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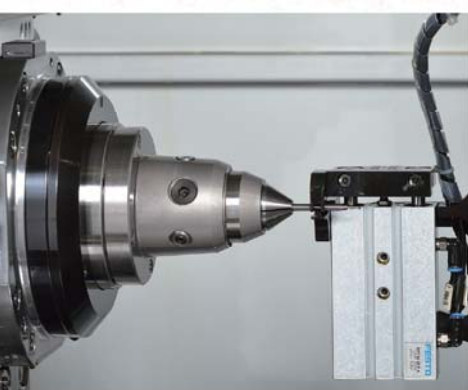


Inspire Creativity

Professional Cutting Tools

▪ Swiss Machines ▪ Swiss Technology ▪ Germany Materials







Company Profile

JANPO has been supplying high-precision and professional cutting tools for many years and continues to develop industry-leading solid carbide end mills. We can offer a complete range of tungsten carbide end mills made from premium nano super, super and micro grain end mill substrates. Furthermore, not only can our cutting tools be used for general purpose machining, it can also be used for hard materials in high speed and soft metal machining applications.

All our products are designed and manufactured in accordance with the highest industry standards to ensure exceptional performance and high durability. Moreover, we can produce end mills with diameters as small as 0.2mm, and cutting tools can machine hardened steel with up to HRC 65. With our vast range of knowledge and experience in the production of precision cutting tools, we are able to customize the manufacture of end mills according to the requirements of our customers.

We source the best raw materials from Germany and use high precision CNC grinding equipment imported from Switzerland, Germany and Australia. JANPO cutting tools also adopts the Swiss “Balzers” coating technology, which provides end mills with higher cutting speeds and a longer service life. Our goal is to offer customers high-quality and cost-effective cutting tools so that they can fully optimize their production operations.

Choose JANPO as your cutting tool partner and experience our outstanding service and high performance products.



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Nano Super Micro Grain **S Series**

- 5 SBA-2T/ SBA-4T/ SEA-2T/ SEA-4T/ SHP-3T/ SHP-4T
- 6 SRC-2T/ SRC-4T/ SBM-2T/ SEM-2T
- 7 SBAB-2T/ SBAB-4T/ SEAB-2T/ SEAB-4T
- 8 SBNB-2T/ SBMB-2T/ SNEB-2T/ SEMB-2T

Super Micro Grain **U Series**

- 9 UBA-2T/ UBH. UBI. UBJ-2T/ UBM-2T
UBO-2T/ UBP-2T/ UBPT-2T
- 10 UBN-2T/ UEM-2T/ UEA-6T
UEH. UEI. UEJ-2T/ UEH. UEI. UEJ-4T
- 11 UEA-2T/ UEA-4T/ UEF-2T/ UEF-4T/ UHP-3T/ UHP-4T
- 12 URA-2T/ URT-2T/ URX-4T/ URB-4T/ URH-3T/ URV-6T
- 13 URL-2T/ URL-4T/ URLB-4T/ UNRT-2T
UNR-2T/ UNE-2T

Micro Grain **X Series**

- 14 XBA-2T/ XBA-4T/ XBT-2T/ XBT-4T/ XBM-2T/ XBMT-2T
- 15 XBH. XBI. XBJ-2T/ XTB-2T/ XNB-2T/ XBS-2T
- 16 XEA-2T/ XEA-4T/ XET-2T/ XET-4T
XEH. XEI. XEJ-2T/ XEH. XEI. XEJ-4T
- 17 XEG-3T/ XEG-4T/ XEG-6T/ XEP-3T/ XHP-3T/ XHP-4T
- 18 XEF-2T/ XEF-4T/ XEMT-2T/ XEM-2T/ XES-4T
- 19 XRT-2T/ XRB-4T/ XRL-2T/ XRL-4T
- 20 XNE-2T/ XTM-2T/ XNH-3T/ XNX-4T
- 21 XTE-2T/ XTF-2T
- 22 XWW-3T/ XWW-4T/ XUW-3T/ XUW-4T
- 23 XAE-2T/ XAE-3T/ XA-2T/ XA-3T/ XAHP-3T/ XAW-3T
- 24 XAT-2T/ XAT-3T/ XAR-3T/ XAB-2T
XANBD-2T/ XANBC-2T

Carbide Drills

- 25 XDRES
- 26 XDRS
- 27 XDRA
- 28 XDRSF
- 29 XDRAF
- 30 XSDA90/ XSD90/ XSDA120/ XSD120

Recommended Cutting Conditions



Icons Description

Carbide



Roughing



Small Roughing

Work Material Hardness



Work material hardness is up to HRC55, HRC60, HRC65

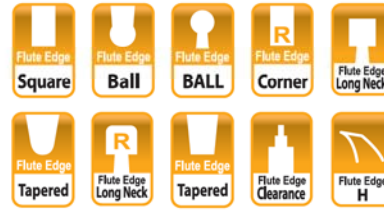
Grain Size



Point Angle



Flute Edge



Helix Angle



Coating



Number of Flutes



Coating

Balzers coating technology provides JANPO cutting tools with excellent performance during engineering process. The following four coatings are commonly used.

BALINIT@FUTURA NANO (NaNo TiAlN)

Microhardness (HV 0.05)	3300
Coating Thickness (μm)	3
Max Working Temperature	900°C

BALINIT@TiXSiN

Microhardness (HV 0.05)	3600
Coating Thickness (μm)	2~2.5
Max Working Temperature	1100°C

High Speed Cutting and High Hardness Cutting (Hardness over HRC 60)

BALINIT@X. TREME (X TiAlN)

Microhardness (HV 0.05)	3500
Coating Thickness (μm)	4
Max Working Temperature	800°C

High Speed Cutting and High Hardness Cutting (Dry Cutting)

BALINIT@nAco-B

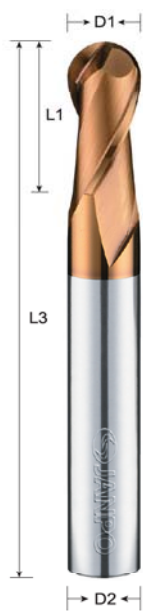
Microhardness (HV 0.05)	4200
Coating Thickness (μm)	3
Max Working Temperature	1200°C

High Speed Cutting and High Hardness Cutting (Hardness over HRC 60)

Solid Carbide Materials

At present, three types of solid carbide materials have been applied on JANPO end mills. Based on the characteristics and the tests that we have conducted, different materials are selected and applied to various end mills in order to provide the best solutions. All solid carbide materials are imported from Germany.

Material Code	Wc%	Co%	Average Grain Size (μm)	Hardness HV30 (kg/mm²)	Hardness HRA (ISO3738)	TRS (N/mm²)	KIC (MNm-3/2)	ISO Classification
S Series	91	9	0.2	1920	93.9	4000	9.3	K10-K30
U Series	88	12	0.4-0.5	1680	92.5	4000	10.0	K40-K50
X Series	90	10	0.6	1610	92.3	4000	10.5	K20-K40



SBA Ball Nose End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SBA 0102	R0.5	2	50	4
SBA 0152	R0.75	3		
SBA 0202	R1	4		
SBA 0302	R1.5	6		
SBA 0402	R2	8		
SBA 0502	R2.5	10		
SBA 0602	R3	12	60	6
SBA 0802	R4	16		
SBA 1002	R5	20		
SBA 1202	R6	24		
SBA 1602	R8	32		
SBA 2002	R10	40		

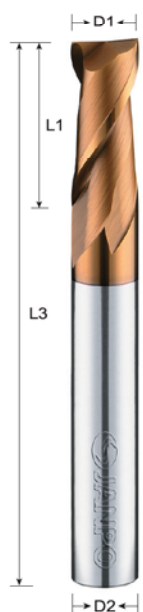


SBA Ball Nose End Mills

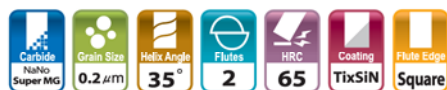


unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SBA 0104	R0.5	2	50	4
SBA 0154	R0.75	3		
SBA 0204	R1	4		
SBA 0304	R1.5	6		
SBA 0404	R2	8		
SBA 0504	R2.5	10		
SBA 0604	R3	12	60	6
SBA 0804	R4	16		
SBA 1004	R5	20		
SBA 1204	R6	24		
SBA 1604	R8	32		
SBA 2004	R10	40		

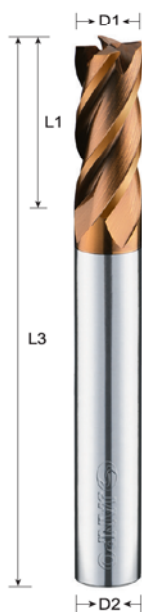


SEA Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SEA 0102	1	3	50	4
SEA 0152	1.5	4		
SEA 0202	2	6		
SEA 0252	2.5	8		
SEA 0302	3	8		
SEA 0352	3.5	10		
SEA 0402	4	11	60	6
SEA 0502	5	13		
SEA 0602	6	16		
SEA 0702	7	16		
SEA 0802	8	20		
SEA 1002	10	25		
SEA 1202	12	30	75	10
SEA 1602	16	40		
SEA 2002	20	45		

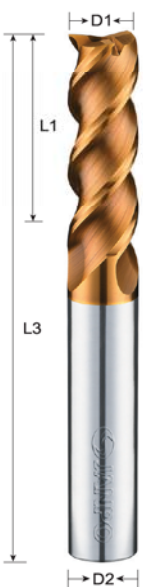


SEA Square End Mills

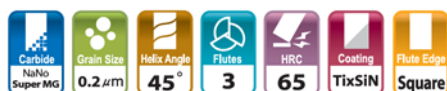


unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SEA 0104	1	3	50	4
SEA 0154	1.5	4		
SEA 0204	2	6		
SEA 0254	2.5	8		
SEA 0304	3	8		
SEA 0354	3.5	10		
SEA 0404	4	11	60	6
SEA 0504	5	13		
SEA 0604	6	16		
SEA 0704	7	16		
SEA 0804	8	20		
SEA 1004	10	25		
SEA 1204	12	30	75	10
SEA 1604	16	40		
SEA 2004	20	45		

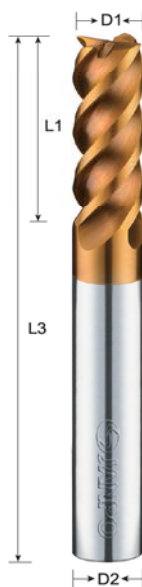


SHP Heavy Cutting Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SHP 0603	6.0	15	50	6
SHP 0803	8.0	20	60	8
SHP 1003	10.0	25	75	10
SHP 1203	12.0	30		12
SHP 1603	16.0	40	100	16
SHP 2003	20.0	40		20



SHP Heavy Cutting Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SHP 0604	6.0	15	50	6
SHP 0804	8.0	20	60	8
SHP 1004	10.0	25	75	10
SHP 1204	12.0	30		12
SHP 1604	16.0	40	100	16
SHP 2004	20.0	40		20

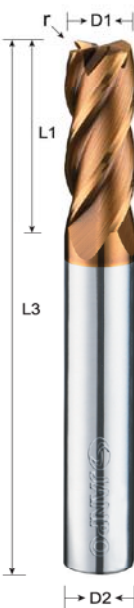
SRC Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
SRC 01022	1.0	0.2	3	50	4
SRC 01522	1.5	0.2	4		
SRC 01552	1.5	0.5	4		
SRC 02022	2.0	0.2	6		
SRC 02052	2.0	0.5	6		
SRC 02522	2.5	0.2	8		
SRC 02552	2.5	0.5	8		
SRC 03022	3.0	0.2	8		
SRC 03052	3.0	0.5	8		
SRC 04022	4.0	0.2	10		
SRC 04052	4.0	0.5	10		
SRC 05052	5.0	0.5	13	60	8
SRC 06022	6.0	0.2	15		
SRC 06052	6.0	0.5	15		
SRC 06102	6.0	1.0	15		
SRC 08052	8.0	0.5	20	75	10
SRC 08102	8.0	1.0	20		
SRC 10052	10.0	0.5	25		
SRC 10102	10.0	1.0	25		
SRC 10202	10.0	2.0	25		
SRC 12052	12.0	0.5	30		12
SRC 12102	12.0	1.0	30		
SRC 12202	12.0	2.0	30		

unit:mm

SRC Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
SRC 01024	1.0	0.2	3	50	4
SRC 01524	1.5	0.2	4		
SRC 01554	1.5	0.5	4		
SRC 02024	2.0	0.2	6		
SRC 02054	2.0	0.5	6		
SRC 02524	2.5	0.2	8		
SRC 02554	2.5	0.5	8		
SRC 03024	3.0	0.2	8		
SRC 03054	3.0	0.5	8		
SRC 04024	4.0	0.2	10		
SRC 04054	4.0	0.5	10		
SRC 05054	5.0	0.5	13	60	8
SRC 06024	6.0	0.2	15		
SRC 06054	6.0	0.5	15		
SRC 06104	6.0	1.0	15		
SRC 08054	8.0	0.5	20	75	10
SRC 08104	8.0	1.0	20		
SRC 10054	10.0	0.5	25		
SRC 10104	10.0	1.0	25		
SRC 10204	10.0	2.0	25		
SRC 12054	12.0	0.5	30		12
SRC 12104	12.0	1.0	30		
SRC 12204	12.0	2.0	30		

unit:mm

SBM Ball Nose End Mills

Micro Diameter

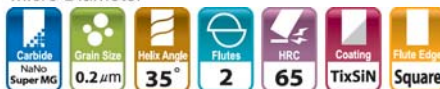


Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SBM 0032	R0.15	0.6	50	4
SBM 0042	R0.2	0.8		
SBM 0052	R0.25	1		
SBM 0062	R0.3	1.2		
SBM 0072	R0.35	1.4		
SBM 0082	R0.4	1.6		
SBM 0102	R0.5	2		
SBM 0122	R0.6	2.4		
SBM 0142	R0.7	2.8		
SBM 0152	R0.75	3		
SBM 0162	R0.8	3.2		
SBM 0182	R0.9	3.6		
SBM 0202	R1	4		
SBM 0302	R1.5	6		

unit:mm

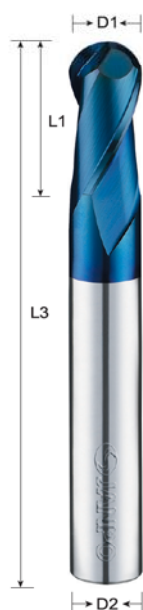
SEM Square End Mills

Micro Diameter



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
SEM 0022	0.2	0.4	50	4
SEM 0032	0.3	0.6		
SEM 0042	0.4	0.8		
SEM 0052	0.5	1		
SEM 0062	0.6	1.2		
SEM 0072	0.7	1.4		
SEM 0082	0.8	1.6		
SEM 0092	0.9	1.8		
SEM 0102	1	2.5		
SEM 0122	1.2	3		
SEM 0142	1.4	3.5		
SEM 0152	1.5	4		
SEM 0162	1.6	4		
SEM 0182	1.8	5		
SEM 0202	2	6		
SEM 0252	2.5	8		
SEM 0302	3	8		

unit:mm

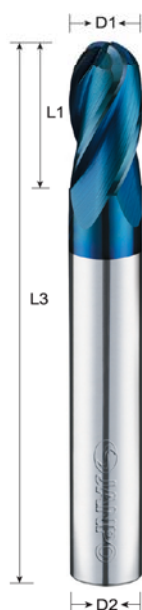


SBAB Ball Nose End Mills

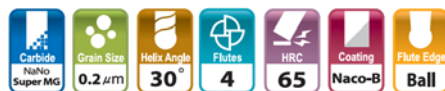


unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SBAB 0102	R0.5	2	50	4
SBAB 0152	R0.75	3		
SBAB 0202	R1	4		
SBAB 0302	R1.5	6		
SBAB 0402	R2	8		
SBAB 0502	R2.5	10		
SBAB 0602	R3	12	60	8
SBAB 0802	R4	16		
SBAB 1002	R5	20		
SBAB 1202	R6	24	75	12
SBAB 1602	R8	32		
SBAB 2002	R10	40		



SBAB Ball Nose End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SBAB 0104	R0.5	2	50	4
SBAB 0154	R0.75	3		
SBAB 0204	R1	4		
SBAB 0304	R1.5	6		
SBAB 0404	R2	6		
SBAB 0504	R2.5	10		
SBAB 0604	R3	12	60	8
SBAB 0804	R4	16		
SBAB 1004	R5	20		
SBAB 1204	R6	24	75	12
SBAB 1604	R8	32		
SBAB 2004	R10	40		

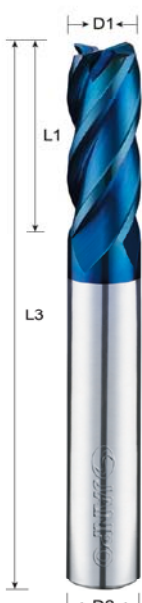


SEAB Square End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SEAB 0102	1	3	50	4
SEAB 0152	1.5	4		
SEAB 0202	2	6		
SEAB 0252	2.5	8		
SEAB 0302	3	8		
SEAB 0402	4	11		
SEAB 0502	5	13	60	8
SEAB 0602	6	16		
SEAB 0702	7	16		
SEAB 0802	8	20	75	12
SEAB 1002	10	25		
SEAB 1202	12	30		
SEAB 1602	16	40	100	16
SEAB 2002	20	45		



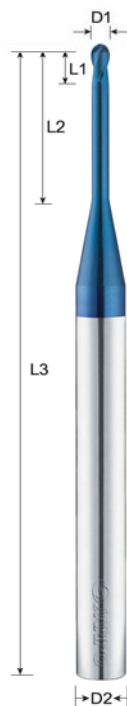
SEAB Square End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SEAB 0104	1	3	50	4
SEAB 0154	1.5	4		
SEAB 0204	2	6		
SEAB 0254	2.5	8		
SEAB 0304	3	8		
SEAB 0404	4	11		
SEAB 0504	5	13	60	8
SEAB 0604	6	16		
SEAB 0704	7	16		
SEAB 0804	8	20	75	12
SEAB 1004	10	25		
SEAB 1204	12	30		
SEAB 1604	16	40	100	16
SEAB 2004	20	45		

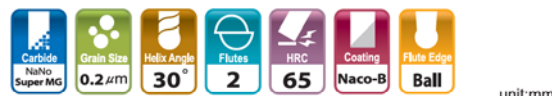
SBNB Ball Nose End Mills



Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
SBNB 05022	R0.25	1	2	50	4
SBNB 05042	R0.25	1	4		
SBNB 05062	R0.25	1	6		
SBNB 06022	R0.3	1.2	4		
SBNB 06042	R0.3	1.2	6		
SBNB 08062	R0.4	1.2	6		
SBNB 08082	R0.4	1.2	8		
SBNB 10062	R0.5	1.5	6		
SBNB 10082	R0.5	1.5	8		
SBNB 10102	R0.5	1.5	10		
SBNB 10122	R0.5	1.5	12		
SBNB 15082	R0.75	2	8		
SBNB 15102	R0.75	2	10		
SBNB 15122	R0.75	2	12		
SBNB 20082	R1	3	8	60	6
SBNB 20102	R1	3	10		
SBNB 20122	R1	3	12		
SBNB 20162	R1	3	16		
SBNB 30082	R1.5	4	8		
SBNB 30102	R1.5	4	10		
SBNB 30122	R1.5	4	12		
SBNB 30162	R1.5	4	16		
SBNB 30202	R1.5	4	20		
SBNB 40122	R2	5	12	75	
SBNB 40162	R2	5	16		
SBNB 40202	R2	5	20		
SBNB 40252	R2	5	25		

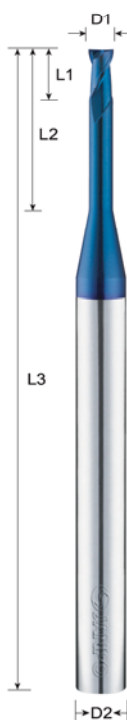


SBMB Ball Nose End Mills



Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SBMB 0032	R0.15	0.6	50	4
SBMB 0042	R0.2	0.8		
SBMB 0052	R0.25	1		
SBMB 0062	R0.3	1.2		
SBMB 0072	R0.35	1.4		
SBMB 0082	R0.4	1.6		
SBMB 0102	R0.5	2		
SBMB 0122	R0.6	2.4		
SBMB 0142	R0.7	2.8		
SBMB 0152	R0.75	3		
SBMB 0162	R0.8	3.2		
SBMB 0182	R0.9	3.6		
SBMB 0202	R1	4		

SNEB Square End Mills



Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
SNEB 05022	0.5	1	2	50	4
SNEB 05042	0.5	1	4		
SNEB 05062	0.5	1	6		
SNEB 10062	1	1.5	6		
SNEB 10082	1	1.5	8		
SNEB 10102	1	1.5	10		
SNEB 10122	1	1.5	12		
SNEB 15082	1.5	2	8		
SNEB 15102	1.5	2	10		
SNEB 15122	1.5	2	12		
SNEB 15162	1.5	2	16		
SBNB 20082	2	3	8	60	6
SBNB 20102	2	3	10		
SBNB 20122	2	3	12		
SBNB 20162	2	3	16		
SBNB 30102	3	4	10		
SBNB 30122	3	4	12		
SBNB 30162	3	4	16		
SBNB 30202	3	4	20		



SEMB Square End Mills



Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
SEMB 0022	0.2	0.4	50	4
SEMB 0032	0.3	0.6		
SEMB 0042	0.4	0.8		
SEMB 0052	0.5	1		
SEMB 0062	0.6	1.2		
SEMB 0072	0.7	1.4		
SEMB 0082	0.8	1.6		
SEMB 0092	0.9	1.8		
SEMB 0102	1.0	3		
SEMB 0122	1.2	3		
SEMB 0142	1.4	3.5		
SEMB 0152	1.5	4		
SEMB 0162	1.6	4		
SEMB 0182	1.8	5		
SEMB 0202	2.0	6		

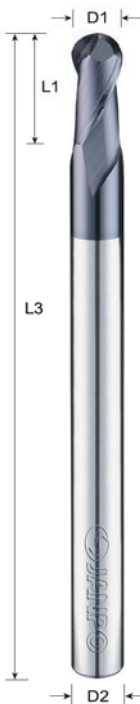


UBA Ball Nose End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UBA 0102	R0.5	2	50	4
UBA 0152	R0.75	3		
UBA 0202	R1	4		
UBA 0302	R1.5	6		
UBA 0402	R2	8		
UBA 0502	R2.5	10		
UBA 0602	R3	12	60	6
UBA 0802	R4	16		
UBA 1002	R5	20		
UBA 1202	R6	24	75	12
UBA 1602	R8	32		
UBA 2002	R10	40	100	20



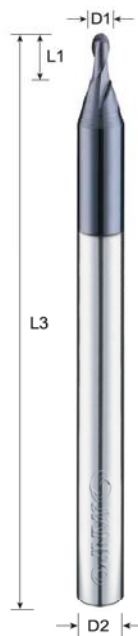
UBH, UBI, UBJ Ball Nose End Mills

Long Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UBH 0202	R1	4	75	6
UBH 0302	R1.5	6		
UBH 0402	R2	8		
UBH 0502	R2.5	10		
UBH 0602	R3	12		
UBH 0802	R4	16		
UBI 0402	R2	8	100	6
UBI 0602	R3	12		6
UBI 0802	R4	16		8
UBI 1002	R5	20		10
UBI 1202	R6	24	150	12
UBJ 1002	R5	20		10
UBJ 1202	R6	24		12
UBJ 1602	R8	32		16
UBJ 2002	R10	40		20



UBM Ball Nose End Mills

Micro Diameter



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UBM 0022	R0.1	0.4	50	4
UBM 0032	R0.15	0.6		
UBM 0042	R0.2	0.8		
UBM 0052	R0.25	1		
UBM 0062	R0.3	1.2		
UBM 0072	R0.35	1.4		
UBM 0082	R0.4	1.6		
UBM 0092	R0.45	1.8		
UBM 0102	R0.5	2		
UBM 0122	R0.6	2.4		
UBM 0142	R0.7	2.8		
UBM 0152	R0.75	3		
UBM 0202	R1	4		
UBM 0302	R1.5	6		
UBM 0402	R2	8		

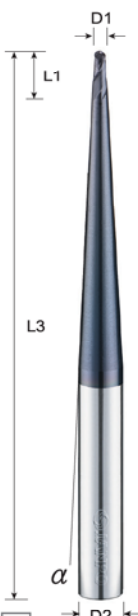


UBO Ball Nose End Mills



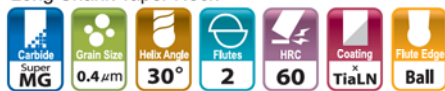
unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
UBO 0102	R0.5	1	3	50	4
UBO 0152	R0.75	2	5		4
UBO 0202	R1	3	6		6
UBO 0302	R1.5	4	8		4
UBO 0402	R2	5	10		4
UBO 0602	R3	6	12		6
UBO 0802	R4	8	16	60	8
UBO 0302L	R1.5	4	8	75	6
UBO 0402L	R2	5	10		
UBO 0602M	R3	6	12	100	6
UBO 0602L	R3	6	16		6
UBO 0802L	R4	8	25		8
UBO 1002L	R5	10	30		10



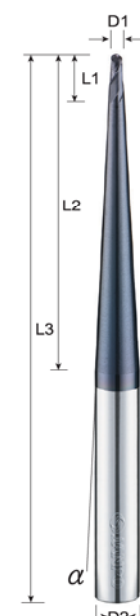
UBP Ball Nose End Mills

Long Shank Taper Neck



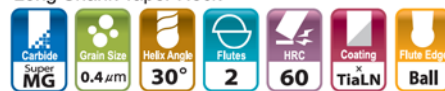
unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2	Taper Angle α
UBP 02032	R1	4	75	6	3°
UBP 02052	R1	4	75		5°
UBP 03152	R1.5	6	100		1.5°
UBP 03032	R1.5	6	75		3°
UBP 03052	R1.5	6	75	8	5°
UBP 04152	R2	8	100		1.5°
UBP 04032	R2	8	100		3°
UBP 04052	R2	8	75		5°
UBP 06152	R3	12	100	10	1.5°
UBP 06032	R3	12	75		3°
UBP 06052	R3	12	100		5°
UBP 06032B	R3	12	100		3°
UBP 06052B	R3	12	100		5°



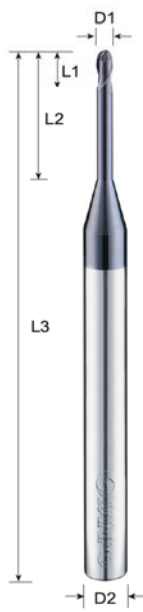
UBPT Ball Nose End Mills

Long Shank Taper Neck



unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2	Taper Angle α
UBPT 02052	R1	3	60	100	6	0.5°
UBPT 02102	R1	3	60			1°
UBPT 02152	R1	3	60			1.5°
UBPT 02202	R1	3	57			2°
UBPT 03052	R1.5	4	60			0.5°
UBPT 03102	R1.5	4	60			1°
UBPT 03152	R1.5	4	57			1.5°
UBPT 03202	R1.5	4	43			2°
UBPT 04052	R2	5	60			0.5°
UBPT 04102	R2	5	57			1°
UBPT 04152	R2	5	38			1.5°
UBPT 04202	R2	5	29			2°



UBN Ball Nose End Mills

Long Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
UBN 05022	R0.25	1	2	50	4
UBN 05042	R0.25	1	4		
UBN 05062	R0.25	1	6		
UBN 06042	R0.3	1.2	4		
UBN 06062	R0.3	1.2	6		
UBN 08062	R0.4	1.2	6		
UBN 08082	R0.4	1.2	8		
UBN 10062	R0.5	1.5	6		
UBN 10082	R0.5	1.5	8		
UBN 10102	R0.5	1.5	10		
UBN 10122	R0.5	1.5	12		
UBN 12082	R0.6	2	8	60	6
UBN 12122	R0.6	2	12		
UBN 15082	R0.75	2	8		
UBN 15122	R0.75	2	12		
UBN 15162	R0.75	2	16		
UBN 15202	R0.75	2	20		
UBN 16082	R0.8	2.5	8		
UBN 16122	R0.8	2.5	12		
UBN 16162	R0.8	2.5	16		
UBN 20082	R1	3	8	75	6
UBN 20122	R1	3	12		
UBN 20162	R1	3	16		
UBN 20202	R1	3	20		
UBN 30082	R1.5	4	8		
UBN 30102	R1.5	4	10		
UBN 30162	R1.5	4	16		
UBN 30202	R1.5	4	20		
UBN 30252	R1.5	4	25		
UBN 40102	R2	5	10		
UBN 40152	R2	5	15		
UBN 40202	R2	5	20		
UBN 40252	R2	5	25		
UBN 40302	R2	5	30		

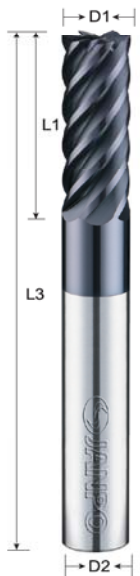


UEM Square End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UEM 0022	0.2	0.4	50	4
UEM 0032	0.3	0.6		
UEM 0042	0.4	0.8		
UEM 0052	0.5	1		
UEM 0062	0.6	1.2		
UEM 0072	0.7	1.4		
UEM 0082	0.8	1.6		
UEM 0092	0.9	1.8		
UEM 0102	1	2.5		
UEM 0122	1.2	3		
UEM 0152	1.5	4		
UEM 0162	1.6	4	50	4
UEM 0182	1.8	5		
UEM 0202	2	6		
UEM 0252	2.5	8		
UEM 0302	3	8		
UEM 0402	4	11		



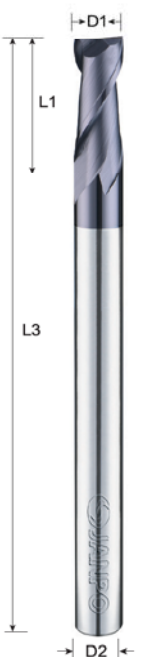
UEA Square End Mills

High Hardness



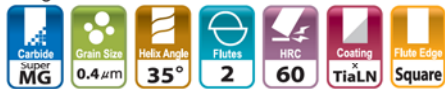
unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UEA 0606	6	16	50	6
UEA 0806	8	20	60	8
UEA 1006	10	25	75	10
UEA 1206	12	30	75	12
UEA 1606	16	40	100	16
UEA 2006	20	45	100	20



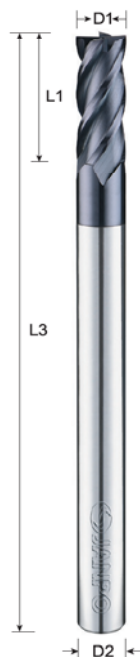
UEH, UEI, UEJ Square End Mills

Long Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UEH 0302	3	8	75	4
UEH 0402	4	11		4
UEH 0502	5	13		6
UEH 0602	6	15		6
UEH 0802	8	20	100	8
UEI 0302M	3	8		4
UEI 0302	3	8		6
UEI 0402M	4	11		4
UEI 0402	4	11	100	6
UEI 0502	5	13		6
UEI 0602	6	15		6
UEI 0802	8	20		8
UEI 1002	10	25	150	10
UEI 1202	12	30		12
UEJ 0802	8	20		8
UEJ 1002	10	25		10
UEJ 1202	12	30	150	12
UEJ 1602	16	40		16
UEJ 1802	18	40		20
UEJ 2002	20	40		20



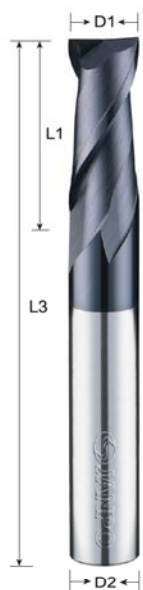
UEH, UEI, UEJ Square End Mills

Long Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
UEH 0304	3	8	75	4
UEH 0404	4	11		4
UEH 0504	5	13		6
UEH 0604	6	15		6
UEH 0804	8	20	100	8
UEI 0404M	4	11		4
UEI 0404	4	11		6
UEI 0604	6	16		6
UEI 0804	8	20	150	8
UEI 1004	10	25		10
UEI 1204	12	30		12
UEJ 0804	8	20		8
UEJ 1004	10	25	150	10
UEJ 1204	12	30		12
UEJ 1604	16	40		16
UEJ 1804	18	40		20
UEJ 2004	20	40		20

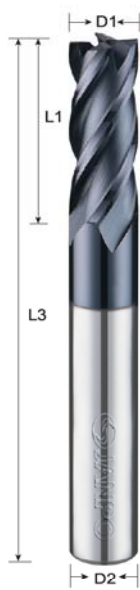


UEA Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UEA 0102S	1	3	50	3
UEA 0102	1	3		4
UEA 0152S	1.5	4		3
UEA 0152	1.5	4		4
UEA 0202S	2	6		3
UEA 0202	2	6		4
UEA 0302S	3	8		3
UEA 0302	3	8		4
UEA 0402S	4	11		4
UEA 0402	4	11		4
UEA 0502	5	13	60	6
UEA 0602	6	16		6
UEA 0802	8	20		8
UEA 1002	10	25		10
UEA 1202	12	30		12
UEA 1602	16	40		16

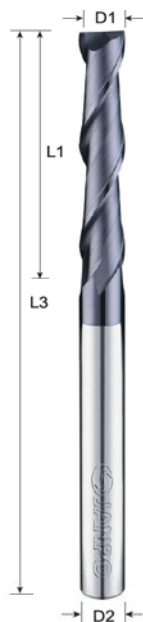


UEA Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UEA 0104	1	3	50	4
UEA 0154	1.5	4		4
UEA 0204	2	6		4
UEA 0304	3	8		4
UEA 0404	4	11		4
UEA 0504	5	13		6
UEA 0604	6	16		6
UEA 0804	8	20		8
UEA 1004	10	25		10
UEA 1204	12	30		12
UEA 1604	16	40	100	16
UEA 2004	20	45		20



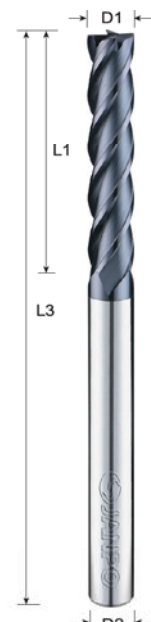
UEF Square End Mills

Long Flute



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UEF 0102	1	5	50	4
UEF 0152	1.5	6		
UEF 0202	2	8		
UEF 0252	2.5	10		
UEF 0302	3	12		
UEF 0352	3.5	14		
UEF 0402	4	16	60	6
UEF 0502	5	20		
UEF 0602	6	25	75	
UEF 0802	8	26		
UEF 0812	8	36	100	8
UEF 1002	10	40		10
UEF 1202	12	46		12
UEF 1602	16	46		16



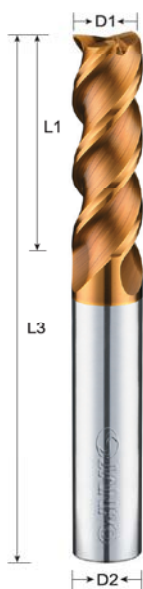
UEF Square End Mills

Long Flute



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UEF 0104	1	5	50	4
UEF 0154	1.5	6		
UEF 0204	2	9		
UEF 0254	2.5	10		
UEF 0304	3	12		
UEF 0354	3.5	14		
UEF 0404	4	16	60	6
UEF 0504	5	25		
UEF 0604	6	25		
UEF 0804	8	35		
UEF 1004	10	40	100	8
UEF 1204	12	45	150	10
UEF 1604	16	65		12
UEF 2004	20	75		16
				20

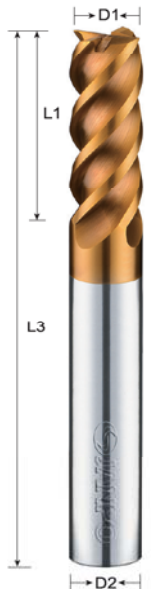


UHP Heavy Cutting Square End Mills

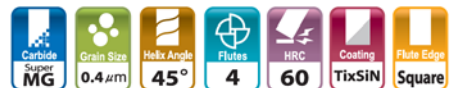


unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UHP 0603	6.0	15	50	6
UHP 0803	8.0	20	60	8
UHP 1003	10.0	25	75	10
UHP 1203	12.0	30		12
UHP 1603	16.0	40	100	16
UHP 2003	20.0	40		20

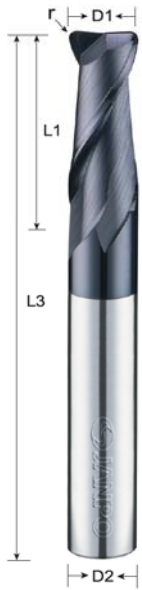


UHP Heavy Cutting Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
UHP 0604	6.0	15	50	6
UHP 0804	8.0	20	60	8
UHP 1004	10.0	25	75	10
UHP 1204	12.0	30		12
UHP 1604	16.0	40	100	16
UHP 2004	20.0	40		20



URA Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
URA 01022	1	0.2	3	50	4
URA 01522	1.5	0.2	4		
URA 02022	2	0.2	6		
URA 02052	2	0.5	6		
URA 02522	2.5	0.2	8		
URA 02552	2.5	0.5	8		
URA 03022	3	0.2	8		
URA 03032	3	0.3	8		
URA 03052	3	0.5	8		
URA 04022	4	0.2	11		
URA 04032	4	0.3	11	60	6
URA 04052	4	0.5	11		
URA 05032	5	0.3	13		
URA 05052	5	0.5	13		
URA 06022	6	0.2	16		
URA 06032	6	0.3	16		
URA 06052	6	0.5	16		
URA 06102	6	1	16		
URA 08032	8	0.3	20		
URA 08052	8	0.5	20	75	8
URA 08102	8	1	20		
URA 10022	10	0.2	25		
URA 10032	10	0.3	25		
URA 10052	10	0.5	25		
URA 10102	10	1	25		
URA 12032	12	0.3	30		12
URA 12052	12	0.5	30		
URA 12102	12	1	30		
URA 12152	12	1.5	30		
URA 12202	12	2	30		

unit:mm



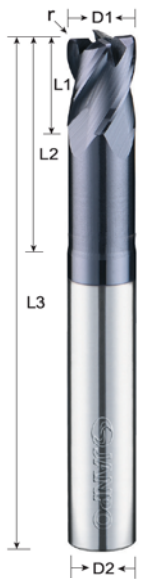
URT Corner Radius End Mills

Short Flute



Type No.	Diameter	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1	r	L1	L2	L3	D2
URT 01022	1	0.2	1	3	50	6
URT 01522	1.5	0.2	1.5	4.5		
URT 01532	1.5	0.3	1.5	4.5		
URT 02022	2	0.2	2	6		
URT 02032	2	0.3	2	6		
URT 02052	2	0.5	2	6		
URT 03022	3	0.2	3	9		
URT 03032	3	0.3	3	9		
URT 03052	3	0.5	3	9		
URT 04022	4	0.2	4	12		
URT 04032	4	0.3	4	12	60	8
URT 04052	4	0.5	4	12		
URT 04102	4	1	4	12		
URT 06022	6	0.2	6	18		
URT 06032	6	0.3	6	18		
URT 06052	6	0.5	6	18		
URT 06102	6	1	6	18		
URT 08032	8	0.3	8	20		
URT 08052	8	0.5	8	20		
URT 08102	8	1	8	20	75	10
URT 10032	10	0.3	10	25		
URT 10052	10	0.5	10	25		
URT 10102	10	1	10	25		
URT 10202	10	2	10	25		
URT 12052	12	0.5	12	30		12
URT 12102	12	1	12	30		
URT 12202	12	2	12	30		
URT 12302	12	3	12	30		

unit:mm



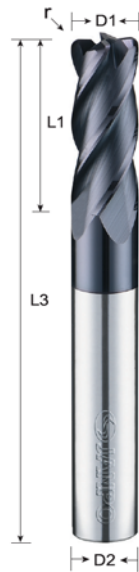
URX Corner Radius End Mills

Clearance



Type No.	Diameter	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1	r	L1	L2	L3	D2
URX 04034	4	0.3	6	12	50	6
URX 04054	4	0.5	6	12		
URX 06034	6	0.3	8	18		
URX 06054	6	0.5	8	18		
URX 06104	6	1	8	18		
URX 08034	8	0.3	10	24		
URX 08054	8	0.5	10	24		
URX 08104	8	1	10	24		
URX 10054	10	0.5	12	30		
URX 10104	10	1	12	30	75	10
URX 10204	10	2	12	30		
URX 10304	10	3	12	30		
URX 12054	12	0.5	15	36		
URX 12104	12	1	15	36		
URX 16054	16	0.5	24	40		16
URX 16104	16	1	24	40		

unit:mm

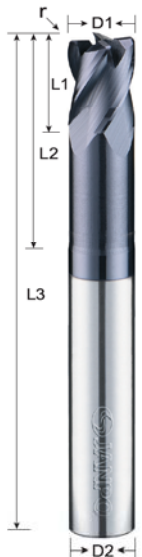


URB Corner Radius End Mills



Unit:mm						
Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia	
	D1	r	L1	L3	D2	
URB 03054	3	0.5	8	50	3	
URB 04054	4	0.5	10		6	
URB 05054	5	0.5	13			
URB 05104	5	1	13			
URB 06054	6	0.5	16			
URB 06104	6	1	16			
URB 08054	8	0.5	20	60		8
URB 08104	8	1	20			
URB 10054	10	0.5	25	75	10	
URB 10104	10	1	25			
URB 10204	10	2	25			
URB 10304	10	3	25			
URB 12054	12	0.5	30			
URB 12104	12	1	30		12	
URB 12204	12	2	30			
URB 12304	12	3	30			
URB 16104	16	1	45	100		16
URB 16204	16	2	45			
URB 16304	16	3	45			

unit:mm



URH Corner Radius End Mills

Long Shank

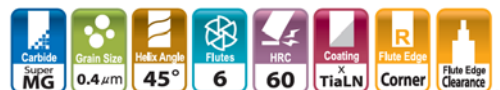


Type No.	Diameter	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1	r	L1	L2	L3	D2
URH 06053	6	0.5	8	30	100	6
URH 08053	8	0.5	10	40		
URH 10053	10	0.5	12	50		
URH 10103	10	1	12	50		
URH 12053	12	0.5	15	50		
URH 16103	16	1	24	50		

unit:mm

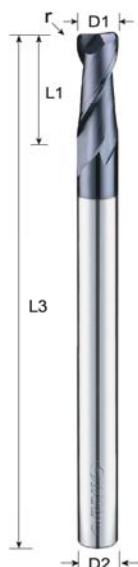


URV Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1	r	L1	L2	L3	D2
URV 06036	6	0.3	8	20	100	6
URV 08036	8	0.3	10	25		
URV 10056	10	0.5	12	30		
URV 12056	12	0.5	15	36		
URV 16106	16	1	24	40		
URV 20106	20	1	30	50		

unit:mm

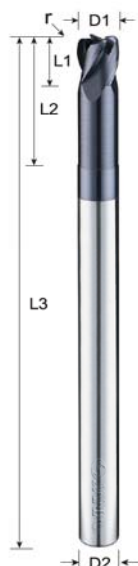


URL Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
URL 06052	6	0.5	16	75	6
URL 06102	6	1	16		8
URL 08052	8	0.5	19		
URL 08102	8	1	19	100	10
URL 10052	10	0.5	25		
URL 10102	10	1	25		
URL 10202	10	2	25		12
URL 12052	12	0.5	30		
URL 12102	12	1	30		
URL 12202	12	2	30		

unit:mm



URLB Corner Radius End Mills



Type No.	Diameter	Neck Dia	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1		r	L1	L2	L3	D2
URLB 06054	6	5.8	0.5	6	18	75	6
URLB 06104	6	5.8	1	6	18		8
URLB 08054	8	7.8	0.5	8	24		
URLB 08104	8	7.8	1	8	24	100	10
URLB 10054	10	9.6	0.5	10	30		
URLB 10104	10	9.6	1	10	30		
URLB 10204	10	9.6	2	10	30		12
URLB 12054	12	11.5	0.5	12	36		
URLB 12104	12	11.5	1	12	36		
URLB 12204	12	11.5	2	12	36	150	16
URLB 16104	16	15.5	1	16	40		
URLB 16204	16	15.5	2	16	40		

unit:mm

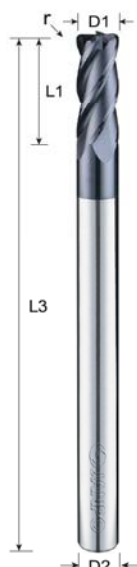


UNR Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1	r	L1	L2	L3	D2
UNR 10042	1	0.1	1.5	4	50	6
UNR 10062	1	0.1	1.5	6		
UNR 10082	1	0.1	1.5	8		
UNR 10102	1	0.1	1.5	10		
UNR 10122	1	0.1	1.5	12		
UNR 15042	1.5	0.1	1.5	4		
UNR 15082	1.5	0.1	1.5	8		
UNR 15102	1.5	0.1	1.5	10		
UNR 15122	1.5	0.1	1.5	12		
UNR 20082	2	0.2	2	8		
UNR 20102	2	0.2	2	10		
UNR 20122	2	0.2	2	12		
UNR 20162	2	0.2	2	16	60	6
UNR 30082	3	0.2	3	8		
UNR 30102	3	0.2	3	10		
UNR 30122	3	0.2	3	12		
UNR 30162	3	0.2	3	16	50	6
UNR 30202	3	0.2	3	20		
UNR 30252	3	0.2	3	25		
UNR 40102	4	0.2	4	10		
UNR 40162	4	0.2	4	16	60	6
UNR 40202	4	0.2	4	20		

unit:mm

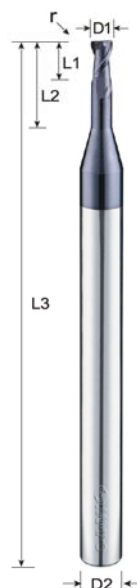


URL Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
URL 06054	6	0.5	16	75	6
URL 06104	6	1	16		8
URL 08054	8	0.5	20		
URL 08104	8	1	20	100	10
URL 10054	10	0.5	25		
URL 10104	10	1	25		
URL 10204	10	2	25		12
URL 12054	12	0.5	30		
URL 12104	12	1	30		
URL 12204	12	2	30	150	16
URL 16104	16	1	45		
URL 16204	16	2	45		

unit:mm



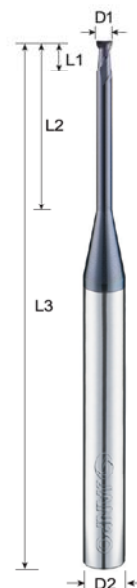
UNRT Corner Radius End Mills

Long Neck



Type No.	Diameter	Neck Dia	Corner R	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1		r	L1	L2	L3	D2
UNRT 10062	1	0.95	0.2	1.5	6	50	4
UNRT 10082	1	0.95		1.5	8		
UNRT 10102	1	0.95		1.5	10		
UNRT 10122	1	0.95		1.5	12		
UNRT 15082	1.5	1.44		2	8		
UNRT 15102	1.5	1.44		2	10		
UNRT 15122	1.5	1.44		2	12		
UNRT 15162	1.5	1.44		2	16		
UNRT 20082	2	1.92		3	8		
UNRT 20102	2	1.92		3	10		
UNRT 20122	2	1.92		3	12		
UNRT 20162	2	1.92		3	16		
UNRT 20202	2	1.92		3	20		
UNRT 25102	2.5	2.4		3	10		
UNRT 25122	2.5	2.4		3	12		
UNRT 25162	2.5	2.4		3	16		
UNRT 25202	2.5	2.4		3	20		
UNRT 25202	2.5	2.4		3	20		

unit:mm



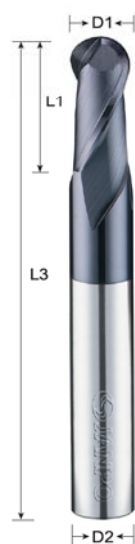
UNE Square End Mills

Long Neck



Type No.	Diameter	Neck Dia	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1		L1	L2	L3	D2
UNE 05022	0.5	0.46	1	2	50	4
UNE 05042	0.5	0.46	1	4		
UNE 05062	0.5	0.46	1	6		
UNE 10062	1	0.95	1.5	6		
UNE 10082	1	0.95	1.5	8		
UNE 10102	1	0.95	1.5	10		
UNE 10122	1	0.95	1.5	12		
UNE 15082	1.5	1.44	2	8		
UNE 15102	1.5	1.44	2	10		
UNE 15122	1.5	1.44	2	12		
UNE 15162	1.5	1.44	2	16		
UNE 20082	2	1.92	3	8	60	6
UNE 20102	2	1.92	3	10		
UNE 20122	2	1.92	3	12		
UNE 20162	2	1.92	3	16		
UNE 20202	2	1.92	3	20		
UNE 25102	2.5	2.4	3	10		
UNE 25122	2.5	2.4	3	12		
UNE 25162	2.5	2.4	3	16		
UNE 25202	2.5	2.4	3	20		
UNE 30102	3	2.9	4	10		
UNE 30122	3	2.9	4	12		
UNE 30162	3	2.9	4	16		
UNE 30202	3	2.9	4	20		
UNE 30252	3	2.9	4	25		

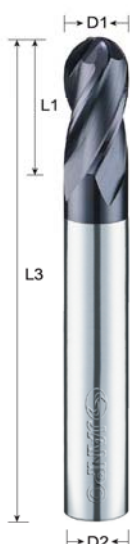
unit:mm



XBA Ball Nose End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBA 0102	R0.5	2	50	4
XBA 0152	R0.75	3		
XBA 0202	R1	4		
XBA 0252	R1.25	5		
XBA 0302	R1.5	6		
XBA 0402	R2	8		
XBA 0502	R2.5	10	75	6
XBA 0602	R3	12		
XBA 0802	R4	16		
XBA 1002	R5	20		
XBA 1202	R6	24		
XBA 1602	R8	32	100	16
XBA 2002	R10	40		



XBA Ball Nose End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBA 0104	R0.5	2	50	4
XBA 0154	R0.75	3		
XBA 0204	R1	4		
XBA 0252	R1.25	5		
XBA 0304	R1.5	6		
XBA 0404	R2	8		
XBA 0504	R2.5	10	75	6
XBA 0604	R3	12		
XBA 0804	R4	16		
XBA 1004	R5	20		
XBA 1204	R6	24		
XBA 1604	R8	32	100	16



XBT Ball Nose End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBT 0102	R0.5	2	50	6
XBT 0152	R0.75	3		
XBT 0202	R1	4		
XBT 0252	R1.25	5		
XBT 0302	R1.5	6		
XBT 0402	R2	8		
XBT 0502	R2.5	10		
XBT 0602	R3	12		



XBT Ball Nose End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBT 0204	R1	4	50	6
XBT 0304	R1.5	6		
XBT 0404	R2	8		
XBT 0504	R2.5	10		
XBT 0604	R3	12		

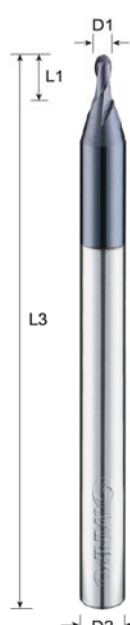


XBM Ball Nose End Mills

Micro Diameter



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBM 0032	R0.15	0.6	50	4
XBM 0042	R0.2	0.8		
XBM 0052	R0.25	1		
XBM 0062	R0.3	1.2		
XBM 0072	R0.35	1.4		
XBM 0082	R0.4	1.6		
XBM 0102	R0.5	2		
XBM 0122	R0.6	2.4		
XBM 0142	R0.7	2.8		
XBM 0152	R0.75	3		
XBM 0162	R0.8	3.2		
XBM 0182	R0.9	3.6		
XBM 0202	R1	4		

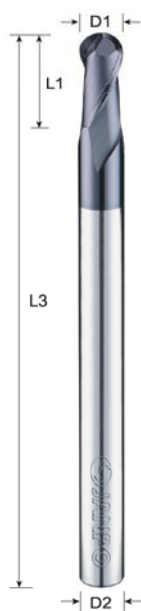


XBMT Ball Nose End Mills

Micro Diameter

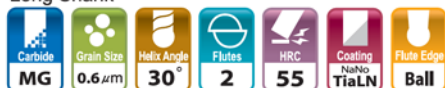


Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XBMT 0032	R0.15	0.6	50	3
XBMT 0042	R0.2	0.8		
XBMT 0052	R0.25	1		
XBMT 0062	R0.3	1.2		
XBMT 0072	R0.35	1.4		
XBMT 0082	R0.4	1.6		
XBMT 0102	R0.5	2		
XBMT 0122	R0.6	2.4		
XBMT 0142	R0.7	2.8		
XBMT 0152	R0.75	3		
XBMT 0162	R0.8	3.2		
XBMT 0182	R0.9	3.6		
XBMT 0202	R1	4		
XBMT 0302	R1.5	6		



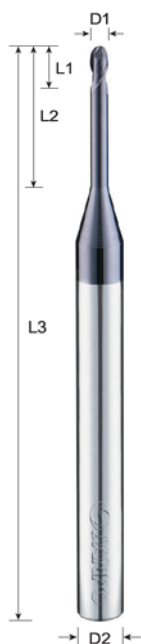
XBH, XBI, XBJ Ball Nose End Mills

Long Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
XBH 0202	R1	4	75	6
XBH 0252	R1.25	5		
XBH 0302	R1.5	6		
XBH 0402	R2	8		
XBH 0502	R2.5	10		
XBH 0602	R3	12		
XBH 0802	R4	16	100	6
XBI 0202	R1	4		
XBI 0302	R1.5	6		
XBI 0402	R2	8		
XBI 0602	R3	12		
XBI 0802	R4	16		
XBI 1002	R5	20	150	10
XBI 1202	R6	24		
XBJ 0602	R3	12		
XBJ 0802	R4	16		
XBJ 1002	R5	20		
XBJ 1202	R6	24		
XBJ 1602	R8	32		



XNB Ball Nose End Mills

Long Neck



unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
XNB 05022	R0.25	1	2	50	4
XNB 05042	R0.25	1	4		
XNB 05062	R0.25	1	6		
XNB 05082	R0.25	1	8		
XNB 06042	R0.3	1.2	4		
XNB 06062	R0.3	1.2	6		
XNB 06082	R0.3	1.2	8	50	4
XNB 08042	R0.4	1.2	4		
XNB 08062	R0.4	1.2	6		
XNB 08082	R0.4	1.2	8		
XNB 10062	R0.5	1.5	6		
XNB 10082	R0.5	1.5	8	50	4
XNB 10102	R0.5	1.5	10		
XNB 10122	R0.5	1.5	12		
XNB 15082	R0.75	2	8		
XNB 15102	R0.75	2	10		
XNB 15122	R0.75	2	12		
XNB 15162	R0.75	2	16	60	6
XNB 15202	R0.75	2	20		
XNB 20082	R1	3	8		
XNB 20102	R1	3	10		
XNB 20122	R1	3	12		
XNB 20162	R1	3	16		
XNB 20202	R1	3	20	75	6
XNB 30082	R1.5	4	8		
XNB 30102	R1.5	4	10		
XNB 30122	R1.5	4	12		
XNB 30162	R1.5	4	16		
XNB 30202	R1.5	4	20		
XNB 30252	R1.5	4	25	75	6
XNB 40122	R2	5	12		
XNB 40162	R2	5	16		
XNB 40202	R2	5	20		
XNB 40252	R2	5	25		
XNB 40302	R2	5	30		



XTB Ball Nose End Mills

Taper



unit:mm

Type No.	Small Mill Dia D1	Flute Length L1	Taper Angle α	Large Mill Dia	O.A.L. L3	Shank Dia D2
XTB 0040302	R0.2	3	3°	0.70	40	4
XTB 0040502	R0.2	3	5°	0.89		
XTB 0040702	R0.2	3	7°	1.10		
XTB 0041002	R0.2	3	10°	1.41		
XTB 0060302	R0.3	3	3°	0.89		
XTB 0060502	R0.3	3	5°	1.08		
XTB 0060702	R0.3	3	7°	1.28	50	6
XTB 0061002	R0.3	3	10°	1.58		
XTB 0100052	R0.5	10	30'	1.17		
XTB 0100102	R0.5	10	1°	1.35		
XTB 0100152	R0.5	10	1°30'	1.52		
XTB 0100202	R0.5	10	2°	1.70	60	8
XTB 0100302	R0.5	10	3°	1.87		
XTB 0100402	R0.5	10	4°	2.05		
XTB 0100502	R0.5	10	5°	2.24		
XTB 0100702	R0.5	10	7°	3.44		
XTB 0150052	R0.75	10	30'	1.67	60	8
XTB 0150102	R0.75	10	1°	1.85		
XTB 0150152	R0.75	10	1°30'	2.02		
XTB 0150202	R0.75	10	2°	2.20		
XTB 0150302	R0.75	10	3°	2.37		
XTB 0150402	R0.75	10	4°	2.55	60	8
XTB 0150502	R0.75	10	5°	3.24		
XTB 0150702	R0.75	10	7°	3.94		
XTB 0151002	R0.75	10	10°	5.02		
XTB 0200052	R1	13	30'	2.22	60	8
XTB 0200102	R1	13	1°	2.45		
XTB 0200152	R1	13	1°30'	2.68		
XTB 0200202	R1	13	2°	3.90		
XTB 0200302	R1	13	3°	3.13		
XTB 0200402	R1	13	4°	3.36	60	8
XTB 0200502	R1	13	5°	4.27		
XTB 0200702	R1	13	7°	5.17		
XTB 0201002	R1	13	10°	6.56		
XTB 0250052	R1.25	15	30'	2.76	60	8
XTB 0250102	R1.25	15	1°	3.03		
XTB 0250152	R1.25	15	1°30'	3.29		
XTB 0250202	R1.25	15	2°	3.56		
XTB 0250302	R1.25	15	3°	3.81		
XTB 0250402	R1.25	15	4°	4.07	60	8
XTB 0250502	R1.25	15	5°	5.13		
XTB 0251002	R1.25	15	10°	7.77		
XTB 0300052	R1.5	20	30'	3.34	60	8
XTB 0300102	R1.5	20	1°	3.60		
XTB 0300152	R1.5	20	1°30'	4.04		
XTB 0300202	R1.5	20	2°	4.39		
XTB 0300302	R1.5	20	3°	5.08		
XTB 0300402	R1.5	20	4°	5.78	60	8
XTB 0300502	R1.5	20	5°	6.48		
XTB 0300702	R1.5	20	7°	7.90		



XBS Ball Nose End Mills

Small Shank



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
XBS 0102	R0.5	2	50	3
XBS 0152	R0.75	3		
XBS 0202	R1.0	4		
XBS 0252	R1.25	5		
XBS 0312	R1.5	6		
XBS 0322	R1.5	6		
XBS 0332	R1.5	6	75	4
XBS 0422	R2.0	8	100	
XBS 0432	R2.0	8	100	



XEA Square End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEA 0102	1	3	50	4
XEA 0152	1.5	4		
XEA 0202	2	6		
XEA 0252	2.5	8		
XEA 0302	3	8		
XEA 0352	3.5	10	60	6
XEA 0402	4	11		
XEA 0502	5	13		
XEA 0602	6	16		
XEA 0702	7	16		
XEA 0802	8	20	75	8
XEA 0902	9	20		
XEA 1002	10	25		
XEA 1102	11	30		
XEA 1202	12	30		
XEA 1602	16	40	100	16
XEA 2002	20	45		



XEA Square End Mills



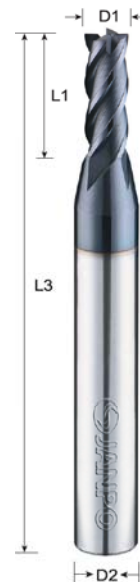
Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEA 0104	1	3	50	4
XEA 0154	1.5	4		
XEA 0204	2	6		
XEA 0254	2.5	8		
XEA 0304	3	8		
XEA 0354	3.5	10	60	6
XEA 0404	4	11		
XEA 0504	5	13		
XEA 0604	6	16		
XEA 0704	7	16		
XEA 0804	8	20	75	8
XEA 0904	9	20		
XEA 1004	10	25		
XEA 1104	11	30		
XEA 1204	12	30		
XEA 1604	16	40	100	16
XEA 2004	20	45		



XET Square End Mills



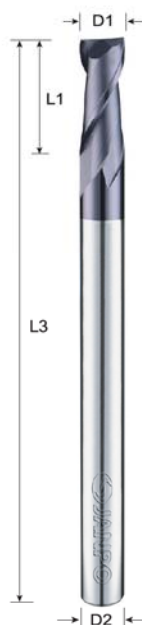
Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XET 0102	1	3	50	6
XET 0152	1.5	4		
XET 0202	2	6		
XET 0252	2.5	8		
XET 0302	3	8		
XET 0402	4	11	60	8
XET 0502	5	13		
XET 0602	6	16		
XET 0702	7	16		
XET 0802	8	20		



XET Square End Mills



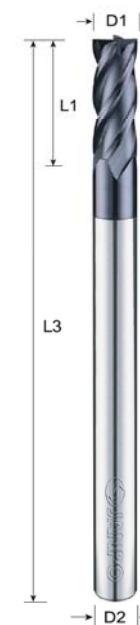
Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XET 0104	1	3	50	6
XET 0154	1.5	4		
XET 0204	2	6		
XET 0254	2.5	8		
XET 0304	3	8		
XET 0404	4	11	60	8
XET 0504	5	13		
XET 0604	6	16		
XET 0704	7	16		
XET 0804	8	20		



XEH. XEI. XEJ Square End Mills



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEH 0302	3	8	75	4
XEH 0402	4	11		
XEH 0502	5	13		
XEH 0602	6	16		
XEH 0802	8	20		
XEI 0302	3	8	100	4
XEI 0402	4	11		
XEI 0602	6	16		
XEI 0802	8	20		
XEI 1002	10	25		
XEI 1202	12	30	150	6
XEJ 0602	6	16		
XEJ 0802	8	20		
XEJ 1002	10	25		
XEJ 1202	12	30		



XEH. XEI. XEJ Square End Mills

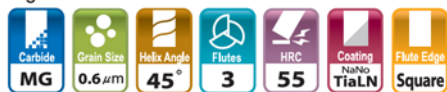


Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEH 0304	3	8	75	4
XEH 0404	4	11		
XEH 0504	5	13		
XEH 0604	6	16		
XEH 0804	8	20		
XEI 0404	4	11	100	4
XEI 0604	6	16		
XEI 0804	8	20		
XEI 1004	10	25		
XEI 1204	12	30	150	6
XEJ 0604	6	16		
XEJ 0804	8	20		
XEJ 1004	10	25		
XEJ 1204	12	30		



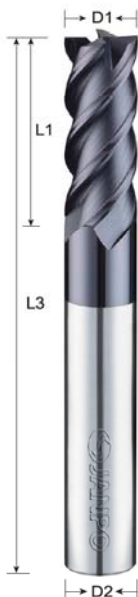
XEG Square End Mills

High Helix



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEG 0203	2	6	50	4
XEG 0303	3	8		
XEG 0403	4	11		
XEG 0503	5	13	60	6
XEG 0603	6	16		
XEG 0803	8	20		
XEG 1003	10	30	75	10
XEG 1203	12	32		
XEG 1603	16	40		
XEG 2003	20	45	100	20

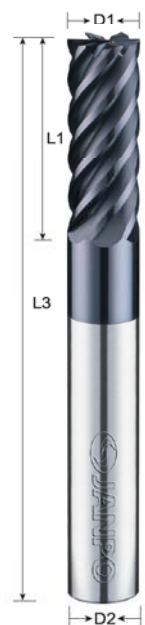


XEG Square End Mills



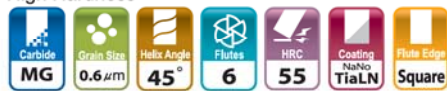
unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEG 0104	1	3	50	4
XEG 0154	1.5	4		
XEG 0204	2	6		
XEG 0254	2.5	8		6
XEG 0304	3	8		
XEG 0354	3.5	10		
XEG 0404	4	11		
XEG 0454	4.5	11		
XEG 0504	5	13		
XEG 0604	6	16		
XEG 0804	8	20	60	8
XEG 1004	10	30	75	10
XEG 1204	12	32		12
XEG 1604	16	40	100	16
XEG 2004	20	45		20



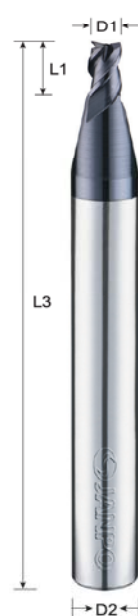
XEG Square End Mills

High Hardness



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEG 0606	6	15	50	6
XEG 0806	8	20	60	8
XEG 1006	10	30	75	10
XEG 1206	12	32	100	12
XEG 1606	16	40		16
XEG 2006	20	45		20
XEG 2506	25	45		25



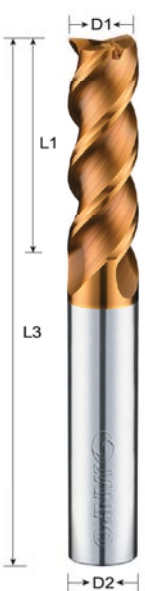
XEP Square End Mills

Short Flute



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEP 0303	3.0	3	50	6
XEP 0403	4.0	4		
XEP 0503	5.0	5		
XEP 0603	6.0	6	60	8
XEP 0803	8.0	8		10
XEP 1003	10.0	10		12

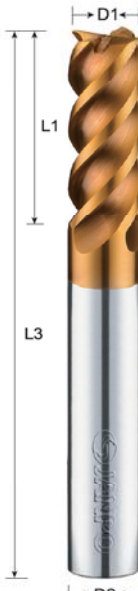


XHP Heavy Cutting Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XHP 0603	6.0	15	50	6
XHP 0803	8.0	20	60	8
XHP 1003	10.0	25	75	10
XHP 1203	12.0	30		12
XHP 1603	16.0	40	100	16
XHP 2003	20.0	40		20

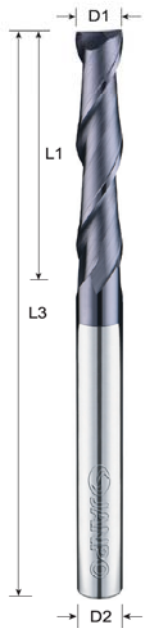


XHP Heavy Cutting Square End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XHP 0404	4	11	50	6
XHP 0604	6	15	60	6
XHP 0804	8	20		8
XHP 1004	10	25	75	10
XHP 1204	12	30		12
XHP 1604	16	40	100	16
XHP 2004	20	40		20



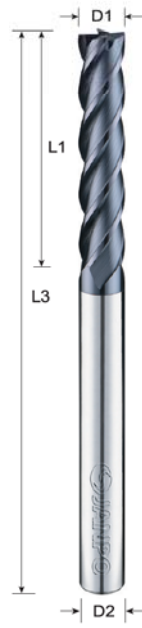
XEF Square End Mills

Long Flute



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEF 0102	1	7	50	4
XEF 0152	1.5	9		
XEF 0202	2	12		
XEF 0252	2.5	12		
XEF 0302	3	15	60	6
XEF 0352	3.5	15		
XEF 0402	4	20	75	
XEF 0502	5	25		
XEF 0602	6	30		
XEF 0802	8	40	100	8
XEF 1002	10	40		10
XEF 1202	12	50		12
XEF 1602	16	60	150	16
XEF 2002	20	90	200	20



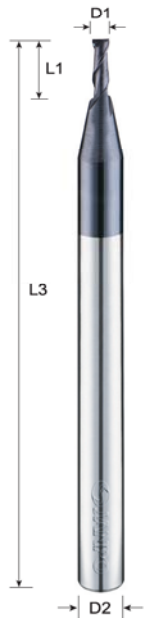
XEF Square End Mills

Long Flute



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XEF 0104	1	6	50	4
XEF 0154	1.5	9		
XEF 0204	2	12		
XEF 0254	2.5	12		
XEF 0304	3	15	60	6
XEF 0354	3.5	15		
XEF 0404	4	20	75	
XEF 0504	5	25		
XEF 0604	6	30		
XEF 0804	8	40	100	8
XEF 1004	10	40		10
XEF 1204	12	50		12
XEF 1604	16	60		150
XEF 2004	20	90	200	20



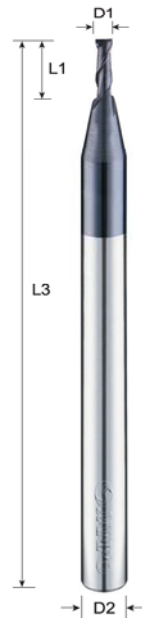
XEMT Square End Mills

Micro Diameter



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
XEMT 0022	0.2	0.4	50	3
XEMT 0032	0.3	0.6		
XEMT 0042	0.4	0.8		
XEMT 0052	0.5	1		
XEMT 0062	0.6	1.2		
XEMT 0082	0.8	1.6		
XEMT 0102	1	2.5		
XEMT 0122	1.2	3		
XEMT 0142	1.4	3		
XEMT 0152	1.5	4		
XEMT 0162	1.6	4		
XEMT 0182	1.8	5		
XEMT 0202	2	6		
XEMT 0252	2.5	8		
XEMT 0302	3	8		



XEM Square End Mills

Micro Diameter

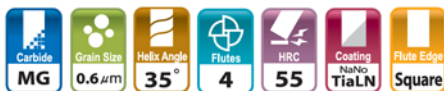


unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
XEM 0022	0.2	0.4	50	4
XEM 0032	0.3	0.6		
XEM 0042	0.4	0.8		
XEM 0052	0.5	1		
XEM 0062	0.6	1.2		
XEM 0072	0.7	1.4		
XEM 0082	0.8	1.6		
XEM 0092	0.9	1.8		
XEM 0102	1	2.5		
XEM 0122	1.2	3		
XEM 0142	1.4	3		
XEM 0152	1.5	4		
XEM 0162	1.6	4		
XEM 0182	1.8	5		
XEM 0202	2	6		

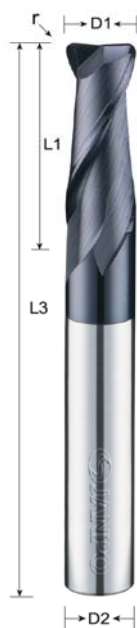


XES Square End Mills



unit:mm

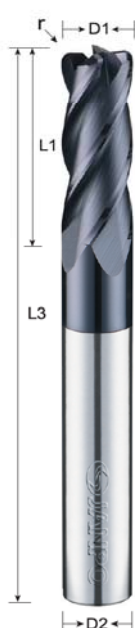
Type No.	Diameter D1	Flute Length L1	O.A.L. L3	Shank Dia D2
XES 0104	1	2.5	50	3
XES 0154	1.5	4		
XES 0204	2	6		
XES 0254	2.5	8		
XES 0304	3	8		



XRT Corner Radius End Mills



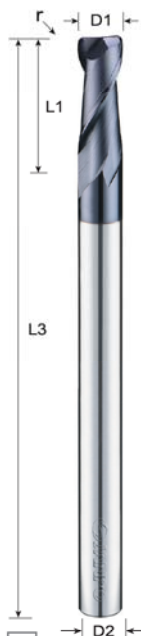
Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
XRT 01012	1	0.1	3	50	4
XRT 01022	1	0.2	3		
XRT 01032	1	0.3	3		
XRT 01522	1.5	0.2	4		
XRT 01532	1.5	0.3	4		
XRT 02022	2	0.2	6		
XRT 02032	2	0.3	6		
XRT 02052	2	0.5	6		
XRT 02522	2.5	0.2	8		
XRT 03022	3	0.2	8		
XRT 03032	3	0.3	8		
XRT 03052	3	0.5	8		
XRT 03102	3	1	8	50	6
XRT 04022	4	0.2	10		
XRT 04032	4	0.3	10		
XRT 04052	4	0.5	10		
XRT 04102	4	1	10		
XRT 04152	4	1.5	10		
XRT 05022	5	0.2	13		
XRT 05032	5	0.3	13		
XRT 05052	5	0.5	13		
XRT 05102	5	1	13		
XRT 06022	6	0.2	15	50	6
XRT 06032	6	0.3	15		
XRT 06052	6	0.5	15		
XRT 06102	6	1	15		
XRT 06152	6	1.5	15		
XRT 06202	6	2	15		
XRT 08032	8	0.3	20		
XRT 08052	8	0.5	20		
XRT 08102	8	1	20		
XRT 08152	8	1.5	20		
XRT 08202	8	2	20	60	8
XRT 08252	8	2.5	20		
XRT 08302	8	3	20		
XRT 10032	10	0.3	25		
XRT 10052	10	0.5	25		
XRT 10102	10	1	25		
XRT 10152	10	1.5	25		
XRT 10202	10	2	25		
XRT 10252	10	2.5	25		
XRT 10302	10	3	25		
XRT 12032	12	0.3	30	75	12
XRT 12052	12	0.5	30		
XRT 12102	12	1	30		
XRT 12152	12	1.5	30		
XRT 12202	12	2	30		
XRT 12252	12	2.5	30		
XRT 12302	12	3	30		



XRB Corner Radius End Mills



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
XRB 02024	2	0.2	6	50	4
XRB 02034	2	0.3	6		
XRB 02054	2	0.5	6		
XRB 02524	2.5	0.2	8		
XRB 03024	3	0.2	8		
XRB 03034	3	0.3	8		
XRB 03054	3	0.5	8		
XRB 03104	3	1	8		
XRB 04024	4	0.2	10		
XRB 04034	4	0.3	10		
XRB 04054	4	0.5	10	50	6
XRB 04104	4	1	10		
XRB 04154	4	1.5	10		
XRB 05024	5	0.2	13		
XRB 05034	5	0.3	13		
XRB 05054	5	0.5	13		
XRB 05104	5	1	13		
XRB 06024	6	0.2	15		
XRB 06034	6	0.3	15		
XRB 06054	6	0.5	15		
XRB 06104	6	1	15	60	8
XRB 06154	6	1.5	15		
XRB 06204	6	2	15		
XRB 08034	8	0.3	20		
XRB 08054	8	0.5	20		
XRB 08104	8	1	20		
XRB 08154	8	1.5	20		
XRB 08204	8	2	20		
XRB 08254	8	2.5	20		
XRB 08304	8	3	20	75	12
XRB 10034	10	0.3	25		
XRB 10054	10	0.5	25		
XRB 10104	10	1	25		
XRB 10154	10	1.5	25		
XRB 10204	10	2	25		
XRB 10254	10	2.5	25		
XRB 10304	10	3	25		
XRB 12034	12	0.3	30		
XRB 12054	12	0.5	30		
XRB 12104	12	1	30	150	16
XRB 12154	12	1.5	30		
XRB 12204	12	2	30		
XRB 12254	12	2.5	30		
XRB 12304	12	3	30		

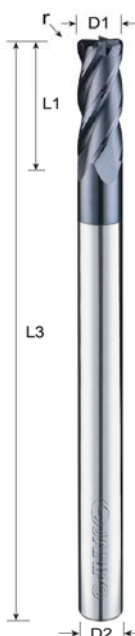


XRL Corner Radius End Mills

Long Shank

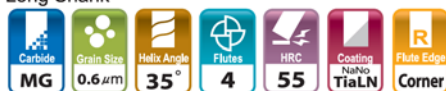


Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
XRL 04052	4	0.5	11	75	4
XRL 06052	6	0.5	16		
XRL 06102	6	1	16		
XRL 06052L	6	0.5	16		
XRL 06102L	6	1	16		
XRL 08052	8	0.5	20		
XRL 08102	8	1	20		
XRL 10052	10	0.5	25		
XRL 10102	10	1	25		
XRL 10202	10	2	25		
XRL 12052	12	0.5	30	100	10
XRL 12102	12	1	30		
XRL 12202	12	2	30		
XRL 04052	4	0.5	11	100	12
XRL 06052	6	0.5	16		
XRL 06102	6	1	16		
XRL 06052L	6	0.5	16		
XRL 06102L	6	1	16		
XRL 08052	8	0.5	20		
XRL 08102	8	1	20		
XRL 10052	10	0.5	25		
XRL 10102	10	1	25		
XRL 10202	10	2	25		
XRL 12052	12	0.5	30		
XRL 12102	12	1	30	150	16
XRL 12202	12	2	30		

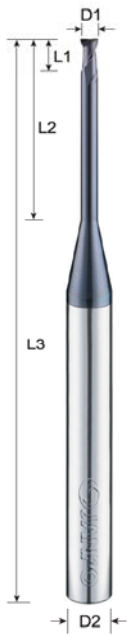


XRL Corner Radius End Mills

Long Shank



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
XRL 06054	6	0.5	16	75	6
XRL 06104	6	1	16		
XRL 06054L	6	0.5	16		
XRL 06104L	6	1	16		
XRL 08054	8	0.5	20		
XRL 08104	8	1	20		
XRL 10054	10	0.5	25		
XRL 10104	10	1	25		
XRL 10204	10	2	25		
XRL 12054	12	0.5	30		
XRL 12104	12	1	30	100	12
XRL 12204	12	2	30		
XRL 16104	16	1	45		
XRL 16204	16	2	45		



XNE Square End Mills

Long Neck



unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
XNE 04022	0.4	0.8	2	50	4
XNE 04042	0.4	0.8	4		
XNE 05022	0.5	1	2		
XNE 05042	0.5	1	4		
XNE 05062	0.5	1	6		
XNE 06022	0.6	1.2	2		
XNE 06042	0.6	1.2	4		
XNE 06062	0.6	1.2	6		
XNE 07042	0.7	1.4	4		
XNE 07062	0.7	1.4	6		
XNE 08042	0.8	1.6	4	50	4
XNE 08062	0.8	1.6	6		
XNE 10062	1	1.5	6		
XNE 10082	1	1.5	8		
XNE 10102	1	1.5	10		
XNE 10122	1	1.5	12		
XNE 15082	1.5	2	8		
XNE 15102	1.5	2	10		
XNE 15122	1.5	2	12		
XNE 15162	1.5	2	16		
XNE 20082	2	3	8	50	4
XNE 20102	2	3	10		
XNE 20122	2	3	12		
XNE 20162	2	3	16		
XNE 20202	2	3	20		
XNE 25102	2.5	3	10		
XNE 25122	2.5	3	12		
XNE 25162	2.5	3	16		
XNE 25202	2.5	3	20		
XNE 30102	3	4	10	60	6
XNE 30122	3	4	12		
XNE 30162	3	4	16		
XNE 30202	3	4	20		
XNE 30252	3	4	25		

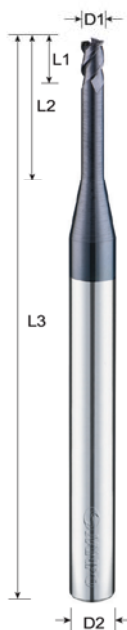


XTM Tapered End Mills



unit:mm

Type No.	Small Mill Dia D1	Flute Length L1	Taper Angle α	Large Mill Dia	O.A.L. L3	Shank Dia D2
XTM 0020052	0.2	0.8	30°	0.21	38	3
XTM 0020102	0.2	0.8	1°	0.23		
XTM 0020152	0.2	0.8	1°30'	0.24		
XTM 0020202	0.2	0.8	2°	0.26		
XTM 0020302	0.2	0.8	3°	0.28		
XTM 0020402	0.2	0.8	4°	0.31		
XTM 0020502	0.2	0.8	5°	0.34		
XTM 0020702	0.2	0.8	7°	0.40		
XTM 0021002	0.2	0.8	10°	0.48		
XTM 0030052	0.3	1.2	30°	0.32		
XTM 0030102	0.3	1.2	1°	0.34		
XTM 0030152	0.3	1.2	1°30'	0.36		
XTM 0030202	0.3	1.2	2°	0.38		
XTM 0030302	0.3	1.2	3°	0.43		
XTM 0030402	0.3	1.2	4°	0.47		
XTM 0030502	0.3	1.2	5°	0.51		
XTM 0030702	0.3	1.2	7°	0.59		
XTM 0031002	0.3	1.2	10°	0.72		
XTM 0040052	0.4	1.6	30°	0.43		
XTM 0040102	0.4	1.6	1°	0.46		
XTM 0040152	0.4	1.6	1°30'	0.48		
XTM 0040202	0.4	1.6	2°	0.51		
XTM 0040302	0.4	1.6	3°	0.57		
XTM 0040402	0.4	1.6	4°	0.62		
XTM 0040502	0.4	1.6	5°	0.68		
XTM 0040702	0.4	1.6	7°	0.79		
XTM 0041002	0.4	1.6	10°	0.96		
XTM 0060052	0.6	2	30°	0.63		
XTM 0060102	0.6	2	1°	0.67		
XTM 0060152	0.6	2	1°30'	0.70		
XTM 0060202	0.6	2	2°	0.74		
XTM 0060252	0.6	2	2°30'	0.77		
XTM 0060302	0.6	2	3°	0.81		
XTM 0060502	0.6	2	5°	0.95		
XTM 0060702	0.6	2	7°	1.09		
XTM 0061002	0.6	2	10°	1.31		
XTM 0061202	0.6	2	12°	1.45		
XTM 0061502	0.6	2	15°	1.67		
XTM 0080052	0.8	3	30°	0.85	60	6
XTM 0080102	0.8	3	1°	0.90		
XTM 0080152	0.8	3	1°30'	0.96		
XTM 0080202	0.8	3	2°	1.01		
XTM 0080252	0.8	3	2°30'	1.06		
XTM 0080302	0.8	3	3°	1.11		
XTM 0080502	0.8	3	5°	1.32		
XTM 0080702	0.8	3	7°	1.54		
XTM 0081002	0.8	3	10°	1.86		
XTM 0081202	0.8	3	12°	2.08		
XTM 0081502	0.8	3	15°	2.41		



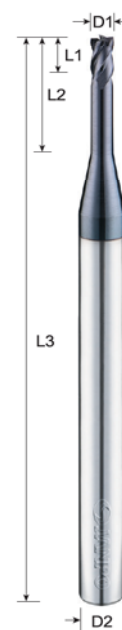
XNH Square End Mills

Long Neck



unit:mm

Type No.	Diameter D1	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
XNH 10063	1	1.5	6	50	4
XNH 10083	1	1.5	8		
XNH 10103	1	1.5	10		
XNH 10123	1	1.5	12		
XNH 15083	1.5	2	8		
XNH 15103	1.5	2	10		
XNH 15123	1.5	2	12		
XNH 15163	1.5	2	16		
XNH 20083	2	3	8		
XNH 20103	2	3	10		
XNH 20123	2	3	12	60	6
XNH 20163	2	3	16		
XNH 20203	2	3	20		
XNH 25103	2.5	3	10		
XNH 25123	2.5	3	12		
XNH 25163	2.5	3	16		
XNH 25203	2.5	3	20		
XNH 30103	3	4	10		
XNH 30123	3	4	12		
XNH 30163	3	4	16		
XNH 30203	3	4	20		
XNH 30253	3	4	25		



XNX Square End Mills

Long Neck



unit:mm

Type No.	Diameter D1	Neck Dia	Flute Length L1	Effective Length L2	O.A.L. L3	Shank Dia D2
XNX 10064	1	0.95	1.5	6	50	4
XNX 10084	1	0.95	1.5	8		
XNX 10104	1	0.95	1.5	10		
XNX 10124	1	0.95	1.5	12		
XNX 15084	1.5	1.45	2	8		
XNX 15104	1.5	1.45	2	10		
XNX 15124	1.5	1.45	2	12		
XNX 15164	1.5	1.45	2	16		
XNX 20084	2	1.92	3	8		
XNX 20104	2	1.92	3	10		
XNX 20124	2	1.92	3	12	60	6
XNX 20164	2	1.92	3	16		
XNX 20204	2	1.92	3	20		
XNX 25104	2.5	2.42	3	10		
XNX 25124	2.5	2.42	3	12		
XNX 25164	2.5	2.42	3	16		
XNX 25204	2.5	2.42	3	20		
XNX 30104	3	2.90	4	10		
XNX 30124	3	2.90	4	12		
XNX 30164	3	2.90	4	16		
XNX 30204	3	2.90	4	20		
XNX 30254	3	2.90	4	25		

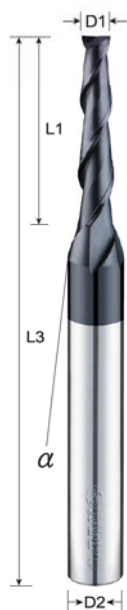


XTE Taper End Mills



unit:mm

Type No.	Diameter D1	Flute Length L1	Taper Angle α	O.A.L. L3	Shank Dia D2
XTE 0050052	0.5	2	30'	50	4
XTE 0050102	0.5	2	1°		
XTE 0050152	0.5	2	1°30'		
XTE 0050202	0.5	2	2°		
XTE 0050252	0.5	2	2°30'		
XTE 0050302	0.5	2	3°		
XTE 0050502	0.5	2	5°		
XTE 0050702	0.5	2	7°		
XTE 0051002	0.5	2	10°		
XTE 0100052	1	4	30'		
XTE 0100102	1	4	1°	50	4
XTE 0100152	1	4	1°30'		
XTE 0100202	1	4	2°		
XTE 0100252	1	4	2°30'		
XTE 0100302	1	4	3°		
XTE 0100502	1	4	5°		
XTE 0100702	1	4	7°		
XTE 0101002	1	4	10°		
XTE 0150052	1.5	5	30'		
XTE 0150102	1.5	5	1°	50	4
XTE 0150152	1.5	5	1°30'		
XTE 0150202	1.5	5	2°		
XTE 0150252	1.5	5	2°30'		
XTE 0150302	1.5	5	3°		
XTE 0150502	1.5	5	5°		
XTE 0150702	1.5	5	7°		
XTE 0151002	1.5	5	10°		
XTE 0200052	2	6	30'		
XTE 0200102	2	6	1°	50	4
XTE 0200152	2	6	1°30'		
XTE 0200202	2	6	2°		
XTE 0200252	2	6	2°30'		
XTE 0200302	2	6	3°		
XTE 0200502	2	6	5°		
XTE 0200702	2	6	7°		
XTE 0201002	2	6	10°		
XTE 0250052	2.5	8	30'		
XTE 0250102	2.5	8	1°	50	4
XTE 0250152	2.5	8	1°30'		
XTE 0250202	2.5	8	2°		
XTE 0250252	2.5	8	2°30'		
XTE 0250302	2.5	8	3°		
XTE 0250502	2.5	8	5°		
XTE 0250702	2.5	8	7°		
XTE 0251002	2.5	8	10°		
XTE 0300052	3	10	30'		
XTE 0300102	3	10	1°	50	4
XTE 0300152	3	10	1°30'		
XTE 0300202	3	10	2°		
XTE 0300252	3	10	2°30'		
XTE 0300302	3	10	3°		
XTE 0300502	3	10	5°		
XTE 0300702	3	10	7°		
XTE 0301002	3	10	10°		
XTE 0400052	4	15	30'		
XTE 0400102	4	15	1°	50	6
XTE 0400152	4	15	1°30'		
XTE 0400202	4	15	2°		
XTE 0400252	4	15	2°30'		
XTE 0400302	4	15	3°		
XTE 0400502	4	15	5°		
XTE 0400702	4	15	7°		
XTE 0500052	5	20	30'		
XTE 0500102	5	20	1°	50	6
XTE 0500152	5	20	1°30'		
XTE 0500202	5	20	2°		
XTE 0500252	5	20	2°30'		
XTE 0500302	5	20	3°		
XTE 0500502	5	20	5°		
XTE 0500702	5	20	7°		
XTE 0600052	6	20	30'		
XTE 0600102	6	20	1°	50	8
XTE 0600152	6	20	1°30'		
XTE 0600202	6	20	2°		
XTE 0600252	6	20	2°30'		
XTE 0600302	6	20	3°		
XTE 0600502	6	20	5°		
XTE 0800052	8	25	30'		
XTE 0800102	8	25	1°	50	10
XTE 0800152	8	25	1°30'		
XTE 0800202	8	25	2°		
XTE 0800252	8	25	2°30'		
XTE 0800302	8	25	3°		
XTE 0800502	8	25	5°		
XTE 1000052	10	35	30'		
XTE 1000102	10	35	1°	50	12
XTE 1000152	10	35	1°30'		
XTE 1000202	10	35	2°		
XTE 1000252	10	35	2°30'		
XTE 1000302	10	35	3°		



XTF Taper End Mills

Long Flute



unit:mm

Type No.	Diameter D1	Flute Length L1	Taper Angle α	O.A.L. L3	Shank Dia D2
XTF 0100052	1	10	30'	50	4
XTF 0100102	1	10	1°		
XTF 0100152	1	10	1°30'		
XTF 0100202	1	10	2°		
XTF 0100252	1	10	2°30'		
XTF 0100302	1	10	3°		
XTF 0100502	1	10	5°		
XTF 0100702	1	10	7°		
XTF 0150052	1.5	10	30'		
XTF 0150102	1.5	10	1°	50	4
XTF 0150152	1.5	10	1°30'		
XTF 0150202	1.5	10	2°		
XTF 0150252	1.5	10	2°30'		
XTF 0150302	1.5	10	3°		
XTF 0200052	2	10	30'		
XTF 0200102	2	10	1°	50	4
XTF 0200152	2	10	1°30'		
XTF 0200202	2	10	2°		
XTF 0200252	2	10	2°30'		
XTF 0200302	2	10	3°		
XTF 0200502	2	10	5°		
XTF 0250052	2.5	15	30'		
XTF 0250102	2.5	15	1°	50	4
XTF 0250152	2.5	15	1°30'		
XTF 0250202	2.5	15	2°		
XTF 0250252	2.5	15	2°30'		
XTF 0250302	2.5	15	3°		
XTF 0250502	2.5	15	5°		
XTF 0300052	3	20	30'		
XTF 0300102	3	20	1°	50	6
XTF 0300152	3	20	1°30'		
XTF 0300202	3	20	2°		
XTF 0300252	3	20	2°30'		
XTF 0300302	3	20	3°		
XTF 0300502	3	20	5°		
XTF 0400052	4	25	30'		
XTF 0400102	4	25	1°	50	6
XTF 0400152	4	25	1°30'		
XTF 0400202	4	25	2°		
XTF 0400252	4	25	2°30'		
XTF 0400302	4	25	3°		
XTF 0405002	4	25	5°		

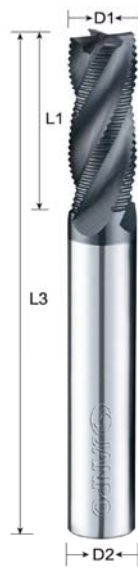


XWW Roughing End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XWW 0503	5	13	50	6
XWW 0603	6	16		
XWW 0703	7	16		
XWW 0803	8	19	60	8
XWW 0903	9	25		
XWW 1003	10	25		10
XWW 1103	11	30	75	12
XWW 1203	12	30		
XWW 1603	16	35		16
XWW 2003	20	45	100	20



XWW Roughing End Mills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XWW 0504	5	13	50	6
XWW 0604	6	16		
XWW 0704	7	16		
XWW 0804	8	19	60	8
XWW 0904	9	25		
XWW 1004	10	25		10
XWW 1104	11	30	75	12
XWW 1204	12	30		
XWW 1604	16	35		16
XWW 2004	20	45	100	20

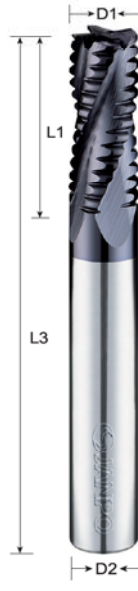


XUW Roughing End Mills

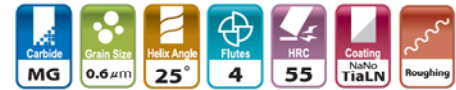


unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XUW 0503	5	13	50	6
XUW 0603	6	16		
XUW 0703	7	16		
XUW 0803	8	19	60	8
XUW 0903	9	25		
XUW 1003	10	25		10
XUW 1103	11	30	75	12
XUW 1203	12	30		
XUW 1603	16	35		16
XUW 2003	20	45	100	20

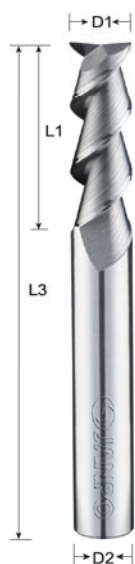


XUW Roughing End Mills



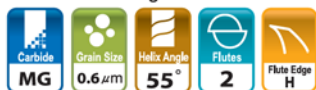
unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XUW 0504	5	13	50	6
XUW 0604	6	16		
XUW 0704	7	16		
XUW 0804	8	19	60	8
XUW 0904	9	25		
XUW 1004	10	25		10
XUW 1104	11	30	75	12
XUW 1204	12	30		
XUW 1604	16	35		16
XUW 2004	20	45	100	20



XAE Square End Mills

Aluminum Cutting



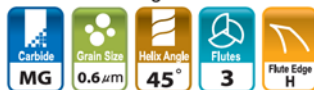
unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAE 0052	0.5	1.5	50	4
XAE 0102	1	3		
XAE 0152	1.5	4		
XAE 0202	2	6		
XAE 0302	3	8		
XAE 0402	4	12		
XAE 0502	5	16	60	6
XAE 0602	6	18		
XAE 0802	8	22		
XAE 1002	10	28		
XAE 1202	12	30		
			75	10
				12



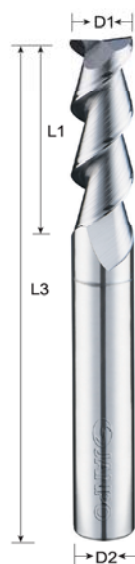
XAE Square End Mills

Aluminum Cutting



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAE 0203	2	6	50	6
XAE 0303	3	10		
XAE 0403	4	12		
XAE 0503	5	16		
XAE 0603	6	18		
XAE 0803	8	20		
XAE 1003	10	25	75	10
XAE 1203	12	30	75	12
XAE 1603	16	40	100	16



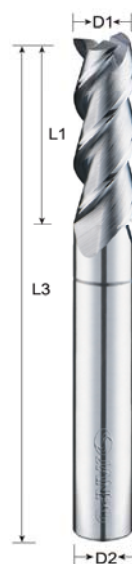
XA Square End Mills

Aluminum Cutting



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XA 0052	0.5	1.5	50	4
XA 0102	1	3		
XA 0152	1.5	4		
XA 0202	2	6		
XA 0302	3	8		
XA 0402	4	12		
XA 0502	5	16	60	6
XA 0602	6	18		
XA 0802	8	22		
XA 1002	10	28		
XA 1202	12	30		
			75	10
				12



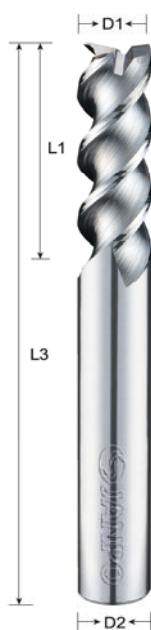
XA Square End Mills

Aluminum Cutting



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XA 0203	2	6	50	6
XA 0303	3	10		
XA 0403	4	12		
XA 0503	5	16		
XA 0603	6	18		
XA 0803	8	20		
XA 1003	10	25	75	10
XA 1203	12	30	75	12
XA 1603	16	40	100	16



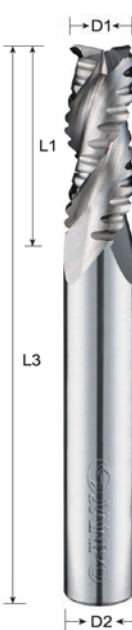
XAHP Heavy Cutting Square End Mills

Aluminum Cutting



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAHP 0603	6	15	50	6
XAHP 0803	8	20	60	8
XAHP 1003	10	25	75	10
XAHP 1203	12	30		12
XAHP 1603	16	40	100	16
XAHP 2003	20	40		20



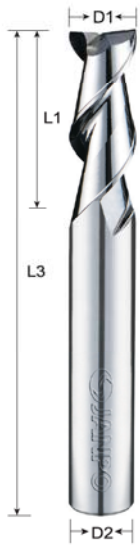
XAW Roughing End Mills

Aluminum Cutting



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAW 0603	6	15	50	6
XAW 0703	7	16	60	8
XAW 0803	8	20		
XAW 0903	9	20	75	10
XAW 1003	10	25		12
XAW 1203	12	30		
XAW 1403	14	32	100	16
XAW 1603	16	35		20
XAW 1803	18	35		
XAW 2003	20	45		



XAT Square End Mills

Aluminum Cutting



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAT 0052	0.5	1.5	50	4
XAT 0102	1	3		6
XAT 0152	1.5	4		
XAT 0202	2	6		
XAT 0302	3	8		
XAT 0402	4	11		
XAT 0502	5	13		
XAT 0602	6	16		
XAT 0802	8	19		
XAT 1002	10	25		
XAT 1202	12	26	75	12

unit:mm



XAT Square End Mills

Aluminum Cutting



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAT 0203	2	6	50	6
XAT 0303	3	10		
XAT 0403	4	12		
XAT 0503	5	16		
XAT 0603	6	18		
XAT 0803	8	20	60	8
XAT 1003	10	25	75	10
XAT 1203	12	30		12
XAT 1603	16	40	100	16

unit:mm



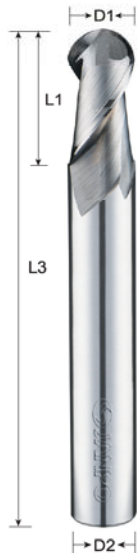
XAR Corner Radius End Mills

Aluminum Cutting



Type No.	Diameter	Corner R	Flute Length	O.A.L.	Shank Dia
	D1	r	L1	L3	D2
XAR 02023	2	0.2	6	50	6
XAR 03023	3	0.2	10		
XAR 04023	4	0.2	12		
XAR 06033	6	0.3	18		
XAR 08053	8	0.5	20	60	8
XAR 10053	10	0.5	30	75	10

unit:mm



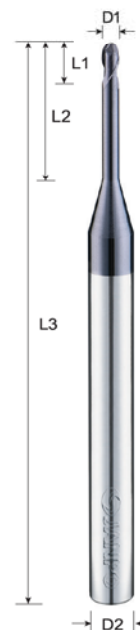
XAB Ball Nose End Mills

Aluminum Cutting



Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XAB 0102	R0.5	2	50	4
XAB 0152	R0.75	3		
XAB 0202	R1	4		
XAB 0302	R1.5	6		
XAB 0402	R2	8		
XAB 0602	R3	12	60	6
XAB 0802	R4	16		8
XAB 1002	R5	20		10
XAB 1202	R6	24	75	12

unit:mm



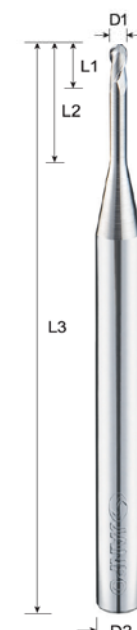
XANBD Ball Nose End Mills

Long Neck Aluminum Cutting



Type No.	Diameter	Neck Dia	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1		L1	L2	L3	D2
XANBD 1004	R0.5	0.95	2	4	50	4
XANBD 1006	R0.5	0.95	2	6		
XANBD 1010	R0.5	0.95	2	10		
XANBD 1012	R0.5	0.95	2	12		
XANBD 1016	R0.5	0.95	2	16		
XANBD 1506	R0.75	1.45	3	6		
XANBD 1510	R0.75	1.45	3	10		
XANBD 1512	R0.75	1.45	3	12		
XANBD 1516	R0.75	1.45	3	16		
XANBD 2008	R1	1.92	4	8		
XANBD 2012	R1	1.92	4	12	60	6
XANBD 2014	R1	1.92	4	14		
XANBD 2020	R1	1.92	4	20		
XANBD 3012	R1.5	2.90	6	12		
XANBD 3016	R1.5	2.90	6	16		
XANBD 3020	R1.5	2.90	6	20		
XANBD 3025	R1.5	2.90	6	25		
XANBD 4010	R2	3.88	8	10		
XANBD 4012	R2	3.88	8	12		
XANBD 4016	R2	3.88	8	16	75	
XANBD 4020	R2	3.88	8	20		
XANBD 4025	R2	3.88	8	25		

unit:mm



XANBC Ball Nose End Mills

Aluminum Cutting



Type No.	Diameter	Neck Dia	Flute Length	Effective Length	O.A.L.	Shank Dia
	D1		L1	L2	L3	D2
XANBC 1004	R0.5	0.95	2	4	50	4
XANBC 1006	R0.5	0.95	2	6		
XANBC 1010	R0.5	0.95	2	10		
XANBC 1012	R0.5	0.95	2	12		
XANBC 1016	R0.5	0.95	2	16		
XANBC 1506	R0.75	1.45	3	6		
XANBC 1510	R0.75	1.45	3	10		
XANBC 1512	R0.75	1.45	3	12		
XANBC 1516	R0.75	1.45	3	16		
XANBC 2008	R1	1.92	4	8		
XANBC 2012	R1	1.92	4	12	60	6
XANBC 2014	R1	1.92	4	14		
XANBC 2020	R1	1.92	4	20		
XANBC 3012	R1.5	2.90	6	12		
XANBC 3016	R1.5	2.90	6	16		
XANBC 3020	R1.5	2.90	6	20		
XANBC 3025	R1.5	2.90	6	25		
XANBC 4010	R2	3.88	8	10		
XANBC 4012	R2	3.88	8	12		
XANBC 4016	R2	3.88	8	16	75	
XANBC 4020	R2	3.88	8	20		
XANBC 4025	R2	3.88	8	25		

unit:mm



XDRES End Mill Shank-Solid Carbide High Speed Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia	
	D1	L1	L3	D2	
XDRES020	2.0	13	44	3	
XDRES021	2.1	13			
XDRES022	2.2	13			
XDRES023	2.3	13			
XDRES024	2.4	15	46		
XDRES025	2.5	15			
XDRES026	2.6	15			
XDRES027	2.7	15			
XDRES028	2.8	17	48		
XDRES029	2.9	17			
XDRES030	3.0	17			
XDRES031	3.1	19			
XDRES032	3.2	19	50	4	
XDRES033	3.3	19			
XDRES034	3.4	21			
XDRES035	3.5	21	52		
XDRES036	3.6	21			
XDRES037	3.7	21			
XDRES038	3.8	21			
XDRES039	3.9	21			
XDRES040	4.0	21			
XDRES041	4.1	21			
XDRES042	4.2	21	63		6
XDRES043	4.3	21			
XDRES044	4.4	25			
XDRES045	4.5	25	68		
XDRES046	4.6	25			
XDRES047	4.7	25			
XDRES048	4.8	27			
XDRES049	4.9	27	70		
XDRES050	5.0	27			
XDRES051	5.1	27			
XDRES052	5.2	27			
XDRES053	5.3	27			
XDRES054	5.4	29	72	8	
XDRES055	5.5	29			
XDRES056	5.6	29			
XDRES057	5.7	29			
XDRES058	5.8	29			
XDRES059	5.9	29			
XDRES060	6.0	29			
XDRES061	6.1	32	75		
XDRES062	6.2	32			
XDRES063	6.3	32			
XDRES064	6.4	32			
XDRES065	6.5	32			
XDRES066	6.6	32			
XDRES067	6.7	32			
XDRES068	6.8	35	78		
XDRES069	6.9	35			
XDRES070	7.0	35			
XDRES071	7.1	35			
XDRES072	7.2	35			
XDRES073	7.3	35			
XDRES074	7.4	35			
XDRES075	7.5	35			

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XDRES076	7.6	35	78	8
XDRES077	7.7	35		
XDRES078	7.8	35		
XDRES079	7.9	35		
XDRES080	8.0	35		
XDRES081	8.1	38	87	10
XDRES082	8.2	38		
XDRES083	8.3	38		
XDRES084	8.4	38		
XDRES085	8.5	38		
XDRES086	8.6	41	90	
XDRES087	8.7	41		
XDRES088	8.8	41		
XDRES089	8.9	41		
XDRES090	9.0	41		
XDRES091	9.1	41	90	
XDRES092	9.2	41		
XDRES093	9.3	41		
XDRES094	9.4	41		
XDRES095	9.5	41		
XDRES096	9.6	44	93	
XDRES097	9.7	44		
XDRES098	9.8	44		
XDRES099	9.9	44		
XDRES100	10.0	44		
XDRES101	10.1	44	100	
XDRES102	10.2	44		
XDRES103	10.3	44		
XDRES104	10.4	44		
XDRES105	10.5	44		
XDRES106	10.6	44	100	
XDRES107	10.7	48		
XDRES108	10.8	48		
XDRES109	10.9	48		
XDRES110	11.0	48		
XDRES111	11.1	48	104	
XDRES112	11.2	48		
XDRES113	11.3	48		
XDRES114	11.4	48		
XDRES115	11.5	48		
XDRES116	11.6	48	104	
XDRES117	11.7	48		
XDRES118	11.8	48		
XDRES119	11.9	48		
XDRES120	12.0	48		
XDRES121	12.1	50	105	
XDRES122	12.2	50		
XDRES123	12.3	50		
XDRES124	12.4	50		
XDRES125	12.5	50		
XDRES126	12.6	50	105	
XDRES127	12.7	50		
XDRES128	12.8	50		
XDRES129	12.9	50		
XDRES130	13.0	50		



XDRS

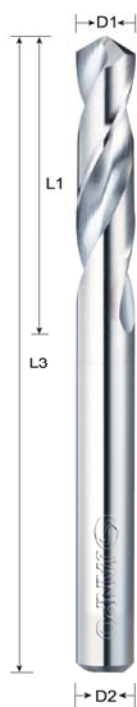
TiAlN Solid Carbide Stud Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.
	D1	L1	L3
XDRS010	1.0	6	26
XDRS011	1.1	7	28
XDRS012	1.2	8	30
XDRS013	1.3		
XDRS014	1.4	9	32
XDRS015	1.5		
XDRS016	1.6	10	34
XDRS017	1.7		
XDRS018	1.8	11	36
XDRS019	1.9		
XDRS020	2.0	12	38
XDRS021	2.1		
XDRS022	2.2	13	40
XDRS023	2.3		
XDRS024	2.4	14	43
XDRS025	2.5		
XDRS026	2.6		
XDRS027	2.7		
XDRS028	2.8	16	46
XDRS029	2.9		
XDRS030	3.0		
XDRS031	3.1		
XDRS032	3.2	18	49
XDRS033	3.3		
XDRS034	3.4		
XDRS035	3.5	20	52
XDRS036	3.6		
XDRS037	3.7		
XDRS038	3.8		
XDRS039	3.9		
XDRS040	4.0	22	55
XDRS041	4.1		
XDRS042	4.2		
XDRS043	4.3		
XDRS044	4.4	24	58
XDRS045	4.5		
XDRS046	4.6		
XDRS047	4.7		
XDRS048	4.8		
XDRS049	4.9		
XDRS050	5.0	26	62
XDRS051	5.1		
XDRS052	5.2		
XDRS053	5.3		
XDRS054	5.4		
XDRS055	5.5		
XDRS056	5.6	28	66
XDRS057	5.7		
XDRS058	5.8		
XDRS059	5.9		
XDRS060	6.0		
XDRS061	6.1		
XDRS062	6.2	31	70
XDRS063	6.3		
XDRS064	6.4		
XDRS065	6.5		

Type No.	Diameter	Flute Length	O.A.L.
	D1	L1	L3
XDRS066	6.6	31	70
XDRS067	6.7		
XDRS068	6.8		
XDRS069	6.9		
XDRS070	7.0		
XDRS071	7.1	34	74
XDRS072	7.2		
XDRS073	7.3		
XDRS074	7.4		
XDRS075	7.5		
XDRS076	7.6		
XDRS077	7.7		
XDRS078	7.8		
XDRS079	7.9		
XDRS080	8.0	37	79
XDRS081	8.1		
XDRS082	8.2		
XDRS083	8.3		
XDRS084	8.4		
XDRS085	8.5		
XDRS086	8.6		
XDRS087	8.7		
XDRS088	8.8		
XDRS089	8.9		
XDRS090	9.0	40	84
XDRS091	9.1		
XDRS092	9.2		
XDRS093	9.3		
XDRS094	9.4		
XDRS095	9.5		
XDRS096	9.6		
XDRS097	9.7		
XDRS098	9.8		
XDRS099	9.9		
XDRS100	10.0		
XDRS101	10.1	43	89
XDRS102	10.2		
XDRS103	10.3		
XDRS104	10.4		
XDRS105	10.5		
XDRS106	10.6		
XDRS107	10.7		
XDRS108	10.8		
XDRS109	10.9		
XDRS110	11.0		
XDRS111	11.1		
XDRS112	11.2	47	95
XDRS113	11.3		
XDRS114	11.4		
XDRS115	11.5		
XDRS116	11.6		
XDRS117	11.7		
XDRS118	11.8		
XDRS119	11.9		
XDRS120	12.0		
XDRS121	12.1		
XDRS122	12.2		
XDRS123	12.3	51	102
XDRS124	12.4		
XDRS125	12.5		
XDRS126	12.6		
XDRS127	12.7		
XDRS128	12.8		
XDRS129	12.9		
XDRS130	13.0		



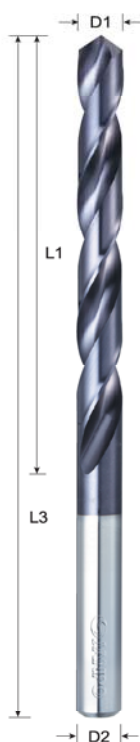
XDRA Solid Carbide Stud Drills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3
XDRA010	1.0	6	26
XDRA011	1.1	7	28
XDRA012	1.2	8	30
XDRA013	1.3		
XDRA014	1.4	9	32
XDRA015	1.5		
XDRA016	1.6	10	34
XDRA017	1.7		
XDRA018	1.8	11	36
XDRA019	1.9		
XDRA020	2.0	12	38
XDRA021	2.1		
XDRA022	2.2	13	40
XDRA023	2.3		
XDRA024	2.4	14	43
XDRA025	2.5		
XDRA026	2.6		
XDRA027	2.7		
XDRA028	2.8	16	46
XDRA029	2.9		
XDRA030	3.0		
XDRA031	3.1		
XDRA032	3.2	18	49
XDRA033	3.3		
XDRA034	3.4		
XDRA035	3.5	20	52
XDRA036	3.6		
XDRA037	3.7		
XDRA038	3.8		
XDRA039	3.9		
XDRA040	4.0	22	55
XDRA041	4.1		
XDRA042	4.2		
XDRA043	4.3		
XDRA044	4.4	24	58
XDRA045	4.5		
XDRA046	4.6		
XDRA047	4.7		
XDRA048	4.8		
XDRA049	4.9		
XDRA050	5.0	26	62
XDRA051	5.1		
XDRA052	5.2		
XDRA053	5.3		
XDRA054	5.4		
XDRA055	5.5		
XDRA056	5.6		
XDRA057	5.7	28	66
XDRA058	5.8		
XDRA059	5.9		
XDRA060	6.0		
XDRA061	6.1		
XDRA062	6.2	31	70
XDRA063	6.3		
XDRA064	6.4		
XDRA065	6.5		

Type No.	Diameter D1	Flute Length L1	O.A.L. L3
XDRA066	6.6	31	70
XDRA067	6.7		
XDRA068	6.8		
XDRA069	6.9		
XDRA070	7.0		
XDRA071	7.1	34	74
XDRA072	7.2		
XDRA073	7.3		
XDRA074	7.4		
XDRA075	7.5		
XDRA076	7.6		
XDRA077	7.7		
XDRA078	7.8		
XDRA079	7.9		
XDRA080	8.0	37	79
XDRA081	8.1		
XDRA082	8.2		
XDRA083	8.3		
XDRA084	8.4		
XDRA085	8.5		
XDRA086	8.6		
XDRA087	8.7		
XDRA088	8.8		
XDRA089	8.9		
XDRA090	9.0	40	84
XDRA091	9.1		
XDRA092	9.2		
XDRA093	9.3		
XDRA094	9.4		
XDRA095	9.5		
XDRA096	9.6		
XDRA097	9.7		
XDRA098	9.8		
XDRA099	9.9		
XDRA100	10.0		
XDRA101	10.1	43	89
XDRA102	10.2		
XDRA103	10.3		
XDRA104	10.4		
XDRA105	10.5		
XDRA106	10.6		
XDRA107	10.7		
XDRA108	10.8		
XDRA109	10.9		
XDRA110	11.0		
XDRA111	11.1		
XDRA112	11.2	47	95
XDRA113	11.3		
XDRA114	11.4		
XDRA115	11.5		
XDRA116	11.6		
XDRA117	11.7		
XDRA118	11.8		
XDRA119	11.9		
XDRA120	12.0		
XDRA121	12.1		
XDRA122	12.2		
XDRA123	12.3	51	102
XDRA124	12.4		
XDRA125	12.5		
XDRA126	12.6		
XDRA127	12.7		
XDRA128	12.8		
XDRA129	12.9		
XDRA130	13.0		



XDRSF TiAlN Solid Carbide Straight Shank Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.
	D1	L1	L3
XDRSF010	1.0	12	34
XDRSF011	1.1		36
XDRSF012	1.2		38
XDRSF013	1.3	16	40
XDRSF014	1.4		42
XDRSF015	1.5		44
XDRSF016	1.6	20	46
XDRSF017	1.7		48
XDRSF018	1.8		50
XDRSF019	1.9	22	52
XDRSF020	2.0		54
XDRSF021	2.1		56
XDRSF022	2.2	24	58
XDRSF023	2.3		60
XDRSF024	2.4		62
XDRSF025	2.5	27	64
XDRSF026	2.6		66
XDRSF027	2.7		68
XDRSF028	2.8	30	70
XDRSF029	2.9		72
XDRSF030	3.0		74
XDRSF031	3.1	33	76
XDRSF032	3.2		78
XDRSF033	3.3		80
XDRSF034	3.4	36	82
XDRSF035	3.5		84
XDRSF036	3.6		86
XDRSF037	3.7	39	88
XDRSF038	3.8		90
XDRSF039	3.9		92
XDRSF040	4.0	43	94
XDRSF041	4.1		96
XDRSF042	4.2		98
XDRSF043	4.3	47	100
XDRSF044	4.4		102
XDRSF045	4.5		104
XDRSF046	4.6	52	106
XDRSF047	4.7		108
XDRSF048	4.8		110
XDRSF049	4.9	57	112
XDRSF050	5.0		114
XDRSF051	5.1		116
XDRSF052	5.2	63	118
XDRSF053	5.3		120
XDRSF054	5.4		122
XDRSF055	5.5	69	124
XDRSF056	5.6		126
XDRSF057	5.7		128
XDRSF058	5.8	75	130
XDRSF059	5.9		132
XDRSF060	6.0		134
XDRSF061	6.1	81	136
XDRSF062	6.2		138
XDRSF063	6.3		140
XDRSF064	6.4	87	142
XDRSF065	6.5		144

Type No.	Diameter	Flute Length	O.A.L.
	D1	L1	L3
XDRSF066	6.6	63	101
XDRSF067	6.7		103
XDRSF068	6.8		105
XDRSF069	6.9	69	109
XDRSF070	7.0		
XDRSF071	7.1		
XDRSF072	7.2		
XDRSF073	7.3		
XDRSF074	7.4		
XDRSF075	7.5		
XDRSF076	7.6	75	117
XDRSF077	7.7		
XDRSF078	7.8		
XDRSF079	7.9		
XDRSF080	8.0		
XDRSF081	8.1		
XDRSF082	8.2		
XDRSF083	8.3		
XDRSF084	8.4		
XDRSF085	8.5		
XDRSF086	8.6	81	125
XDRSF087	8.7		
XDRSF088	8.8		
XDRSF089	8.9		
XDRSF090	9.0		
XDRSF091	9.1		
XDRSF092	9.2		
XDRSF093	9.3		
XDRSF094	9.4		
XDRSF095	9.5		
XDRSF096	9.6	87	133
XDRSF097	9.7		
XDRSF098	9.8		
XDRSF099	9.9		
XDRSF100	10.0		
XDRSF101	10.1		
XDRSF102	10.2		
XDRSF103	10.3		
XDRSF104	10.4		
XDRSF105	10.5		
XDRSF106	10.6	94	142
XDRSF107	10.7		
XDRSF108	10.8		
XDRSF109	10.9		
XDRSF110	11.0		
XDRSF111	11.1		
XDRSF112	11.2		
XDRSF113	11.3		
XDRSF114	11.4		
XDRSF115	11.5		
XDRSF116	11.6	101	151
XDRSF117	11.7		
XDRSF118	11.8		
XDRSF119	11.9		
XDRSF120	12.0		
XDRSF121	12.1		
XDRSF122	12.2		
XDRSF123	12.3		
XDRSF124	12.4		
XDRSF125	12.5		
XDRSF126	12.6	107	157
XDRSF127	12.7		
XDRSF128	12.8		
XDRSF129	12.9		
XDRSF130	13.0	114	164
XDRSF131	13.1		



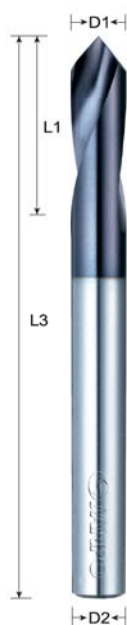
XDRAF Solid Carbide Straight Shank Drills



unit:mm

Type No.	Diameter D1	Flute Length L1	O.A.L. L3
XDRAF010	1.0	12	34
XDRAF011	1.1		36
XDRAF012	1.2	16	38
XDRAF013	1.3		
XDRAF014	1.4	18	40
XDRAF015	1.5		
XDRAF016	1.6	20	43
XDRAF017	1.7		
XDRAF018	1.8	22	46
XDRAF019	1.9		
XDRAF020	2.0	24	49
XDRAF021	2.1		
XDRAF022	2.2	27	53
XDRAF023	2.3		
XDRAF024	2.4	30	57
XDRAF025	2.5		
XDRAF026	2.6		
XDRAF027	2.7	33	61
XDRAF028	2.8		
XDRAF029	2.9		
XDRAF030	3.0		
XDRAF031	3.1	36	65
XDRAF032	3.2		
XDRAF033	3.3		
XDRAF034	3.4	39	70
XDRAF035	3.5		
XDRAF036	3.6		
XDRAF037	3.7		
XDRAF038	3.8	43	75
XDRAF039	3.9		
XDRAF040	4.0		
XDRAF041	4.1	47	80
XDRAF042	4.2		
XDRAF043	4.3		
XDRAF044	4.4		
XDRAF045	4.5		
XDRAF046	4.6	52	86
XDRAF047	4.7		
XDRAF048	4.8		
XDRAF049	4.9		
XDRAF050	5.0		
XDRAF051	5.1	57	93
XDRAF052	5.2		
XDRAF053	5.3		
XDRAF054	5.4		
XDRAF055	5.5		
XDRAF056	5.6		
XDRAF057	5.7		
XDRAF058	5.8		
XDRAF059	5.9		
XDRAF060	6.0		
XDRAF061	6.1	63	101
XDRAF062	6.2		
XDRAF063	6.3		
XDRAF064	6.4		
XDRAF065	6.5		

Type No.	Diameter D1	Flute Length L1	O.A.L. L3
XDRAF066	6.6	63	101
XDRAF067	6.7		
XDRAF068	6.8		
XDRAF069	6.9		
XDRAF070	7.0		
XDRAF071	7.1	69	109
XDRAF072	7.2		
XDRAF073	7.3		
XDRAF074	7.4		
XDRAF075	7.5		
XDRAF076	7.6		
XDRAF077	7.7		
XDRAF078	7.8		
XDRAF079	7.9		
XDRAF080	8.0	75	117
XDRAF081	8.1		
XDRAF082	8.2		
XDRAF083	8.3		
XDRAF084	8.4		
XDRAF085	8.5		
XDRAF086	8.6		
XDRAF087	8.7		
XDRAF088	8.8		
XDRAF089	8.9		
XDRAF090	9.0	81	125
XDRAF091	9.1		
XDRAF092	9.2		
XDRAF093	9.3		
XDRAF094	9.4		
XDRAF095	9.5		
XDRAF096	9.6		
XDRAF097	9.7		
XDRAF098	9.8		
XDRAF099	9.9		
XDRAF100	10.0		
XDRAF101	10.1	87	133
XDRAF102	10.2		
XDRAF103	10.3		
XDRAF104	10.4		
XDRAF105	10.5		
XDRAF106	10.6		
XDRAF107	10.7		
XDRAF108	10.8		
XDRAF109	10.9		
XDRAF110	11.0		
XDRAF111	11.1		
XDRAF112	11.2	94	142
XDRAF113	11.3		
XDRAF114	11.4		
XDRAF115	11.5		
XDRAF116	11.6		
XDRAF117	11.7		
XDRAF118	11.8		
XDRAF119	11.9		
XDRAF120	12.0		
XDRAF121	12.1		
XDRAF122	12.2		
XDRAF123	12.3		
XDRAF124	12.4	101	151
XDRAF125	12.5		
XDRAF126	12.6		
XDRAF127	12.7		
XDRAF128	12.8		
XDRAF129	12.9		
XDRAF130	13.0		

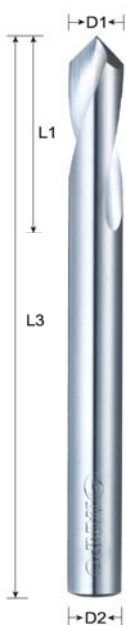


XSDA90 90° Solid Carbide NC Spotting Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XSDA90 030	3	10	45	3
XSDA90 040	4	12	50	4
XSDA90 050	5	15		5
XSDA90 060	6	20	60	6
XSDA90 080	8	25	75	8
XSDA90 100	10	25		10
XSDA90 120	12	30		12
XSDA90 160	16	35	100	16

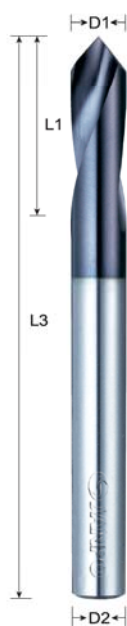


XSD90 90° Solid Carbide NC Spotting Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XSD90 030	3	10	45	3
XSD90 040	4	12	50	4
XSD90 050	5	15		5
XSD90 060	6	20	60	6
XSD90 080	8	25	75	8
XSD90 100	10	25		10
XSD90 120	12	30		12
XSD90 160	16	35	100	16

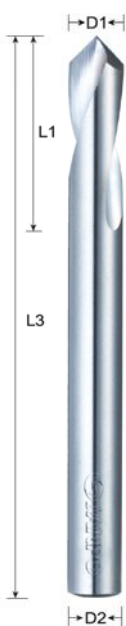


XSDA120 120° Solid Carbide NC Spotting Drills



unit:mm

Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XSDA120 030	3	10	45	3
XSDA120 040	4	12	50	4
XSDA120 050	5	15		5
XSDA120 060	6	20	60	6
XSDA120 080	8	25	75	8
XSDA120 100	10	25		10
XSDA120 120	12	30		12
XSDA120 160	16	35	100	16



XSD120 120° Solid Carbide NC Spotting Drills



unit:mm

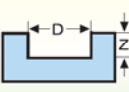
Type No.	Diameter	Flute Length	O.A.L.	Shank Dia
	D1	L1	L3	D2
XSD120 030	3	10	45	3
XSD120 040	4	12	50	4
XSD120 050	5	15		5
XSD120 060	6	20	60	6
XSD120 080	8	25	75	8
XSD120 100	10	25		10
XSD120 120	12	30		12
XSD120 160	16	35	100	16

Recommended Cutting Conditions

List of recommended milling conditions:

SEA-2T / SEAB-2T / UEA-2T

Work Material	Carbon Steels S45C, S50C HB225		Alloy Steels SK, SCM, SUS HB225-325		Prehardened Steels NAK, SKD HRC30-45		Hardened Steels SKD11, 61, SKT HRC45-55	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
1	20000	125	15000	120	12000	65	7100	30
2	11000	130	8500	120	6400	70	4000	40
3	7400	195	6400	145	4500	80	2800	45
4	5900	230	5000	190	3500	90	2150	50
5	5300	310	4200	230	2950	90	1850	55
6	4400	305	3500	230	2450	100	1500	55
8	3300	290	2600	230	1850	95	1200	50
10	2600	275	2100	225	1450	95	950	50
12	2200	275	1750	225	1200	90	800	45



Slot Milling
 $D \leq \phi 1$, $Z = 0.1D$
 $\phi 1 \leq D < \phi 3$, $Z = 0.3D$
 $\phi 3 \leq D$, $Z = 0.5D$

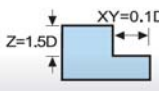
$D < \phi 1$,
 $Z = 0.01D$
 $\phi 1 \leq D < \phi 3$,
 $Z = 0.02D$
 $\phi 3 \leq D$,
 $Z = 0.05D$

List of recommended milling conditions:

SEA-4T / SEAB-4T / UEA-4T SHP-4T / UHP-4T

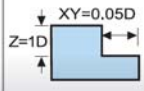
Work Material	HRC20-30		HRC30-48		HRC48-58		HRC58-62	
Velocity	V=170m/min		V=110m/min		V=80m/min		V=50m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
2	26500	850	17500	560	12800	410	8000	250
3	18000	720	11500	465	8500	340	3200	130
4	13500	810	8800	525	6350	380	2400	145
5	11000	650	7000	420	5100	305	1900	115
6	9000	720	5800	465	4250	340	1600	130
8	6800	675	4400	440	3200	320	1200	120
10	5400	755	3500	490	2500	355	1000	140
12	4500	720	2900	465	2100	340	800	130
16	3400	745	2200	480	1600	350	600	130
20	2700	745	1750	480	1280	350	320	130

Side Milling



$Z = 1.5D$
 $XY = 0.1D$

Side Milling



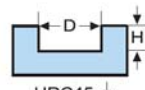
$XY = 0.05D$
 $Z = 1D$

List of recommended milling conditions:

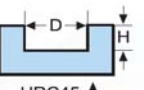
URA / URT

Work Material	Carbon Steels, Alloy Steels S45C, FC, FCD, SCM, S50C, SKS		Alloy Steels, Tool Steels SCr, SNCM, SKD11, SKD61, NAK80		Hardened Steels SKD11	
Hardness	~HRC30		~HRC50		~HRC60	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
3	7600	180	4800	120	2900	50
4	6500	260	4000	160	2500	55
5	5500	270	3200	160	2000	60
6	4800	300	2900	170	1800	70
8	3700	325	2200	170	1500	85
10	2900	280	1700	140	1100	70
12	2400	230	1400	120	1000	65
16	1800	170	1100	90	700	45

Depth of Cut



$H \leq 0.3D$
 HRC45 ↓



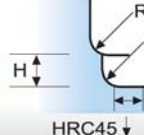
$H \leq 0.15D$
 HRC45 ↑

List of recommended milling conditions:

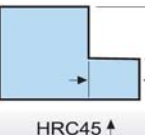
URB / URX

Work Material	Carbon Steels, Alloy Steels S45C, FC, FCD, SCM, S50C, SKS		Alloy Steels, Tool Steels SCr, SNCM, SKD11, SKD61, NAK80		Hardened Steels SKD11	
Hardness	~HRC30		~HRC50		~HRC60	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
2	26000	1600	16500	1000	7500	300
3	19000	1800	12000	1200	5400	360
4	16000	3200	10000	1900	4800	480
5	14000	3300	8000	2000	3800	500
6	12000	3600	7200	2200	3500	650
8	9600	4000	5600	2200	2700	750
10	7000	3400	4400	1700	2100	650
12	6000	2800	3600	1400	1800	600
16	4500	2000	2800	1000	1400	450

Depth of Cut



$H \leq 0.02R$
 $P \leq 0.02R$
 HRC45 ↓



$H \leq 0.1D$
 $W \leq 0.02D$
 HRC45 ↑

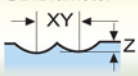
List of recommended milling conditions:

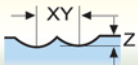
SBNB / UBN

Work Material		S50C. PX5. SKD11. HPM-1. NAK55				
Radius	Effective Length	Speed (mm· ⁻¹)	Feed (mm/mim)	Long Neck Milling (mm/per time)	Feed (mm/mim)	3D Milling (mm/per time)
R0.5	6L	12800-30000	300-800	0.01-0.05	800-1200	0.1-0.3
	8L					
	10L					
	12L					
R0.75	8L	8500-30000		0.02-0.10	800-1200	0.1-0.4
	12L					
	16L					
	20L					
R1	8L	6400-30000		0.02-0.30	800-2000	0.1-0.4
	12L					
	16L					
	20L					
R1.5	8L	4200-20000		0.02-0.30	800-2000	0.1-0.4
	10L					
	16L					
	20L					
R2	25L	3200-15000		0.02-0.30	800-1500	0.1-0.5
	30L					
	10L					
	15L					
	20L					

List of recommended milling conditions:

SBM / UBM / SBMB

Work Material	Carbon Steels S45C, S50C HB150-250		Alloy Steels SCM, PD55, PD53 HRC20-35		Prehardened Steels NAK80, SKD11 HRC35-45		Hardened Steels SKD61 HBC45-55	
Velocity	V=80-120m/min		V=60-100m/min		V=40-80m/min		V=40m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
R0.1	30000	500-700	30000	450-600	25000	300-600	20000	200-400
R0.15	30000	500-700	30000	450-600	25000		20000	
R0.2	30000	600-800	30000	500-700	25000		20000	
R0.25	30000	600-800	30000	500-700	25000		20000	
R0.3	25000	800-1000	25000	600-1000	20000		18000	
R0.35	25000	800-1000	25000	600-1000	20000		18000	
R0.4	20000	800-1000	20000	600-1000	20000		18000	
R0.5	20000	800-1000	20000	600-1000	20000		18000	
■ D: Diameter  ■ (Z) HRC45 below 0.05-0.15R HRC50 below 0.05-0.15R ■ (Z) HRC45 below 0.05-0.15R HRC50 below 0.05-0.08R								

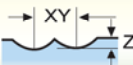
Work Material	Copper		HRC20-30		HRC30-48	
Velocity	V=230m/min		V=100m/min		V=70m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
R0.15	60000	600	60000	600	60000	500
R0.2	60000	600	60000	600	45000	500
R0.25	60000	600	45000	600	45000	500
R0.3	60000	1000	45000	900	32000	600
R0.35	60000	1200	45000	950	32000	650
R0.4	60000	1200	36000	950	25000	650
R0.5	60000	1800	32000	950	18500	650
R0.75	49000	1800	21000	850	15000	550
R1	36500	1800	16000	850	11000	550
R1.5	24000	1800	10000	850	7400	550
R2	18000	1800	8000	850	5500	550
■ D: Diameter						
	XY=0.1D Z=0.01D		XY=0.1D Z=0.01D		XY=0.1D Z=0.01D	

List of recommended milling conditions:

UBH-2T / UBI-2T

Work Material	HRC30-50		HRC50-55		HRC55-62	
Velocity	V=380m/min		V=300m/min		V=150m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
R1	15000	1000	15000	875	15000	750
R1.5	15000	1500	15000	1200	12000	660
R2	15000	1500	15000	1250	10000	600
R2.5	15000	1500	15000	1300	9000	580
R3	15000	1500	15000	1300	8000	550
R4	15000	1500	12000	1000	6000	420
R5	12500	1250	9500	800	4800	340
R6	10000	1000	8000	700	4000	280

D: Diameter



XY=0.2D

Z=0.05D

List of recommended milling conditions:

SBA-2T / SBAB-2T / UBA-2T

Work Material	NAK80 HRC40					
Velocity	V=376m/min		V=250m/min		V=188m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
R1	40000	2000	40000	2000	30000	2000
R1.5	30000	2000	26000	2000	20000	2000
R2	25000	4800	20000	3200	15000	2400
R3	20000	6000	13000	4800	10000	4000
R4	15000	4500	10000	4000	7500	3300
R5	12000	4000	8000	3600	6000	2200
R6	10000	3500	6600	2400	5000	1800

	XY=0.3D Z=0.05D	XY=0.5D Z=0.1D	XY=0.6D Z=0.1D
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Work Material	Hardened Steels SKD61 HRC52					
Velocity	V=376m/min		V=250m/min		V=188m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
R1	20000	2000	15000	1200	10000	1000
R1.5	20000	2000	15000	1200	10000	1000
R2	20000	2000	15000	1200	10000	1000
R3	20000	6000	13000	4500	6400	1500
R4	15000	4000	10000	3600	4800	1500
R5	12000	4000	8000	3200	3800	1500
R6	10000	3600	6600	1800	3200	1500
						
	XY=0.1D Z=0.02D		XY=0.15D Z=0.04D		XY=0.2D Z=0.04D	

Recommended Cutting Conditions

List of recommended milling conditions:

UBJ-2T

Work Material	Carbon Steels S45C, S50C HB150-250		Alloy Steels SCM, P20, PD55, PD53 HRC20-35		Prehardened Steels NAK80 HRC35-48		Hardened Steels SKD61 HRC48-60	
Radius	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
R5	4400	990	3650	640	2950	510	1830	260
R6	3700	990	3050	720	2500	540	1530	300
R8	2800	1080	2300	720	1850	540	1150	270
R10	2200	1080	1850	720	14500	540	750	270

■ D: Diameter



XY=0.1D

Z=0.03D

List of recommended milling conditions:

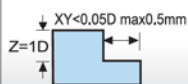
UEA-6T

Work Material	Carbon Steels Alloy Steels <HRC50		Hardened Steels HRC50-60		Hardened Steels >HRC60	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	16000	5800	8000	2900	4000	1400
8	12000	5800	6000	2900	3000	1400
10	9500	5700	4800	2900	2400	1400
12	8000	4800	4000	2400	2000	1200
16	6000	3600	3000	1800	1500	900

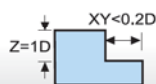
■ D: Diameter



Z=1-1.5D



Z=1D



Z=1D

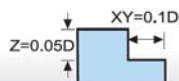
List of recommended milling conditions:

URV

Work Material	HRC40-80		HRC48-55		HRC55-65	
Velocity	V=160m/min		V=140m/min		V=110m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	8500	5100	7400	4450	5800	3000
8	6400	4400	5580	3800	4400	2600
10	5100	3800	4450	3350	3500	2300
12	4250	3450	3700	3000	2900	2100
16	3200	3200	2800	2800	2200	2200

■ D: Diameter

■ Side Milling



XY=0.1D

Z=0.05D

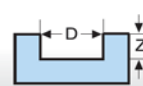
List of recommended milling conditions:

SEM / SEMB / UEM

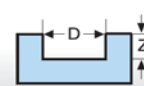
Work Material	Carbon Steels S45C, S50C HB150-250		Alloy Steels SCM, P20, PD55, PD53, SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
Velocity	V=80-120m/min		V=60-100m/min		V=40-80m/min		V=40m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
0.2	30000	90	30000	80	30000	40	20000	25
0.3	30000	100	30000	80	30000	60	16500	25
0.4	25000	110	25000	90	25000	65	12500	25
0.5	25000	110	25000	90	25000	65	10000	25
0.6	25000	110	25000	90	25000	65	8500	25
0.7	25000	110	25000	90	25000	65	6500	25
0.8	25000	110	25000	90	25000	65	6500	25
1	20000	120	15000	100	13000	70	6000	30
1.2	20000	120	15000	100	13000	70	5000	30
1.5	15000	120	10000	100	8500	70	4500	35
1.6	15000	120	10000	100	8500	70	4500	35
1.8	11000	120	7500	110	6800	80	4000	35
2	11000	130	7500	110	6800	80	4000	40
2.5	9000	150	6500	110	6000	80	3500	40
3	7500	195	6000	110	5500	80	2800	40

■ D: Diameter

D ≤ Ø1
Z=0.1D
Ø1 ≤ D < Ø3
Z=0.3D



D ≤ Ø1
Z=0.1D
Ø1 ≤ D < Ø3
Z=0.3D

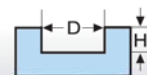


List of recommended milling conditions:

SNEB / UNE

Work Material	Alloy Steels, Tool Steels, Hardened Steels S45C, SCM, S50C, SCr, SNCM, SKD11, SKD61, NAK80		
Diameter	Effective Length	Speed (mm ⁻¹)	Feed (mm/min)
1	4	30000	2200
	6		2200
	8		2200
	10		2200
1.5	4	25000	1800
	6		1800
	8		1800
	10		1800
2	4	20000	1500
	6		1500
	8		1500
	10		1500
3	4	12000	900
	6		900
	8		900
	10		900
4	4	9000	850
	6		850
	8		850
	10		850

Depth of Cut



List of recommended milling conditions:

XBA-2T / XBT-2T / XBH-2T / XBI-2T XBJ-2T / XBA-4T / XBT-4T

Work Material	Carbon Steels S45C.S50C HB150-250		Alloy Steels SCM.P20.PD55.PD53.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
Velocity	V=100m/min		V=80m/min		V=70m/min		V=40m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
R1	16000		12700		11000		6400	
R1.5	10600		8500		7430		4250	
R2	8000		6400		5650		3200	
R3	5300	400-1000	4200	300-800	3750	200-400	2100	80-250
R4	4000		3200		2800		1600	
R5	3200		2500		2250		1200	
R6	2700		2100		1900		1000	

XY=0.2D
Z=0.1-0.3D

XY=0.2D (Z)
HRC45 below 0.1-0.3D
HRC50 below 0.05-0.02D

List of recommended milling conditions:

XNB

Work Material		S50C.PX-5.SKD11.HPM-1.NAK55 HRC30-40			S50C.PX-5.SKD11.HPM-1.NAK55 HRC30-40					NAK80 HRC40		
Radius	Effective Length	Standard		Cutting Depth	High Speed					Speed	Feed	Cutting Depth
		Speed (mm ⁻¹)	Feed (mm/min)	(mm per time)	Speed (mm ⁻¹)	Feed (mm/min)	Long Neck Milling (mm/per time)	Feed (mm/min)	3d Milling Cutting Depth			
R0.5	6L	30000	800	0.05	28000-30000	300-800	0.01-0.05	800-1200	0.1-0.3	20000	1000	0.05
	8L		800	0.04							1000	0.04
	10L		800	0.02							1000	0.02
	12L		800	0.02							1000	0.02
R0.75	8L	24000	1000	0.1	9500-30000	300-800	0.01-0.15	800-1500	0.1-0.3	16000	2000	0.1
	10L		1000	0.08							2000	0.08
	12L		1000	0.06							2000	0.06
	16L		800	0.04							1600	0.04
R1	20L		800	0.02							1600	0.02
	8L	20000	1200	0.12	6400-30000	300-800	0.01-0.3	800-2000	0.1-0.5	12000	2500	0.2
	10L		1200	0.12							2500	0.2
	12L		1200	0.1							2500	0.16
R1.5	16L		1000	0.06							2000	0.1
	20L		1000	0.06							2000	0.1
	10L	13000	1500	0.2	4200-20000	300-800	0.01-0.3	800-2000	0.1-0.5	10000	2500	0.25
	12L		1500	0.2							2500	0.25
R2	16L		1500	0.16							2500	0.2
	20L		1200	0.16							2000	0.18
	25L		1200	0.1							2000	0.15
	12L	9000	1200	0.2	3200-15000	300-800	0.01-0.3	800-1500	0.1-0.5	8000	1600	0.3
R2	16L		1200	0.2							1600	0.3
	20L		1200	0.2							1600	0.3
	25L		1200	0.16							1600	0.2
	30L		1200	0.16							1600	0.2

List of recommended milling conditions:

XBS / XBMT / XBM

Work Material	Carbon Steels S45C.S50C HB150-250		Alloy Steels SCM.P20.PD55.PD53.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
Velocity	V=100m/min		V=80m/min		V=70m/min		V=40m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
R0.15	32000	450	32000	400	32000	200	25000	140
R0.2	32000	460	32000	410	32000	200	25000	135
R0.25	32000	480	32000	550	32000	230	25000	150
R0.3	32000	530	32000	550	32000	250	25000	160
R0.35	32000	580	32000	580	30000	250	24000	160
R0.4	32000	610	32000	620	28000	280	23500	210
R0.5	32000	750	32000	620	22000	280	19000	210
R0.6	30000	750	30000	620	18500	280	15500	210
R0.7	27000	750	22000	620	15500	280	13500	210
R0.75	25000	750	21000	620	14200	280	12000	210
R0.8	23500	750	19000	620	13500	280	11500	210
R0.9	21000	750	18000	620	12000	280	10500	210
R1.0	19000	750	16000	620	11000	280	9500	210

XY=0.05D
Z=0.2D

XY=0.05D
Z=0.1D

List of recommended milling conditions:

XEMT / XEM

Work Material	Carbon Steels S45C.S50C HB150-250		Alloy Steels SCM.P20.PD55.PD53.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
Velocity	V=80-120m/min		V=60-100m/min		V=40-80m/min		V=40m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
0.2	30000	90	30000	80	30000	40	20000	25
0.3	30000	100	30000	80	30000	60	16500	25
0.4	25000	110	25000	90	25000	65	12500	25
0.5	25000	110	25000	90	25000	65	10000	25
0.6	25000	110	25000	90	25000	65	8500	25
0.7	25000	110	25000	90	25000	65	6500	25
0.8	25000	110	25000	90	25000	65	6500	25
1.0	20000	120	15000	100	13000	70	6000	30
1.2	20000	120	15000	100	13000	70	5000	30
1.4	20000	120	15000	100	13000	70	5000	30
1.5	15000	120	10000	100	8500	70	4500	35
1.6	15000	120	10000	100	8500	70	4500	35
1.8	11000	120	7500	110	6800	80	4000	35
2.0	11000	130	7500	110	6800	80	4000	40
2.5	9000	150	6500	110	6000	80	3500	40
3.0	7500	195	6000	110	5500	80	2800	40

D ≤ Ø1
Z=0.1D
Ø1 ≤ D < Ø3
Z=0.3D

D ≤ Ø1
Z=0.1D
Ø1 ≤ D < Ø3
Z=0.3D

List of recommended milling conditions:

XNE

Work Material		S50C.NAK.HPM.SUS				
Diameter	Effective Length	Standard		High Speed		Speed (mm/s)
		Speed (mm/s)	Feed (mm/min)	Speed (mm/s)	Feed (mm/min)	
1	6L	16000		24000	2000	0.06
	8L			24000	2000	0.04
	10L			24000	2000	0.03
	12L			24000	2000	0.02
1.5	8L	12000	450	16000	1400	0.12
	10L			16000	1400	0.08
	12L			16000	1400	0.05
	16L			16000	1400	0.02
2	10L	8000		12000	1000	0.20
	12L			12000	1000	0.15
	16L			8000	700	0.08
	20L			8000	650	0.04
2.5	10L	6600		10000	800	0.25
	12L			8000	600	0.20
	16L			5000	400	0.15
	20L			4000	400	0.10
3	10L	5600		8000	680	0.30
	12L			8000	680	0.30
	16L			5500	450	0.25
	20L			4000	350	0.25
	25L			3200	260	0.20

Recommended Cutting Conditions

List of recommended milling conditions:

XEA-2T / XET-2T
XEH-2T / XEI-2T / XEJ-2T

Work Material	Mild Steels, Carbon Steels, Cast Iron, S5400, S55C, FC250/750N/mm ²				Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD1-3/38HRC		Stainless Steels, Prehardened Steels, SKT, SKD, NAK55, HPM30-38HRC		Stainless Steels, Prehardened Steels, SUS304, SKD, NAK80, HPM50/38-45HRC		Hardened Steels, (45-55HRC), Heat Resistant, Alloy Steels		Hardened Steels, (55-60HRC)	
	Diameter	Speed (mm ³ /min)	Feed (mm/min)	Speed (mm ³ /min)	Feed (mm/min)	Speed (mm ³ /min)	Feed (mm/min)	Speed (mm ³ /min)	Feed (mm/min)	Speed (mm ³ /min)	Feed (mm/min)	Speed (mm ³ /min)	Feed (mm/min)	
1	19500	130	14500	125	12500	90	11000	65	7000	30	5050	25		
1.5	14000	130	10500	125	8900	90	7950	65	5050	40	3550	25		
2	11000	135	8400	125	7000	90	6350	70	3950	40	2750	25		
2.5	8900	170	7250	135	6000	95	5200	70	3250	40	2300	25		
3	7450	200	7200	230	5850	125	5300	100	3200	45	2100	25		
3.5	6850	225	6200	230	5000	125	4550	100	2750	45	1800	25		
4	6000	235	5400	230	4400	125	4000	100	2400	45	1600	25		
4.5	5650	270	4800	230	3900	125	3550	100	2100	45	1400	25		
5	5300	315	4350	235	3500	130	3200	100	1900	55	1300	30		
5.5	4800	310	3950	235	3250	130	2750	100	1750	55	1150	30		
6	4400	310	3600	235	2900	130	2650	100	1600	55	1050	25		
8	3300	295	2700	235	2200	125	2000	100	1200	50	795	25		
10	2650	280	2150	230	1750	125	1600	95	955	50	635	25		
12	2200	280	1800	230	1450	125	1350	95	795	45	530	20		

Depth of Cut



$D \leq \phi$	Z
$\phi < D$	0.5D

$D \leq \phi$	Z
$\phi < D$	0.2D

$D \leq \phi$	Z
$\phi < D$	0.05D

List of recommended milling conditions:

XEA-4T / XET-4T / XEG-4T
XEH-4T / XEI-4T / XEJ-4T / XHP-4T

Work Material	Carbon Steels S45C,S50C HB150-250		Alloy Steels SCM.SUS(HPM) HBC20-35		Prehardened Steels NAK(HPM) HRC40		Hardened Steels SKD61 HRC50	
Diameter	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
1	21000	400	18000	210	16000	160	9800	110
2	14000	400	9600	250	8000	180	4800	110
3	9500	450	6400	250	5300	200	3200	120
4	7200	550	4800	320	4000	200	2400	120
5	5700	700	3800	350	3200	220	1900	160
6	4800	700	3200	380	2650	220	1600	180
8	3600	600	2400	380	2000	220	1200	180
10	2900	600	1900	380	1600	220	950	180
12	2400	430	1600	300	1300	200	800	150

Side Milling
below Ø3

Side Milling
up to Ø4

Side Milling

Diagram of a stepped cantilever beam. The vertical dimension is labeled $Z=1.5D$ and the horizontal dimension is labeled $XY=0.05D$.

Diagram of an L-shaped cross-section. The vertical leg has a height of $Z = 1.5D$. The horizontal leg has a thickness of $XY = 0.1D$.

Diagram of a stepped cantilever beam cross-section. The top flange has a height $Z = 1D$ and a width $XY = 0.05D$. The web has a height of $2D$. The total height is $3D$.

Work Material	Alloy Steels SCM520(HPM) HRC20-35		Prehardened Steels NAK80(HPM) HRC35-45		Hardened Steels SKD61 HRC45-55	
Velocity	V=170m/min		V=110m/min		V=80m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
3	18000	720	11500	465	8500	340
4	13500	810	8800	525	6400	380
5	10800	650	7000	420	5100	300
6	9000	720	5800	465	4250	340
8	6800	675	4400	440	3200	320
10	5400	755	3500	490	2550	355
12	4500	720	2900	465	2100	340
16	3400	745	2200	480	1600	350

Diagram of an L-shaped cross-section. The vertical leg has a height of $Z = 1.5D$. The horizontal leg has a thickness of $XY = 0.1D$.

List of recommended milling conditions:

XEF-2T

Work Material	Carbon Steels S45C,S50C HB150-250		Alloy Steels SCM(HPM) HRC20-35		Prehardened Steels NAK(HPM) HRC40		Hardened Steels SKD61 HRC50	
Diameter	Speed (mm ⁻¹)	Feed (mm/mm)	Speed (mm ⁻¹)	Feed (mm/mm)	Speed (mm ⁻¹)	Feed (mm/mm)	Speed (mm ⁻¹)	Feed (mm/mm)
2	4800	60	2850	30	2250	20	1650	15
3	3700	60	2250	40	2000	30	1800	20
4	3200	80	1900	50	1700	40	1500	30
5	2850	100	1700	65	1550	50	1350	45
6	2650	120	1600	70	1450	60	1250	55
8	2000	120	1200	70	1100	60	950	55
10	1600	120	950	70	850	60	750	55
12	1300	120	800	70	700	60	600	55

Side Milling

Side Milling

Diagram of a stepped cantilever beam cross-section. The top flange has a height $Z=3D$ and a width $XY=0.02D$. The stem has a width D . The total height is $4D$.

List of recommended milling conditions:

XEF-4T

Work Material	Carbon Steels S45C,S50C HB150-250		Alloy Steels SCM.SUS(HPM) HRC20-35		Prehardened Steels NAK(HPM) HRC40		Hardened Steels SKD61 HBC50	
	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
2	4800	70	2850	40	2250	35	1650	20
3	3700	100	2250	60	2000	50	1800	40
4	3200	150	1900	90	1700	70	1500	50
5	2850	160	1700	100	1550	80	1350	60
6	2650	200	1600	135	1450	100	1250	80
8	2000	200	1200	135	1100	100	950	80
10	1600	200	950	135	850	100	750	80
12	1300	200	800	135	700	100	600	80
16	1000	160	600	90	500	80	450	65
20	800	130	500	80	400	60	350	50

Side Milling

Side Milling

Diagram of an L-shaped cross-section. The vertical leg has a height of $Z=3D$. The horizontal leg has a width of $XY=0.02D$.

List of recommended milling conditions:

XRT-2T / XRL-2T / XRLL-2T

Work Material	Carbon Steels S50C			Alloy Steels SCM.SKD.SUS			Prehardened Steels HPM.NAK			Hardened Steels SKD61 +HRC52		
Velocity	V=60-80m/min			V=50-70m/min			V=30-50m/min			V=20-30m/min		
Diameter	Spindle Speed (mm ³ /min)	Feed (mm/min)		Spindle Speed (mm ³ /min)	Feed (mm/min)		Spindle Speed (mm ³ /min)	Feed (mm/min)		Spindle Speed (mm ³ /min)	Feed (mm/min)	
		Side Milling	Slotting		Side Milling	Slotting		Side Milling	Slotting		Side Milling	Slotting
2	12800	400	150	9600	210	70	6400	110	55	3200	80	40
3	8500	450	160	6400	250	80	4300	120	60	2100	100	50
4	6400	450	160	4800	250	80	3200	120	60	1600	100	50
5	5100	600	200	3800	300	90	2600	150	75	1300	120	60
6	2400	170	70	2100	140	55	1600	110	45	1100	80	30
8	1800	170	70	1600	140	55	1200	110	45	800	80	30
10	1400	170	70	1300	140	55	1000	110	45	650	80	30
12	1200	170	70	1100	140	55	800	110	45	530	80	30

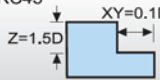
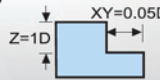
Side Milling

Slotting

- Adjust feed according to inclined angle.
- When corner processing, reduce the feed by approximately 50%-30%.
- When using low speed machine, reduce feed and depth of cut.

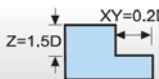
List of recommended milling conditions:

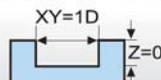
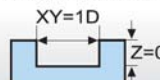
XRB-4T / XRL-4T / XRLL-4T

Work Material	Carbon Steels S45C.S50C HRC20-40		Alloy Steels NAK80 HRC40-50		Prehardened Steels SKD61 HRC50-60		Hardened Steels SKD11 UP HBC60	
Diameter	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
6	4300	780	3200	580	2200	380	1100	160
8	3200		2400		1600		800	
10	2600		1900		1300		650	
12	2100		1600		1000		530	
Side Milling below HRC45					Side Milling up HRC45			
								

List of recommended milling conditions:

XEG-3T / XHP-3T

Work Material	Carbon Steels S50C.SCM.55 below HRC30		Alloy Steels SUS304.SUS316		Prehardened Steels NAK80.SKD61 HRC35-45		Hardened Steels SKD61.SKD11 HRC45-55	
Diameter	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
2	9500	150	8000	120	6400	80	3200	25
3	6400	150	5300	100	4200	80	2100	30
4	4800	180	4000	150	3200	100	1600	40
5	3800	240	3200	180	2550	100	1300	40
6	3200	260	2700	200	2100	130	1000	50
8	2400	260	2000	200	1600	130	800	45
10	1900	260	1600	200	1300	130	650	45
12	1600	260	1300	200	1000	130	530	40
16	1200	180	1000	140	800	90	400	30
Side Milling					Side Milling			
								

Work Material	Carbon Steels S50C.SCM.55 below HRC30		Alloy Steels SUS304.SUS316		Prehardened Steels NAK80.SKD61 HRC35-45		Hardened Steels SKD61.SKD11 HRC45-55	
Diameter	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)	Speed (mm ⁻¹)	Feed (mm/mim)
2	8000	90	6400	40	6400	30	3200	20
3	5300	100	4200	50	4200	40	2100	20
4	4000	120	3200	60	3200	50	1600	25
5	3200	170	2550	75	2550	65	1300	30
6	2700	180	1500	85	1500	70	1100	35
8	2000	190	1100	95	1100	80	800	35
10	1600	190	960	90	960	85	650	35
12	1300	190	800	90	800	70	530	25
16	1000	120	600	60	600	50	400	20
Neck Milling-Front Milling					Neck Milling-Front Milling			
								

List of recommended milling conditions:

XAB (Side Milling)

Work Material	Copper		Aluminum	
Velocity	V=70-120m/min		V=100-250m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/mim) Rough Milling Refined Milling	Speed (mm ⁻¹)	Feed (mm/mim) Rough Milling Refined Milling
R0.5	37680	250 700	47000	320 860
R0.75	25500	250 700	47000	320 860
R1	19100	250 700	23800	600 1650
R1.5	12700	300 900	16000	750 1650
R2	9500	300 900	12000	750 1650
R3	6400	300 900	8000	750 1650
R4	4800	300 900	6000	750 1650
R5	3800	300 900	4800	750 1650
R6	3200	300 900	4200	750 1650
Rough Milling			Refined Milling	
				

Work Material	Copper Alloys		Aluminum Alloys	
Velocity	V=70-120m/min		V=100-250m/min	
Radius	Speed (mm ⁻¹)	Feed (mm/mim) Refined Milling	Speed (mm ⁻¹)	Feed (mm/mim) Refined Milling
R3	13000	4800	26500	8000
R4	10000	4000	19500	9500
R5	8000	3200	15500	9000
R6	6600	2400	13000	8000
Refined Milling				
				

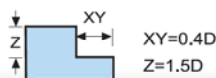
Recommended Cutting Conditions

List of recommended milling conditions:

XWW-3T / XUW-3T (Side Milling)

Work Material	Cast iron, FC, FCD		Mild Steels, Carbon Steels, S45C, S55C, (~750N/mm ²)		Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD (~30HRC)		Prehardened Steels, SKT, SKD, NAK55 HPM (30-38HRC)		Stainless Steels, SUS304, SKD (38-45HRC)	
Velocity	100-140m/min		80-120m/min		70-100m/min		50-80m/min		35-65m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	6350	760	5300	640	4500	360	3450	280	2650	210
8	4750	760	4000	640	3400	410	2600	310	2000	240
10	3800	760	3200	640	2700	430	2050	330	1600	260
12	3200	770	2650	640	2250	450	1700	340	1350	270
14	2750	770	2250	650	1950	470	1500	360	1150	280
16	2400	770	2000	640	1700	780	1300	360	1000	280
18	2100	760	1750	630	1500	480	1150	350	900	270
20	1900	760	1600	610	1350	470	1050	350	800	260

Depth of Cut



XY=0.3D
Z=1.5D

List of recommended milling conditions:

XWW-4T / XUW-4T (Side Milling)

Work Material	Cast iron, FC, FCD		Mild Steels, Carbon Steels, S45C, S55C, (~750N/mm ²)		Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD (~30HRC)		Prehardened Steels, SKT, SKD, NAK55 HPM (30-38HRC)		Stainless Steels, SUS304, SKD (38-45HRC)	
Velocity	100-140m/min		80-120m/min		70-100m/min		50-80m/min		35-65m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	6350	760	5300	640	4500	360	3450	280	2650	210
8	4750	760	4000	640	3400	410	2600	310	2000	240
10	3800	760	3200	640	2700	430	2050	330	1600	260
12	3200	770	2650	640	2250	450	1700	340	1350	270
14	2750	770	2250	650	1950	470	1500	360	1150	280
16	2400	770	2000	640	1700	780	1300	360	1000	280
18	2100	760	1750	630	1500	480	1150	350	900	270
20	1900	760	1600	610	1350	470	1050	350	800	260

Depth of Cut



XY=0.3D
Z=1.5D

- Use an air blow. When using cutting fluids, use high-quality fluid with high smoke retardant properties.
- When chattering occurs, reduce the speed and feed simultaneously.
- Use a rigid and precise machine and holder.

(Slotting)

Work Material	Cast iron, FC, FCD		Mild Steels, Carbon Steels, S45C, S55C, (~750N/mm ²)		Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD (~30HRC)		Prehardened Steels, SKT, SKD, NAK55 HPM (30-38HRC)		Stainless Steels, SUS304, SKD (38-45HRC)	
Velocity	100-140m/min		80-120m/min		70-100m/min		50-80m/min		35-65m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	5300	640	4500	540	3700	300	2900	230	2400	190
8	4000	640	3400	540	2800	340	2200	260	1800	220
10	3200	640	2700	540	2250	360	1750	280	1450	230
12	2650	640	2250	540	1850	370	1450	290	1200	240
14	2250	630	1950	570	1600	380	1250	300	1000	240
16	2000	640	1700	540	1400	390	1100	310	900	250
18	1750	630	1500	540	1250	400	950	290	800	240
20	1600	640	1350	510	1100	390	900	300	700	230

Depth of Cut

Z=0.75D

Z=0.5D

(Slotting)

Work Material	Cast iron, FC, FCD		Mild Steels, Carbon Steels, S45C, S55C, (~750N/mm ²)		Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD (~30HRC)		Prehardened Steels, SKT, SKD, NAK55 HPM (30-38HRC)		Stainless Steels, SUS304, SKD (38-45HRC)	
Velocity	80-120m/min		70-100m/min		55-85m/min		40-70m/min		30-60m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	5300	640	4500	540	3700	300	2900	230	2400	190
8	4000	640	3400	540	2800	340	2200	260	1800	220
10	3200	640	2700	540	2250	360	1750	280	1450	230
12	2650	640	2250	540	1850	370	1450	290	1200	240
14	2250	630	1950	570	1600	380	1250	300	1000	240
16	2000	640	1700	540	1400	390	1100	310	900	250
18	1750	630	1500	540	1250	400	950	290	800	240
20	1600	640	1350	510	1100	390	900	300	700	230

Depth of Cut

XYmax=12mm
Z=0.75D

Z=0.5D

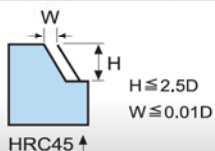
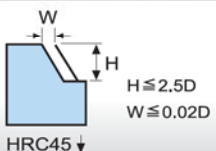
- Use an air blow. When using cutting fluids, use high-quality fluid with high smoke retardant properties.
- When chattering occurs, reduce the speed and feed simultaneously.
- Use a rigid and precise machine and holder.

List of recommended milling conditions:

XTE / XTF

Work Material	Carbon Steels, Alloy Steels, S45C, FC, FCD, SCM, S50C, SKS		Alloy Steels, Tool Steels, SCr, SNCM, SKD11, SKD61, NAK80		Hardened Steels, SKD11	
Hardness	~HRC30		~HRC50		~HRC60	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
1	12000	65	6800	40	2500	15
1.5	9600	70	5200	45	2000	15
2	7500	85	4000	48	1500	18
2.5	6800	100	3700	60	1700	20
4	3500	120	1800	60	600	20
6	2500	150	1600	80	550	25
8	2000	150	1200	80	450	25
10	1500	150	1000	80	350	25

Depth of Cut

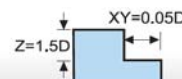


List of recommended milling conditions:

XEG-6T

Work Material	Alloy Steels, <HRC50		Prehardened Steels, HRC50-60		Hardened Steels, >HRC60	
Velocity	V=170m/min		V=110m/min		V=80m/min	
Diameter	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
6	9000	800	5800	525	4250	380
8	6800	1000	4400	660	3200	480
10	5400	980	3500	630	2500	460
12	4500	950	2900	615	2100	450
16	3400	1200	2200	790	1600	570

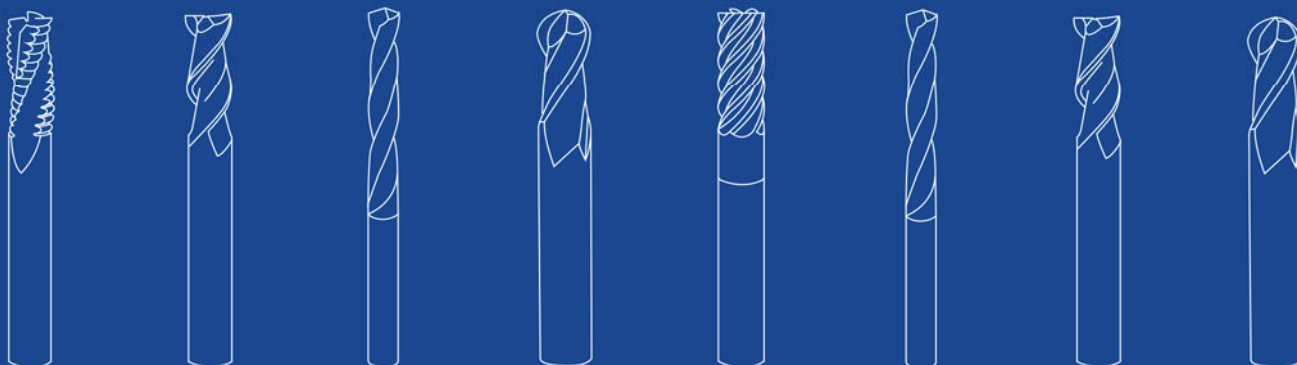
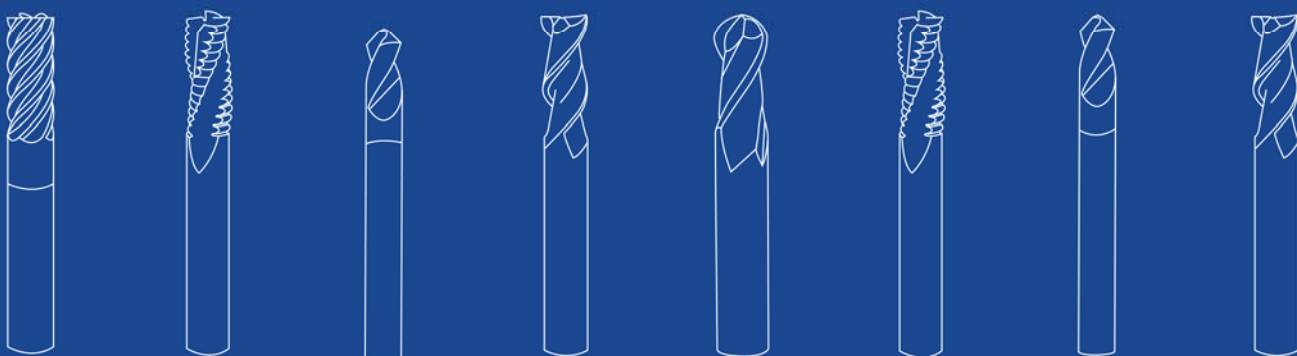
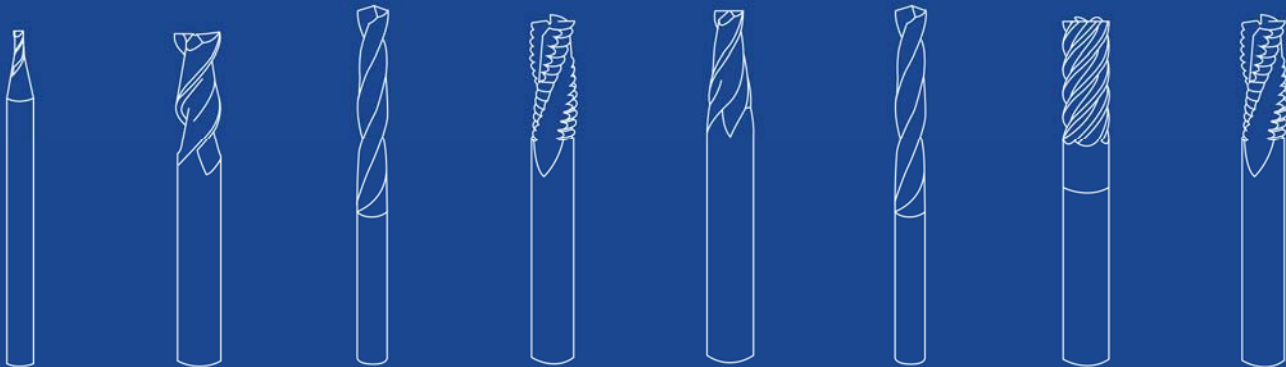
■ D: Diameter



Comparison Chart Scale For Hardness

Brinell Hardness			Diamond Pyramid Hardness Number, Vickers	Rockwell Hardness				Shore Scleroscope Hardness Number	Approx. Tensile Strength
Standard 10mm Ball	Halt-Gren 10mm Ball	Tungsten 10mm Ball		A Scale 60Kgf	B Scale 100Kgf 1/16in	C Scale 150Kgf	D Scale 100Kgf		
	HB		HV	HRA	HRB	HRC	HRD	HS	N/mm ²
			940	85.6		68.0	76.9	97	
			920	85.3		67.5	76.5	96	
			900	85.0		67.0	76.1	95	
		767	880	84.7		66.4	75.7	93	
		757	860	84.4		65.9	75.3	92	
		745	840	84.1		65.3	74.8	91	
		733	820	83.8		64.7	74.3	90	
		722	800	83.4		64.0	73.8	88	
		712							
		710	780	83.0		63.3	73.3	87	
		698	760	82.6		62.5	72.6	86	
		684	740	82.2		61.8	72.1		
		682	737	82.2		61.7	72.0	84	
		670	720	81.8		61.0	71.5	83	
		656	700	81.3		60.1	70.8		
		653	697	81.2		60.0	70.7	81	
		647	690	81.1		59.7	70.5		
		638	680	80.8		59.2	70.1	80	
		630	670	80.6		58.8	69.8		
		627	667	80.5		58.7	69.7	79	
	601		677	80.7		59.1	70.0		
		601	640	79.8		57.3	68.7	77	
	578		640	79.8		57.3	68.7		
		578	615	79.1		56.0	67.7	75	
	555		607	78.8		55.6	67.4		
		555	591	78.4		54.7	66.7	73	2055
	534		579	78.0		54.0	66.1		2015
		534	569	77.8		53.5	65.8	71	1985
	514		533	77.1		52.5	65.0		1915
		514	547	76.9		52.1	64.7	70	1890
495			539	76.7		51.6	64.3		1855
	495		530	76.4		51.1	63.9		1825
		496	528	76.3		51.0	63.8	68	1820
477			516	75.9		50.3	63.2		1780
	477		508	75.6		49.6	62.7		1740
		477	508	75.6		49.6	62.7	66	1740
461			495	75.1		48.8	61.9		1680
	461		491	74.9		48.5	61.7		1670
		461	491	74.9		48.5	61.7	65	1670
444			474	74.3		47.2	61.0		1595
	444		472	74.2		47.1	60.8		1585
		444	472	74.2		47.1	60.8	63	1585

Brinell Hardness			Diamond Pyramid Hardness Number, Vickers	Rockwell Hardness				Shore Scleroscope Hardness Number	Approx. Tensile Strength
Standard 10mm Ball	Halt-Gren 10mm Ball	Tungsten 10mm Ball		A Scale 60Kgf	B Scale 100Kgf 1/16in	C Scale 150Kgf	D Scale 100Kgf		
	HB		HV	HRA	HRB	HRC	HRD	HS	N/mm ²
429	429	429	455	73.4		45.7	59.7	61	1510
415	415	415	440	72.8		44.5	58.8	59	1460
401	401	401	425	72.0		43.1	57.8	58	1390
388	388	388	410	71.4		41.8	56.8	56	1330
375	375	375	396	70.6		40.4	55.7	54	1270
363	363	363	383	70.0		39.1	54.6	52	1220
352	352	352	372	69.3	110.0	37.9	53.8	51	1180
341	341	341	360	68.7	109.0	36.6	52.8	50	1130
331	331	331	350	68.1	108.5	35.5	51.9	48	1095
321	321	321	339	67.5	108.0	34.3	51.0	47	1060
311	311	311	328	66.9	107.5	33.1	50.0	46	1025
302	302	302	319	66.3	107.0	32.1	49.3	45	1005
293	293	293	309	65.7	106.0	30.9	48.3	43	970
285	285	285	301	65.3	105.5	29.9	47.6		950
277	277	277	292	64.6	104.5	28.8	46.7	41	925
269	269	269	284	64.1	104.0	27.8	45.9	40	895
262	262	262	276	63.6	103.0	26.6	45.0	39	875
255	255	255	269	63.0	102.0	25.4	44.2	38	850
248	248	248	261	62.5	101.0	24.2	43.2	37	825
241	241	241	253	61.8	100.0	22.8	42.0	36	800
235	235	235	247	61.4	99.0	21.7	41.4	35	785
229	229	229	241	60.8	98.2	20.5	40.5	34	765
223	223	223	234		97.3	18.8			
217	217	217	228		96.4	17.5		33	725
212	212	212	222		95.5	16.0			705
207	207	207	218		94.6	15.2		32	690
201	201	201	212		93.8	13.8		31	675
197	197	197	207		92.8	12.7		30	655
192	192	192	202		91.9	11.5		29	640
187	187	187	196		90.7	10.0			620
183	183	183	192		90.9	9.0		28	615
179	179	179	188		89.0	8.0		27	600
174	174	174	182		87.8	6.4			585
170	170	170	178		86.8	5.4		26	570
167	167	167	175		86.0	4.4			560
163	163	163	171		85.0	3.3		25	545
156	156	156	163		82.9	0.9			525
149	149	149	156		80.8			23	505
143	143	143	150		78.8			22	490
137	137	137	143		76.4			21	460
131	131	131	137		74.0				450
126	126	126	132		72.0			20	435
121	121	121	127		69.8			19	415
116	116	116	122		67.6			18	400
111	111	111	117		65.7			15	985



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