 8.0 | 9.0 | 64.0 | 4 | 26.0 | 7.4 | S5218.0XR0.5 |
| 8.0 | 1.00 | 8.0 | 9.0 | 64.0 | 4 | 26.0 | 7.4 | S5218.0XR1.0 |
| 10.0 | 1.00 | 10.0 | 11.0 | 70.0 | 4 | 31.0 | 9.2 | S52110.0XR1.0 |
| 10.0 | 2.00 | 10.0 | 11.0 | 70.0 | 4 | 31.0 | 9.2 | S52110.0XR2.0 |
| 12.0 | 1.00 | 12.0 | 13.0 | 75.0 | 4 | 37.0 | 11.0 | S52112.0XR1.0 |
| 12.0 | 2.00 | 12.0 | 13.0 | 75.0 | 4 | 37.0 | 11.0 | S52112.0XR2.0 |
| 16.0 | 1.00 | 16.0 | 17.0 | 90.0 | 4 | 43.0 | 15.0 | S52116.0XR1.0 |
| 16.0 | 2.00 | 16.0 | 17.0 | 90.0 | 4 | 43.0 | 15.0 | S52116.0XR2.0 |
| 16.0 | 3.00 | 16.0 | 17.0 | 90.0 | 4 | 43.0 | 15.0 | S52116.0XR3.0 |

Condiciones de corte iniciales




| S521 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 175 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 95 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,60 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | max | 0,05 | 60 | | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



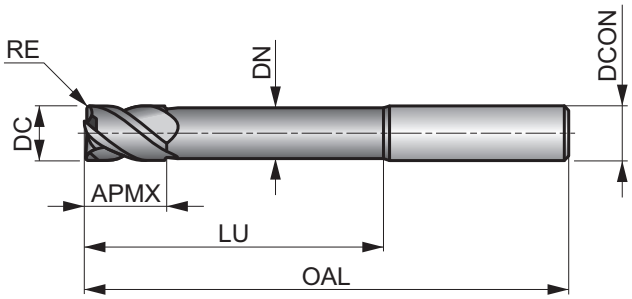

| S521 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 90 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 50 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,50 | 1,00 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | 1,00 | | 30 | | 0,002 | 0,003 | 0,004 | 0,005 | 0,005 | 0,007 | 0,008 | 0,011 | 0,011 | 0,013 | 0,014 | 0,016 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S524 • Fresas con radio

**S524** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S524** HM | N | Z 4 | λ40° γ-6° | DIN 6535HA | TiSiN | h9 | DORMER

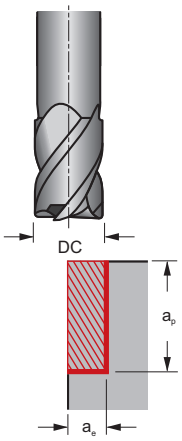



S524

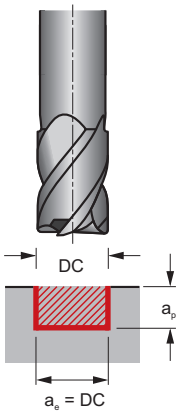
3.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S524 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 0.30 | 6.0 | 5.0 | 75.0 | 4 | 30.0 | 2.8 | S5243.0XR0.3 |
| 4.0 | 0.30 | 6.0 | 8.0 | 75.0 | 4 | 32.0 | 3.7 | S5244.0XR0.3 |
| 4.0 | 0.50 | 6.0 | 8.0 | 75.0 | 4 | 32.0 | 3.7 | S5244.0XR0.5 |
| 5.0 | 0.30 | 6.0 | 9.0 | 75.0 | 4 | 32.0 | 4.6 | S5245.0XR0.3 |
| 5.0 | 0.50 | 6.0 | 9.0 | 75.0 | 4 | 32.0 | 4.6 | S5245.0XR0.5 |
| 6.0 | 0.30 | 6.0 | 10.0 | 75.0 | 4 | 40.0 | 5.5 | S5246.0XR0.3 |
| 6.0 | 0.50 | 6.0 | 10.0 | 75.0 | 4 | 40.0 | 5.5 | S5246.0XR0.5 |
| 6.0 | 1.00 | 6.0 | 10.0 | 75.0 | 4 | 40.0 | 5.5 | S5246.0XR1.0 |
| 8.0 | 0.30 | 8.0 | 12.0 | 75.0 | 4 | 40.0 | 7.4 | S5248.0XR0.3 |
| 8.0 | 0.50 | 8.0 | 12.0 | 75.0 | 4 | 40.0 | 7.4 | S5248.0XR0.5 |
| 8.0 | 1.00 | 8.0 | 12.0 | 75.0 | 4 | 40.0 | 7.4 | S5248.0XR1.0 |
| 10.0 | 0.50 | 10.0 | 14.0 | 75.0 | 4 | 40.0 | 9.2 | S52410.0XR0.5 |
| 10.0 | 1.00 | 10.0 | 14.0 | 75.0 | 4 | 40.0 | 9.2 | S52410.0XR1.0 |
| 10.0 | 2.00 | 10.0 | 14.0 | 75.0 | 4 | 40.0 | 9.2 | S52410.0XR2.0 |
| 12.0 | 0.50 | 12.0 | 16.0 | 100.0 | 4 | 60.0 | 11.0 | S52412.0XR0.5 |
| 12.0 | 1.00 | 12.0 | 16.0 | 100.0 | 4 | 60.0 | 11.0 | S52412.0XR1.0 |
| 12.0 | 2.00 | 12.0 | 16.0 | 100.0 | 4 | 60.0 | 11.0 | S52412.0XR2.0 |
| 16.0 | 0.50 | 16.0 | 22.0 | 125.0 | 4 | 85.0 | 15.0 | S52416.0XR0.5 |
| 16.0 | 1.00 | 16.0 | 22.0 | 125.0 | 4 | 85.0 | 15.0 | S52416.0XR1.0 |
| 16.0 | 2.00 | 16.0 | 22.0 | 125.0 | 4 | 85.0 | 15.0 | S52416.0XR2.0 |
| 16.0 | 3.00 | 16.0 | 22.0 | 125.0 | 4 | 85.0 | 15.0 | S52416.0XR3.0 |

Condiciones de corte iniciales




| S524 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 175 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 95 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,60 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | max | 0,05 | 60 | | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



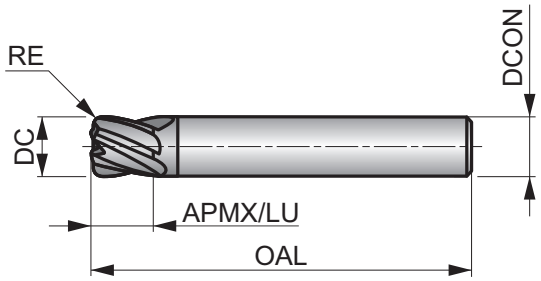

| S524 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 120 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 90 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 65 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 50 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,50 | 1,00 | 40 | $f_z$ | 0,003 | 0,004 | 0,005 | 0,006 | 0,007 | 0,009 | 0,011 | 0,014 | 0,015 | 0,017 | 0,019 | 0,021 |
| | | | 1,00 | | 30 | | 0,002 | 0,003 | 0,004 | 0,005 | 0,005 | 0,007 | 0,008 | 0,011 | 0,011 | 0,013 | 0,014 | 0,016 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S536 • Fresas alto avance

**S536** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S536** HM N Z 4-6 λ25° γ0° DIN 6535HA TiSiN h9 DORMER

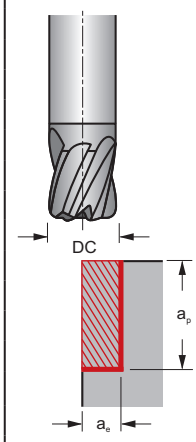



S536

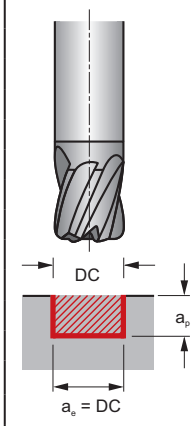
6.00 - 12.00

| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S536 |
|---|---|---|---|---|---|---|
| 6.0 | 1.00 | 6.0 | 6.0 | 60.0 | 4 | S5366.0XR1.0 |
| 8.0 | 2.00 | 8.0 | 8.0 | 64.0 | 6 | S5368.0XR2.0 |
| 10.0 | 2.00 | 10.0 | 10.0 | 75.0 | 6 | S53610.0XR2.0 |
| 12.0 | 2.00 | 12.0 | 12.0 | 75.0 | 6 | S53612.0XR2.0 |

Condiciones de corte iniciales




| S536 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,03 | 0,60 | 200 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,03 | 0,60 | 110 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,03 | 0,60 | 70 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



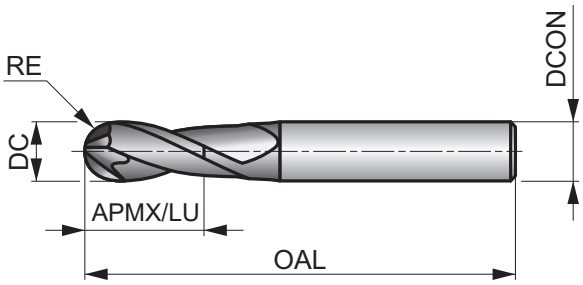

| S536 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,03 | 1,00 | 150 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,03 | 1,00 | 80 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,03 | 1,00 | 55 | $f_z$ | - | - | - | - | 0,073 | 0,085 | 0,097 | 0,107 | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S501 • Fresas esfericas

| S501 | | |
|---|---|---|
| | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N3.1 N3.2 |
| | ◪ | P4.3 M3.1 M3.2 M3.3 M4.1 N1.1 N1.2 N1.3 N2.1 N2.2 N2.3 N3.3 N4.1 N4.2 S1.1 S1.2 S2.1 S3.1 S4.1 |

**S501** HM | N | Z 2 | λ30° γ10° | DIN 6535HA | X-CEED | h9 | DORMER



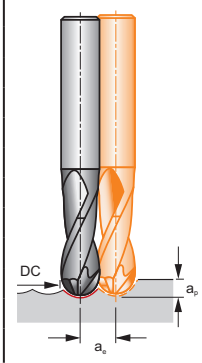

S501

1.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S501 |
|---|---|---|---|---|---|---|
| 1.0 | 0.50 | 3.0 | 3.0 | 38.0 | 2 | S5011.0 |
| 1.5 | 0.75 | 3.0 | 3.0 | 38.0 | 2 | S5011.5 |
| 2.0 | 1.00 | 3.0 | 6.0 | 38.0 | 2 | S5012.0 |
| 2.5 | 1.25 | 3.0 | 7.0 | 38.0 | 2 | S5012.5 |
| 3.0 | 1.50 | 3.0 | 7.0 | 38.0 | 2 | S5013.0 |
| 4.0 | 2.00 | 6.0 | 8.0 | 57.0 | 2 | S5014.0 |
| 5.0 | 2.50 | 6.0 | 10.0 | 57.0 | 2 | S5015.0 |
| 6.0 | 3.00 | 6.0 | 10.0 | 57.0 | 2 | S5016.0 |
| 7.0 | 3.50 | 8.0 | 13.0 | 63.0 | 2 | S5017.0 |
| 8.0 | 4.00 | 8.0 | 16.0 | 63.0 | 2 | S5018.0 |
| 9.0 | 4.50 | 10.0 | 16.0 | 72.0 | 2 | S5019.0 |
| 10.0 | 5.00 | 10.0 | 19.0 | 72.0 | 2 | S50110.0 |
| 12.0 | 6.00 | 12.0 | 22.0 | 83.0 | 2 | S50112.0 |
| 16.0 | 8.00 | 16.0 | 26.0 | 92.0 | 2 | S50116.0 |

Condiciones de corte iniciales

| S501 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,10 | 0,10 | 200 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | 0,05 | 0,03 | 280 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,10 | 0,10 | 130 | $f_z$ | 0,006 | 0,011 | 0,021 | 0,029 | 0,035 | 0,045 | 0,056 | 0,067 | 0,078 | 0,090 |
| | | | 0,05 | 0,03 | 175 | | 0,014 | 0,026 | 0,050 | 0,070 | 0,085 | 0,112 | 0,139 | 0,166 | 0,197 | 0,224 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,10 | 0,10 | 80 | $f_z$ | 0,006 | 0,011 | 0,021 | 0,029 | 0,035 | 0,045 | 0,056 | 0,067 | 0,078 | 0,090 |
| | | | 0,05 | 0,03 | 105 | | 0,014 | 0,026 | 0,050 | 0,070 | 0,085 | 0,112 | 0,139 | 0,166 | 0,197 | 0,224 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,10 | 0,10 | 200 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | 0,05 | 0,03 | 270 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,10 | 0,10 | 190 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | 0,05 | 0,03 | 260 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |

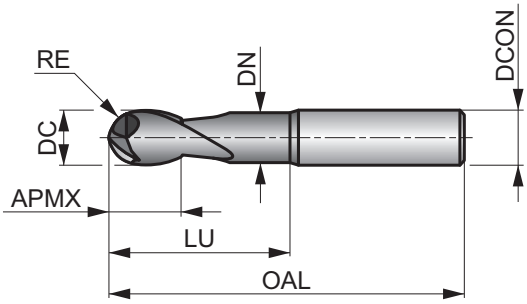



La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S229 • Fresas esfericas

**S229** ▪ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2

**S229** HM | N | Z 2 | λ30° γ3° | DIN 6535HA | TiSiN | h9 | DORMER

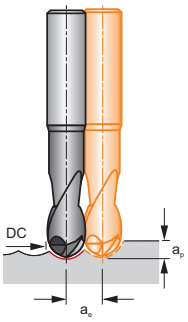



S229

1.50 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S229 |
|---|---|---|---|---|---|---|---|---|
| 1.5 | 0.75 | 4.0 | 3.0 | 50.0 | 2 | 6.0 | 1.4 | S2291.5XD4 |
| 2.0 | 1.00 | 3.0 | 4.0 | 50.0 | 2 | 8.0 | 1.9 | S2292.0XD3 |
| 2.0 | 1.00 | 4.0 | 4.0 | 50.0 | 2 | 8.0 | 1.9 | S2292.0XD4 |
| 3.0 | 1.50 | 3.0 | 5.0 | 50.0 | 2 | 14.0 | 2.8 | S2293.0XD3 |
| 3.0 | 1.50 | 6.0 | 5.0 | 50.0 | 2 | 14.0 | 2.8 | S2293.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 50.0 | 2 | 20.0 | 3.7 | S2294.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 50.0 | 2 | 20.0 | 3.7 | S2294.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 50.0 | 2 | 20.0 | 4.6 | S2295.0XD5 |
| 5.0 | 2.50 | 6.0 | 9.0 | 50.0 | 2 | 20.0 | 4.6 | S2295.0XD6 |
| 6.0 | 3.00 | 6.0 | 10.0 | 50.0 | 2 | 20.0 | 5.5 | S2296.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 64.0 | 2 | 30.0 | 7.4 | S2298.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 70.0 | 2 | 32.0 | 9.2 | S22910.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 75.0 | 2 | 38.0 | 11.0 | S22912.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 90.0 | 2 | 44.0 | 13.0 | S22914.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 90.0 | 2 | 46.0 | 15.0 | S22916.0 |

Condiciones de corte iniciales

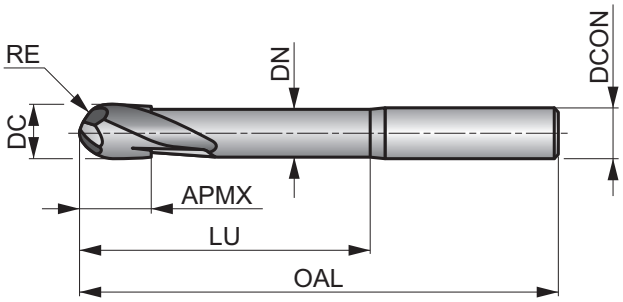
| S229 | | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|  | C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,10 | 0,10 | 130 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | | 0,05 | 0,03 | 185 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |
| | 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| | GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S231 • Fresas esfericas

**S231** ▪ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2

**S231** HM | N | Z 2 | λ30° γ3° | DIN 6535HA | TiSiN | h9 | DORMER



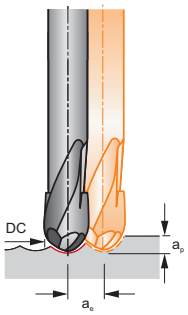

S231

1.50 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S231 |
|---|---|---|---|---|---|---|---|---|
| 1.5 | 0.75 | 4.0 | 3.0 | 75.0 | 2 | 10.0 | 1.4 | S2311.5XD4 |
| 2.0 | 1.00 | 3.0 | 4.0 | 60.0 | 2 | 14.0 | 1.9 | S2312.0XD3 |
| 2.0 | 1.00 | 4.0 | 4.0 | 75.0 | 2 | 14.0 | 1.9 | S2312.0XD4 |
| 3.0 | 1.50 | 3.0 | 5.0 | 60.0 | 2 | 21.0 | 2.8 | S2313.0XD3 |
| 3.0 | 1.50 | 6.0 | 5.0 | 75.0 | 2 | 21.0 | 2.8 | S2313.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 60.0 | 2 | 28.0 | 3.7 | S2314.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 75.0 | 2 | 28.0 | 3.7 | S2314.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 60.0 | 2 | 32.0 | 4.6 | S2315.0 |
| 6.0 | 3.00 | 6.0 | 10.0 | 75.0 | 2 | 40.0 | 5.5 | S2316.0 |
| 8.0 | 4.00 | 8.0 | 10.0 | 75.0 | 2 | 40.0 | 7.4 | S2318.0 |
| 10.0 | 5.00 | 10.0 | 12.0 | 75.0 | 2 | 40.0 | 9.2 | S23110.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 100.0 | 2 | 60.0 | 11.0 | S23112.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 125.0 | 2 | 80.0 | 13.0 | S23114.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 125.0 | 2 | 80.0 | 15.0 | S23116.0 |

Condiciones de corte iniciales

| S231 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,10 | 0,10 | 105 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | 0,05 | 0,03 | 150 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

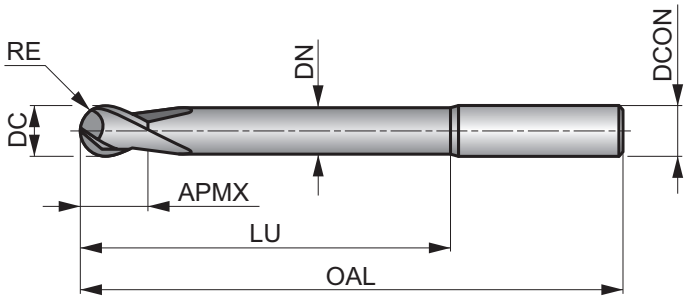



La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S233 • Fresas esfericas

**S233** ▪ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2

**S233** HM | N | Z 2 | λ30° γ3° | DIN 6535HA | TiSiN | h9 | DORMER



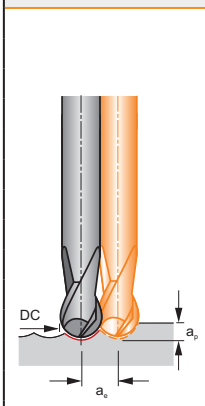

S233

2.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S233 |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 1.00 | 3.0 | 4.0 | 100.0 | 2 | 20.0 | 1.9 | S2332.0XD3 |
| 2.0 | 1.00 | 4.0 | 4.0 | 100.0 | 2 | 20.0 | 1.9 | S2332.0XD4 |
| 3.0 | 1.50 | 3.0 | 5.0 | 100.0 | 2 | 30.0 | 2.8 | S2333.0XD3 |
| 3.0 | 1.50 | 6.0 | 5.0 | 100.0 | 2 | 30.0 | 2.8 | S2333.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 100.0 | 2 | 40.0 | 3.7 | S2334.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 100.0 | 2 | 40.0 | 3.7 | S2334.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 100.0 | 2 | 50.0 | 4.6 | S2335.0 |
| 6.0 | 3.00 | 6.0 | 10.0 | 100.0 | 2 | 60.0 | 5.5 | S2336.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 100.0 | 2 | 60.0 | 7.4 | S2338.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 125.0 | 2 | 85.0 | 9.2 | S23310.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 125.0 | 2 | 85.0 | 11.0 | S23312.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 150.0 | 2 | 110.0 | 13.0 | S23314.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 150.0 | 2 | 110.0 | 15.0 | S23316.0 |

Condiciones de corte iniciales

| S233 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,10 | 0,10 | 70 | $f_z$ | 0,008 | 0,013 | 0,025 | 0,033 | 0,045 | 0,056 | 0,069 | 0,084 | 0,096 | 0,111 |
| | | | 0,05 | 0,03 | 90 | | 0,019 | 0,032 | 0,061 | 0,082 | 0,110 | 0,138 | 0,174 | 0,210 | 0,242 | 0,278 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

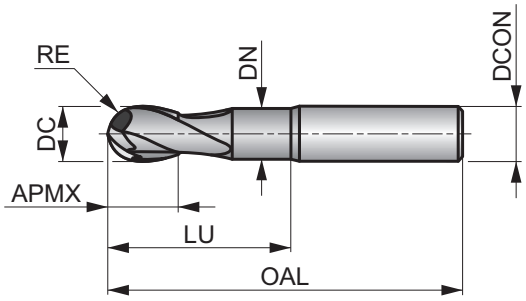



La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S529 • Fresas esfericas

## S529 ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

S529 HM N Z 2 λ30° γ-10° DIN 6535HA TiSiN h9 DORMER



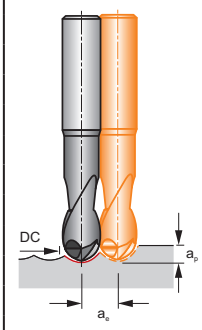

S529

1.50 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S529 |
|---|---|---|---|---|---|---|---|---|
| 1.5 | 0.75 | 6.0 | 3.0 | 50.0 | 2 | 6.0 | 1.4 | S5291.5 |
| 2.0 | 1.00 | 4.0 | 4.0 | 50.0 | 2 | 8.0 | 1.9 | S5292.0XD4 |
| 2.0 | 1.00 | 6.0 | 4.0 | 50.0 | 2 | 8.0 | 1.9 | S5292.0XD6 |
| 3.0 | 1.50 | 3.0 | 5.0 | 50.0 | 2 | 14.0 | 2.8 | S5293.0XD3 |
| 3.0 | 1.50 | 6.0 | 5.0 | 50.0 | 2 | 14.0 | 2.8 | S5293.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 50.0 | 2 | 20.0 | 3.7 | S5294.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 50.0 | 2 | 20.0 | 3.7 | S5294.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 50.0 | 2 | 20.0 | 4.6 | S5295.0XD5 |
| 5.0 | 2.50 | 6.0 | 9.0 | 50.0 | 2 | 20.0 | 4.6 | S5295.0XD6 |
| 6.0 | 3.00 | 6.0 | 10.0 | 50.0 | 2 | 20.0 | 5.5 | S5296.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 64.0 | 2 | 30.0 | 7.4 | S5298.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 70.0 | 2 | 32.0 | 9.2 | S52910.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 75.0 | 2 | 38.0 | 11.0 | S52912.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 90.0 | 2 | 44.0 | 13.0 | S52914.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 90.0 | 2 | 46.0 | 15.0 | S52916.0 |

Condiciones de corte iniciales

| S529 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,10 | 0,10 | 200 | $f_z$ | 0,006 | 0,013 | 0,023 | 0,031 | 0,040 | 0,050 | 0,061 | 0,075 | 0,087 | 0,099 |
| | | | 0,05 | 0,03 | 270 | | 0,014 | 0,032 | 0,055 | 0,076 | 0,098 | 0,125 | 0,153 | 0,188 | 0,219 | 0,248 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,10 | 0,10 | 105 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 150 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,10 | 0,10 | 70 | $f_z$ | 0,006 | 0,009 | 0,011 | 0,014 | 0,017 | 0,024 | 0,031 | 0,041 | 0,045 | 0,053 |
| | | | 0,05 | 0,03 | 95 | | 0,014 | 0,021 | 0,028 | 0,035 | 0,043 | 0,059 | 0,076 | 0,101 | 0,113 | 0,131 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

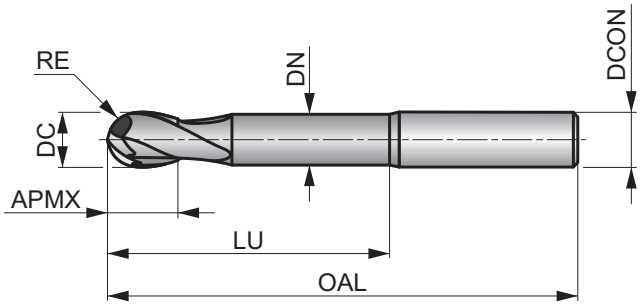



La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S531 • Fresas esfericas

**S531** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S531** HM N Z 2 λ30° γ-10° DIN 6535HA TiSiN h9 DORMER

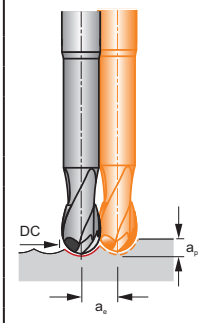



S531

1.50 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S531 |
|---|---|---|---|---|---|---|---|---|
| 1.5 | 0.75 | 6.0 | 3.0 | 75.0 | 2 | 10.0 | 1.4 | S5311.5 |
| 2.0 | 1.00 | 4.0 | 4.0 | 75.0 | 2 | 14.0 | 1.9 | S5312.0XD4 |
| 2.0 | 1.00 | 6.0 | 4.0 | 75.0 | 2 | 14.0 | 1.9 | S5312.0XD6 |
| 3.0 | 1.50 | 3.0 | 5.0 | 60.0 | 2 | 21.0 | 2.8 | S5313.0XD3 |
| 3.0 | 1.50 | 6.0 | 5.0 | 75.0 | 2 | 21.0 | 2.8 | S5313.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 60.0 | 2 | 28.0 | 3.7 | S5314.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 75.0 | 2 | 28.0 | 3.7 | S5314.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 60.0 | 2 | 32.0 | 4.6 | S5315.0XD5 |
| 5.0 | 2.50 | 6.0 | 9.0 | 75.0 | 2 | 32.0 | 4.6 | S5315.0XD6 |
| 6.0 | 3.00 | 6.0 | 10.0 | 75.0 | 2 | 40.0 | 5.5 | S5316.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 75.0 | 2 | 40.0 | 7.4 | S5318.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 75.0 | 2 | 40.0 | 9.2 | S53110.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 100.0 | 2 | 60.0 | 11.0 | S53112.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 125.0 | 2 | 80.0 | 13.0 | S53114.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 125.0 | 2 | 80.0 | 15.0 | S53116.0 |

Condiciones de corte iniciales



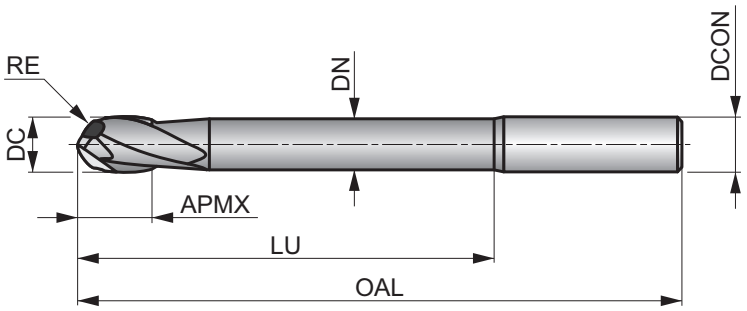

| S531 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,10 | 0,10 | 160 | $f_z$ | 0,006 | 0,013 | 0,023 | 0,031 | 0,040 | 0,050 | 0,061 | 0,075 | 0,087 | 0,099 |
| | | | 0,05 | 0,03 | 220 | | 0,014 | 0,032 | 0,055 | 0,076 | 0,098 | 0,125 | 0,153 | 0,188 | 0,219 | 0,248 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,10 | 0,10 | 90 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 120 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,10 | 0,10 | 55 | $f_z$ | 0,006 | 0,009 | 0,011 | 0,014 | 0,017 | 0,024 | 0,031 | 0,041 | 0,045 | 0,053 |
| | | | 0,05 | 0,03 | 80 | | 0,014 | 0,021 | 0,028 | 0,035 | 0,043 | 0,059 | 0,076 | 0,101 | 0,113 | 0,131 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S533 • Fresas esfericas

**S533** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S533** HM N Z 2 λ30° γ-10° DIN 6535HA TiSiN h9 DORMER

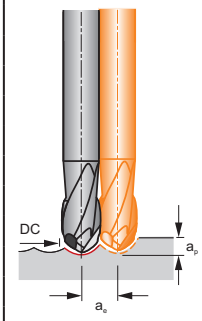


S533

2.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S533 |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 1.00 | 4.0 | 4.0 | 100.0 | 2 | 20.0 | 1.9 | S5332.0XD4 |
| 2.0 | 1.00 | 6.0 | 4.0 | 100.0 | 2 | 20.0 | 1.9 | S5332.0XD6 |
| 3.0 | 1.50 | 4.0 | 5.0 | 100.0 | 2 | 30.0 | 2.8 | S5333.0XD4 |
| 3.0 | 1.50 | 6.0 | 5.0 | 100.0 | 2 | 30.0 | 2.8 | S5333.0XD6 |
| 4.0 | 2.00 | 4.0 | 8.0 | 100.0 | 2 | 40.0 | 3.7 | S5334.0XD4 |
| 4.0 | 2.00 | 6.0 | 8.0 | 100.0 | 2 | 40.0 | 3.7 | S5334.0XD6 |
| 5.0 | 2.50 | 5.0 | 9.0 | 100.0 | 2 | 50.0 | 4.6 | S5335.0XD5 |
| 5.0 | 2.50 | 6.0 | 9.0 | 100.0 | 2 | 50.0 | 4.6 | S5335.0XD6 |
| 6.0 | 3.00 | 6.0 | 10.0 | 100.0 | 2 | 60.0 | 5.5 | S5336.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 100.0 | 2 | 60.0 | 7.4 | S5338.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 125.0 | 2 | 85.0 | 9.2 | S53310.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 125.0 | 2 | 85.0 | 11.0 | S53312.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 150.0 | 2 | 110.0 | 13.0 | S53314.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 150.0 | 2 | 110.0 | 15.0 | S53316.0 |

Condiciones de corte iniciales



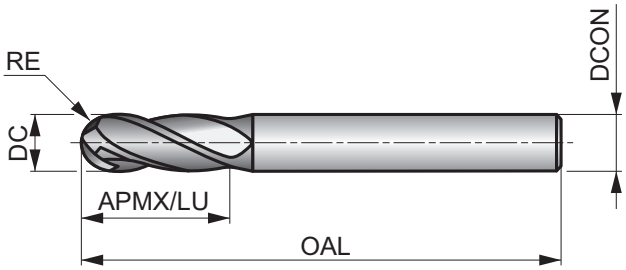

| S533 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,10 | 0,10 | 100 | $f_z$ | 0,006 | 0,013 | 0,023 | 0,031 | 0,040 | 0,050 | 0,061 | 0,075 | 0,087 | 0,099 |
| | | | 0,05 | 0,03 | 135 | | 0,014 | 0,032 | 0,055 | 0,076 | 0,098 | 0,125 | 0,153 | 0,188 | 0,219 | 0,248 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,10 | 0,10 | 50 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 70 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,10 | 0,10 | 35 | $f_z$ | 0,006 | 0,009 | 0,011 | 0,014 | 0,017 | 0,024 | 0,031 | 0,041 | 0,045 | 0,053 |
| | | | 0,05 | 0,03 | 50 | | 0,014 | 0,021 | 0,028 | 0,035 | 0,043 | 0,059 | 0,076 | 0,101 | 0,113 | 0,131 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S511 • Fresas esfericas

| S511 | | |
|---|---|---|
| | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N3.1 N3.2 |
| | ◪ | P4.3 M3.1 M3.2 M3.3 M4.1 N1.1 N1.2 N1.3 N2.1 N2.2 N2.3 N3.3 N4.1 N4.2 S1.1 S1.2 S2.1 S3.1 S4.1 |

**S511** HM | N | Z 4 | λ30° γ10° | DIN 6535HA | X-CEED | h9 | DORMER

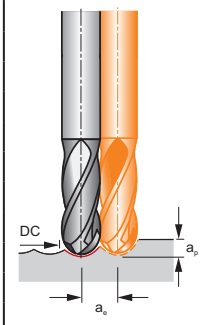



S511

3.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S511 |
|---|---|---|---|---|---|---|
| 3.0 | 1.50 | 6.0 | 8.0 | 80.0 | 4 | S5113.0 |
| 4.0 | 2.00 | 6.0 | 11.0 | 80.0 | 4 | S5114.0 |
| 5.0 | 2.50 | 6.0 | 13.0 | 80.0 | 4 | S5115.0 |
| 6.0 | 3.00 | 6.0 | 13.0 | 80.0 | 4 | S5116.0 |
| 7.0 | 3.50 | 8.0 | 16.0 | 100.0 | 4 | S5117.0 |
| 8.0 | 4.00 | 8.0 | 19.0 | 100.0 | 4 | S5118.0 |
| 9.0 | 4.50 | 10.0 | 19.0 | 100.0 | 4 | S5119.0 |
| 10.0 | 5.00 | 10.0 | 22.0 | 100.0 | 4 | S51110.0 |
| 12.0 | 6.00 | 12.0 | 26.0 | 100.0 | 4 | S51112.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 100.0 | 4 | S51116.0 |

Condiciones de corte iniciales



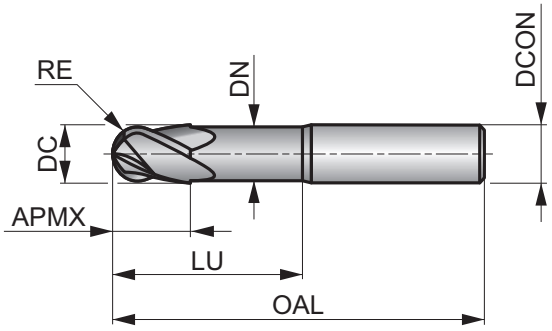

| S511 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,10 | 0,10 | 200 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 280 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,10 | 0,10 | 150 | $f_z$ | 0,006 | 0,009 | 0,016 | 0,019 | 0,025 | 0,032 | 0,042 | 0,049 | 0,057 | 0,065 |
| | | | 0,05 | 0,03 | 175 | | 0,014 | 0,021 | 0,039 | 0,047 | 0,061 | 0,079 | 0,104 | 0,123 | 0,144 | 0,162 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,10 | 0,10 | 80 | $f_z$ | 0,006 | 0,009 | 0,016 | 0,019 | 0,025 | 0,032 | 0,042 | 0,049 | 0,057 | 0,065 |
| | | | 0,05 | 0,03 | 105 | | 0,014 | 0,021 | 0,039 | 0,047 | 0,061 | 0,079 | 0,104 | 0,123 | 0,144 | 0,162 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,10 | 0,10 | 200 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 270 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,10 | 0,10 | 190 | $f_z$ | 0,006 | 0,011 | 0,018 | 0,024 | 0,032 | 0,040 | 0,050 | 0,061 | 0,069 | 0,080 |
| | | | 0,05 | 0,03 | 260 | | 0,014 | 0,026 | 0,044 | 0,059 | 0,079 | 0,099 | 0,125 | 0,152 | 0,174 | 0,201 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S534 • Fresas esfericas

**S534** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S534** HM N Z 4 λ30° γ-10° DIN 6535HA TiSiN h9 DORMER




S534

3.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S534 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 1.50 | 6.0 | 5.0 | 50.0 | 4 | 14.0 | 2.8 | S5343.0 |
| 4.0 | 2.00 | 6.0 | 8.0 | 50.0 | 4 | 20.0 | 3.7 | S5344.0 |
| 5.0 | 2.50 | 6.0 | 9.0 | 50.0 | 4 | 20.0 | 4.6 | S5345.0 |
| 6.0 | 3.00 | 6.0 | 10.0 | 50.0 | 4 | 20.0 | 5.5 | S5346.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 64.0 | 4 | 30.0 | 7.4 | S5348.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 70.0 | 4 | 32.0 | 9.2 | S53410.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 75.0 | 4 | 38.0 | 11.0 | S53412.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 90.0 | 4 | 44.0 | 13.0 | S53414.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 90.0 | 4 | 46.0 | 15.0 | S53416.0 |

Condiciones de corte iniciales

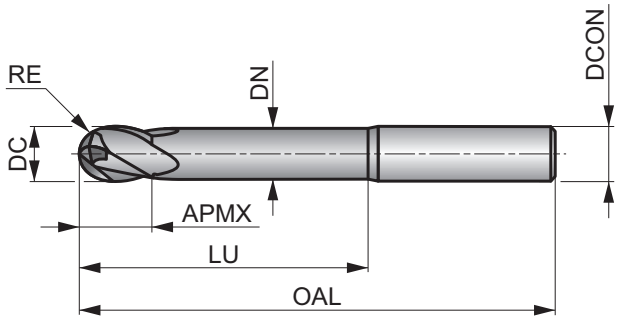
| S534 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,10 | 0,10 | 200 | $f_z$ | 0,006 | 0,009 | 0,018 | 0,021 | 0,030 | 0,037 | 0,044 | 0,055 | 0,063 | 0,074 |
| | | | 0,05 | 0,03 | 270 | | 0,014 | 0,021 | 0,044 | 0,053 | 0,073 | 0,092 | 0,111 | 0,137 | 0,159 | 0,186 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,10 | 0,10 | 105 | $f_z$ | 0,006 | 0,009 | 0,014 | 0,019 | 0,022 | 0,029 | 0,036 | 0,043 | 0,051 | 0,059 |
| | | | 0,05 | 0,03 | 150 | | 0,014 | 0,021 | 0,033 | 0,047 | 0,055 | 0,073 | 0,090 | 0,108 | 0,129 | 0,147 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,10 | 0,10 | 70 | $f_z$ | 0,006 | 0,009 | 0,011 | 0,014 | 0,017 | 0,024 | 0,031 | 0,041 | 0,045 | 0,053 |
| | | | 0,05 | 0,03 | 100 | | 0,014 | 0,021 | 0,028 | 0,035 | 0,043 | 0,059 | 0,076 | 0,101 | 0,113 | 0,131 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S535 • Fresas esfericas

**S535** ■ H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2

**S535** HM | N | Z 4 | λ30° γ-10° | DIN 6535HA | TiSiN | h9 | DORMER

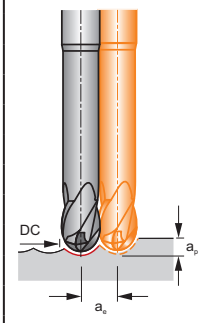



S535

3.00 - 16.00

| DC mm | RE mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S535 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 1.50 | 6.0 | 5.0 | 75.0 | 4 | 21.0 | 2.8 | S5353.0 |
| 4.0 | 2.00 | 6.0 | 8.0 | 75.0 | 4 | 28.0 | 3.7 | S5354.0 |
| 5.0 | 2.50 | 6.0 | 9.0 | 75.0 | 4 | 32.0 | 4.6 | S5355.0 |
| 6.0 | 3.00 | 6.0 | 10.0 | 75.0 | 4 | 40.0 | 5.5 | S5356.0 |
| 8.0 | 4.00 | 8.0 | 12.0 | 75.0 | 4 | 40.0 | 7.4 | S5358.0 |
| 10.0 | 5.00 | 10.0 | 14.0 | 75.0 | 4 | 40.0 | 9.2 | S53510.0 |
| 12.0 | 6.00 | 12.0 | 16.0 | 100.0 | 4 | 60.0 | 11.0 | S53512.0 |
| 14.0 | 7.00 | 14.0 | 32.0 | 125.0 | 4 | 80.0 | 13.0 | S53514.0 |
| 16.0 | 8.00 | 16.0 | 32.0 | 125.0 | 4 | 80.0 | 15.0 | S53516.0 |

Condiciones de corte iniciales



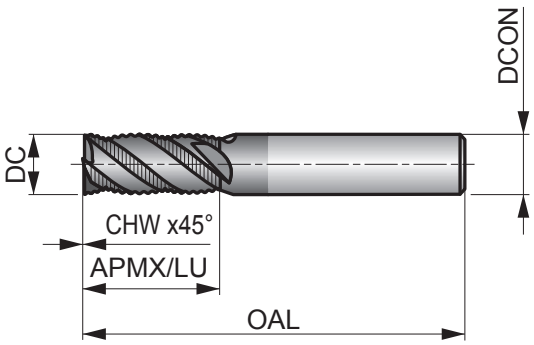

| S535 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Copiado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,10 | 0,10 | 160 | $f_z$ | 0,006 | 0,009 | 0,018 | 0,021 | 0,030 | 0,037 | 0,044 | 0,055 | 0,063 | 0,074 |
| | | | 0,05 | 0,03 | 220 | | 0,014 | 0,021 | 0,044 | 0,053 | 0,073 | 0,092 | 0,111 | 0,137 | 0,159 | 0,186 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,10 | 0,10 | 90 | $f_z$ | 0,006 | 0,009 | 0,014 | 0,019 | 0,022 | 0,029 | 0,036 | 0,043 | 0,051 | 0,059 |
| | | | 0,05 | 0,03 | 120 | | 0,014 | 0,021 | 0,033 | 0,047 | 0,055 | 0,073 | 0,090 | 0,108 | 0,129 | 0,147 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 0,10 | 0,10 | 60 | $f_z$ | 0,006 | 0,009 | 0,011 | 0,014 | 0,017 | 0,024 | 0,031 | 0,041 | 0,045 | 0,053 |
| | | | 0,05 | 0,03 | 80 | | 0,014 | 0,021 | 0,028 | 0,035 | 0,043 | 0,059 | 0,076 | 0,101 | 0,113 | 0,131 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S765 • Fresas de desbaste

| S765 | ■ | P1.1 | P1.2 | P1.3 | P2.1 | P2.2 | P2.3 | P3.1 | P3.2 | P3.3 | P4.1 | P4.2 | M1.1 | M1.2 | M2.1 | M2.2 | M3.1 | M3.2 | K1.1 | K1.2 | K1.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K2.1 | K2.2 | K2.3 | K3.1 | K3.2 | K3.3 | K4.1 | K4.2 | K4.3 | K4.4 | K4.5 | K5.1 | K5.2 | K5.3 | S1.2 | S2.1 | S3.1 | S4.1 | | |

S765 HM NR Z 4 λ40° γ10° DIN 6535HA AlCrN h9 DORMER

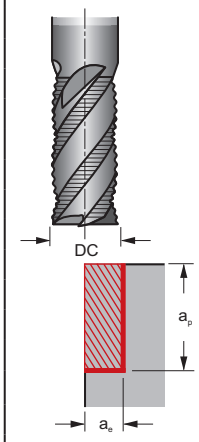


S765

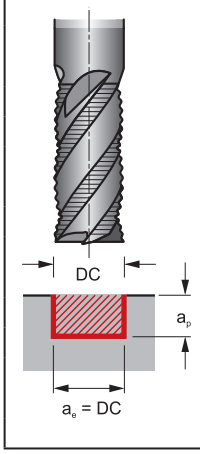
6.00 - 20.00

| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S765 |
|---|---|---|---|---|---|---|
| 6.0 | 0.10 | 6.0 | 16.0 | 50.0 | 4 | S7656.0 |
| 8.0 | 0.20 | 8.0 | 20.0 | 64.0 | 4 | S7658.0 |
| 10.0 | 0.20 | 10.0 | 22.0 | 70.0 | 4 | S76510.0 |
| 12.0 | 0.20 | 12.0 | 26.0 | 75.0 | 4 | S76512.0 |
| 14.0 | 0.30 | 14.0 | 32.0 | 90.0 | 4 | S76514.0 |
| 16.0 | 0.30 | 16.0 | 32.0 | 90.0 | 4 | S76516.0 |
| 18.0 | 0.30 | 18.0 | 38.0 | 100.0 | 4 | S76518.0 |
| 20.0 | 0.40 | 20.0 | 38.0 | 100.0 | 4 | S76520.0 |

Condiciones de corte iniciales




| S765 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 235 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 150 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 110 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 230 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 215 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |



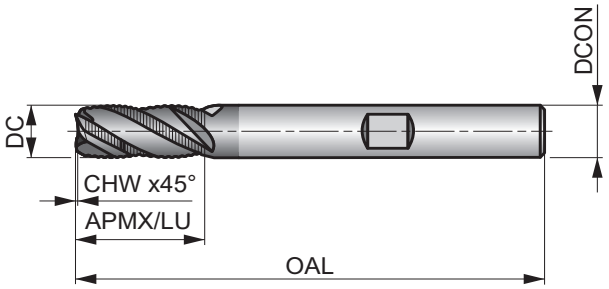

| S765 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 75 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 60 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 110 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S264 • Fresas de desbaste

**S264** ■ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 H1.1 H2.1 H3.1 H3.2

**S264** HM NR Z 4 λ40° γ4° DIN 6535HB AlCrN h9 DORMER

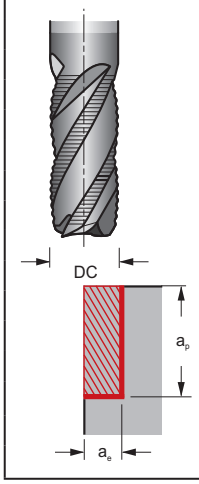



S264

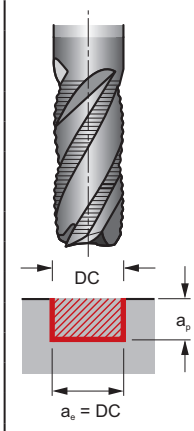
6.00 - 20.00

| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S264 |
|---|---|---|---|---|---|---|
| 6.0 | 0.10 | 6.0 | 13.0 | 57.0 | 4 | S2646.0 |
| 8.0 | 0.20 | 8.0 | 20.0 | 64.0 | 4 | S2648.0 |
| 10.0 | 0.20 | 10.0 | 22.0 | 72.0 | 4 | S26410.0 |
| 12.0 | 0.20 | 12.0 | 26.0 | 83.0 | 4 | S26412.0 |
| 14.0 | 0.30 | 14.0 | 26.0 | 83.0 | 4 | S26414.0 |
| 16.0 | 0.30 | 16.0 | 32.0 | 92.0 | 4 | S26416.0 |
| 18.0 | 0.30 | 18.0 | 32.0 | 92.0 | 4 | S26418.0 |
| 20.0 | 0.40 | 20.0 | 38.0 | 104.0 | 4 | S26420.0 |

Condiciones de corte iniciales




| S264 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 145 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 265 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 145 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |



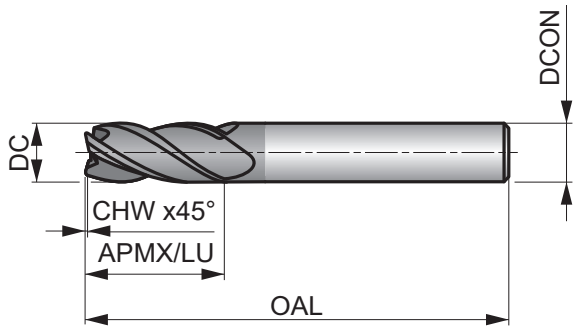

| S264 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 70 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 130 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 70 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S766 • Fresas cilindricas

| S766 | ■ | P1.1 | P1.2 | P1.3 | P2.1 | P2.2 | P2.3 | P3.1 | P3.2 | P3.3 | P4.1 | P4.2 | M1.1 | M1.2 | M2.1 | M2.2 | M3.1 | M3.2 | K1.1 | K1.2 | K1.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K2.1 | K2.2 | K2.3 | K3.1 | K3.2 | K3.3 | K4.1 | K4.2 | K4.3 | K4.4 | K4.5 | K5.1 | K5.2 | K5.3 | S1.2 | S2.1 | S3.1 | S4.1 | | |

S766 HM N Z 4 λ≠ γ10° DIN 6535HA TiSiN h9 DORMER

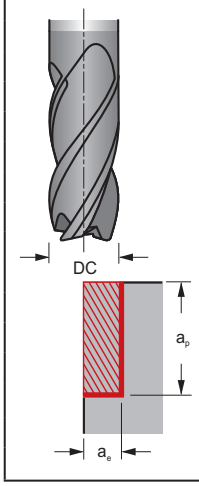



S766

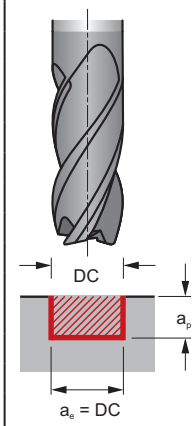
4.00 - 20.00

| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S766 |
|---|---|---|---|---|---|---|
| 4.0 | 0.10 | 6.0 | 11.0 | 57.0 | 4 | S7664.0 |
| 5.0 | 0.10 | 6.0 | 13.0 | 57.0 | 4 | S7665.0 |
| 6.0 | 0.10 | 6.0 | 13.0 | 57.0 | 4 | S7666.0 |
| 8.0 | 0.20 | 8.0 | 20.0 | 64.0 | 4 | S7668.0 |
| 10.0 | 0.20 | 10.0 | 22.0 | 72.0 | 4 | S76610.0 |
| 12.0 | 0.20 | 12.0 | 26.0 | 83.0 | 4 | S76612.0 |
| 14.0 | 0.30 | 14.0 | 26.0 | 83.0 | 4 | S76614.0 |
| 16.0 | 0.30 | 16.0 | 32.0 | 92.0 | 4 | S76616.0 |
| 20.0 | 0.40 | 20.0 | 38.0 | 104.0 | 4 | S76620.0 |

Condiciones de corte iniciales




| S766 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 235 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 150 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 110 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 230 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 215 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |



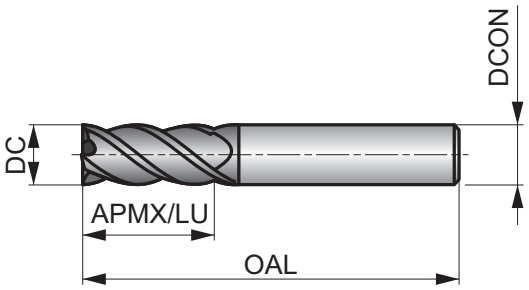

| S766 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 75 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 60 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 110 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S216 • Fresas cilindricas

**S216** ■ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2

**S216** HM | N | Z 4 | λ40° γ3° | DIN 6535HA | AlTiN | h9 | DORMER

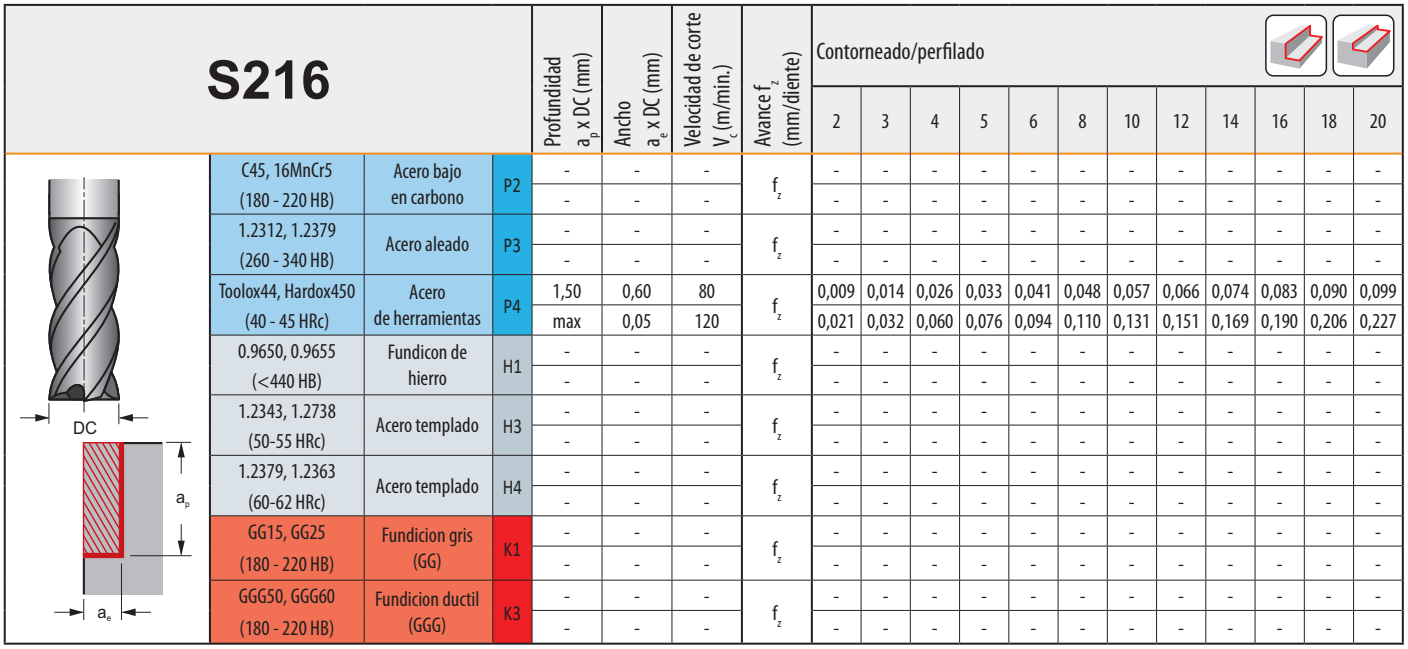



**S216**

2.00 - 20.00

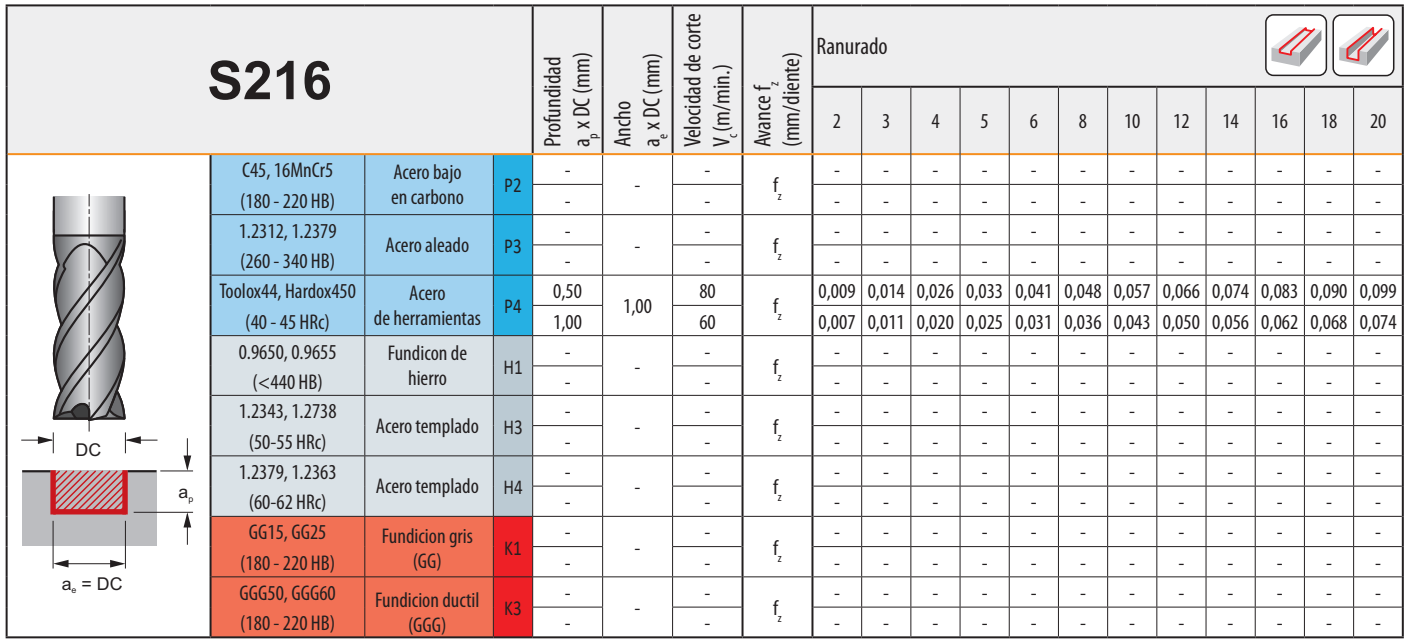
| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S216 |
|---|---|---|---|---|---|
| 2.0 | 4.0 | 6.5 | 40.0 | 4 | S2162.0 |
| 3.0 | 3.0 | 9.0 | 40.0 | 4 | S2163.0XD3 |
| 3.0 | 6.0 | 9.0 | 50.0 | 4 | S2163.0XD6 |
| 4.0 | 4.0 | 12.0 | 50.0 | 4 | S2164.0XD4 |
| 4.0 | 6.0 | 12.0 | 50.0 | 4 | S2164.0XD6 |
| 5.0 | 5.0 | 15.0 | 50.0 | 4 | S2165.0 |
| 6.0 | 6.0 | 16.0 | 50.0 | 4 | S2166.0 |
| 8.0 | 8.0 | 20.0 | 64.0 | 4 | S2168.0 |
| 10.0 | 10.0 | 22.0 | 70.0 | 4 | S21610.0 |
| 12.0 | 12.0 | 25.0 | 75.0 | 4 | S21612.0 |
| 14.0 | 14.0 | 32.0 | 90.0 | 4 | S21614.0 |
| 16.0 | 16.0 | 32.0 | 90.0 | 4 | S21616.0 |
| 18.0 | 18.0 | 38.0 | 100.0 | 4 | S21618.0 |
| 20.0 | 20.0 | 38.0 | 100.0 | 4 | S21620.0 |

Condiciones de corte iniciales



| S216 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 80 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 120 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |





| S216 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 80 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 60 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

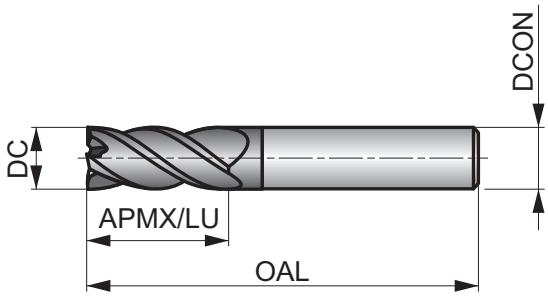


La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S761 • Fresas cilindricas

| S761 | ■ | P1.1 | P1.2 | P1.3 | P2.1 | P2.2 | P2.3 | P3.1 | P3.2 | P3.3 | P4.1 | P4.2 | M1.1 | M1.2 | M2.1 | M2.2 | M3.1 | M3.2 | K1.1 | K1.2 | K1.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | K2.1 | K2.2 | K2.3 | K3.1 | K3.2 | K3.3 | K4.1 | K4.2 | K4.3 | K4.4 | K4.5 | K5.1 | K5.2 | K5.3 | S1.2 | S2.1 | S3.1 | S4.1 | | |

S761 HM N Z 4 λ40° γ10° DIN 6535HA AlCrN h9 DORMER

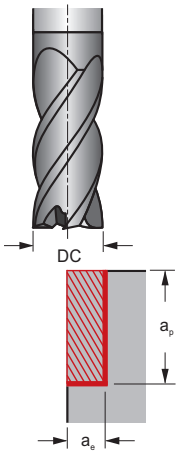



S761

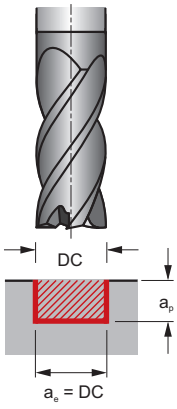
3.00 - 20.00

| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S761 |
|---|---|---|---|---|---|
| 3.0 | 6.0 | 9.0 | 57.0 | 4 | S7613.0 |
| 4.0 | 6.0 | 12.0 | 57.0 | 4 | S7614.0 |
| 5.0 | 6.0 | 13.0 | 57.0 | 4 | S7615.0 |
| 6.0 | 6.0 | 13.0 | 57.0 | 4 | S7616.0 |
| 8.0 | 8.0 | 20.0 | 64.0 | 4 | S7618.0 |
| 10.0 | 10.0 | 22.0 | 72.0 | 4 | S76110.0 |
| 12.0 | 12.0 | 26.0 | 83.0 | 4 | S76112.0 |
| 14.0 | 14.0 | 32.0 | 83.0 | 4 | S76114.0 |
| 16.0 | 16.0 | 32.0 | 92.0 | 4 | S76116.0 |
| 20.0 | 20.0 | 38.0 | 104.0 | 4 | S76120.0 |

Condiciones de corte iniciales




| S761 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 235 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 150 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 110 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 230 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 215 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |



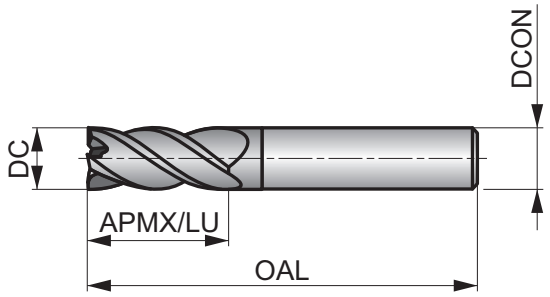

| S761 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 160 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 100 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 75 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 60 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 155 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 120 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 145 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 110 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S260 • Fresas cilindricas

**S260** ■ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 H1.1 H2.1 H3.1 H3.2

**S260** HM | N | Z 4 | λ40° γ4° | DIN 6535HA | AlCrN | h9 | DORMER

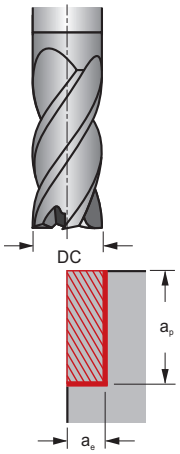



S260

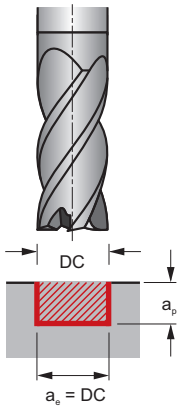
3.00 - 20.00

| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S260 |
|---|---|---|---|---|---|
| 3.0 | 6.0 | 9.0 | 57.0 | 4 | S2603.0 |
| 4.0 | 6.0 | 12.0 | 57.0 | 4 | S2604.0 |
| 5.0 | 6.0 | 13.0 | 57.0 | 4 | S2605.0 |
| 6.0 | 6.0 | 13.0 | 57.0 | 4 | S2606.0 |
| 8.0 | 8.0 | 20.0 | 64.0 | 4 | S2608.0 |
| 10.0 | 10.0 | 22.0 | 72.0 | 4 | S26010.0 |
| 12.0 | 12.0 | 26.0 | 83.0 | 4 | S26012.0 |
| 14.0 | 14.0 | 32.0 | 83.0 | 4 | S26014.0 |
| 16.0 | 16.0 | 32.0 | 92.0 | 4 | S26016.0 |
| 18.0 | 18.0 | 38.0 | 92.0 | 4 | S26018.0 |
| 20.0 | 20.0 | 38.0 | 104.0 | 4 | S26020.0 |

Condiciones de corte iniciales




| S260 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 145 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,60 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | max | 0,05 | 265 | | 0,014 | 0,021 | 0,039 | 0,050 | 0,062 | 0,073 | 0,087 | 0,101 | 0,112 | 0,126 | 0,137 | 0,151 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,60 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | max | 0,05 | 145 | | 0,011 | 0,018 | 0,032 | 0,041 | 0,050 | 0,060 | 0,071 | 0,080 | 0,092 | 0,101 | 0,110 | 0,121 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |




| S260 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 70 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 0,50 | 1,00 | 180 | $f_z$ | 0,006 | 0,009 | 0,017 | 0,022 | 0,027 | 0,032 | 0,038 | 0,044 | 0,049 | 0,055 | 0,060 | 0,066 |
| | | | 1,00 | | 130 | | 0,005 | 0,007 | 0,013 | 0,017 | 0,020 | 0,024 | 0,029 | 0,033 | 0,037 | 0,041 | 0,045 | 0,050 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 0,50 | 1,00 | 100 | $f_z$ | 0,005 | 0,008 | 0,014 | 0,018 | 0,022 | 0,026 | 0,031 | 0,035 | 0,040 | 0,044 | 0,048 | 0,053 |
| | | | 1,00 | | 70 | | 0,004 | 0,006 | 0,011 | 0,014 | 0,017 | 0,020 | 0,023 | 0,026 | 0,030 | 0,033 | 0,036 | 0,040 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |

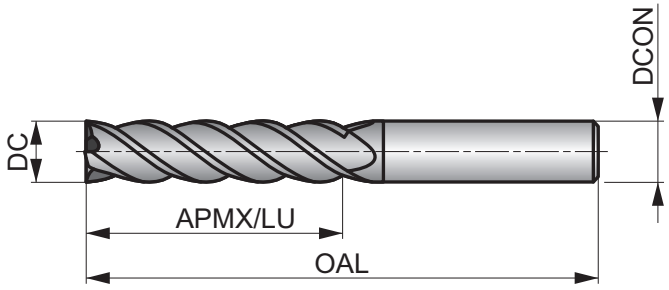
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S717
# S217

- Fresas cilindricas

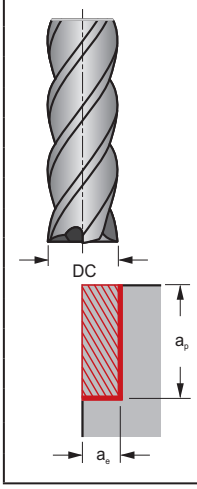
| | | |
|---|---|---|
| S717 | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 M3.1 M3.2 K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 S1.2 S2.1 S3.1 S4.1 |
| | ◪ | N1.1 N1.2 N1.3 N2.1 N2.2 N2.3 N3.3 |
| S217 | ■ | P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S717 | HM | | N | Z 4 | | λ40° γ10° | DIN 6535HA | AlCrN | h9 | | DORMER |
| S217 | HM | | N | Z 4 | | λ40° γ3° | DIN 6535HA | AlTiN | h9 | | DORMER |



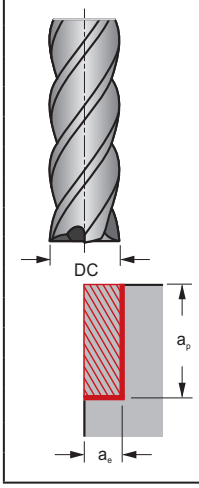
| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S717 | S217 |
|---|---|---|---|---|---|---|
| 3.0 | 3.0 | 19.0 | 60.0 | 4 | S7173.0 | S2173.0XD3 |
| 3.0 | 6.0 | 19.0 | 75.0 | 4 | | S2173.0XD6 |
| 4.0 | 4.0 | 19.0 | 60.0 | 4 | S7174.0 | S2174.0XD4 |
| 4.0 | 6.0 | 19.0 | 75.0 | 4 | | S2174.0XD6 |
| 5.0 | 5.0 | 19.0 | 60.0 | 4 | S7175.0 | S2175.0 |
| 6.0 | 6.0 | 31.0 | 75.0 | 4 | S7176.0 | S2176.0 |
| 8.0 | 8.0 | 31.0 | 75.0 | 4 | S7178.0 | S2178.0 |
| 10.0 | 10.0 | 31.0 | 75.0 | 4 | S71710.0 | S21710.0 |
| 12.0 | 12.0 | 50.0 | 100.0 | 4 | S71712.0 | S21712.0 |
| 14.0 | 14.0 | 57.0 | 125.0 | 4 | S71714.0 | S21714.0 |
| 16.0 | 16.0 | 57.0 | 125.0 | 4 | S71716.0 | S21716.0 |
| 18.0 | 18.0 | 57.0 | 125.0 | 4 | S71718.0 | S21718.0 |
| 20.0 | 20.0 | 57.0 | 125.0 | 4 | S71720.0 | S21720.0 |

Condiciones de corte iniciales




## S717

| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 105 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 160 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 70 | $f_z$ | 0,006 | 0,011 | 0,019 | 0,024 | 0,030 | 0,036 | 0,042 | 0,049 | 0,054 | 0,061 | 0,066 | 0,073 |
| | | | max | 0,05 | 100 | | 0,014 | 0,025 | 0,044 | 0,055 | 0,069 | 0,082 | 0,096 | 0,112 | 0,124 | 0,140 | 0,151 | 0,167 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 50 | $f_z$ | 0,006 | 0,011 | 0,019 | 0,024 | 0,030 | 0,036 | 0,042 | 0,049 | 0,054 | 0,061 | 0,066 | 0,073 |
| | | | max | 0,05 | 70 | | 0,014 | 0,025 | 0,044 | 0,055 | 0,069 | 0,082 | 0,096 | 0,112 | 0,124 | 0,140 | 0,151 | 0,167 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 100 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 150 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 95 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 140 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |




## S217

| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 65 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 95 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

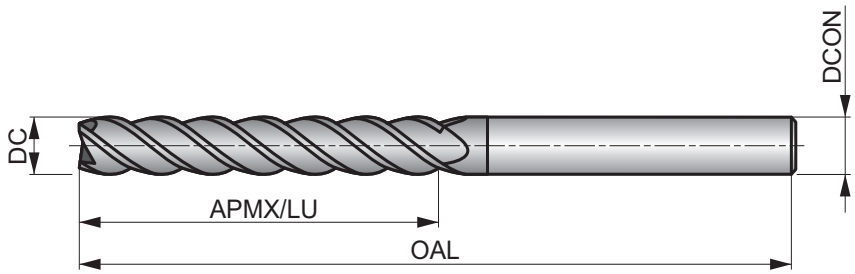
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S718
# S218

- Fresas cilindricas

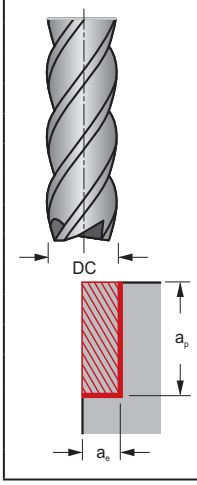
| | | |
|---|---|---|
| S718 | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 M3.1 M3.2 K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 S1.2 S2.1 S3.1 S4.1 |
| | ◪ | N1.1 N1.2 N1.3 N2.1 N2.2 N2.3 N3.3 |
| S218 | ■ | P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S718 | HM | | N | Z 4 | | λ40° γ10° | DIN 6535HA | AlCrN | h9 | | | DORMER |
| S218 | HM | | N | Z 4 | | λ40° γ3° | DIN 6535HA | AlTiN | h9 | | | DORMER |



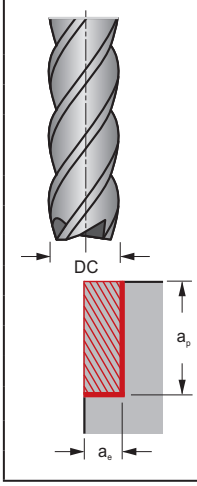
| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S718 | S218 |
|---|---|---|---|---|---|---|
| 3.0 | 3.0 | 25.0 | 100.0 | 4 | S7183.0 | S2183.0 |
| 4.0 | 4.0 | 31.0 | 100.0 | 4 | S7184.0 | S2184.0 |
| 5.0 | 5.0 | 31.0 | 100.0 | 4 | S7185.0 | S2185.0 |
| 6.0 | 6.0 | 38.0 | 100.0 | 4 | S7186.0 | S2186.0 |
| 8.0 | 8.0 | 41.0 | 100.0 | 4 | S7188.0 | S2188.0 |
| 10.0 | 10.0 | 57.0 | 125.0 | 4 | S71810.0 | S21810.0 |
| 12.0 | 12.0 | 75.0 | 150.0 | 4 | S71812.0 | S21812.0 |
| 14.0 | 14.0 | 75.0 | 150.0 | 4 | S71814.0 | S21814.0 |
| 16.0 | 16.0 | 75.0 | 150.0 | 4 | S71816.0 | S21816.0 |
| 18.0 | 18.0 | 75.0 | 150.0 | 4 | S71818.0 | S21818.0 |
| 20.0 | 20.0 | 75.0 | 150.0 | 4 | S71820.0 | S21820.0 |

Condiciones de corte iniciales




# S718

| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,60 | 65 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 100 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,60 | 40 | $f_z$ | 0,006 | 0,011 | 0,019 | 0,024 | 0,030 | 0,036 | 0,042 | 0,049 | 0,054 | 0,061 | 0,066 | 0,073 |
| | | | max | 0,05 | 60 | | 0,014 | 0,025 | 0,044 | 0,055 | 0,069 | 0,082 | 0,096 | 0,112 | 0,124 | 0,140 | 0,151 | 0,167 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 30 | $f_z$ | 0,006 | 0,011 | 0,019 | 0,024 | 0,030 | 0,036 | 0,042 | 0,049 | 0,054 | 0,061 | 0,066 | 0,073 |
| | | | max | 0,05 | 45 | | 0,014 | 0,025 | 0,044 | 0,055 | 0,069 | 0,082 | 0,096 | 0,112 | 0,124 | 0,140 | 0,151 | 0,167 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,60 | 65 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 95 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,60 | 60 | $f_z$ | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| | | | max | 0,05 | 90 | | 0,018 | 0,030 | 0,055 | 0,069 | 0,085 | 0,010 | 0,119 | 0,137 | 0,153 | 0,172 | 0,188 | 0,206 |




# S218

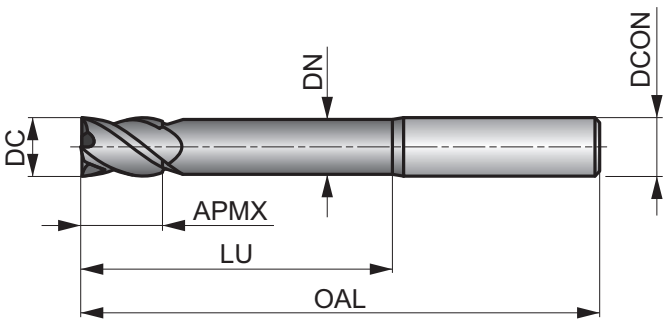
| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 40 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 60 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S219 • Fresas cilindricas

**S219** ■ P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2

**S219** HM | N | Z 4 | λ40° γ3° | DIN 6535HA | AlTiN | h9 | DORMER



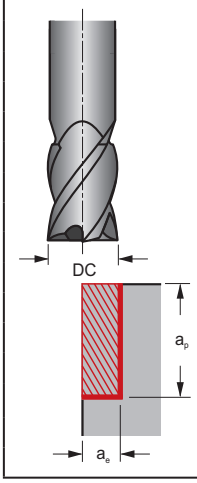

**S219**

3.00 - 20.00

| DC mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | LU | DN mm | S219 |
|---|---|---|---|---|---|---|---|
| 3.0 | 3.0 | 5.0 | 60.0 | 4 | 30.0 | 2.8 | S2193.0 |
| 4.0 | 4.0 | 8.0 | 60.0 | 4 | 32.0 | 3.7 | S2194.0 |
| 5.0 | 5.0 | 9.0 | 60.0 | 4 | 32.0 | 4.6 | S2195.0 |
| 6.0 | 6.0 | 10.0 | 75.0 | 4 | 40.0 | 5.5 | S2196.0 |
| 8.0 | 8.0 | 12.0 | 75.0 | 4 | 40.0 | 7.4 | S2198.0 |
| 10.0 | 10.0 | 14.0 | 75.0 | 4 | 40.0 | 9.2 | S21910.0 |
| 12.0 | 12.0 | 16.0 | 100.0 | 4 | 60.0 | 11.0 | S21912.0 |
| 14.0 | 14.0 | 22.0 | 125.0 | 4 | 85.0 | 13.0 | S21914.0 |
| 16.0 | 16.0 | 22.0 | 125.0 | 4 | 85.0 | 15.0 | S21916.0 |
| 18.0 | 18.0 | 26.0 | 125.0 | 4 | 85.0 | 17.0 | S21918.0 |
| 20.0 | 20.0 | 26.0 | 125.0 | 4 | 85.0 | 19.0 | S21920.0 |

Condiciones de corte iniciales

# S219




| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,60 | 65 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 95 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

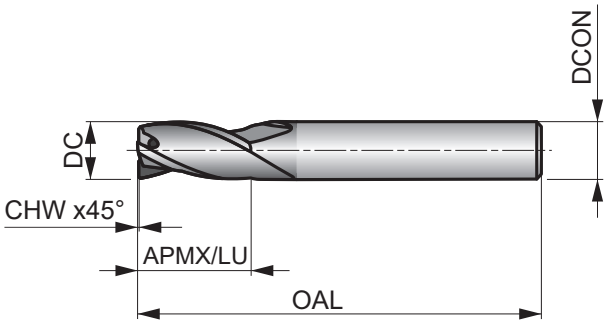
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S813HA
# S813HB

- Fresas cilindricas

| | | |
|---|---|---|
| S813HA<br>S813HB | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 K1.1 K1.2 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N1.3 N2.1 N2.2 N2.3 N3.1 N3.2 |
| | ◪ | P4.3 M3.1 M3.2 M3.3 M4.1 N1.1 N1.2 N3.3 N4.1 N4.2 S1.1 S1.2 S2.1 S3.1 S4.1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S813HA | HM | P9 | N | Z 3 | | λ 28° γ 9° | DIN 6535HA | Alcrona | | | DIN 6527L |
| S813HB | HM | P9 | N | Z 3 | | λ 28° γ 9° | DIN 6535HB | Alcrona | | | DIN 6527L |

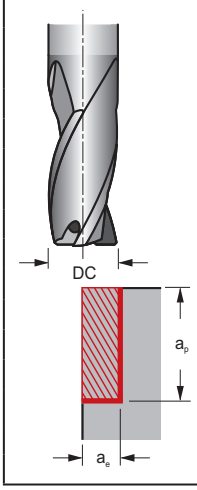



| S813HA | S813HB |
|---|---|
| | |
| 2.00 - 20.00 | 2.00 - 20.00 |

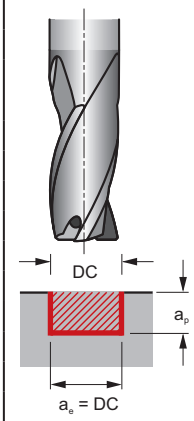
| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S813HA | S813HB |
|---|---|---|---|---|---|---|---|
| 2.0 | 0.00 | 6.0 | 6.0 | 57.0 | 3 | S813HA2.0 | S813HB2.0 |
| 2.5 | 0.08 | 6.0 | 7.0 | 57.0 | 3 | S813HA2.5 | S813HB2.5 |
| 3.0 | 0.08 | 6.0 | 7.0 | 57.0 | 3 | S813HA3.0 | S813HB3.0 |
| 3.5 | 0.08 | 6.0 | 7.0 | 57.0 | 3 | S813HA3.5 | S813HB3.5 |
| 4.0 | 0.13 | 6.0 | 8.0 | 57.0 | 3 | S813HA4.0 | S813HB4.0 |
| 4.5 | 0.13 | 6.0 | 8.0 | 57.0 | 3 | S813HA4.5 | S813HB4.5 |
| 5.0 | 0.13 | 6.0 | 10.0 | 57.0 | 3 | S813HA5.0 | S813HB5.0 |
| 6.0 | 0.13 | 6.0 | 10.0 | 57.0 | 3 | S813HA6.0 | S813HB6.0 |
| 7.0 | 0.13 | 8.0 | 13.0 | 63.0 | 3 | S813HA7.0 | S813HB7.0 |
| 8.0 | 0.20 | 8.0 | 16.0 | 63.0 | 3 | S813HA8.0 [1] | S813HB8.0 [1] |
| 9.0 | 0.20 | 10.0 | 16.0 | 72.0 | 3 | S813HA9.0 [1] | S813HB9.0 [1] |
| 10.0 | 0.20 | 10.0 | 19.0 | 72.0 | 3 | S813HA10.0 [1] | S813HB10.0 [1] |
| 12.0 | 0.20 | 12.0 | 22.0 | 83.0 | 3 | S813HA12.0 [1] | S813HB12.0 [1] |
| 14.0 | 0.20 | 14.0 | 22.0 | 83.0 | 3 | S813HA14.0 [1] | S813HB14.0 [1] |
| 16.0 | 0.20 | 16.0 | 26.0 | 92.0 | 3 | S813HA16.0 [1] | S813HB16.0 [1] |
| 18.0 | 0.20 | 18.0 | 26.0 | 92.0 | 3 | S813HA18.0 [1] | S813HB18.0 [1] |
| 20.0 | 0.30 | 20.0 | 32.0 | 104.0 | 3 | S813HA20.0 [1] | S813HB20.0 [1] |

[1] CHW ±0.05x45° mm

Condiciones de corte iniciales




| S813HA S813HB | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,50 | 125 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 180 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,50 | 75 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 115 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,50 | 45 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 70 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,50 | 120 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 175 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,50 | 115 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 165 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |



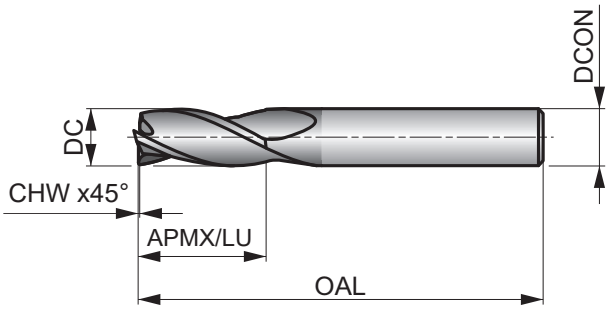

| S813HA S813HB | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 120 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 90 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 80 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 60 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 45 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 35 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 120 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 90 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 110 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 85 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S823 • Fresas cilindricas

| S823 | | |
|---|---|---|
| | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 M1.1 M1.2 M2.1 M2.2 K1.1 K1.2 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N1.3 N2.1 N2.2 N2.3 N3.1 N3.2 |
| | ◪ | P4.3 M3.1 M3.2 M3.3 M4.1 N1.1 N1.2 N3.3 N4.1 N4.2 S1.1 S1.2 S2.1 S3.1 S4.1 |

| S823 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HM | P9 | N | Z 3 | | λ 28° γ 9° | DIN 6535HA | Alcrona | | | DORMER |



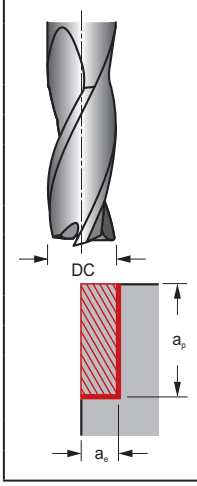

S823

2.00 - 20.00

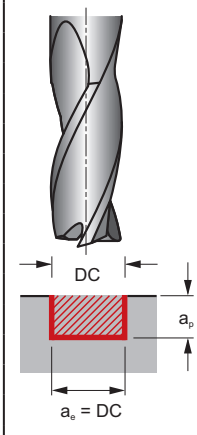
| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S823 |
|---|---|---|---|---|---|---|
| 2.0 | - | 6.0 | 8.0 | 57.0 | 3 | S8232.0 |
| 2.5 | 0.08 | 6.0 | 12.0 | 57.0 | 3 | S8232.5 |
| 3.0 | 0.08 | 6.0 | 12.0 | 57.0 | 3 | S8233.0 |
| 4.0 | 0.13 | 6.0 | 14.0 | 57.0 | 3 | S8234.0 |
| 5.0 | 0.13 | 6.0 | 16.0 | 57.0 | 3 | S8235.0 |
| 6.0 | 0.13 | 6.0 | 19.0 | 57.0 | 3 | S8236.0 |
| 7.0 | 0.13 | 8.0 | 19.0 | 63.0 | 3 | S8237.0 |
| 8.0 | 0.20 | 8.0 | 19.0 | 63.0 | 3 | S8238.0 [1] |
| 9.0 | 0.20 | 10.0 | 21.0 | 72.0 | 3 | S8239.0 [1] |
| 10.0 | 0.20 | 10.0 | 22.0 | 72.0 | 3 | S82310.0 [1] |
| 12.0 | 0.20 | 12.0 | 25.0 | 83.0 | 3 | S82312.0 [1] |
| 14.0 | 0.20 | 14.0 | 30.0 | 83.0 | 3 | S82314.0 [1] |
| 16.0 | 0.20 | 16.0 | 32.0 | 92.0 | 3 | S82316.0 [1] |
| 18.0 | 0.20 | 18.0 | 32.0 | 92.0 | 3 | S82318.0 [1] |
| 20.0 | 0.30 | 20.0 | 38.0 | 104.0 | 3 | S82320.0 [1] |

[1] CHW ±0.05x45° mm

Condiciones de corte iniciales




| S823 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 1,50 | 0,50 | 110 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 160 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 1,50 | 0,50 | 70 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 100 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,50 | 40 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | max | 0,05 | 60 | | 0,016 | 0,027 | 0,050 | 0,062 | 0,076 | 0,092 | 0,108 | 0,124 | 0,137 | 0,156 | 0,169 | 0,185 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 1,50 | 0,50 | 110 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 160 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 1,50 | 0,50 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | max | 0,05 | 150 | | 0,021 | 0,032 | 0,060 | 0,076 | 0,094 | 0,110 | 0,131 | 0,151 | 0,169 | 0,190 | 0,206 | 0,227 |




| S823 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 110 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 80 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 70 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 50 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 40 | $f_z$ | 0,007 | 0,012 | 0,022 | 0,027 | 0,033 | 0,040 | 0,047 | 0,054 | 0,060 | 0,068 | 0,074 | 0,081 |
| | | | 1,00 | | 30 | | 0,005 | 0,009 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,041 | 0,045 | 0,051 | 0,056 | 0,061 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 110 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 80 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 100 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 75 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |

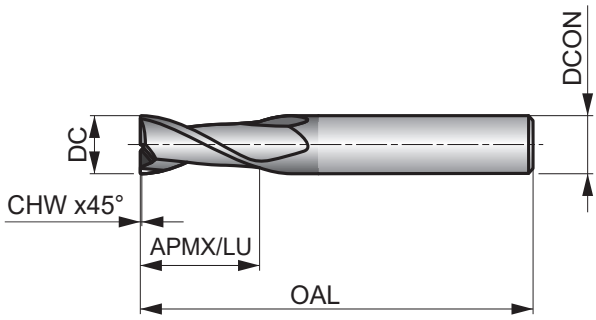
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S812HA
# S812HB

- Fresas cilindricas

| | | |
|---|---|---|
| S812HA<br>S812HB | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 P4.3 M1.1 M1.2 M2.1 M2.2 M3.1 M3.2 M3.3<br>M4.1 K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N1.3<br>N2.1 N2.2 N2.3 N3.1 N3.2 S1.1 S1.2 S2.1 S3.1 S4.1 |
| | ◪ | N1.1 N1.2 N3.3 N4.1 N4.2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S812HA | HM | P9 | N | Z 2 | | λ 28° γ 9° | DIN 6535HA | Alcrona | | | | DIN 6527L |
| S812HB | HM | P9 | N | Z 2 | | λ 28° γ 9° | DIN 6535HB | Alcrona | | | | DIN 6527L |

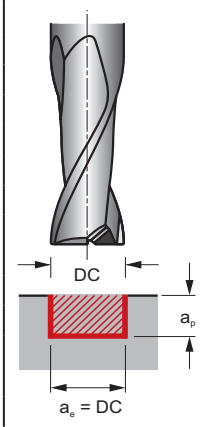



| S812HA | S812HB |
|---|---|
| | |
| 2.00 - 20.00 | 2.00 - 20.00 |

| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S812HA | S812HB |
|---|---|---|---|---|---|---|---|
| 2.0 | - | 6.0 | 6.0 | 57.0 | 2 | S812HA2.0 | S812HB2.0 |
| 2.5 | 0.08 | 6.0 | 7.0 | 57.0 | 2 | S812HA2.5 | S812HB2.5 |
| 3.0 | 0.08 | 6.0 | 7.0 | 57.0 | 2 | S812HA3.0 | S812HB3.0 |
| 3.5 | 0.08 | 6.0 | 7.0 | 57.0 | 2 | S812HA3.5 | S812HB3.5 |
| 4.0 | 0.13 | 6.0 | 8.0 | 57.0 | 2 | S812HA4.0 | S812HB4.0 |
| 4.5 | 0.13 | 6.0 | 8.0 | 57.0 | 2 | S812HA4.5 | S812HB4.5 |
| 5.0 | 0.13 | 6.0 | 10.0 | 57.0 | 2 | S812HA5.0 | S812HB5.0 |
| 6.0 | 0.13 | 6.0 | 10.0 | 57.0 | 2 | S812HA6.0 | S812HB6.0 |
| 7.0 | 0.13 | 8.0 | 13.0 | 63.0 | 2 | S812HA7.0 | S812HB7.0 |
| 8.0 | 0.20 | 8.0 | 16.0 | 63.0 | 2 | S812HA8.0 [1] | S812HB8.0 [1] |
| 9.0 | 0.20 | 10.0 | 16.0 | 72.0 | 2 | S812HA9.0 [1] | S812HB9.0 [1] |
| 10.0 | 0.20 | 10.0 | 19.0 | 72.0 | 2 | S812HA10.0 [1] | S812HB10.0 [1] |
| 12.0 | 0.20 | 12.0 | 22.0 | 83.0 | 2 | S812HA12.0 [1] | S812HB12.0 [1] |
| 14.0 | 0.20 | 14.0 | 22.0 | 83.0 | 2 | S812HA14.0 [1] | S812HB14.0 [1] |
| 16.0 | 0.20 | 16.0 | 26.0 | 92.0 | 2 | S812HA16.0 [1] | S812HB16.0 [1] |
| 18.0 | 0.20 | 18.0 | 26.0 | 92.0 | 2 | S812HA18.0 [1] | S812HB18.0 [1] |
| 20.0 | 0.30 | 20.0 | 32.0 | 104.0 | 2 | S812HA20.0 [1] | S812HB20.0 [1] |

[1] CHW ±0.05x45° mm

Condiciones de corte iniciales



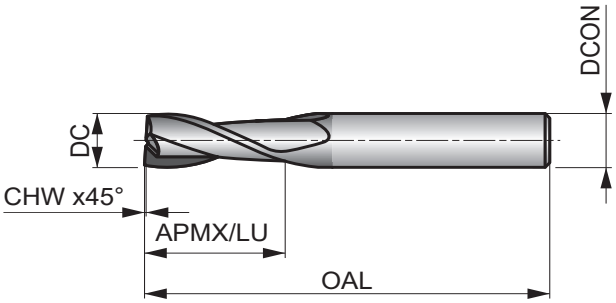

| S812HA<br>S812HB | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 120 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 90 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 80 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 60 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 50 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 35 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 120 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 90 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 110 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 85 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S822 • Fresas cilindricas

| S822 | | |
|---|---|---|
| | ■ | P1.1 P1.2 P1.3 P2.1 P2.2 P2.3 P3.1 P3.2 P3.3 P4.1 P4.2 P4.3 M1.1 M1.2 M2.1 M2.2 M3.1 M3.2 M3.3 M4.1 |
| | ■ | K1.1 K1.2 K1.3 K2.1 K2.2 K2.3 K3.1 K3.2 K3.3 K4.1 K4.2 K4.3 K4.4 K4.5 K5.1 K5.2 K5.3 N1.3 N2.1 N2.2 |
| | ■ | N2.3 N3.1 N3.2 S1.1 S1.2 S2.1 S3.1 S4.1 |
| | ◪ | N1.1 N1.2 N3.3 N4.1 N4.2 |

**S822** HM | P9 | N | Z 2 | λ 28° γ 9° | DIN 6535HA | Alcrona | DORMER




S822

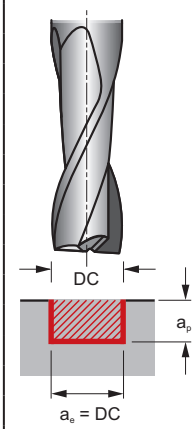
2.00 - 20.00

| DC mm | CHW x45° mm | DCON h6 mm | APMX/LU mm | OAL mm | ZEFP | S822 |
|---|---|---|---|---|---|---|
| 2.0 | - | 6.0 | 8.0 | 57.0 | 2 | S8222.0 |
| 2.5 | 0.08 | 6.0 | 12.0 | 57.0 | 2 | S8222.5 |
| 3.0 | 0.08 | 6.0 | 12.0 | 57.0 | 2 | S8223.0 |
| 4.0 | 0.13 | 6.0 | 14.0 | 57.0 | 2 | S8224.0 |
| 5.0 | 0.13 | 6.0 | 16.0 | 57.0 | 2 | S8225.0 |
| 6.0 | 0.13 | 6.0 | 19.0 | 57.0 | 2 | S8226.0 |
| 7.0 | 0.13 | 8.0 | 19.0 | 63.0 | 2 | S8227.0 |
| 8.0 | 0.20 | 8.0 | 19.0 | 63.0 | 2 | S8228.0 [1] |
| 9.0 | 0.20 | 10.0 | 21.0 | 72.0 | 2 | S8229.0 [1] |
| 10.0 | 0.20 | 10.0 | 22.0 | 72.0 | 2 | S82210.0 [1] |
| 12.0 | 0.20 | 12.0 | 25.0 | 83.0 | 2 | S82212.0 [1] |
| 14.0 | 0.20 | 14.0 | 30.0 | 83.0 | 2 | S82214.0 [1] |
| 16.0 | 0.20 | 16.0 | 32.0 | 92.0 | 2 | S82216.0 [1] |
| 18.0 | 0.20 | 18.0 | 32.0 | 92.0 | 2 | S82218.0 [1] |
| 20.0 | 0.30 | 20.0 | 38.0 | 104.0 | 2 | S82220.0 [1] |

[1] CHW ±0.05x45° mm

Condiciones de corte iniciales

# S822




| | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Ranurado 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | 0,50 | 1,00 | 110 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 80 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | 0,50 | 1,00 | 70 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 50 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 0,50 | 1,00 | 40 | $f_z$ | 0,009 | 0,014 | 0,026 | 0,033 | 0,041 | 0,048 | 0,057 | 0,066 | 0,074 | 0,083 | 0,090 | 0,099 |
| | | | 1,00 | | 30 | | 0,007 | 0,011 | 0,020 | 0,025 | 0,031 | 0,036 | 0,043 | 0,050 | 0,056 | 0,062 | 0,068 | 0,074 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | 0,50 | 1,00 | 110 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 80 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | 0,50 | 1,00 | 100 | $f_z$ | 0,011 | 0,017 | 0,032 | 0,040 | 0,049 | 0,059 | 0,069 | 0,080 | 0,089 | 0,100 | 0,109 | 0,120 |
| | | | 1,00 | | 75 | | 0,008 | 0,013 | 0,024 | 0,030 | 0,037 | 0,044 | 0,052 | 0,060 | 0,067 | 0,075 | 0,082 | 0,090 |

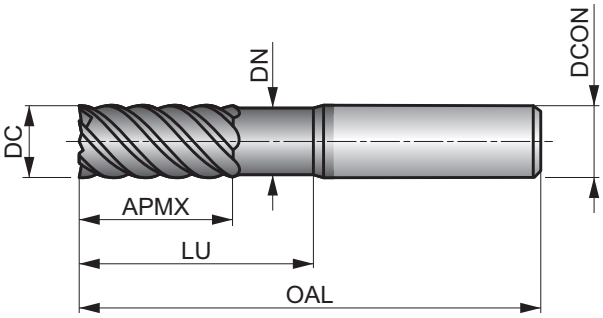
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S225
# S525

- Fresas de acabado

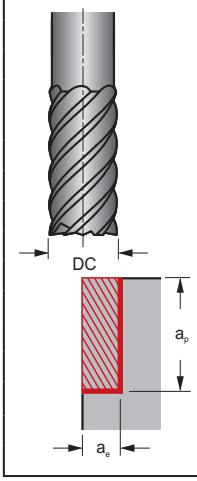
| | | |
|---|---|---|
| S225 | ■ | P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 |
| S525 | ■ | H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S225 | HM | | N | Z 6-8 | | λ50° γ3° | DIN 6535HA | AlTiN | h9 | | DORMER |
| S525 | HM | | N | Z 6-8 | | λ50° γ-26° | DIN 6535HA | TiSiN | h9 | | DORMER |

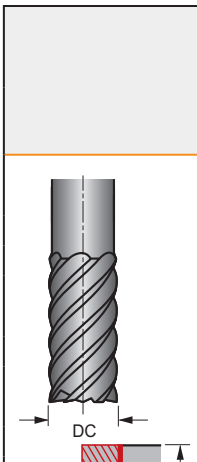


| DC mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S225 | S525 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 6.0 | 8.0 | 50.0 | 6 | 20.0 | 2.8 | S2253.0 | S5253.0 |
| 4.0 | 6.0 | 11.0 | 50.0 | 6 | 20.0 | 3.7 | S2254.0 | S5254.0 |
| 6.0 | 6.0 | 15.0 | 50.0 | 6 | 20.0 | 5.5 | S2256.0 | S5256.0 |
| 8.0 | 8.0 | 20.0 | 64.0 | 6 | 30.0 | 7.4 | S2258.0 | S5258.0 |
| 10.0 | 10.0 | 22.0 | 70.0 | 6 | 32.0 | 9.2 | S22510.0 | S52510.0 |
| 12.0 | 12.0 | 25.0 | 75.0 | 6 | 37.0 | 11.0 | S22512.0 | S52512.0 |
| 14.0 | 14.0 | 30.0 | 90.0 | 6 | 44.0 | 13.0 | S22514.0 | S52514.0 |
| 16.0 | 16.0 | 30.0 | 90.0 | 8 | 46.0 | 15.0 | S22516.0 | S52516.0 |
| 18.0 | 18.0 | 35.0 | 100.0 | 8 | 53.0 | 17.0 | S22518.0 | S52518.0 |
| 20.0 | 20.0 | 38.0 | 100.0 | 8 | 58.0 | 19.0 | S22520.0 | S52520.0 |

Condiciones de corte iniciales




| S225 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,05 | 120 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |




| S525 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,05 | 175 | $f_z$ | 0,011 | 0,021 | 0,037 | 0,046 | 0,055 | 0,066 | 0,078 | 0,089 | 0,101 | 0,112 | 0,124 | 0,135 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,05 | 95 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,05 | 60 | $f_z$ | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

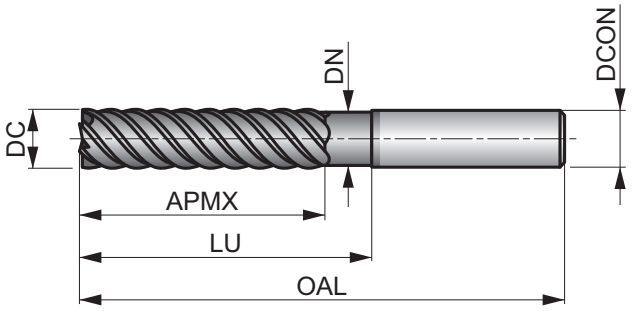
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S226
# S526

- Fresas de acabado

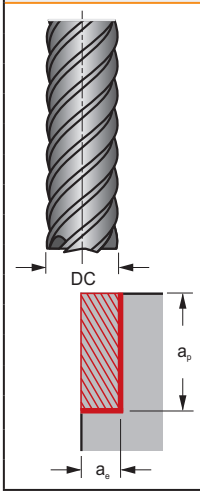
| | | |
|---|---|---|
| S226 | ■ | P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 |
| S526 | ■ | H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S226 | HM | | N | Z 6-8 | | λ50° γ3° | DIN 6535HA | AlTiN | h9 | | DORMER |
| S526 | HM | | N | Z 6-8 | | λ50° γ-26° | DIN 6535HA | TiSiN | h9 | | DORMER |

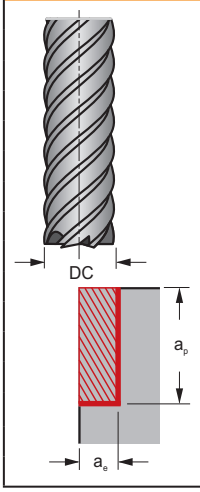


| DC mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S226 | S526 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 6.0 | 19.0 | 75.0 | 6 | 30.0 | 2.8 | S2263.0 | S5263.0 |
| 4.0 | 6.0 | 19.0 | 75.0 | 6 | 32.0 | 3.7 | S2264.0 | S5264.0 |
| 6.0 | 6.0 | 31.0 | 75.0 | 6 | 40.0 | 5.5 | S2266.0 | S5266.0 |
| 8.0 | 8.0 | 31.0 | 75.0 | 6 | 40.0 | 7.4 | S2268.0 | S5268.0 |
| 10.0 | 10.0 | 45.0 | 100.0 | 6 | 60.0 | 9.2 | S22610.0 | S52610.0 |
| 12.0 | 12.0 | 50.0 | 100.0 | 6 | 60.0 | 11.0 | S22612.0 | S52612.0 |
| 14.0 | 14.0 | 57.0 | 125.0 | 6 | 85.0 | 13.0 | S22614.0 | S52614.0 |
| 16.0 | 16.0 | 57.0 | 125.0 | 8 | 85.0 | 15.0 | S22616.0 | S52616.0 |
| 18.0 | 18.0 | 57.0 | 125.0 | 8 | 85.0 | 17.0 | S22618.0 | S52618.0 |
| 20.0 | 20.0 | 57.0 | 125.0 | 8 | 85.0 | 19.0 | S22620.0 | S52620.0 |

Condiciones de corte iniciales




| S226 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,05 | 95 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |




| S526 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,05 | 140 | $f_z$ | 0,011 | 0,021 | 0,037 | 0,046 | 0,055 | 0,066 | 0,078 | 0,089 | 0,101 | 0,112 | 0,124 | 0,135 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,05 | 80 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,05 | 50 | $f_z$ | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

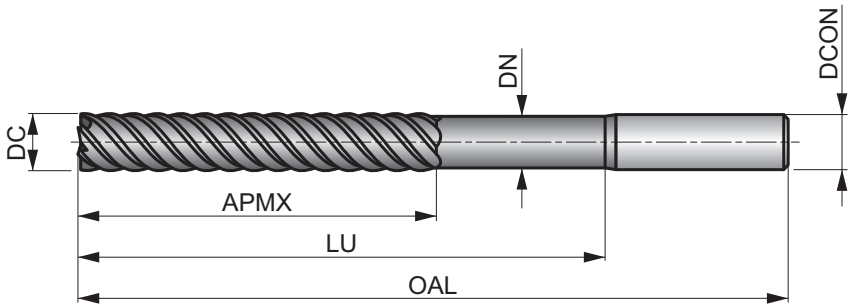
La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# S227
# S527

- Fresas de acabado

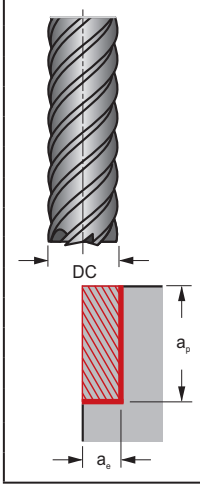
| | | |
|---|---|---|
| S227 | ■ | P4.3 M2.3 M3.3 M4.1 M4.2 S1.3 S2.2 S3.2 S4.2 |
| S527 | ■ | H1.1 H2.1 H2.2 H3.1 H3.2 H4.1 H4.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S227 | HM | | N | Z 6-8 | | λ50° γ3° | DIN 6535HA | AlTiN | h9 | | DORMER |
| S527 | HM | | N | Z 6-8 | | λ50° γ-26° | DIN 6535HA | TiSiN | h9 | | DORMER |

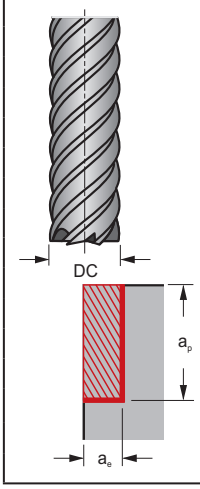


| DC mm | DCON h6 mm | APMX mm | OAL mm | ZEFP | LU mm | DN mm | S227 | S527 |
|---|---|---|---|---|---|---|---|---|
| 3.0 | 6.0 | 25.0 | 100.0 | 6 | 60.0 | 2.8 | | S5273.0 |
| 4.0 | 6.0 | 31.0 | 100.0 | 6 | 60.0 | 3.7 | | S5274.0 |
| 6.0 | 6.0 | 38.0 | 100.0 | 6 | 60.0 | 5.5 | S2276.0 | S5276.0 |
| 8.0 | 8.0 | 41.0 | 100.0 | 6 | 60.0 | 7.4 | S2278.0 | S5278.0 |
| 10.0 | 10.0 | 57.0 | 125.0 | 6 | 85.0 | 9.2 | S22710.0 | S52710.0 |
| 12.0 | 12.0 | 75.0 | 150.0 | 6 | 110.0 | 11.0 | S22712.0 | S52712.0 |
| 14.0 | 14.0 | 75.0 | 150.0 | 6 | 110.0 | 13.0 | S22714.0 | S52714.0 |
| 16.0 | 16.0 | 75.0 | 150.0 | 8 | 110.0 | 15.0 | S22716.0 | S52716.0 |
| 18.0 | 18.0 | 75.0 | 150.0 | 8 | 110.0 | 17.0 | S22718.0 | S52718.0 |
| 20.0 | 20.0 | 75.0 | 150.0 | 8 | 110.0 | 19.0 | S22720.0 | S52720.0 |

Condiciones de corte iniciales




| S227 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | 1,50 | 0,05 | 60 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |




| S527 | | | Profundidad $a_p$ x DC (mm) | Ancho $a_e$ x DC (mm) | Velocidad de corte $V_c$ (m/min.) | Avance $f_z$ (mm/diente) | Contorneado/perfilado | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C45, 16MnCr5 (180 - 220 HB) | Acero bajo en carbono | P2 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1.2312, 1.2379 (260 - 340 HB) | Acero aleado | P3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| Toolox44, Hardox450 (40 - 45 HRc) | Acero de herramientas | P4 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| 0.9650, 0.9655 (<440 HB) | Fundicon de hierro | H1 | 1,50 | 0,05 | 90 | $f_z$ | 0,011 | 0,021 | 0,037 | 0,046 | 0,055 | 0,066 | 0,078 | 0,089 | 0,101 | 0,112 | 0,124 | 0,135 |
| 1.2343, 1.2738 (50-55 HRc) | Acero templado | H3 | 1,50 | 0,05 | 45 | $f_z$ | 0,009 | 0,016 | 0,030 | 0,037 | 0,046 | 0,053 | 0,064 | 0,073 | 0,082 | 0,092 | 0,101 | 0,110 |
| 1.2379, 1.2363 (60-62 HRc) | Acero templado | H4 | 1,50 | 0,05 | 30 | $f_z$ | 0,007 | 0,009 | 0,011 | 0,014 | 0,016 | 0,021 | 0,025 | 0,032 | 0,034 | 0,039 | 0,044 | 0,048 |
| GG15, GG25 (180 - 220 HB) | Fundicion gris (GG) | K1 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |
| GGG50, GGG60 (180 - 220 HB) | Fundicion ductil (GGG) | K3 | - | - | - | $f_z$ | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - |

La velocidad de corte y los valores de avance son aproximados.
La velocidad de corte se puede cambiar en un rango (+/-10%) y el avance en un rango (+/-25%).
No se tienen en cuenta factores específicos del cliente, como la potencia de entrada, la estabilidad de la máquina, el voladizo de la herramienta, el tipo de sujeción, etc.

# SIMPLY RELIABLE

Como profesional se puede juzgar la calidad del trabajo sólo mirarando la viruta. La viruta es una forma limpia y sin complicaciones, que en sí misma cuenta una historia.
Es una señal clara y consistente y es por eso que la usamos como un símbolo por ser **simplemente fiables**.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DORMER PRAMET