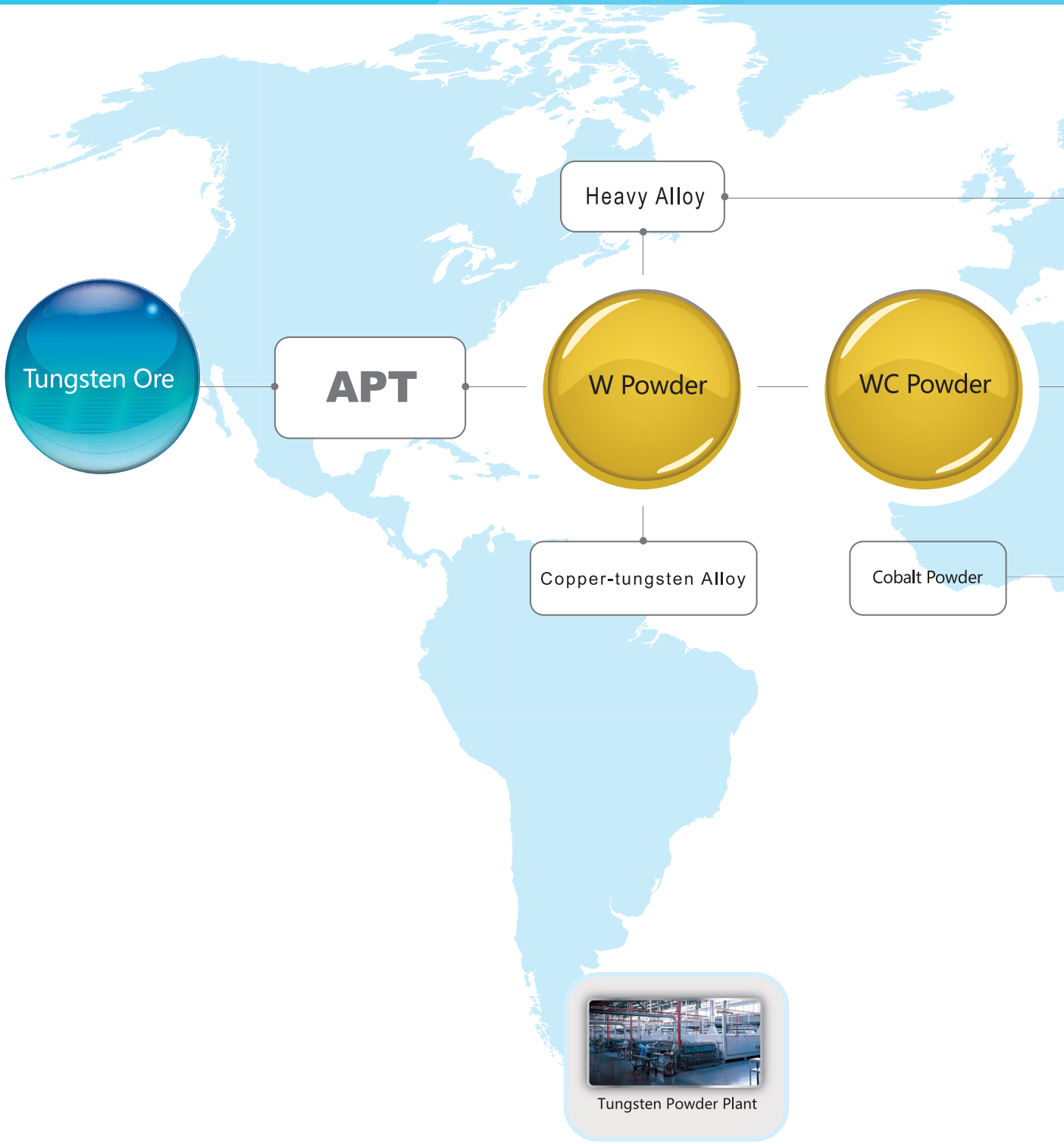
WinTech
www.wintechcarbide.com

# SOLID CARBIDE ENDMILLS

## CATALOG-2017.1

## INDUSTRIAL CHAIN






Tungsten Powder Plant

**Wintech has the unique distinction of complete control "in-house" of the Tungsten Industrial Supply Chain - from ore mining to the tungsten powder, to cemented carbide, to the final precision cutting tools.**



Cemented Carbide Plant


Solid Carbide Cutting Tools Plant


PCB Tools Plant

# Guidelines to Icons

| | Mark | Description |
|---|---|---|
| Shank |  | ISO Standard Shank |
| Coating |  | AlCrN Coating |
| |  | AlCrSiN Coating |
| |  | AlTiN Coating |
| |  | Nano Coating AlTiN |
| |  | AlCrN/TiSiN Coating |
| |  | Nano Coating AlTiN/TiSiN |
| |  | TiAlCrSiN Coating |
| |  | AlNova Coating |
| |  | Ultra Fine Grain Diamond Coating |
| Endteeth Type |  | Square End |
| |  | Corner Radius |
| |  | Ballnose |
| |  | Square End with Chamfer |
| Cutting Condition |  | For Side Milling |
| |  | For Slotting |
| |  | For Profile Milling |

| | Mark | Description |
|---|---|---|
| Helix |  | -20°Helix |
| |  | 30°Helix |
| |  | 35°Helix |
| |  | Variable Helix |
| |  | 40°Helix |
| |  | 45°Helix |
| |  | Variable Helix |
| No. of Flutes |  | 1 Flute Endmills |
| |  | 2 Flute Endmills |
| |  | 3 Flute Endmills |
| |  | 4 Flute Endmills |
| |  | 5 Flute Endmills |
| |  | 6 Flute Endmills |
| |  | 12 Flute Endmills |
| Workpiece Material |  | Steels |
| |  | Stainless Steels |
| |  | Cast Iron |
| |  | Non-ferrous Materials |
| |  | Heat-resistant Super Alloys,Titanium Alloys |
| |  | High Hardened Materials |

# PRODUCT SERIES INDEX

## EP50 (≤35HRC)

EP50: Page 6-30

EP50 Endmills for General Purpose

- Suitable for steels&cast iron(≤35HRC).
- Sharp cutting edges design, meet the cutting of soft material.

## SS200

Page 31-32

SS200 Endmill for High Efficiency Milling of Stainless Steel

- Suitable for high efficiency rough milling and semi-finishing of stainless steel (<280HB).
- Variable helix angle and differential flute pitch, reduces and eliminates vibration.
- Applicable for high efficiency machining at large cutting depth (ap), large cutting width (ae), high material removal rate.
- Water soluable or oil based are the best cooling methods.

## UA100

Page 33-36

UA100 Endmills for General Machining of Aluminum Alloy

- Suitable for aluminum alloy (Si ≤ 12%) and copper alloy (< 200HB) general processing.
- Special edge design, reduces vibration, effectively solve the crumbs.
- Water cooling is the best cooling method.

## SH160 (48-55HRC)

Page 37-50

SH160 Endmills for Hardened Steels(48-55HRC)

- High hardness, high toughness matrix materials, special angle design , special for hardened steels processing.
- 48-55HRC; For hardened steels (48-55 HRC)finishing .
- Recommended to use air or oil mist cooling.

## SH200-H

Page 51-52

SH200-H Endmills Optimized for Hardened Steels

- 48~60HRC Suitable for Semi-Finishing and Finishing of 48~60HRC Hardened Steels;
- High strength, high toughness matrix materials base material with newly developed coating, lengthens the tool life significantly.
- Recommended to use air or oil mist cooling.

# EP50 -

1

| Workpiece | Code of Series | |
|---|---|---|
| Steel Cast Iron | EP50 | Suitable for Steels&Cast Iron(≤35HRC) |
| Stainless Steel | SS200 | Suitable for High Efficiency Machining of Stainless Steel |
| Aluminium Alloy | UA100 | Suitable for General Machining of Aluminium Alloy |
| High Hardened Material | SH160 | Suitable for high Speed Machining of Hardened Steels(48-55HRC) |
| | SH200-H | Suitable for high Speed Machining of Hardened Steels (48-60HRC) |

| S | S | 2- | 060 | 09 |
|---|---|---|---|---|
| 2 | 3 | 4 | 5 | 6 |

| End Profile | |
|---|---|
| S | Square |
| B | Ballnose |
| R | Cornor Radius |
| C | Square End with Chamfer |

| Length of Flute | |
|---|---|
| N | Reduce Neck |
| H | Long Shank |
| L | Long Flute |
| S | Short Flute |
| | Blank: Standard |

| No. of Flutes |
|---|
| 2 |
| 3 |
| 4 |

| Diameter | |
|---|---|
| | 006 |
| 6mm | 060 |
| | 100 |

| Code Characteristic | |
|---|---|
| 1 | Square End\Ballnose:<br>a. Neck Length<br>b. Flute Length<br>6-06 10-10 |
| 2 | Cornor Radius<br>r0.2-02 r1-10 |
| 3 | Miniature<br>a. Neck Length<br>1-01 10-10<br>b. Flute Lengt (*10):<br>0.8-08 1.6-16 |
| 4 | Square End with Chamfer:<br>C0.03-03<br>C0.13-13 |

# EP50-S2

2 Flute,Standard Length

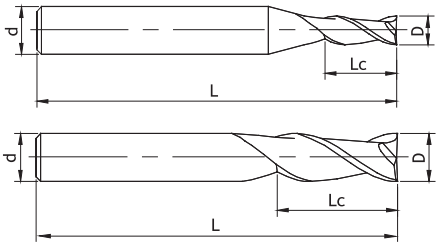



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S2-01003 | 1 | 3 | 50 | 4 | 1 | ● |
| EP50-S2-01505 | 1.5 | 5 | 50 | 4 | 1 | ● |
| EP50-S2-02006 | 2 | 6 | 50 | 4 | 1 | ○ |
| EP50-S2-02506 | 2.5 | 6 | 50 | 4 | 1 | ○ |
| EP50-S2-02508 | 2.5 | 8 | 50 | 4 | 1 | ● |
| EP50-S2-03009 | 3 | 9 | 50 | 4 | 1 | ● |
| EP50-S2-03509 | 3.5 | 9 | 50 | 4 | 1 | ● |
| EP50-S2-63509 | 3.5 | 9 | 50 | 6 | 1 | ● |
| EP50-S2-04011 | 4 | 11 | 50 | 4 | 2 | ● |
| EP50-S2-64011 | 4 | 11 | 50 | 6 | 1 | ● |
| EP50-S2-04511 | 4.5 | 11 | 50 | 6 | 1 | ● |
| EP50-S2-05013 | 5 | 13 | 50 | 6 | 1 | ○ |
| EP50-S2-06016 | 6 | 16 | 50 | 6 | 2 | ● |
| EP50-S2-06516 | 6.5 | 16 | 60 | 8 | 1 | ● |
| EP50-S2-07020 | 7 | 20 | 60 | 8 | 1 | ○ |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-S2

2 Flute,Standard Length

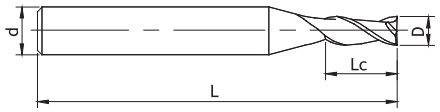



Fig1

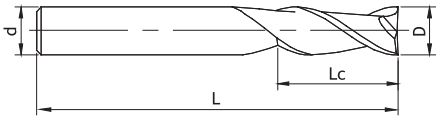



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S2-07520 | 7.5 | 20 | 60 | 8 | 1 | ● |
| EP50-S2-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| EP50-S2-08523 | 8.5 | 23 | 75 | 10 | 1 | ● |
| EP50-S2-09023 | 9 | 23 | 75 | 10 | 1 | ● |
| EP50-S2-09525 | 9.5 | 25 | 75 | 10 | 1 | ● |
| EP50-S2-10025 | 10 | 25 | 75 | 10 | 2 | ● |
| EP50-S2-10526 | 10.5 | 26 | 75 | 12 | 1 | ● |
| EP50-S2-11028 | 11 | 28 | 75 | 12 | 1 | ● |
| EP50-S2-12030 | 12 | 30 | 75 | 12 | 2 | ● |
| EP50-S2-14034 | 14 | 34 | 100 | 14 | 2 | ○ |
| EP50-S2-15036 | 15 | 36 | 90 | 16 | 1 | ○ |
| EP50-S2-16036 | 16 | 36 | 100 | 16 | 2 | ● |
| EP50-S2-17040 | 17 | 40 | 100 | 20 | 1 | ○ |
| EP50-S2-18040 | 18 | 40 | 100 | 18 | 2 | ● |
| EP50-S2-19040 | 19 | 40 | 100 | 20 | 1 | ● |
| EP50-S2-20045 | 20 | 45 | 100 | 20 | 2 | ● |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-SL2

2 Flute, Long Flute Length

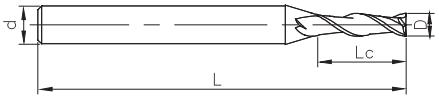



Fig1

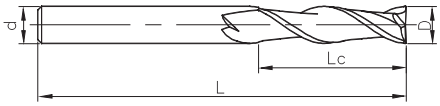



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-SL2-02015 | 2 | 15 | 75 | 4 | 1 | ○ |
| EP50-SL2-03025 | 3 | 25 | 75 | 4 | 1 | ○ |
| EP50-SL2-04030 | 4 | 30 | 75 | 4 | 2 | ○ |
| EP50-SL2-05030 | 5 | 30 | 75 | 6 | 1 | ● |
| EP50-SL2-06035 | 6 | 35 | 75 | 6 | 2 | ○ |
| EP50-SL2-08040 | 8 | 40 | 100 | 8 | 2 | ○ |
| EP50-SL2-10045 | 10 | 45 | 100 | 10 | 2 | ● |
| EP50-SL2-12050 | 12 | 50 | 100 | 12 | 2 | ○ |
| EP50-SL2-14055 | 14 | 55 | 100 | 14 | 2 | ● |
| EP50-SL2-16050 | 16 | 50 | 150 | 16 | 2 | ○ |
| EP50-SL2-16060 | 16 | 60 | 150 | 16 | 2 | ○ |
| EP50-SL2-18065 | 18 | 65 | 150 | 18 | 2 | ○ |
| EP50-SL2-20070 | 20 | 70 | 150 | 20 | 2 | ○ |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-SH2

2 Flute, with Long Shank Length

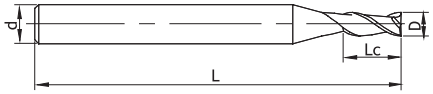



Fig1

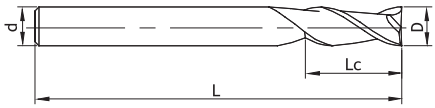



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-SH2-02006 | 2 | 6 | 75 | 4 | 1 | ● |
| EP50-SH2-03009 | 3 | 9 | 75 | 4 | 1 | ● |
| EP50-SH2-63012 | 3 | 12 | 75 | 6 | 1 | ● |
| EP50-SH2-04011 | 4 | 11 | 75 | 4 | 2 | ○ |
| EP50-SH2-05020 | 5 | 20 | 75 | 6 | 1 | ● |
| EP50-SH2-06016 | 6 | 16 | 100 | 6 | 2 | ○ |
| EP50-SH2-06020 | 6 | 20 | 100 | 6 | 2 | ○ |
| EP50-SH2-08020 | 8 | 20 | 75 | 8 | 2 | ● |
| EP50-SH2-08025 | 8 | 25 | 100 | 8 | 2 | ● |
| EP50-SH2-10030 | 10 | 30 | 100 | 10 | 2 | ● |
| EP50-SH2-12035 | 12 | 35 | 100 | 12 | 2 | ● |
| EP50-SH2-16036 | 16 | 36 | 150 | 16 | 2 | ● |
| EP50-SH2-20045 | 20 | 45 | 150 | 20 | 2 | ○ |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-S3

3 Flute, Standard Length

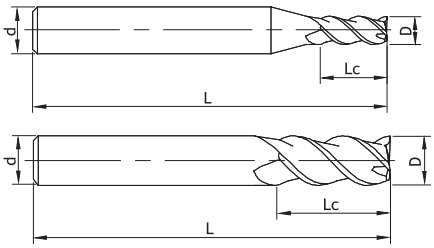



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S3-02006 | 2 | 6 | 50 | 4 | 1 | ○ |
| EP50-S3-03009 | 3 | 9 | 50 | 4 | 1 | ● |
| EP50-S3-04011 | 4 | 11 | 50 | 4 | 2 | ● |
| EP50-S3-05013 | 5 | 13 | 50 | 6 | 1 | ● |
| EP50-S3-06016 | 6 | 16 | 50 | 6 | 2 | ● |
| EP50-S3-06516 | 6.5 | 16 | 60 | 8 | 1 | ○ |
| EP50-S3-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| EP50-S3-09524 | 9.5 | 24 | 75 | 10 | 1 | ● |
| EP50-S3-10025 | 10 | 25 | 75 | 10 | 2 | ● |
| EP50-S3-12030 | 12 | 30 | 75 | 12 | 2 | ● |
| EP50-S3-16036 | 16 | 36 | 100 | 16 | 2 | ● |
| EP50-S3-18040 | 18 | 40 | 100 | 18 | 2 | ● |
| EP50-S3-20045 | 20 | 45 | 100 | 20 | 2 | ● |
| EP50-S3-25050 | 25 | 50 | 100 | 25 | 2 | ○ |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-S4

4 Flute, Standard Length

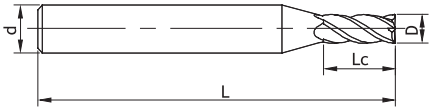



Fig1

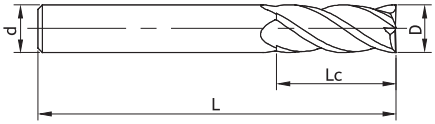



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S4-01003 | 1 | 3 | 50 | 4 | 1 | ● |
| EP50-S4-01505 | 1.5 | 5 | 50 | 4 | 1 | ○ |
| EP50-S4-02006 | 2 | 6 | 50 | 4 | 1 | ● |
| EP50-S4-02508 | 2.5 | 8 | 50 | 4 | 1 | ● |
| EP50-S4-03006 | 3 | 6 | 50 | 4 | 1 | ○ |
| EP50-S4-03511 | 3.5 | 11 | 50 | 4 | 1 | ● |
| EP50-S4-04011 | 4 | 11 | 50 | 4 | 2 | ● |
| EP50-S4-04511 | 4.5 | 11 | 50 | 6 | 1 | ● |
| EP50-S4-05008 | 5 | 8 | 50 | 6 | 1 | ● |
| EP50-S4-05013 | 5 | 13 | 50 | 6 | 1 | ● |
| EP50-S4-05513 | 5.5 | 13 | 50 | 6 | 1 | ● |
| EP50-S4-06016 | 6 | 16 | 50 | 6 | 2 | ● |
| EP50-S4-06516 | 6.5 | 16 | 60 | 8 | 1 | ○ |
| EP50-S4-07020 | 7 | 20 | 60 | 8 | 1 | ● |
| EP50-S4-07520 | 7.5 | 20 | 60 | 8 | 1 | ● |
| EP50-S4-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| EP50-S4-08523 | 8.5 | 23 | 75 | 10 | 1 | ● |
| EP50-S4-09023 | 9 | 23 | 75 | 10 | 1 | ○ |
| EP50-S4-09525 | 9.5 | 25 | 75 | 10 | 1 | ● |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-S4

4 Flute, Standard Length

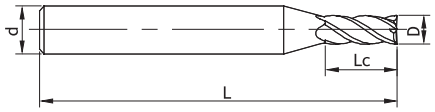



Fig1

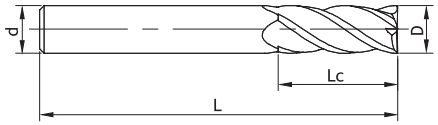



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S4-10025 | 10 | 25 | 75 | 10 | 2 | ● |
| EP50-S4-11028 | 11 | 28 | 75 | 12 | 1 | ● |
| EP50-S4-12030 | 12 | 30 | 75 | 12 | 2 | ○ |
| EP50-S4-13032 | 13 | 32 | 90 | 14 | 1 | ● |
| EP50-S4-14034 | 14 | 34 | 100 | 14 | 2 | ● |
| EP50-S4-15036 | 15 | 36 | 100 | 16 | 1 | ○ |
| EP50-S4-16036 | 16 | 36 | 100 | 16 | 2 | ● |
| EP50-S4-17038 | 17 | 38 | 100 | 18 | 1 | ● |
| EP50-S4-18038 | 18 | 38 | 100 | 18 | 2 | ● |
| EP50-S4-20045 | 20 | 45 | 100 | 20 | 2 | ● |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-SL4

4 Flute, Long Flute Length

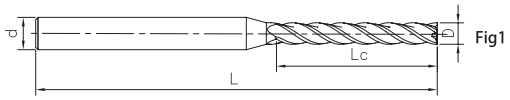


Fig1

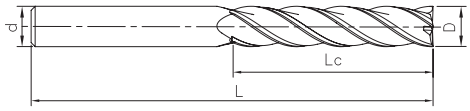


Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-SL4-01004 | 1 | 4 | 50 | 4 | 1 | ○ |
| EP50-SL4-02010 | 2 | 10 | 50 | 4 | 1 | ● |
| EP50-SL4-03015 | 3 | 15 | 60 | 4 | 1 | ● |
| EP50-SL4-63015 | 3 | 15 | 60 | 6 | 1 | ● |
| EP50-SL4-04020 | 4 | 20 | 60 | 4 | 2 | ● |
| EP50-SL4-64020 | 4 | 20 | 75 | 6 | 1 | ● |
| EP50-SL4-04030 | 4 | 30 | 75 | 4 | 2 | ○ |
| EP50-SL4-05025 | 5 | 25 | 75 | 6 | 1 | ● |
| EP50-SL4-05030 | 5 | 30 | 75 | 6 | 1 | ○ |
| EP50-SL4-06030 | 6 | 30 | 75 | 6 | 2 | ● |
| EP50-SL4-06035 | 6 | 35 | 75 | 6 | 2 | ○ |
| EP50-SL4-08035 | 8 | 35 | 100 | 8 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D⩽12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

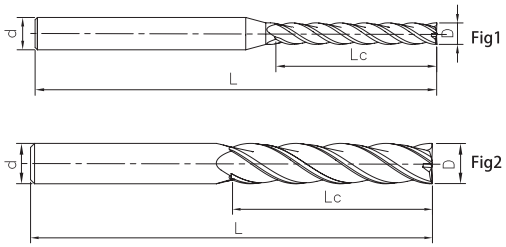
unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-SL4

4 Flute, Long Flute Length





See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-SL4-08040 | 8 | 40 | 100 | 8 | 2 | ○ |
| EP50-SL4-10045 | 10 | 45 | 100 | 10 | 2 | ● |
| EP50-SL4-10050 | 10 | 50 | 100 | 10 | 2 | ● |
| EP50-SL4-12045 | 12 | 45 | 100 | 12 | 2 | ● |
| EP50-SL4-12050 | 12 | 50 | 100 | 12 | 2 | ● |
| EP50-SL4-14045 | 14 | 45 | 100 | 14 | 2 | ● |
| EP50-SL4-16050 | 16 | 50 | 150 | 16 | 2 | ○ |
| EP50-SL4-16060 | 16 | 60 | 150 | 16 | 2 | ● |
| EP50-SL4-16070 | 16 | 70 | 150 | 16 | 2 | ● |
| EP50-SL4-18070 | 18 | 70 | 150 | 18 | 2 | ● |
| EP50-SL4-20070 | 20 | 70 | 150 | 20 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-SH4

4 Flute, with Long Shank Length

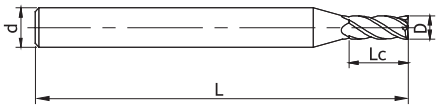



Fig1

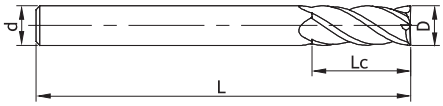



Fig2

SHANK h6 | 4 | AlNova | 35° Helix | Square | L

See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-SH4-02010 | 2 | 10 | 75 | 4 | 1 | ● |
| EP50-SH4-03012 | 3 | 12 | 75 | 4 | 1 | ● |
| EP50-SH4-04011 | 4 | 11 | 75 | 4 | 2 | ● |
| EP50-SH4-04015 | 4 | 15 | 75 | 4 | 2 | ○ |
| EP50-SH4-05020 | 5 | 20 | 75 | 6 | 1 | ○ |
| EP50-SH4-06020 | 6 | 20 | 75 | 6 | 2 | ○ |
| EP50-SH4-08025 | 8 | 25 | 100 | 8 | 2 | ● |
| EP50-SH4-10035 | 10 | 35 | 100 | 10 | 2 | ○ |
| EP50-SH4-12035 | 12 | 35 | 100 | 12 | 2 | ● |
| EP50-SH4-16036 | 16 | 36 | 150 | 16 | 2 | ○ |
| EP50-SH4-20045 | 20 | 45 | 150 | 20 | 2 | ○ |

●Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-S6

6 Flute, Standard Length

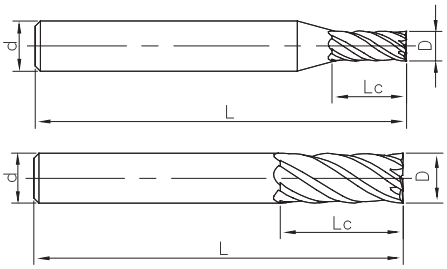



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| EP50-S6-06015 | 6 | 15 | 50 | 6 | 2 | ○ |
| EP50-S6-08020 | 8 | 20 | 60 | 8 | 2 | ○ |
| EP50-S6-10025 | 10 | 25 | 75 | 10 | 2 | ○ |
| EP50-S6-12030 | 12 | 30 | 75 | 12 | 2 | ○ |
| EP50-S6-16036 | 16 | 36 | 100 | 16 | 2 | ○ |
| EP50-S6-20045 | 20 | 45 | 100 | 20 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R2

2 Flute, Corner Radius

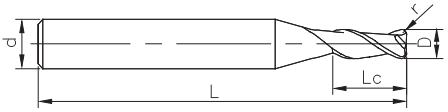



Fig1

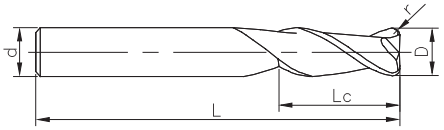



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R2-01002 | 1 | 3 | 0.2 | 50 | 4 | 1 | ● |
| EP50-R2-02002 | 2 | 6 | 0.2 | 50 | 4 | 1 | ○ |
| EP50-R2-03002 | 3 | 9 | 0.2 | 50 | 4 | 1 | ○ |
| EP50-R2-63002 | 3 | 9 | 0.2 | 50 | 6 | 1 | ○ |
| EP50-R2-03003 | 3 | 9 | 0.3 | 50 | 4 | 1 | ● |
| EP50-R2-63003 | 3 | 9 | 0.3 | 50 | 6 | 1 | ○ |
| EP50-R2-03005 | 3 | 9 | 0.5 | 50 | 4 | 1 | ● |
| EP50-R2-63005 | 3 | 9 | 0.5 | 50 | 6 | 1 | ○ |
| EP50-R2-04002 | 4 | 11 | 0.2 | 50 | 4 | 2 | ○ |
| EP50-R2-64002 | 4 | 11 | 0.2 | 50 | 6 | 1 | ○ |
| EP50-R2-04003 | 4 | 11 | 0.3 | 50 | 4 | 2 | ○ |
| EP50-R2-64003 | 4 | 11 | 0.3 | 50 | 6 | 1 | ○ |
| EP50-R2-04005 | 4 | 11 | 0.5 | 50 | 4 | 2 | ○ |
| EP50-R2-64005 | 4 | 11 | 0.5 | 50 | 6 | 1 | ○ |
| EP50-R2-04010 | 4 | 11 | 1 | 50 | 4 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R2

2 Flute, Corner Radius

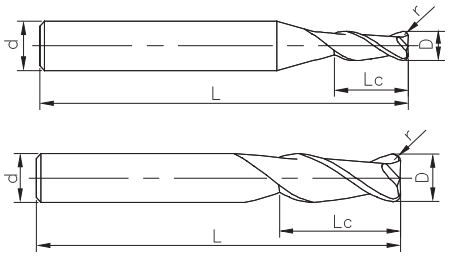



Fig1




Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R2-05002 | 5 | 13 | 0.2 | 50 | 6 | 1 | ○ |
| EP50-R2-05003 | 5 | 13 | 0.3 | 50 | 6 | 1 | ● |
| EP50-R2-05005 | 5 | 13 | 0.5 | 50 | 6 | 1 | ○ |
| EP50-R2-05010 | 5 | 13 | 1 | 50 | 6 | 1 | ○ |
| EP50-R2-06005 | 6 | 16 | 0.5 | 50 | 6 | 2 | ● |
| EP50-R2-06010 | 6 | 16 | 1 | 50 | 6 | 2 | ● |
| EP50-R2-06015 | 6 | 16 | 1.5 | 50 | 6 | 2 | ● |
| EP50-R2-06020 | 6 | 16 | 2 | 50 | 6 | 2 | ○ |
| EP50-R2-08003 | 8 | 20 | 0.3 | 60 | 8 | 2 | ○ |
| EP50-R2-08005 | 8 | 20 | 0.5 | 60 | 8 | 2 | ● |
| EP50-R2-08010 | 8 | 20 | 1 | 60 | 8 | 2 | ● |
| EP50-R2-08015 | 8 | 20 | 1.5 | 60 | 8 | 2 | ● |
| EP50-R2-08020 | 8 | 20 | 2 | 60 | 8 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R2

2 Flute, Corner Radius

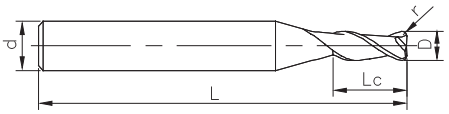



Fig1

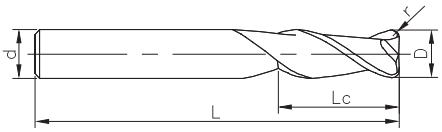



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R2-10003 | 10 | 25 | 0.3 | 75 | 10 | 2 | ○ |
| EP50-R2-10005 | 10 | 25 | 0.5 | 75 | 10 | 2 | ● |
| EP50-R2-10010 | 10 | 25 | 1 | 75 | 10 | 2 | ● |
| EP50-R2-10015 | 10 | 25 | 1.5 | 75 | 10 | 2 | ● |
| EP50-R2-10020 | 10 | 25 | 2 | 75 | 10 | 2 | ● |
| EP50-R2-10030 | 10 | 25 | 3 | 75 | 10 | 2 | ○ |
| EP50-R2-12005 | 12 | 30 | 0.5 | 75 | 12 | 2 | ● |
| EP50-R2-12010 | 12 | 30 | 1 | 75 | 12 | 2 | ● |
| EP50-R2-12015 | 12 | 30 | 1.5 | 75 | 12 | 2 | ● |
| EP50-R2-12020 | 12 | 30 | 2 | 75 | 12 | 2 | ● |
| EP50-R2-12030 | 12 | 30 | 3 | 75 | 12 | 2 | ● |
| EP50-R2-16010 | 16 | 36 | 1 | 100 | 16 | 2 | ○ |
| EP50-R2-16020 | 16 | 36 | 2 | 100 | 16 | 2 | ○ |
| EP50-R2-16030 | 16 | 36 | 3 | 100 | 16 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-RH2

2 Flute Corner Radius, with Long Shank Length

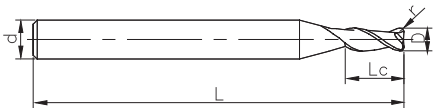



Fig1

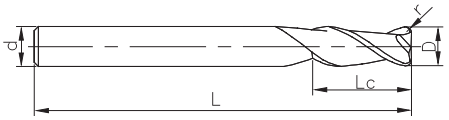



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-RH2-06005 | 6 | 16 | 0.5 | 75 | 6 | 2 | ● |
| EP50-RH2-06010 | 6 | 16 | 1 | 75 | 6 | 2 | ● |
| EP50-RH2-06015 | 6 | 16 | 1.5 | 75 | 6 | 2 | ○ |
| EP50-RH2-08005 | 8 | 20 | 0.5 | 100 | 8 | 2 | ○ |
| EP50-RH2-08010 | 8 | 20 | 1 | 100 | 8 | 2 | ○ |
| EP50-RH2-08015 | 8 | 20 | 1.5 | 100 | 8 | 2 | ○ |
| EP50-RH2-10005 | 10 | 25 | 0.5 | 100 | 10 | 2 | ● |
| EP50-RH2-10010 | 10 | 25 | 1 | 100 | 10 | 2 | ● |
| EP50-RH2-10015 | 10 | 25 | 1.5 | 100 | 10 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-RH2

2 Flute Corner Radius, with Long Shank Length

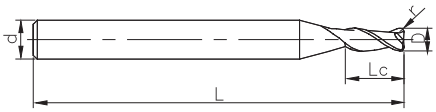



Fig1

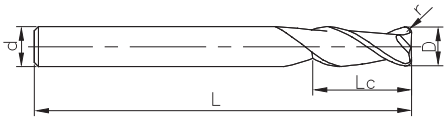



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-RH2-10020 | 10 | 25 | 2 | 100 | 10 | 2 | ○ |
| EP50-RH2-12005 | 12 | 30 | 0.5 | 100 | 12 | 2 | ○ |
| EP50-RH2-12010 | 12 | 30 | 1 | 100 | 12 | 2 | ○ |
| EP50-RH2-12015 | 12 | 30 | 1.5 | 100 | 12 | 2 | ○ |
| EP50-RH2-12020 | 12 | 30 | 2 | 100 | 12 | 2 | ○ |
| EP50-RH2-16005 | 16 | 36 | 0.5 | 150 | 16 | 2 | ○ |
| EP50-RH2-16010 | 16 | 36 | 1 | 150 | 16 | 2 | ○ |
| EP50-RH2-16015 | 16 | 36 | 1.5 | 150 | 16 | 2 | ○ |
| EP50-RH2-16020 | 16 | 36 | 2 | 150 | 16 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R4

4 Flute, Corner Radius

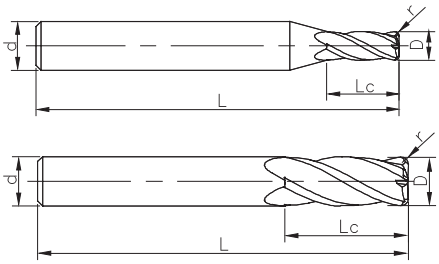



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R4-01502 | 1.5 | 5 | 0.2 | 50 | 4 | 1 | ○ |
| EP50-R4-02002 | 2 | 6 | 0.2 | 50 | 4 | 1 | ● |
| EP50-R4-03002 | 3 | 9 | 0.2 | 50 | 4 | 1 | ● |
| EP50-R4-03003 | 3 | 9 | 0.3 | 50 | 4 | 1 | ○ |
| EP50-R4-03005 | 3 | 9 | 0.5 | 50 | 4 | 1 | ● |
| EP50-R4-04002 | 4 | 11 | 0.2 | 50 | 4 | 2 | ○ |
| EP50-R4-04003 | 4 | 11 | 0.3 | 50 | 4 | 2 | ○ |
| EP50-R4-04005 | 4 | 11 | 0.5 | 50 | 4 | 2 | ● |
| EP50-R4-04010 | 4 | 11 | 1 | 50 | 4 | 2 | ● |
| EP50-R4-04510 | 4.5 | 12 | 1 | 50 | 6 | 1 | ● |
| EP50-R4-05002 | 5 | 13 | 0.2 | 50 | 6 | 1 | ○ |
| EP50-R4-05005 | 5 | 13 | 0.5 | 50 | 6 | 1 | ● |
| EP50-R4-05010 | 5 | 13 | 1 | 50 | 6 | 1 | ● |
| EP50-R4-05015 | 5 | 13 | 1.5 | 50 | 6 | 1 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R4

4 Flute, Corner Radius

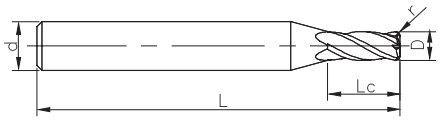



Fig1

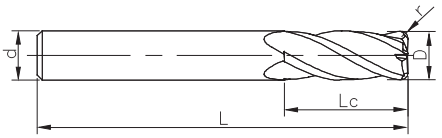



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R4-06005 | 6 | 16 | 0.5 | 50 | 6 | 2 | ● |
| EP50-R4-06010 | 6 | 16 | 1 | 50 | 6 | 2 | ● |
| EP50-R4-06015 | 6 | 16 | 1.5 | 50 | 6 | 2 | ● |
| EP50-R4-08003 | 8 | 20 | 0.3 | 60 | 8 | 2 | ○ |
| EP50-R4-08005 | 8 | 20 | 0.5 | 60 | 8 | 2 | ● |
| EP50-R4-08010 | 8 | 20 | 1 | 60 | 8 | 2 | ● |
| EP50-R4-08015 | 8 | 20 | 1.5 | 60 | 8 | 2 | ● |
| EP50-R4-08020 | 8 | 20 | 2 | 60 | 8 | 2 | ● |
| EP50-R4-10003 | 10 | 25 | 0.3 | 75 | 10 | 2 | ○ |
| EP50-R4-10005 | 10 | 25 | 0.5 | 75 | 10 | 2 | ● |
| EP50-R4-10010 | 10 | 25 | 1 | 75 | 10 | 2 | ● |
| EP50-R4-10015 | 10 | 25 | 1.5 | 75 | 10 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-R4

4 Flute, Corner Radius

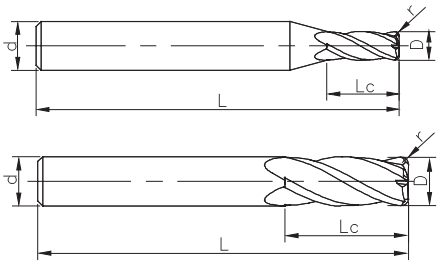



Fig1




Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-R4-10020 | 10 | 25 | 2 | 75 | 10 | 2 | ○ |
| EP50-R4-10025 | 10 | 25 | 2.5 | 75 | 10 | 2 | ○ |
| EP50-R4-10030 | 10 | 25 | 3 | 75 | 10 | 2 | ○ |
| EP50-R4-12005 | 12 | 30 | 0.5 | 75 | 12 | 2 | ● |
| EP50-R4-12010 | 12 | 30 | 1 | 75 | 12 | 2 | ● |
| EP50-R4-12015 | 12 | 30 | 1.5 | 75 | 12 | 2 | ● |
| EP50-R4-12020 | 12 | 30 | 2 | 75 | 12 | 2 | ○ |
| EP50-R4-12025 | 12 | 30 | 2.5 | 75 | 12 | 2 | ○ |
| EP50-R4-12030 | 12 | 30 | 3 | 75 | 12 | 2 | ○ |
| EP50-R4-16005 | 16 | 36 | 0.5 | 100 | 16 | 2 | ● |
| EP50-R4-16010 | 16 | 36 | 1 | 100 | 16 | 2 | ● |
| EP50-R4-16020 | 16 | 36 | 2 | 100 | 16 | 2 | ○ |
| EP50-R4-16030 | 16 | 36 | 3 | 100 | 16 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-RH4

4 Flute Corner Radius, with Long Shank Length

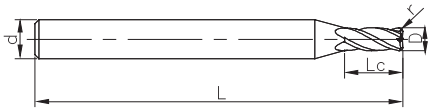



Fig1

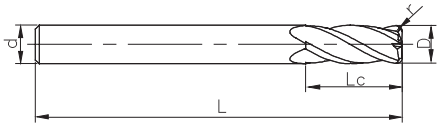



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-RH4-06005 | 6 | 16 | 0.5 | 75 | 6 | 2 | ● |
| EP50-RH4-06010 | 6 | 16 | 1 | 75 | 6 | 2 | ● |
| EP50-RH4-06015 | 6 | 16 | 1.5 | 75 | 6 | 2 | ○ |
| EP50-RH4-08005 | 8 | 20 | 0.5 | 100 | 8 | 2 | ● |
| EP50-RH4-08010 | 8 | 20 | 1 | 100 | 8 | 2 | ● |
| EP50-RH4-08015 | 8 | 20 | 1.5 | 100 | 8 | 2 | ○ |
| EP50-RH4-08020 | 8 | 20 | 2 | 100 | 8 | 2 | ○ |
| EP50-RH4-10005 | 10 | 25 | 0.5 | 100 | 10 | 2 | ● |
| EP50-RH4-10010 | 10 | 25 | 1 | 100 | 10 | 2 | ○ |
| EP50-RH4-10015 | 10 | 25 | 1.5 | 100 | 10 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-RH4

4 Flute Corner Radius, with Long Shank Length

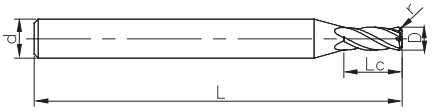



Fig1

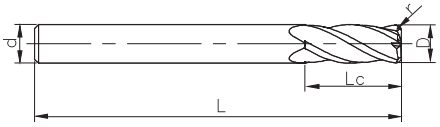



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-RH4-10020 | 10 | 25 | 2 | 100 | 10 | 2 | ○ |
| EP50-RH4-12005 | 12 | 30 | 0.5 | 100 | 12 | 2 | ● |
| EP50-RH4-12010 | 12 | 30 | 1 | 100 | 12 | 2 | ○ |
| EP50-RH4-12015 | 12 | 30 | 1.5 | 100 | 12 | 2 | ○ |
| EP50-RH4-12020 | 12 | 30 | 2 | 100 | 12 | 2 | ○ |
| EP50-RH4-12030 | 12 | 30 | 3 | 100 | 12 | 2 | ○ |
| EP50-RH4-16005 | 16 | 36 | 0.5 | 150 | 16 | 2 | ○ |
| EP50-RH4-16010 | 16 | 36 | 1 | 150 | 16 | 2 | ○ |
| EP50-RH4-16015 | 16 | 36 | 1.5 | 150 | 16 | 2 | ○ |
| EP50-RH4-16020 | 16 | 36 | 2 | 150 | 16 | 2 | ○ |
| EP50-RH4-16030 | 16 | 36 | 3 | 150 | 16 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ◎ | ○ | ◎ | | | |

◎ Most Suitable ○ Suitable

# EP50-B2

2 Flute, Ballnose

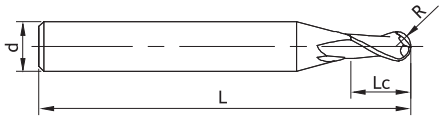



Fig1

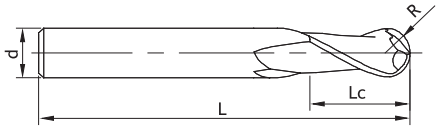



Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-B2-00801 | 0.8 | 0.4 | 1.6 | 50 | 4 | 1 | ○ |
| EP50-B2-00901 | 0.9 | 0.45 | 1.8 | 50 | 4 | 1 | ○ |
| EP50-B2-01002 | 1 | 0.5 | 2 | 50 | 4 | 1 | ○ |
| EP50-B2-01503 | 1.5 | 0.75 | 3 | 50 | 4 | 1 | ○ |
| EP50-B2-02004 | 2 | 1 | 4 | 50 | 4 | 1 | ● |
| EP50-B2-02505 | 2.5 | 1.25 | 5 | 50 | 4 | 1 | ○ |
| EP50-B2-03006 | 3 | 1.5 | 6 | 50 | 4 | 1 | ○ |
| EP50-B2-04008 | 4 | 2 | 8 | 50 | 4 | 2 | ○ |
| EP50-B2-05010 | 5 | 2.5 | 10 | 50 | 6 | 1 | ● |
| EP50-B2-06012 | 6 | 3 | 12 | 50 | 6 | 2 | ○ |
| EP50-B2-07014 | 7 | 3.5 | 14 | 60 | 8 | 1 | ○ |
| EP50-B2-08014 | 8 | 4 | 14 | 60 | 8 | 2 | ○ |
| EP50-B2-09016 | 9 | 4.5 | 16 | 75 | 10 | 1 | ● |
| EP50-B2-10018 | 10 | 5 | 18 | 75 | 10 | 2 | ○ |
| EP50-B2-11020 | 11 | 5.5 | 20 | 75 | 12 | 1 | ● |

●Stock
○Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-B2

2 Flute, Ballnose

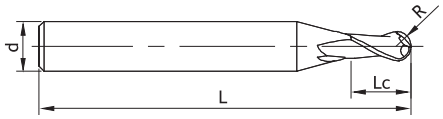



Fig1

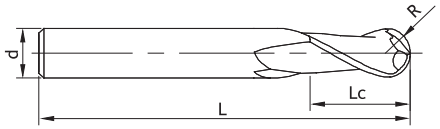



Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-B2-12022 | 12 | 6 | 22 | 75 | 12 | 2 | ● |
| EP50-B2-13026 | 13 | 6.5 | 26 | 90 | 16 | 1 | ● |
| EP50-B2-14026 | 14 | 7 | 26 | 90 | 16 | 1 | ○ |
| EP50-B2-15030 | 15 | 7.5 | 30 | 90 | 16 | 1 | ● |
| EP50-B2-16030 | 16 | 8 | 30 | 100 | 16 | 2 | ○ |
| EP50-B2-20038 | 20 | 10 | 38 | 100 | 20 | 2 | ● |

●Stock
○Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-BH2

2 Flute Ballnose, with Long Shank Length

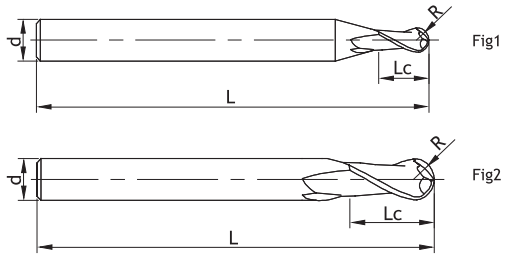



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-BH2-02004 | 2 | 1 | 4 | 75 | 4 | 1 | ● |
| EP50-BH2-03006 | 3 | 1.5 | 6 | 75 | 4 | 1 | ● |
| EP50-BH2-04008 | 4 | 2 | 8 | 75 | 4 | 2 | ● |
| EP50-BH2-05010 | 5 | 2.5 | 10 | 75 | 6 | 1 | ● |
| EP50-BH2-06012 | 6 | 3 | 12 | 100 | 6 | 2 | ● |
| EP50-BH2-08016 | 8 | 4 | 16 | 100 | 8 | 2 | ● |
| EP50-BH2-10020 | 10 | 5 | 20 | 150 | 10 | 2 | ● |
| EP50-BH2-12024 | 12 | 6 | 24 | 150 | 12 | 2 | ● |

●Stock
○Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# EP50-B4

4 Flute, Ballnose

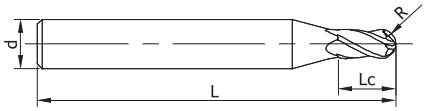



Fig1

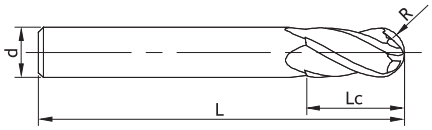



Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| EP50-B4-02004 | 2 | 1 | 4 | 50 | 4 | 1 | ○ |
| EP50-B4-02505 | 2.5 | 1.25 | 5 | 50 | 4 | 1 | ● |
| EP50-B4-03006 | 3 | 1.5 | 6 | 50 | 4 | 1 | ● |
| EP50-B4-04008 | 4 | 2 | 8 | 50 | 4 | 2 | ● |
| EP50-B4-05010 | 5 | 2.5 | 10 | 50 | 6 | 1 | ● |
| EP50-B4-06012 | 6 | 3 | 12 | 50 | 6 | 2 | ● |
| EP50-B4-07014 | 7 | 3.5 | 14 | 60 | 8 | 1 | ● |
| EP50-B4-08014 | 8 | 4 | 14 | 60 | 8 | 2 | ● |
| EP50-B4-09016 | 9 | 4.5 | 16 | 75 | 10 | 1 | ● |
| EP50-B4-10018 | 10 | 5 | 18 | 75 | 10 | 2 | ● |
| EP50-B4-11020 | 11 | 5.5 | 20 | 75 | 12 | 1 | ● |
| EP50-B4-12022 | 12 | 6 | 22 | 75 | 12 | 2 | ● |
| EP50-B4-14024 | 14 | 7 | 24 | 75 | 14 | 2 | ○ |
| EP50-B4-16030 | 16 | 8 | 30 | 100 | 16 | 2 | ○ |
| EP50-B4-20038 | 20 | 10 | 38 | 100 | 20 | 2 | ○ |

●Stock
○Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| ◎ | ○ | ○ | ◎ | ○ | ○ | |

◎ Most Suitable ○ Suitable

# SS200-CS4

4 Flute, Stub Length with variable Helix

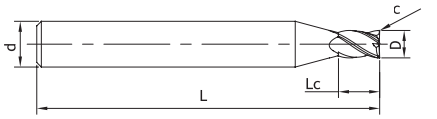



Fig1

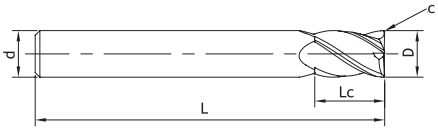



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | C | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SS200-CS4-02002 | 2 | 4 | 0.02 | 50 | 6 | 1 | ● |
| SS200-CS4-03003 | 3 | 6 | 0.03 | 50 | 6 | 1 | ● |
| SS200-CS4-04004 | 4 | 8 | 0.04 | 50 | 6 | 1 | ● |
| SS200-CS4-05005 | 5 | 9 | 0.05 | 50 | 6 | 1 | ● |
| SS200-CS4-06006 | 6 | 10 | 0.06 | 50 | 6 | 2 | ● |
| SS200-CS4-08008 | 8 | 12 | 0.08 | 60 | 8 | 2 | ● |
| SS200-CS4-10010 | 10 | 14 | 0.10 | 75 | 10 | 2 | ● |
| SS200-CS4-12012 | 12 | 16 | 0.12 | 75 | 12 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.04}$ |

unit (mm)

| P | | M | K | S | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Heat-resistant Alloys | Titanium Alloys |
| ○ | ○ | ◎ | ○ | ○ | ○ |

◎ Most Suitable ○ Suitable

# SS200-C4

4 Flute, with Variable Helix

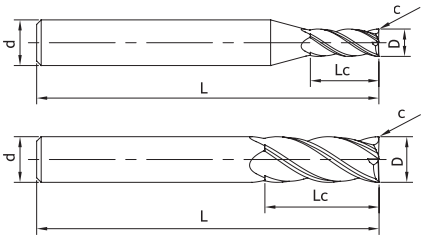



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | C | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SS200-C4-02002 | 2 | 6 | 0.02 | 50 | 6 | 1 | ● |
| SS200-C4-03003 | 3 | 9 | 0.03 | 50 | 6 | 1 | ● |
| SS200-C4-04004 | 4 | 11 | 0.04 | 50 | 6 | 1 | ● |
| SS200-C4-05005 | 5 | 13 | 0.05 | 50 | 6 | 1 | ● |
| SS200-C4-06006 | 6 | 15 | 0.06 | 50 | 6 | 2 | ● |
| SS200-C4-08008 | 8 | 20 | 0.08 | 60 | 8 | 2 | ● |
| SS200-C4-10010 | 10 | 25 | 0.10 | 75 | 10 | 2 | ● |
| SS200-C4-12012 | 12 | 30 | 0.12 | 75 | 12 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.04}$ |

unit (mm)

| P | | M | K | S | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Heat-resistant Alloys | Titanium Alloys |
| ○ | ○ | ◎ | ○ | ○ | ○ |

◎ Most Suitable ○ Suitable

# UA100-S2

2 Flute, Standard Length

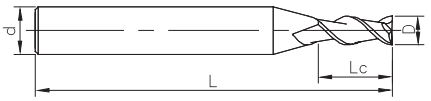



Fig1

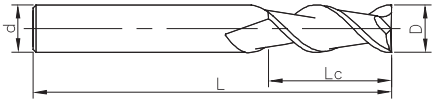



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| UA100-S2-01003 | 1 | 3 | 50 | 4 | 1 | ● |
| UA100-S2-01504 | 1.5 | 4 | 50 | 4 | 1 | ● |
| UA100-S2-02006 | 2 | 6 | 50 | 4 | 1 | ● |
| UA100-S2-03009 | 3 | 9 | 50 | 4 | 1 | ● |
| UA100-S2-63009 | 3 | 9 | 50 | 6 | 1 | ● |
| UA100-S2-04006 | 4 | 6 | 50 | 4 | 2 | ○ |
| UA100-S2-04011 | 4 | 11 | 50 | 4 | 2 | ● |
| UA100-S2-64011 | 4 | 11 | 50 | 6 | 1 | ● |
| UA100-S2-04512 | 4.5 | 12 | 50 | 6 | 1 | ● |
| UA100-S2-05013 | 5 | 13 | 50 | 6 | 1 | ● |
| UA100-S2-05516 | 5.5 | 16 | 50 | 6 | 1 | ● |
| UA100-S2-06006 | 6 | 6 | 50 | 6 | 2 | ○ |
| UA100-S2-06012 | 6 | 12 | 50 | 6 | 2 | ○ |
| UA100-S2-06016 | 6 | 16 | 50 | 6 | 2 | ● |
| UA100-S2-07020 | 7 | 20 | 60 | 8 | 1 | ● |
| UA100-S2-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| UA100-S2-09023 | 9 | 23 | 75 | 10 | 1 | ● |
| UA100-S2-10025 | 10 | 25 | 75 | 10 | 2 | ○ |
| UA100-S2-12030 | 12 | 30 | 75 | 12 | 2 | ● |
| UA100-S2-16036 | 16 | 36 | 100 | 16 | 2 | ○ |
| UA100-S2-20045 | 20 | 45 | 100 | 20 | 2 | ○ |

● Stock
○Available upon Order

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | |
| | | | | ◎ | ◎ | |

◎ Most Suitable ○ Suitable

# UA100-SL2

2 Flute, Long Flute Length

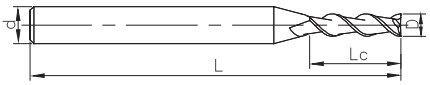



Fig1

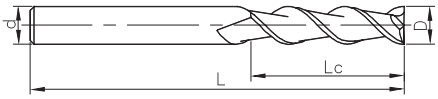



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| UA100-SL2-02020 | 2 | 20 | 75 | 4 | 1 | ○ |
| UA100-SL2-03025 | 3 | 25 | 75 | 4 | 1 | ● |
| UA100-SL2-04030 | 4 | 30 | 75 | 4 | 2 | ○ |
| UA100-SL2-05030 | 5 | 30 | 75 | 6 | 1 | ● |
| UA100-SL2-06035 | 6 | 35 | 75 | 6 | 2 | ○ |
| UA100-SL2-08040 | 8 | 40 | 100 | 8 | 2 | ● |
| UA100-SL2-10045 | 10 | 45 | 100 | 10 | 2 | ○ |
| UA100-SL2-12050 | 12 | 50 | 100 | 12 | 2 | ● |
| UA100-SL2-16060 | 16 | 60 | 150 | 16 | 2 | ○ |
| UA100-SL2-20070 | 20 | 70 | 150 | 20 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| | | | | ◎ | ◎ | |

◎ Most Suitable ○ Suitable

# UA100-SH2

2 Flute, with Long Shank Length

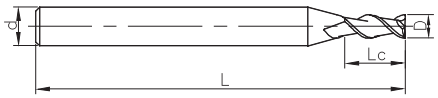



Fig1

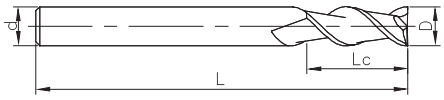
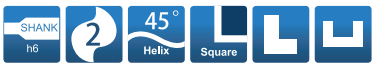



Fig2




See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| UA100-SH2-02006 | 2 | 6 | 75 | 4 | 1 | ● |
| UA100-SH2-03009 | 3 | 9 | 75 | 4 | 1 | ○ |
| UA100-SH2-04010 | 4 | 10 | 75 | 4 | 2 | ● |
| UA100-SH2-06016 | 6 | 16 | 75 | 6 | 2 | ● |
| UA100-SH2-08020 | 8 | 20 | 100 | 8 | 2 | ● |
| UA100-SH2-10025 | 10 | 25 | 100 | 10 | 2 | ○ |
| UA100-SH2-12030 | 12 | 30 | 100 | 12 | 2 | ○ |
| UA100-SH2-16036 | 16 | 36 | 150 | 16 | 2 | ● |
| UA100-SH2-20045 | 20 | 45 | 150 | 20 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D⩽12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| | | | | ◎ | ◎ | |

◎ Most Suitable ○ Suitable

# UA100-B2

2 Flute, Ballnose

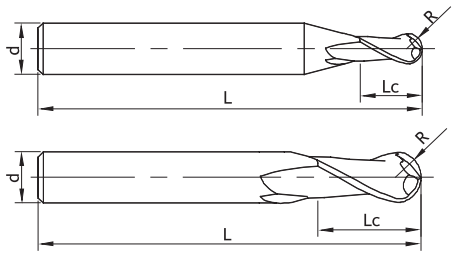



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| UA100-B2-01002 | 1 | 0.5 | 2 | 50 | 4 | 1 | ○ |
| UA100-B2-02004 | 2 | 1 | 4 | 50 | 4 | 1 | ○ |
| UA100-B2-03006 | 3 | 1.5 | 6 | 50 | 4 | 1 | ● |
| UA100-B2-63006 | 3 | 1.5 | 6 | 50 | 6 | 1 | ● |
| UA100-B2-04008 | 4 | 2 | 8 | 50 | 4 | 2 | ● |
| UA100-B2-64008 | 4 | 2 | 8 | 50 | 6 | 1 | ○ |
| UA100-B2-05010 | 5 | 2.5 | 10 | 50 | 6 | 1 | ● |
| UA100-B2-06012 | 6 | 3 | 12 | 50 | 6 | 2 | ○ |
| UA100-B2-07014 | 7 | 3.5 | 14 | 60 | 8 | 1 | ● |
| UA100-B2-08014 | 8 | 4 | 14 | 60 | 8 | 2 | ● |
| UA100-B2-09016 | 9 | 4.5 | 16 | 75 | 10 | 1 | ● |
| UA100-B2-10018 | 10 | 5 | 18 | 75 | 10 | 2 | ○ |
| UA100-B2-12022 | 12 | 6 | 22 | 75 | 12 | 2 | ● |
| UA100-B2-16026 | 16 | 8 | 26 | 100 | 16 | 2 | ○ |

● Stock
○ Available upon Order

| R | Tol |
|---|---|
| R<3 | ±0.015 |
| R⩾3 | ±0.02 |

unit (mm)

| P | | M | K | N | | |
|---|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Aluminium Alloys | Copper Alloys | Graphite |
| | | | | ◎ | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-S2

2 Flute, Standard Length

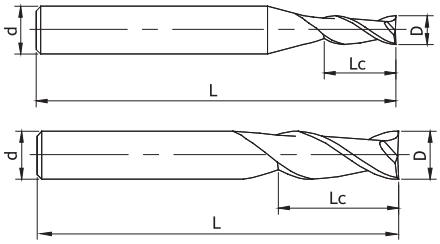



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| SH160-S2-00501 | 0.5 | 1.5 | 50 | 4 | 1 | ● |
| SH160-S2-01003 | 1 | 3 | 50 | 4 | 1 | ● |
| SH160-S2-01504 | 1.5 | 4 | 50 | 4 | 1 | ● |
| SH160-S2-02006 | 2 | 6 | 50 | 4 | 1 | ● |
| SH160-S2-02508 | 2.5 | 8 | 50 | 4 | 1 | ○ |
| SH160-S2-03009 | 3 | 9 | 50 | 4 | 1 | ● |
| SH160-S2-63009 | 3 | 9 | 50 | 6 | 1 | ● |
| SH160-S2-04010 | 4 | 10 | 50 | 4 | 2 | ● |
| SH160-S2-64010 | 4 | 10 | 50 | 6 | 1 | ● |
| SH160-S2-05013 | 5 | 13 | 50 | 6 | 1 | ● |
| SH160-S2-06015 | 6 | 15 | 50 | 6 | 2 | ● |
| SH160-S2-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| SH160-S2-10025 | 10 | 25 | 75 | 10 | 2 | ● |
| SH160-S2-12030 | 12 | 30 | 75 | 12 | 2 | ● |
| SH160-S2-16036 | 16 | 36 | 100 | 16 | 2 | ● |
| SH160-S2-20045 | 20 | 45 | 100 | 20 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

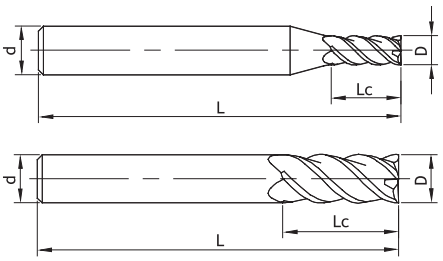
unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-S4

4 Flute, Standard Length





See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| SH160-S4-01003 | 1 | 3 | 50 | 4 | 1 | ○ |
| SH160-S4-01504 | 1.5 | 4 | 50 | 4 | 1 | ○ |
| SH160-S4-02006 | 2 | 6 | 50 | 4 | 1 | ○ |
| SH160-S4-02508 | 2.5 | 8 | 50 | 4 | 1 | ○ |
| SH160-S4-03009 | 3 | 9 | 50 | 4 | 1 | ○ |
| SH160-S4-63009 | 3 | 9 | 50 | 6 | 1 | ○ |
| SH160-S4-04010 | 4 | 10 | 50 | 4 | 2 | ○ |
| SH160-S4-64010 | 4 | 10 | 50 | 6 | 1 | ○ |
| SH160-S4-05013 | 5 | 13 | 50 | 6 | 1 | ○ |
| SH160-S4-06015 | 6 | 15 | 50 | 6 | 2 | ○ |
| SH160-S4-08020 | 8 | 20 | 60 | 8 | 2 | ○ |
| SH160-S4-09023 | 9 | 23 | 75 | 10 | 1 | ○ |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-S4

4 Flute, Standard Length

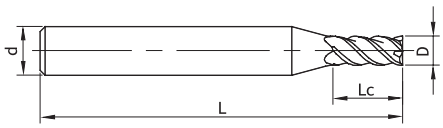



Fig1

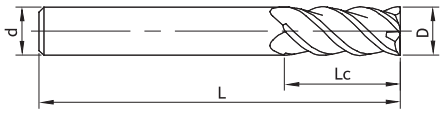



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| SH160-S4-10025 | 10 | 25 | 75 | 10 | 2 | ○ |
| SH160-S4-12030 | 12 | 30 | 75 | 12 | 2 | ○ |
| SH160-S4-16036 | 16 | 36 | 100 | 16 | 2 | ○ |
| SH160-S4-20045 | 20 | 45 | 100 | 20 | 2 | ○ |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-SH4

4 Flute, with Long Shank Length

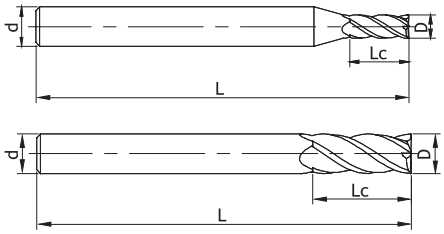



Fig1




Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| SH160-SH4-03012 | 3 | 12 | 75 | 4 | 1 | ● |
| SH160-SH4-04015 | 4 | 15 | 75 | 4 | 2 | ● |
| SH160-SH4-06020 | 6 | 20 | 100 | 6 | 2 | ● |
| SH160-SH4-08025 | 8 | 25 | 100 | 8 | 2 | ● |
| SH160-SH4-10030 | 10 | 30 | 100 | 10 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-S6

6 Flute, Standard Length

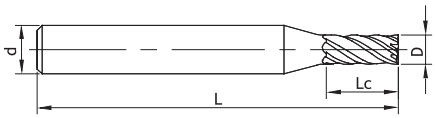



Fig1

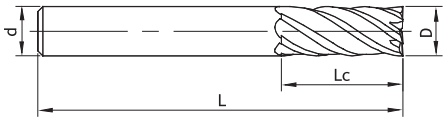



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|
| SH160-S6-06015 | 6 | 15 | 50 | 6 | 2 | ● |
| SH160-S6-08020 | 8 | 20 | 60 | 8 | 2 | ● |
| SH160-S6-10025 | 10 | 25 | 75 | 10 | 2 | ○ |
| SH160-S6-12030 | 12 | 30 | 75 | 12 | 2 | ● |
| SH160-S6-16036 | 16 | 36 | 100 | 16 | 2 | ● |
| SH160-S6-20045 | 20 | 45 | 100 | 20 | 2 | ○ |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D⩽12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-R2

2 Flute, Corner Radius

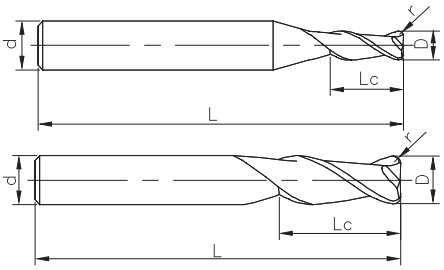



Fig1

Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-R2-02002 | 2 | 6 | 0.2 | 50 | 4 | 1 | ● |
| SH160-R2-03003 | 3 | 9 | 0.3 | 50 | 4 | 1 | ○ |
| SH160-R2-03005 | 3 | 9 | 0.5 | 50 | 4 | 1 | ○ |
| SH160-R2-04005 | 4 | 10 | 0.5 | 50 | 4 | 2 | ○ |
| SH160-R2-04010 | 4 | 10 | 1 | 50 | 4 | 2 | ● |
| SH160-R2-05005 | 5 | 13 | 0.5 | 50 | 6 | 1 | ○ |
| SH160-R2-05010 | 5 | 13 | 1 | 50 | 6 | 1 | ○ |
| SH160-R2-06005 | 6 | 15 | 0.5 | 50 | 6 | 2 | ● |
| SH160-R2-06010 | 6 | 15 | 1 | 50 | 6 | 2 | ● |
| SH160-R2-08005 | 8 | 20 | 0.5 | 60 | 8 | 2 | ○ |
| SH160-R2-08010 | 8 | 20 | 1 | 60 | 8 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-R2

2 Flute, Corner Radius

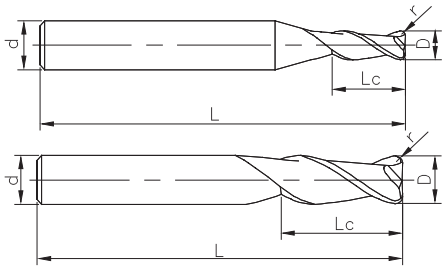



Fig1




Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-R2-10005 | 10 | 25 | 0.5 | 75 | 10 | 2 | ○ |
| SH160-R2-10010 | 10 | 25 | 1 | 75 | 10 | 2 | ○ |
| SH160-R2-10015 | 10 | 25 | 1.5 | 75 | 10 | 2 | ○ |
| SH160-R2-10020 | 10 | 25 | 2 | 75 | 10 | 2 | ○ |
| SH160-R2-12005 | 12 | 30 | 0.5 | 75 | 12 | 2 | ○ |
| SH160-R2-12010 | 12 | 30 | 1 | 75 | 12 | 2 | ○ |
| SH160-R2-12015 | 12 | 30 | 1.5 | 75 | 12 | 2 | ○ |
| SH160-R2-12020 | 12 | 30 | 2 | 75 | 12 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-R4

4 Flute, Corner Radius

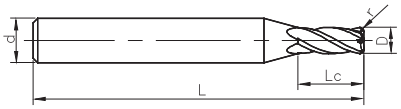



Fig1

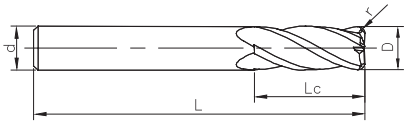



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-R4-03003 | 3 | 9 | 0.3 | 50 | 4 | 1 | ○ |
| SH160-R4-03005 | 3 | 9 | 0.5 | 50 | 4 | 1 | ○ |
| SH160-R4-63003 | 3 | 8 | 0.3 | 50 | 6 | 1 | ○ |
| SH160-R4-63005 | 3 | 8 | 0.5 | 50 | 6 | 1 | ○ |
| SH160-R4-04003 | 4 | 10 | 0.3 | 50 | 4 | 2 | ○ |
| SH160-R4-04005 | 4 | 10 | 0.5 | 50 | 4 | 2 | ○ |
| SH160-R4-04010 | 4 | 10 | 1 | 50 | 4 | 2 | ○ |
| SH160-R4-64003 | 4 | 10 | 0.3 | 50 | 6 | 1 | ○ |
| SH160-R4-64005 | 4 | 10 | 0.5 | 50 | 6 | 1 | ○ |
| SH160-R4-64010 | 4 | 10 | 1 | 50 | 6 | 1 | ○ |
| SH160-R4-05003 | 5 | 13 | 0.3 | 50 | 6 | 1 | ○ |
| SH160-R4-05005 | 5 | 13 | 0.5 | 50 | 6 | 1 | ○ |
| SH160-R4-05010 | 5 | 13 | 1 | 50 | 6 | 1 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-R4

4 Flute, Corner Radius

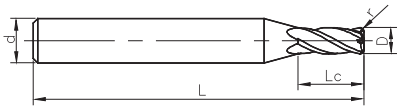



Fig1

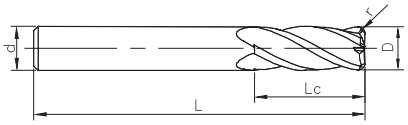



Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-R4-06003 | 6 | 15 | 0.3 | 50 | 6 | 2 | ○ |
| SH160-R4-06005 | 6 | 15 | 0.5 | 50 | 6 | 2 | ○ |
| SH160-R4-06010 | 6 | 15 | 1 | 50 | 6 | 2 | ○ |
| SH160-R4-08002 | 8 | 20 | 0.2 | 60 | 8 | 2 | ○ |
| SH160-R4-08003 | 8 | 20 | 0.3 | 60 | 8 | 2 | ○ |
| SH160-R4-08005 | 8 | 20 | 0.5 | 60 | 8 | 2 | ○ |
| SH160-R4-08010 | 8 | 20 | 1 | 60 | 8 | 2 | ○ |
| SH160-R4-10005 | 10 | 25 | 0.5 | 75 | 10 | 2 | ○ |
| SH160-R4-10010 | 10 | 25 | 1 | 75 | 10 | 2 | ○ |
| SH160-R4-10015 | 10 | 25 | 1.5 | 75 | 10 | 2 | ○ |
| SH160-R4-10020 | 10 | 25 | 2 | 75 | 10 | 2 | ○ |
| SH160-R4-12005 | 12 | 30 | 0.5 | 75 | 12 | 2 | ○ |
| SH160-R4-12010 | 12 | 30 | 1 | 75 | 12 | 2 | ○ |
| SH160-R4-12015 | 12 | 30 | 1.5 | 75 | 12 | 2 | ○ |
| SH160-R4-12020 | 12 | 30 | 2 | 75 | 12 | 2 | ○ |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-RH4

4 Flute Corner Radius, with Long Shank Length

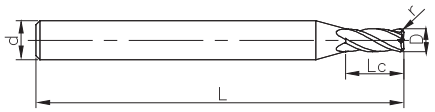



Fig1

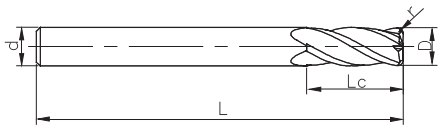



Fig2

SHANK h6 | 4 | AlTiN | 45° Helix | Corner-R | L

See page 2 for guidelines to icons

| Ordering code | D | Lc | r | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-RH4-06005 | 6 | 15 | 0.5 | 75 | 6 | 2 | ● |
| SH160-RH4-06010 | 6 | 15 | 1 | 75 | 6 | 2 | ● |
| SH160-RH4-08005 | 8 | 20 | 0.5 | 100 | 8 | 2 | ● |
| SH160-RH4-08010 | 8 | 20 | 1 | 100 | 8 | 2 | ● |
| SH160-RH4-10005 | 10 | 25 | 0.5 | 100 | 10 | 2 | ● |
| SH160-RH4-10010 | 10 | 25 | 1 | 100 | 10 | 2 | ● |

● Stock
○Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |
| D>12 | $^{0}_{-0.03}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC以下) Alloy Steel,Tool Steel(48HRC以下) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-B2

2 Flute, Ballnose

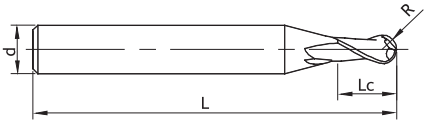



Fig1

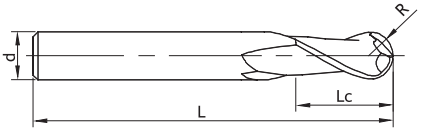



Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-B2-00501 | 0.5 | 0.25 | 1 | 50 | 4 | 1 | ○ |
| SH160-B2-01002 | 1 | 0.5 | 2 | 50 | 4 | 1 | ○ |
| SH160-B2-01503 | 1.5 | 0.75 | 3 | 50 | 4 | 1 | ○ |
| SH160-B2-02004 | 2 | 1 | 4 | 50 | 4 | 1 | ○ |
| SH160-B2-03006 | 3 | 1.5 | 6 | 50 | 4 | 1 | ○ |
| SH160-B2-04008 | 4 | 2 | 8 | 50 | 4 | 2 | ○ |
| SH160-B2-05010 | 5 | 2.5 | 10 | 50 | 6 | 1 | ○ |
| SH160-B2-06012 | 6 | 3 | 12 | 50 | 6 | 2 | ○ |
| SH160-B2-07014 | 7 | 3.5 | 14 | 60 | 8 | 1 | ○ |
| SH160-B2-08014 | 8 | 4 | 14 | 60 | 8 | 2 | ○ |

● Stock
○ Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-B2

2 Flute, Ballnose

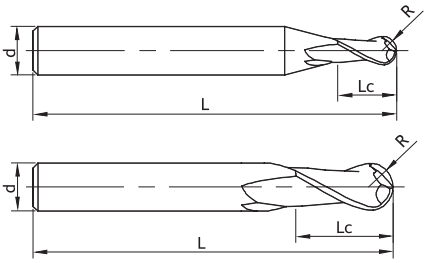



Fig1




Fig2


See page 2 for guidelines to icons

continued

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-B2-09016 | 9 | 4.5 | 16 | 75 | 10 | 1 | ○ |
| SH160-B2-10018 | 10 | 5 | 18 | 75 | 10 | 2 | ○ |
| SH160-B2-11020 | 11 | 5.5 | 20 | 75 | 12 | 1 | ○ |
| SH160-B2-12022 | 12 | 6 | 22 | 75 | 12 | 2 | ○ |
| SH160-B2-16026 | 16 | 8 | 26 | 100 | 16 | 2 | ○ |

● Stock
○ Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-BH2

2 Flute, Ballnose with Long Shank Length

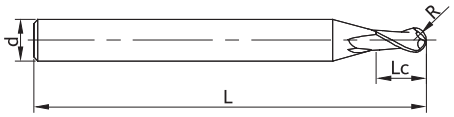



Fig1

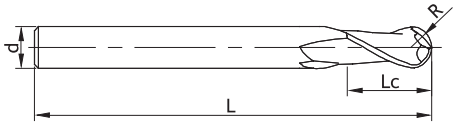



Fig2


See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-BH2-06012 | 6 | 3 | 12 | 100 | 6 | 2 | ● |
| SH160-BH2-08014 | 8 | 4 | 14 | 100 | 8 | 2 | ● |
| SH160-BH2-10018 | 10 | 5 | 18 | 100 | 10 | 2 | ● |
| SH160-BH2-12024 | 12 | 6 | 24 | 100 | 12 | 2 | ○ |

● Stock
○ Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

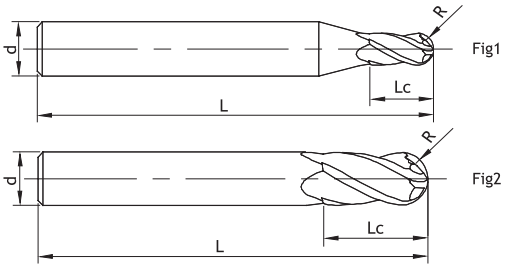
unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| | | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH160-B4

4 Flute, Ballnose





See page 2 for guidelines to icons

| Ordering code | D | R | Lc | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|
| SH160-B4-02004 | 2 | 1 | 4 | 50 | 4 | 1 | ○ |
| SH160-B4-03006 | 3 | 1.5 | 6 | 50 | 4 | 1 | ○ |
| SH160-B4-04008 | 4 | 2 | 8 | 50 | 4 | 2 | ○ |
| SH160-B4-05010 | 5 | 2.5 | 10 | 50 | 6 | 1 | ○ |
| SH160-B4-06012 | 6 | 3 | 12 | 50 | 6 | 2 | ○ |
| SH160-B4-07014 | 7 | 3.5 | 14 | 60 | 8 | 1 | ○ |
| SH160-B4-08014 | 8 | 4 | 14 | 60 | 8 | 2 | ○ |
| SH160-B4-09016 | 9 | 4.5 | 16 | 75 | 10 | 1 | ○ |
| SH160-B4-10018 | 10 | 5 | 18 | 75 | 10 | 2 | ○ |
| SH160-B4-11020 | 11 | 5.5 | 20 | 75 | 12 | 1 | ○ |
| SH160-B4-12022 | 12 | 6 | 22 | 75 | 12 | 2 | ○ |
| SH160-B4-16026 | 16 | 8 | 26 | 100 | 16 | 2 | ○ |

● Stock
○ Available upon Order

| R | Tol |
|---|---|
| R≤1.5 | $^{0}_{-0.01}$ |
| 1.5<R<3 | $^{0}_{-0.015}$ |
| R≥3 | $^{0}_{-0.02}$ |

unit (mm)

| P | | M | K | H | |
|---|---|---|---|---|---|
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel(48HRC) | Stainless Steel | Cast Iron | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | | | | ◎ | |

◎ Most Suitable ○ Suitable

# SH200-S4-H

4 Flute, Standard Length

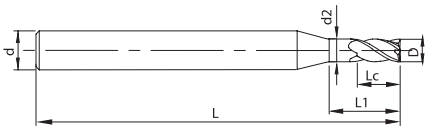



Fig1

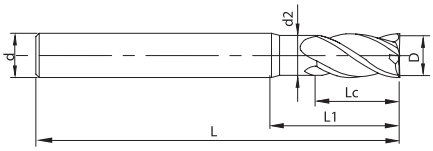



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | d2 | L1 | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|---|
| SH200-S4-01003-H | 1 | 2 | 0.96 | 3 | 50 | 4 | 1 | ● |
| SH200-S4-01505-H | 1.5 | 3 | 1.44 | 4.5 | 50 | 4 | 1 | ● |
| SH200-S4-02006-H | 2 | 4 | 1.92 | 6 | 50 | 4 | 1 | ● |
| SH200-S4-03009-H | 3 | 6 | 2.88 | 9 | 50 | 4 | 1 | ● |
| SH200-S4-04012-H | 4 | 8 | 3.85 | 12 | 50 | 4 | 2 | ● |
| SH200-S4-05015-H | 5 | 10 | 4.8 | 15 | 50 | 6 | 1 | ● |
| SH200-S4-06018-H | 6 | 12 | 5.8 | 18 | 50 | 6 | 2 | ● |
| SH200-S4-08024-H | 8 | 16 | 7.8 | 24 | 60 | 8 | 2 | ● |
| SH200-S4-10030-H | 10 | 20 | 9.8 | 30 | 75 | 10 | 2 | ● |
| SH200-S4-12036-H | 12 | 24 | 11.8 | 36 | 75 | 12 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |

unit (mm)

| P | | | H | |
|---|---|---|---|---|
| | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel (48HRC) | PH (<35HRC) PH and Ferrite/Martensitic Steel (<35HRC) | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | ◎ | | ◎ | ○ |

◎ Most Suitable ○ Suitable

# SH200-SH4-H

4 Flute, with Long Shank Length

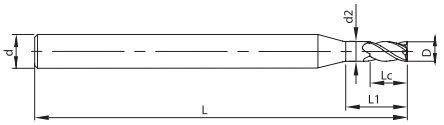



Fig1

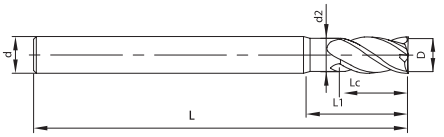



Fig2


See page 2 for guidelines to icons

| Ordering code | D | Lc | d2 | L1 | L | d | Figure No. | Stock |
|---|---|---|---|---|---|---|---|---|
| SH200-SH4-01003-H | 1 | 2 | 0.96 | 3 | 60 | 4 | 1 | ○ |
| SH200-SH4-01505-H | 1.5 | 3 | 1.44 | 4.5 | 60 | 4 | 1 | ○ |
| SH200-SH4-02006-H | 2 | 4 | 1.92 | 6 | 60 | 4 | 1 | ○ |
| SH200-SH4-03009-H | 3 | 6 | 2.88 | 9 | 60 | 4 | 1 | ○ |
| SH200-SH4-04012-H | 4 | 8 | 3.85 | 12 | 60 | 4 | 2 | ○ |
| SH200-SH4-05015-H | 5 | 10 | 4.8 | 15 | 60 | 6 | 1 | ○ |
| SH200-SH4-06018-H | 6 | 12 | 5.8 | 18 | 60 | 6 | 2 | ● |
| SH200-SH4-08024-H | 8 | 16 | 7.8 | 24 | 75 | 8 | 2 | ● |
| SH200-SH4-10030-H | 10 | 20 | 9.8 | 30 | 100 | 10 | 2 | ● |
| SH200-SH4-12036-H | 12 | 24 | 11.8 | 36 | 100 | 12 | 2 | ● |

● Stock
○ Available upon Order

| D | Tol |
|---|---|
| D≤12 | $^{0}_{-0.02}$ |

unit (mm)

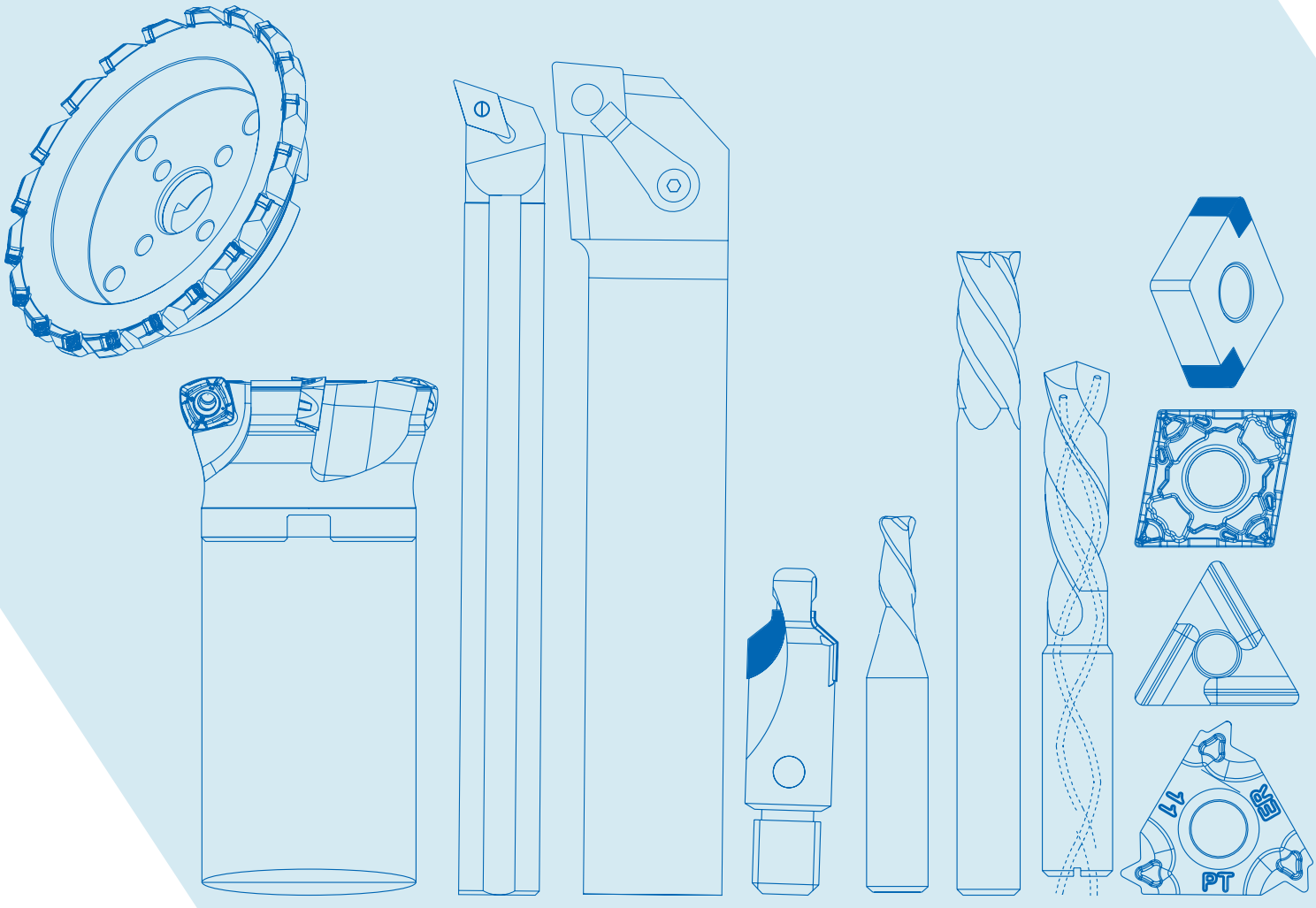
| P | | | H | |
|---|---|---|---|---|
| | | | | |
| (<35HRC) Carbon Steel,Alloy Steel(<35HRC) | (48HRC) Alloy Steel,Tool Steel (48HRC) | PH (<35HRC) PH and Ferrite/Martensitic Steel (<35HRC) | Hardened Steel (45-55HRC) | Hardened Steel (55-60HRC) |
| | ◎ | | ◎ | ○ |

◎ Most Suitable ○ Suitable

# Cutting Parameters and General Formula

| Parameter and Unit | |
|---|---|
| D Diameter (mm) | Fn Feed per Revolution (mm/rev) |
| ap Cutting Depth (mm) | fz Feeding per Teeth (mm/tooth) |
| ae Cutting Width (mm) | Z Number of Teeth |
| Vf Feed Rate (mm/min) | n Spindle Speed (rev/min) |
| Vc Cutting Speed (m/min) | L Length (mm) |
| Q Rate of Metal Removal ($cm^3$/min) | Tc Processing Time (min) |

| General Formula | |
|---|---|
| n Spindle Speed | $n = \frac{Vc * 1000}{\pi * D}$ (rev/min) |
| Vc Cutting Speed | $Vc = \frac{\pi * D * n}{1000}$ (m/min) |
| Vf Feed Rate | $V_f = f_z * z * n$ (mm/min) |
| fz Feed per Teeth | $f_z = \frac{V_f}{z * n}$ (mm) |
| Q Rate of Metal Removal | $Q = \frac{ae * ap * V_f}{1000}$ ($cm^3$/min) |
| Tc Processing Time | $T_c = \frac{L}{V_f}$ (min) |



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