

SGSO MILLING TOOLS

V.2026



SGSO

KEEP ADVANCING WITH YOU



SGSO TECHNOLOGY EUROPE GMBH



SGSO

KEEP ADVANCING WITH YOU



Keep Advancing With You

**Tools Crafted With Ingenuity,
With Unlimited Potential And Possibility.**

SGSO CATALOG

01	COMPANY PROFILE	P2-3
02	GLOBAL SALES NETWORK	P4-5
03	DESCRIPTION OF ICONS	P7
04	INTRODUCTION OF COATING MATERIALS	P8
05	CUTTING TOOL TYPE MARKING GUIDELINES	P9
06	SERIES INDEX	P10-13
07	SOLID END MILL	P14-180

Ball Nose
End Mill

Radius End
Mill

Square End
Mill

High Feed
End Mill

Thread Mill

Inserts

Technical Guidance

ABOUT US **SGSO**

SGSO Europe was established in October 2024, equipped with a warehouse in Krefeld, Germany, ensuring rapid delivery to customers and partners. Meanwhile, SGSO Europe also provides professional technical support across the entire European region.

SGSO China, founded in 2013, has developed rapidly into a multi-national high-tech enterprise dedicated to the research, development, and manufacturing of high-performance nano-coated tools.

Our headquarter R&D team includes three senior German engineers and a number of highly experienced Chinese engineers, each with more than ten years of practical expertise.

SGSO integrates fundamental scientific research with practical engineering development. Through cooperation with both domestic and international research institutes, we have established an advanced coating tool technology research center.

The nano-coated high-performance tools developed and produced by SGSO are widely applied in automotive manufacturing, aerospace, information technology, and other critical industrial fields.

Our newly established intelligent manufacturing workshop further demonstrates our commitment to innovation, enabling us to support global smart manufacturing with enhanced product quality and superior standards.



Production Equipment

Our advanced production equipment and skilled personnel ensure high precision and superior performance in our end mill products.



Testing Equipment

State-of-the-art testing equipment is utilized in our R&D processes to develop new products. It also ensures consistent performance, both for internal quality control and in response to specific customer requirements.



GLOBAL Sales Network

Europe Germany

SGSO Technology Europe GmbH
Address: Europark Fichtenhain A13a,
47807 Krefeld, Germany.
Email: info@sgso-europe.com

Taizhou China

SGSO Technology Co.,Ltd
Address: Houyang Industrial District,
Huangyan, Taizhou City, Zhejiang
Tel: +86-576-84116878

Australia branch

SGSO Technology Australia(PTE.LTD.)
Address: 92 Wellington Street, Kew, Vic
3101, Australia
Tel: +0061 3 9988 3502



SGSO **Keep Advancing With You**

- High precision
- High stability
- High efficiency
- High performance hard milling
- High speed milling

Description Of Icon

Materials



Cubic Boron Nitride



Ultra Fine Grain Solid Carbide



Fine Grain Solid Carbide

Coating



TiSiN



TiSiN+X



AlCrSiN

OD Relief Angle Type



Arc Angle Relief Type



Straight Line Relief Angle

Corner Shape



Protection Edge



Corner Radius

Number of Flutes



2 Flutes



4 Flutes



5 Flutes



6 Flutes

Machining Hardness



< 45HRC



< 55HRC



< 65HRC



≤ 70HRC

Helix Angle



0° Helix Angle



-9° Helix Angle



20° Helix Angle



30° Helix Angle



42° Helix Angle



45° Helix Angle



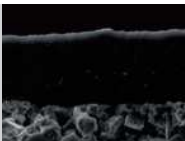
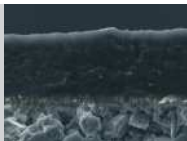
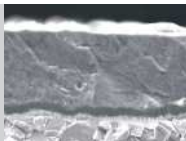
52° Helix Angle



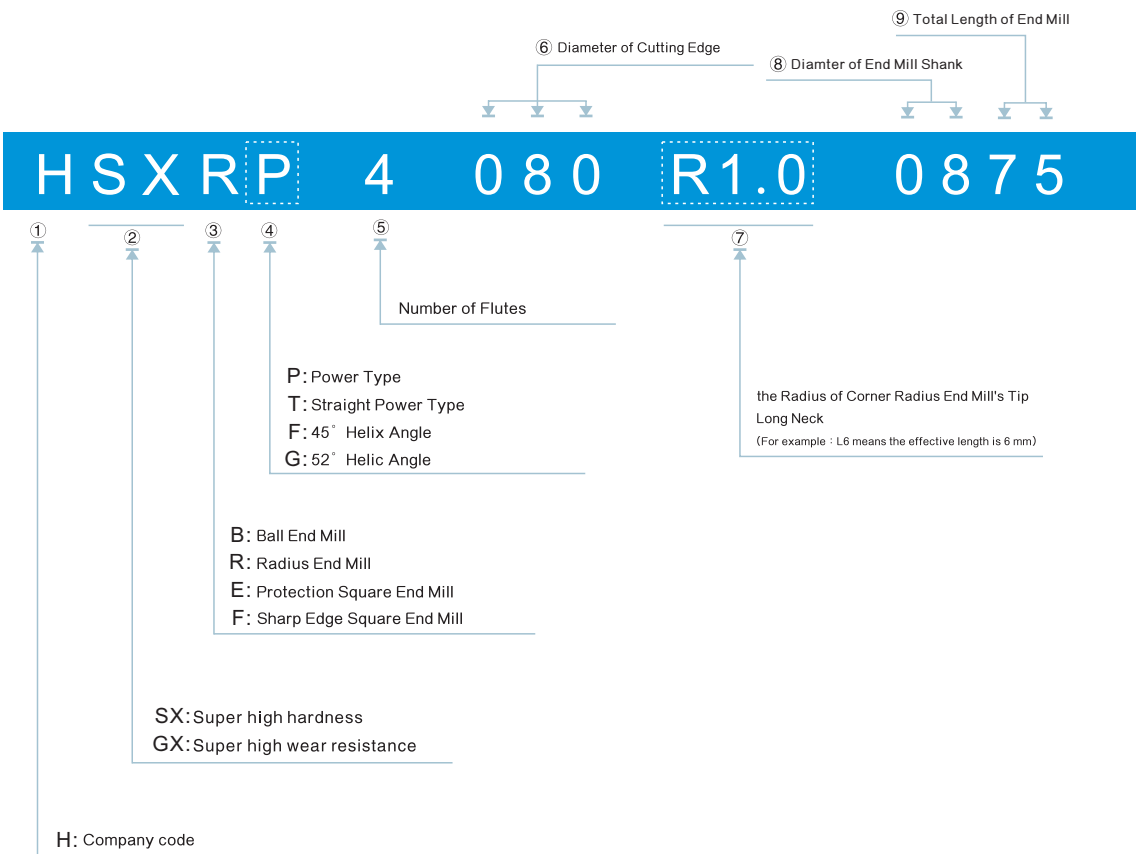
Left Blade

Coatings

Feature Of Coating Layer

NEW PRODUCT NEW PRODUCT			
Coating Series	HX	AHX	ATX
Components	TiSiN	TiSiN+X	AlCrSi
Color	Bronze-colored	Gold	Black and Grey
Coating structure			
Features	Super hardness, Super Oxidation Resistance, High adhesion	Super Hardness, Super Oxidation Resistance, High Adhesion	Super Oxidation Resistance, Low Friction
Hardness	3500(HV)	3550(HV)	3200(HV)
Coefficeient of friction	0.4	0.36	0.32
Oxidation start temperature	1100(°C)	1200(°C)	1100(°C)
Coating thickness	2-4um	2-4um	2-4um

Item Code Description



SERIES INDEX



Product Series		Description	ø D
Ball Nose End Mill	SCBN-B2	2-Flute CBN Deep Ball Nose End mill	0.1-6
	HSXB2	2-Flute Ball End Mill	0.1-12
	HSXBC4	4-fluted High-hardness Ball End Mill	1-12
	HSXB2L	2-Flute Long Neck Ball End Mill	0.1-6
	HGXB2	2-Flute Ball End Mill	0.1-12
	HGXB4	4-Flute Ball End Mill	6-12
	HGXB2L	2-Flute Long Neck Ball End Mill	0.1-6
	HGXPB2	2-Flute Taper Neck Ball End Mill	0.6-12
Radius End Mill	HSXR2L	2-Flute Long Neck Corner Radius End Mill	0.2-6
	HSXR4L	4-Flute Long Neck Corner Radius End Mill	0.8-4
	HSXRP4	4-Flute Short Corner Radius End Mill	0.8-12
	HSXRT4	4-Flute Power Corner Radius End Mill	2-12
	HSXEF4-CR	4-flute Power Corner Radius End Mill	3-12
	HSXHE6-CR	6-flute Hard Milling Corner Radius End Mill	6-20
	HSXR4	4-Flute Corner Radius End Mill	0.8-16
	HGHFE4-3D-CR	4-flute HPC Corner Radius 3D End Mill	1-20
	HGHFE4-5D-CR	4-flute HPC Corner Radius 5D End Mill	1-20
	HGXRP	4-Flute Short Corner Radius End Mill	1-12
	HGXR2	2-flute General Purpose Radius End Mill	0.2-12
	HGXR4	4-flute General Purpose Radius End Mill	0.8-16
Square End Mill	HSXE2L	2-Flute Long Neck End Mill	0.1-6
	HSXE4L	4-Flute Long Neck End Mill	0.8-4

Shape	Coating	Specification	Cutting Parameter
		P16-19	P20-21
	AHX	P22-23	P24
	AHX	P25-26	P27-29
	AHX	P30-35	P36-41
	ATX	P42-43	P44
	ATX	P45-46	P47
	ATX	P48-54	P55-60
	ATX	P61-63	P64-65
	AHX	P66-75	P76-80
	AHX	P81-87	P88-92
	AHX	P93-96	P97
	AHX	P98	P99
	AHX	P100	P101-102
	AHX	P103	P104
	AHX	P105-108	P109-110
	ATX	P111	P113
	ATX	P112	P113
	ATX	P114-117	P118
	ATX	P119-121	P122
	ATX	P123-126	P127-128
	AHX	P129-134	P135-140
	AHX	P141-143	P144-146

SERIES INDEX



Product Series		Description	Ø D
Square End Mill	HSXEF4	4-Flute Power End Mill	1-20
	HSXHE	4/6-Flute Hard Milling End Mill	1-20
	HSXEG6	6-Flute Hard Milling End Mill	6-20
	HGHFE4-3D	4-Flute HPC 3D End Mill	1-20
	HGHFE4-3D-W	4-Flute HPC 3D End Mill Weldon Shank	1-20
	HGHFE4-5D	4-Flute HPC 5D End Mill	1-20
	HGHFE5-3.5D	5-Flute HPC 3.5D End Mill Weldon Shank	6-20
	HGXEF4	4-Flute Power End Mill	1-20
	HGXE2	2-Flute General Purpose End Mill	0.1-20
	HGXE4	4-Flute General Purpose End Mill	0.8-20
High Feed End Mill	HSHFR4	4-Flute High Feed End Mill	6-12
	HSXHR	4/6-flute High Feed End Mill	1-12
Thread Mill	HSXDT	Thread Milling Cutter-2.5D Underneck	M2-M20
Inserts	VSB	VSB Finishing Ball Nose Insert	16-30
	MSB	MSB Finishing Ball Nose Insert	12-30

Shape	Coating	Specification	Cutting Parameter
	AHX	P147-148	P149
	AHX	P150	P151
	AHX	P152	P153
	ATX	P155	P159
	ATX	P156	P159
	ATX	P157	P159
	ATX	P158	P159
	ATX	P160-161	P162
	ATX	P163-164	P165
	ATX	P166-167	P168
	HX	P169-170	P171
	AHX	P172-173	P174
	AHX	P175-176	P177
	AHX	P178-179	P180
	AHX	P178-179	P180

BALL NOSE END MILL

RADIUS END MILL

SQUARE END MILL

HIGH FEED END MILL

THREAD MILL

INSERTS

HSX SERIES

The Speciality of HSX Series

- 0.3 μ m ultra fine substrate.
- TiSiN multilayer coatings.
- Specially designed for hardened materials.

$\leq 70\text{HRC}$



HGX SERIES

The Speciality of HGX Series

- 0.3 μ m ultra fine substrate.
- 'Non-drops' surface coating with high machining lubrications.
- Specially designed to satisfy general purpose machining with HRC $\leq$ 55.

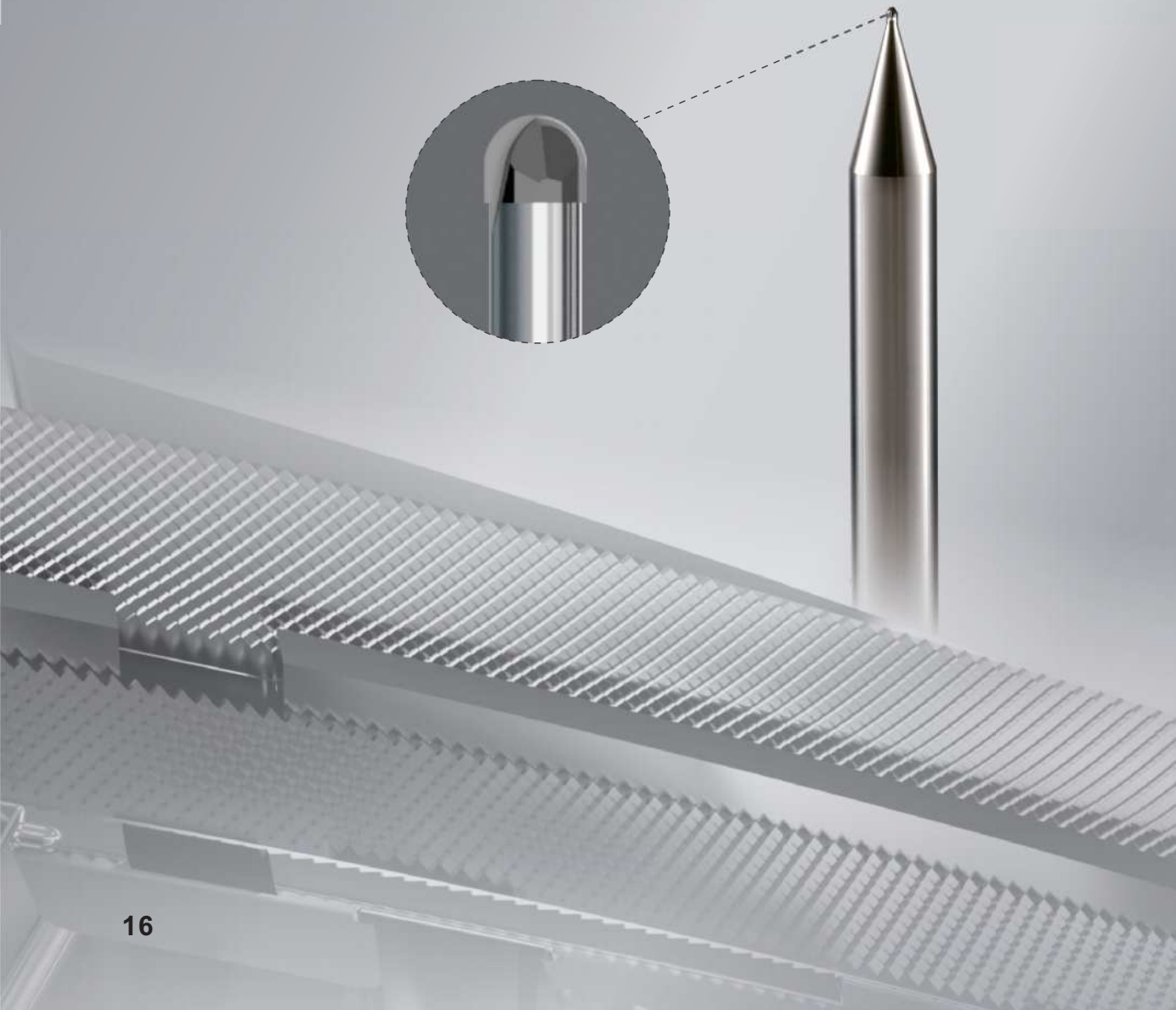
$\leq$ 55HRC



CBN SERIES

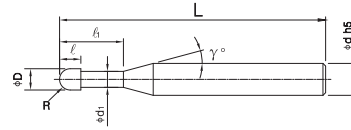
The Speciality of CBN Series

- Newly developed brazing technology ensures high stability.
- High CBN content provides excellent wear resistance for hard materials.
- Cutting edges designed to reduce cutting forces.
- Combined with suitable cutting conditions, can achieve shiny surface finishes.





SCBN-B2 2-Flute CBN Deep Ball Nose End mill



ϕD	D Tol. [mm]	ϕD	R Tol. [mm]
$D \leq 3$	0 ~ -0.010	$D \leq 1$	± 0.003
$3 < D \leq 6$	0 ~ -0.012	$1 < D \leq 6$	± 0.005

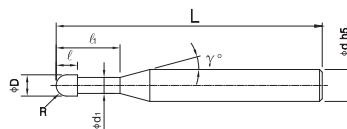


Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma / ^\circ$	L	ϕd	
SCBN-B2001L0.3 0450	0.1	R0.05	0.07	0.3	0.09	15	50	4	★
SCBN-B2001L0.5 0450	0.1	R0.05	0.07	0.5	0.09	15	50	4	★
SCBN-B20015L0.45 0450	0.15	R0.075	0.1	0.45	0.14	15	50	4	★
SCBN-B20015L0.75 0450	0.15	R0.075	0.1	0.75	0.14	15	50	4	★
SCBN-B2002L0.3 0450	0.2	R0.1	0.15	0.3	0.19	15	50	4	
SCBN-B2002L0.6 0450	0.2	R0.1	0.15	0.6	0.19	15	50	4	
SCBN-B2002L0.8 0450	0.2	R0.1	0.15	0.8	0.19	15	50	4	
SCBN-B2002L1 0450	0.2	R0.1	0.15	1	0.19	15	50	4	
SCBN-B2003L0.3 0450	0.3	R0.15	0.2	0.3	0.28	15	50	4	
SCBN-B2003L0.5 0450	0.3	R0.15	0.2	0.5	0.28	15	50	4	
SCBN-B2003L0.75 0450	0.3	R0.15	0.2	0.75	0.28	15	50	4	
SCBN-B2003L0.9 0450	0.3	R0.15	0.2	0.9	0.28	15	50	4	
SCBN-B2003L1.2 0450	0.3	R0.15	0.2	1.2	0.28	15	50	4	
SCBN-B2003L1.5 0450	0.3	R0.15	0.2	1.5	0.28	15	50	4	
SCBN-B2004L0.5 0450	0.4	R0.2	0.3	0.5	0.37	15	50	4	
SCBN-B2004L0.75 0450	0.4	R0.2	0.3	0.75	0.37	15	50	4	
SCBN-B2004L1 0450	0.4	R0.2	0.3	1	0.37	15	50	4	
SCBN-B2004L1.2 0450	0.4	R0.2	0.3	1.2	0.37	15	50	4	
SCBN-B2004L1.5 0450	0.4	R0.2	0.3	1.5	0.37	15	50	4	
SCBN-B2004L2 0450	0.4	R0.2	0.3	2	0.37	15	50	4	
SCBN-B2004L2.5 0450	0.4	R0.2	0.3	2.5	0.37	15	50	4	
SCBN-B2004L3 0450	0.4	R0.2	0.3	3	0.37	15	50	4	★
SCBN-B2005L1 0450	0.5	R0.25	0.35	1	0.46	15	50	4	
SCBN-B2005L1.5 0450	0.5	R0.25	0.35	1.5	0.46	15	50	4	
SCBN-B2005L2.5 0450	0.5	R0.25	0.35	2.5	0.46	15	50	4	
SCBN-B2005L3.5 0450	0.5	R0.25	0.35	3.5	0.46	15	50	4	★
SCBN-B2006L1.2 0450	0.6	R0.3	0.45	1.2	0.56	15	50	4	
SCBN-B2006L1.5 0450	0.6	R0.3	0.45	1.5	0.56	15	50	4	



SCBN-B2 2-Flute CBN Deep Ball Nose End mill



∅ D	D Tol. [mm]	∅ D	R Tol. [mm]
D < 3	0 ~ -0.010	D < 1	±0.003
3 < D ≤ 6	0 ~ -0.012	1 < D ≤ 6	±0.005

Unit : mm

Type No.	Dia. ∅D	Radius R	Length of Cut ℓ	Under Neck Length ℓ ₁	Neck Dia. ∅d ₁	Neck Taper Angle γ/°	Overall Length L	Shank Dia. ∅d	
SCBN-B2006L3 0450	0.6	R0.3	0.45	3	0.56	15	50	4	
SCBN-B2006L4 0450	0.6	R0.3	0.45	4	0.56	15	50	4	★
SCBN-B2006L5 0450	0.6	R0.3	0.45	5	0.56	15	50	4	★
SCBN-B2006L6 0450	0.6	R0.3	0.45	6	0.56	15	50	4	★
SCBN-B2008L1.6 0450	0.8	R0.4	0.6	1.6	0.76	15	50	4	
SCBN-B2008L2 0450	0.8	R0.4	0.6	2	0.76	15	50	4	
SCBN-B2008L4 0450	0.8	R0.4	0.6	4	0.76	15	50	4	★
SCBN-B2008L6 0450	0.8	R0.4	0.6	6	0.76	15	50	4	★
SCBN-B2010L2 0450	1	R0.5	0.7	2	0.95	15	50	4	
SCBN-B2010L2.5 0450	1	R0.5	0.7	2.5	0.95	15	50	4	
SCBN-B2010L4 0450	1	R0.5	0.7	4	0.95	15	50	4	
SCBN-B2010L6 0450	1	R0.5	0.7	6	0.95	15	50	4	★
SCBN-B2010L8 0450	1	R0.5	0.7	8	0.95	15	50	4	★
SCBN-B2010L10 0450	1	R0.5	0.7	10	0.95	15	50	4	★
SCBN-B2012L2.4 0450	1.2	R0.6	0.8	2.4	1.15	15	50	4	★
SCBN-B2012L3 0450	1.2	R0.6	0.8	3	1.15	15	50	4	★
SCBN-B2012L6 0450	1.2	R0.6	0.8	6	1.15	15	50	4	★
SCBN-B2015L3 0450	1.5	R0.75	1	3	1.45	15	50	4	★
SCBN-B2015L3.8 0450	1.5	R0.75	1	3.8	1.45	15	50	4	★
SCBN-B2015L7.5 0450	1.5	R0.75	1	7.5	1.45	15	50	4	★
SCBN-B2015L10 0450	1.5	R0.75	1	10	1.45	15	50	4	★
SCBN-B2015L15 0450	1.5	R0.75	1	15	1.45	15	50	4	★
SCBN-B2020L4 0450	2	R1	1.2	4	1.94	15	50	4	★
SCBN-B2020L5 0450	2	R1	1.2	5	1.94	15	50	4	★
SCBN-B2020L6 0450	2	R1	1.2	6	1.94	15	50	4	★
SCBN-B2020L8 0450	2	R1	1.2	8	1.94	15	50	4	★
SCBN-B2020L10 0450	2	R1	1.2	10	1.94	15	50	4	★
SCBN-B2020L14 0450	2	R1	1.2	14	1.94	15	50	4	★



SCBN-B2 2-Flute CBN Deep Ball Nose End mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	
	ϕD	R	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd	
SCBN-B2020L20 0460	2	R1	1.2	20	1.94	15	60	4	★
SCBN-B2030L6 0650	3	R1.5	1.8	6	2.9	12	50	6	★
SCBN-B2030L9 0660	3	R1.5	1.8	9	2.9	12	60	6	★
SCBN-B2040L8 0650	4	R2	2.4	8	3.9	12	50	6	★
SCBN-B2040L12 0660	4	R2	2.4	12	3.9	12	60	6	★
SCBN-B2050L10 0660	5	R2.5	3	10	4.85	12	60	6	★
SCBN-B2050L15 0675	5	R2.5	3	15	4.85	12	75	6	★
SCBN-B2060L12 0660	6	R3	3.6	12	5.85	-	60	6	★
SCBN-B2060L18 0675	6	R3	3.6	18	5.85	-	75	6	★

★ Available on Request

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable
 ○ Suitable

CARBON STEELS	ALLOY STEELS	PRE-HARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
		○	○	○	○	○	○						



Cutting Parameter

SCBN-B2 2-Flute CBN Deep Ball Nose End mill 3D Milling Finishing

Workpiece		Pre-Hardened Steels (48-52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-68HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.05	0.3	50000	200	0.005	0.005	50000	140	0.005	0.005	50000	100	0.003	0.003
	0.5	50000	120	0.003	0.003	50000	84	0.002	0.002	50000	60	0.001	0.002
R0.075	0.45	50000	300	0.005	0.005	50000	210	0.005	0.005	50000	150	0.003	0.003
	0.75	50000	200	0.003	0.003	50000	140	0.003	0.003	50000	100	0.002	0.002
R0.1	0.3	40000	300	0.007	0.01	40000	210	0.007	0.01	40000	150	0.003	0.005
	0.6	40000	260	0.006	0.01	40000	182	0.006	0.01	40000	130	0.003	0.005
	0.8	40000	220	0.005	0.005	40000	154	0.005	0.005	40000	110	0.003	0.003
	1	40000	200	0.003	0.003	40000	140	0.003	0.003	40000	100	0.003	0.003
R0.15	0.3	35000	500	0.006	0.01	35000	350	0.006	0.01	35000	250	0.006	0.005
	0.5	35000	462	0.006	0.01	35000	325	0.006	0.01	35000	231	0.006	0.005
	0.75	35000	428	0.006	0.01	35000	300	0.006	0.01	35000	214	0.006	0.005
	0.9	35000	384	0.006	0.01	35000	265	0.006	0.01	35000	192	0.006	0.005
	1.2	35000	384	0.005	0.007	35000	265	0.005	0.007	35000	192	0.005	0.003
	1.5	35000	384	0.005	0.005	35000	265	0.005	0.005	35000	192	0.005	0.003
R0.2	0.5	32000	800	0.008	0.012	32000	560	0.006	0.012	32000	392	0.005	0.008
	0.75	32000	720	0.008	0.012	32000	504	0.006	0.012	32000	352	0.005	0.008
	1	32000	640	0.008	0.012	32000	448	0.006	0.012	32000	313	0.005	0.008
	1.2	32000	600	0.008	0.012	32000	420	0.006	0.012	32000	294	0.005	0.008
	1.5	32000	600	0.008	0.012	32000	420	0.006	0.012	32000	294	0.005	0.008
	2	32000	500	0.008	0.01	32000	350	0.006	0.01	32000	245	0.005	0.007
	2.5	30000	450	0.008	0.01	30000	315	0.006	0.01	30000	220	0.005	0.007
	3	30000	400	0.008	0.01	30000	280	0.006	0.01	30000	196	0.005	0.007
R0.25	1	30000	1000	0.01	0.012	30000	700	0.01	0.012	30000	500	0.01	0.008
	1.5	30000	800	0.01	0.012	30000	560	0.01	0.012	30000	400	0.01	0.008
	2.5	28000	600	0.01	0.011	28000	420	0.01	0.011	28000	300	0.01	0.008
	3.5	28000	500	0.008	0.011	28000	350	0.008	0.011	28000	250	0.008	0.007
R0.3	1.2	25000	1200	0.01	0.013	25000	1200	0.01	0.013	25000	600	0.01	0.01
	1.5	25000	1000	0.01	0.013	25000	1000	0.01	0.013	25000	500	0.01	0.01
	3	25000	800	0.01	0.013	25000	800	0.01	0.013	25000	400	0.01	0.01
	4	25000	550	0.008	0.013	25000	400	0.008	0.013	25000	280	0.005	0.006
	5	25000	360	0.008	0.012	25000	320	0.008	0.012	25000	180	0.005	0.006
	6	25000	240	0.006	0.012	25000	200	0.006	0.012	25000	120	0.005	0.005



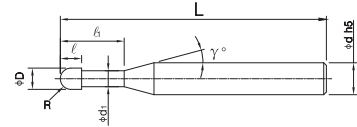
Cutting Parameter

SCBN-B2 2-Flute CBN Deep Ball Nose End mill 3D Milling Finishing

Workpiece		Pre-Hardened Steels (48-52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-68HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.4	1.6	24000	1500	0.01	0.015	24000	1000	0.01	0.015	24000	750	0.01	0.015
	2	24000	1200	0.01	0.015	24000	720	0.01	0.015	24000	600	0.01	0.015
	4	24000	1000	0.01	0.015	24000	700	0.01	0.015	24000	500	0.005	0.01
	6	22000	800	0.01	0.012	22000	560	0.01	0.012	22000	400	0.005	0.005
R0.5	2	22000	1800	0.01	0.02	22000	1260	0.01	0.02	22000	900	0.01	0.02
	2.5	22000	1500	0.01	0.02	22000	1050	0.01	0.02	22000	750	0.01	0.02
	4	22000	1200	0.01	0.02	22000	840	0.01	0.02	22000	600	0.01	0.02
	6	20000	1000	0.01	0.02	20000	700	0.01	0.02	20000	500	0.01	0.015
	8	20000	800	0.007	0.015	20000	560	0.008	0.015	20000	400	0.007	0.008
	10	20000	600	0.006	0.015	20000	420	0.006	0.015	20000	300	0.005	0.005



HSXB 2-Flute Ball End Mill



∅ D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D < 6	0 ~ -0.012
6 < D < 10	0 ~ -0.015
10 < D < 12	0 ~ -0.018

∅ D	R Tol. [mm]
D < 1	±0.003
1 < D < 12	±0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	∅D	R	ℓ	ℓ ₁	∅d ₁	γ/°	L	∅d
HSXB2001 0450	0.1	R0.05	0.1	—	—	12	50	4
HSXB20015 0450	0.15	R0.075	0.15	—	—	12	50	4
HSXB2002 0450	0.2	R0.1	0.2	—	—	12	50	4
HSXB2003 0450	0.3	R0.15	0.3	—	—	12	50	4
HSXB2004 0450	0.4	R0.2	0.6	—	—	12	50	4
HSXB2005 0450	0.5	R0.25	0.8	—	—	12	50	4
HSXB2006 0450	0.6	R0.3	0.9	—	—	12	50	4
HSXB2008 0450	0.8	R0.4	1.2	—	—	12	50	4
HSXB2010 0450	1	R0.5	0.75	2	0.95	12	50	4
HSXB2010 0650	1	R0.5	0.75	2.5	0.95	12	50	6
HSXB2010 0660	1	R0.5	0.75	2.5	0.95	12	60	6
HSXB2010 0675	1	R0.5	0.75	2.5	0.95	12	75	6
HSXB2012 0450	1.2	R0.6	0.9	2.4	1.14	11	50	4
HSXB2015 0450	1.5	R0.75	1.2	3	1.42	11	50	4
HSXB2015 0650	1.5	R0.75	1.2	4	1.42	11	50	6
HSXB2015 0660	1.5	R0.75	1.2	4	1.42	11	60	6
HSXB2015 0675	1.5	R0.75	1.2	4	1.42	11	75	6
HSXB2020 0450	2	R1	1.6	4	1.9	11	50	4
HSXB2020 0650	2	R1	1.6	6	1.9	11	50	6
HSXB2020 0660	2	R1	1.6	6	1.9	11	60	6
HSXB2020 0675	2	R1	1.6	6	1.9	11	75	6
HSXB2025 0450	2.5	R1.25	2	5	2.4	11	50	4
HSXB2025 0650	2.5	R1.25	2	7	2.4	11	50	6
HSXB2025 0660	2.5	R1.25	2	7	2.4	11	60	6
HSXB2025 0675	2.5	R1.25	2	7	2.4	11	75	6
HSXB2030 0450	3	R1.5	2.4	6	2.9	11	50	4
HSXB2030 0650	3	R1.5	2.4	8	2.9	11	50	6
HSXB2030 0660	3	R1.5	2.4	8	2.9	11	60	6



HSXB 2-Flute Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma / ^\circ$	L	ϕd
HSXB2030 0675	3	R1.5	2.4	8	2.9	11	75	6
HSXB2040 0450	4	R2	6	—	—	—	50	4
HSXB2040 0475	4	R2	6	—	—	—	75	4
HSXB2040 0650	4	R2	3.2	10	3.9	11	50	6
HSXB2040 0660	4	R2	3.2	10	3.9	11	60	6
HSXB2040 0675	4	R2	3.2	10	3.9	11	75	6
HSXB2050 0650	5	R2.5	4	12	4.85	11	50	6
HSXB2050 0660	5	R2.5	4	12	4.85	11	60	6
HSXB2050 0675	5	R2.5	4	12	4.85	11	75	6
HSXB2060 0650	6	R3	9	—	—	—	50	6
HSXB2060 0660	6	R3	9	—	—	—	60	6
HSXB2060 0675	6	R3	9	—	—	—	75	6
HSXB2060 06100	6	R3	9	—	—	—	100	6
HSXB2080 0860	8	R4	12	—	—	—	60	8
HSXB2080 0875	8	R4	12	—	—	—	75	8
HSXB2080 08100	8	R4	12	—	—	—	100	8
HSXB2100 1075	10	R5	15	—	—	—	75	10
HSXB2100 10100	10	R5	15	—	—	—	100	10
HSXB2100 10125	10	R5	15	—	—	—	125	10
HSXB2120 1275	12	R6	18	—	—	—	75	12
HSXB2120 12100	12	R6	18	—	—	—	100	12
HSXB2120 12125	12	R6	18	—	—	—	125	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PRE-HARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
		○	○	○	○	○	○						



Cutting Parameter

HSXB 2-Flute Ball End Mill 3D Milling Finishing

Workpiece Type No.	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HSXB2001	40000	120	0.003	0.005	40000	100	0.002	0.005	40000	70	0.002	0.003
HSXB20015	40000	180	0.003	0.005	40000	150	0.002	0.005	40000	100	0.002	0.003
HSXB2002	40000	350	0.01	0.01	40000	300	0.006	0.006	36000	200	0.003	0.003
HSXB2003	36500	500	0.01	0.01	30000	400	0.01	0.01	30000	280	0.008	0.01
HSXB2004	36300	720	0.02	0.03	33000	720	0.01	0.03	30000	580	0.009	0.02
HSXB2005	35500	800	0.02	0.03	31800	720	0.01	0.03	28000	640	0.01	0.025
HSXB2006	33000	1000	0.03	0.03	31320	800	0.03	0.03	26800	760	0.01	0.03
HSXB2008	24200	1920	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.02	0.05
HSXB2010	24000	1920	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.02	0.05
HSXB2015	21600	2000	0.03	0.05	19800	1760	0.03	0.05	18000	1600	0.02	0.05
HSXB2020	18000	2000	0.04	0.06	16500	1760	0.04	0.06	15000	1600	0.03	0.06
HSXB2025	18000	2500	0.04	0.06	16500	2000	0.04	0.06	15000	1600	0.03	0.06
HSXB2030	16800	2500	0.04	0.08	15400	2200	0.04	0.08	14000	2000	0.03	0.08
HSXB2040	13200	3000	0.05	0.1	12200	2500	0.05	0.08	11400	2000	0.04	0.08
HSXB2050	12000	2800	0.03	0.1	11000	2500	0.05	0.08	10000	2000	0.04	0.1
HSXB2060	9000	2800	0.05	0.15	9000	2800	0.05	0.12	8550	2400	0.05	0.1
HSXB2080	8000	3000	0.05	0.2	8000	3000	0.05	0.15	7600	3000	0.05	0.15
HSXB2100	7200	3000	0.08	0.25	7200	3000	0.08	0.2	6840	3000	0.08	0.25
HSXB2120	6400	3000	0.1	0.25	6400	3000	0.08	0.25	6080	3000	0.08	0.25

HSX SERIES

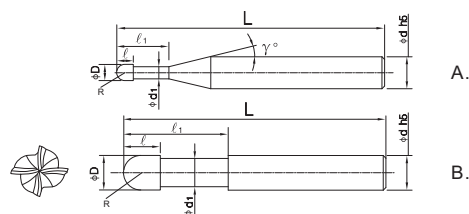
HSXBC-Highlights

- Possible for both side milling and profile milling.
- HSX coating leads to long tool life in hard milling.
- Excellent performance in 45-70HRC materials.
- Unequal flutes design reduces the vibration.
- Stable milling in corner by optimized chip pockets.

45-70HRC



HSXBC 4-Fluted High-hardness Ball End Mill



∅ D	D Tol. [mm]	∅ D	R Tol. [mm]
D<3	0~-0.010	1<D<3	±0.005
3<D<6	0~-0.012	4<D<6	±0.007
6<D<10	0~-0.015	8<D<12	±0.01
10<D<18	0~-0.018		

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Type
	∅D	R	ℓ	ℓ ₁	∅d ₁	γ/°	L	∅d	
HSXBC4010 0450	1	R0.5	1.8	3	0.95	15	50	4	A
HSXBC4010 0650	1	R0.5	1.8	3	0.95	15	50	6	A
HSXBC4015 0450	1.5	R0.75	2.7	4.5	1.42	15	50	4	A
HSXBC4015 0650	1.5	R0.75	2.7	4.5	1.42	15	50	6	A
HSXBC4020 0450	2	R1	4	6	1.9	15	50	4	A
HSXBC4020 0650	2	R1	4	6	1.9	15	50	6	A
HSXBC4025 0650	2.5	R1.25	4.5	7.5	2.4	15	50	6	A
HSXBC4030 0460	3	R1.5	5.4	9	2.9	15	60	4	A
HSXBC4030 0660	3	R1.5	5.4	9	2.9	15	60	6	A
HSXBC4040 0460	4	R2	6.4	12	3.9	-	60	4	B
HSXBC4040 0660	4	R2	6.4	12	3.9	15	60	6	A
HSXBC4050 0660	5	R2.5	9	15	4.85	15	60	6	A
HSXBC4060 0660	6	R3	10.8	18	5.85	-	60	6	B
HSXBC4080 0875	8	R4	14.4	24	7.8	-	75	8	B
HSXBC4080 08100	8	R4	14.4	24	7.8	-	100	8	B
HSXBC4100 1075	10	R5	18	30	9.8	-	75	10	B
HSXBC4100 10100	10	R5	18	30	9.8	-	100	10	B
HSXBC4120 12100	12	R6	21.6	36	11.7	-	100	12	B

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
		○	○	○	○	○	○						



Cutting Parameter

HSXBC 4-Fluted High-hardness Ball End Mill Z Constant Milling Roughing

Workpiece	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXBC4010 0450	38216	1650	0.1	0.25	35000	1500	0.08	0.2	28700	1140	0.06	0.15
HSXBC4010 0650	38216	1650	0.1	0.25	35000	1500	0.08	0.2	28700	1140	0.06	0.15
HSXBC4015 0450	25477	1720	0.15	0.33	23400	1600	0.12	0.3	19100	1220	0.09	0.225
HSXBC4015 0650	25477	1720	0.15	0.33	23400	1600	0.12	0.3	19100	1220	0.09	0.225
HSXBC4020 0450	19108	1720	0.2	0.4	17500	1600	0.16	0.4	14300	1220	0.12	0.3
HSXBC4020 0650	19108	1720	0.2	0.4	17500	1600	0.16	0.4	14300	1220	0.12	0.3
HSXBC4025 0650	15286	1760	0.25	0.525	14000	1650	0.2	0.5	11500	1350	0.15	0.375
HSXBC4030 0460	12738	1760	0.3	0.75	11700	1650	0.24	0.6	9600	1350	0.18	0.45
HSXBC4030 0660	12738	1760	0.3	0.75	11700	1650	0.24	0.6	9600	1350	0.18	0.45
HSXBC4040 0460	9554	1800	0.4	1	8800	1700	0.32	0.8	7200	1460	0.24	0.6
HSXBC4040 0660	9554	1800	0.4	1	8800	1700	0.32	0.8	7200	1460	0.24	0.6
HSXBC4040 0675	9554	1800	0.4	1	8800	1700	0.32	0.8	7200	1460	0.24	0.6
HSXBC4050 0660	7643	1920	0.5	1.25	7000	1800	0.4	1	5700	1470	0.3	0.75
HSXBC4050 0675	7643	1920	0.5	1.25	7000	1800	0.4	1	5700	1470	0.3	0.75
HSXBC4060 0660	6369	2000	0.6	1.5	5800	1850	0.48	1.2	4800	1560	0.36	0.9
HSXBC4060 0675	6369	2000	0.6	1.5	5800	1850	0.48	1.2	4800	1560	0.36	0.9
HSXBC4080 0860	4777	2080	0.8	2	4400	1860	0.64	1.6	3600	1560	0.48	1.2
HSXBC4080 0875	4777	2080	0.8	2	4400	1860	0.64	1.6	3600	1560	0.48	1.2
HSXBC4080 08100	4777	2080	0.8	2	4400	1860	0.64	1.6	3600	1560	0.48	1.2
HSXBC4100 1075	3821	2100	1	2.5	3500	1950	0.8	2	2900	1630	0.6	1.5
HSXBC4100 10100	3821	2100	1	2.5	3500	1950	0.8	2	2900	1630	0.6	1.5
HSXBC4120 12100	3184	2400	1.2	2.8	2900	2000	0.96	2.4	2400	1660	0.72	1.8



Cutting Parameter

HSXBC 4-Fluted High-hardness Ball End Mill Side milling

Workpiece Type No.	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXBC4010 0450	45000	2730	1	0.02	40000	2275	1	0.02	34394	1750	1	0.02
HSXBC4010 0650	45000	2730	1	0.02	40000	2275	1	0.02	34394	1750	1	0.02
HSXBC4015 0450	30000	2400	1.5	0.04	26750	2000	1.5	0.03	23000	1590	1.5	0.02
HSXBC4015 0650	30000	2400	1.5	0.04	26750	2000	1.5	0.03	23000	1590	1.5	0.02
HSXBC4020 0450	22500	2400	2	0.05	20000	2000	2	0.04	17200	1590	2	0.03
HSXBC4020 0650	22500	2400	2	0.05	20000	2000	2	0.04	17200	1590	2	0.03
HSXBC4025 0650	18000	2280	2.5	0.06	16050	1900	2.5	0.05	13800	1490	2.5	0.04
HSXBC4030 0460	15000	2340	3	0.08	13380	1950	3	0.06	11500	1500	3	0.05
HSXBC4030 0660	15000	2340	3	0.08	13380	1950	3	0.06	11500	1500	3	0.05
HSXBC4040 0460	11250	2340	4	0.1	10000	1950	4	0.08	8600	1520	4	0.06
HSXBC4040 0660	11250	2340	4	0.1	10000	1950	4	0.08	8600	1520	4	0.06
HSXBC4040 0675	11250	2340	4	0.1	10000	1950	4	0.08	8600	1520	4	0.06
HSXBC4050 0660	9000	2400	5	0.12	8050	2000	5	0.1	6800	1550	5	0.08
HSXBC4050 0675	9000	2400	5	0.12	8050	2000	5	0.1	6800	1550	5	0.08
HSXBC4060 0660	7500	2400	6	0.15	6687	2000	6	0.12	5750	1540	6	0.09
HSXBC4060 0675	7500	2400	6	0.15	6687	2000	6	0.12	5750	1540	6	0.09
HSXBC4080 0860	5625	2500	8	0.2	5015	2080	8	0.16	4300	1600	8	0.12
HSXBC4080 0875	5625	2500	8	0.2	5015	2080	8	0.16	4300	1600	8	0.12
HSXBC4080 08100	5625	2500	8	0.2	5015	2080	8	0.16	4300	1600	8	0.12
HSXBC4100 1075	4500	2500	10	0.25	4012	2080	10	0.2	3400	1600	10	0.15
HSXBC4100 10100	4500	2500	10	0.25	4012	2080	10	0.2	3400	1600	10	0.15
HSXBC4120 12100	3750	2350	12	0.3	3343	1950	12	0.24	2880	1500	12	0.18

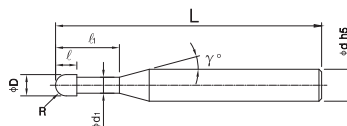


Cutting Parameter

HSXBC 4-Fluted High-hardness Ball End Mill Profile Finishing

Workpiece Type No.	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXBC4010 0450	40000	1500	0.02	0.02	38500	1500	0.02	0.02	38216	1300	0.02	0.02
HSXBC4010 0650	40000	1500	0.02	0.02	38500	1500	0.02	0.02	38216	1300	0.02	0.02
HSXBC4015 0450	35000	2000	0.03	0.03	33800	2000	0.03	0.03	25400	1300	0.02	0.03
HSXBC4015 0650	35000	2000	0.03	0.03	33800	2000	0.03	0.03	25400	1300	0.02	0.03
HSXBC4020 0450	32000	2000	0.04	0.04	25500	2000	0.04	0.04	19100	1300	0.02	0.04
HSXBC4020 0650	32000	2000	0.04	0.04	25500	2000	0.04	0.04	19100	1300	0.02	0.04
HSXBC4025 0650	25600	2400	0.05	0.06	20382	2400	0.05	0.06	15280	1360	0.03	0.05
HSXBC4030 0460	21300	2400	0.05	0.08	17000	2400	0.05	0.08	12738	1370	0.03	0.06
HSXBC4030 0660	21300	2400	0.05	0.08	17000	2400	0.05	0.08	12738	1370	0.03	0.06
HSXBC4040 0460	16000	2500	0.05	0.1	12738	2500	0.05	0.1	9550	1370	0.03	0.08
HSXBC4040 0660	16000	2500	0.05	0.1	12738	2500	0.05	0.1	9550	1370	0.03	0.08
HSXBC4040 0675	16000	2500	0.05	0.1	12738	2500	0.05	0.1	9550	1370	0.03	0.08
HSXBC4050 0660	12800	3000	0.06	0.12	10200	3000	0.06	0.12	7600	1400	0.04	0.1
HSXBC4050 0675	12800	3000	0.06	0.12	10200	3000	0.06	0.12	7600	1400	0.04	0.1
HSXBC4060 0660	10660	3200	0.08	0.15	8500	3200	0.08	0.15	6400	1400	0.04	0.12
HSXBC4060 0675	10660	3200	0.08	0.15	8500	3200	0.08	0.15	6400	1400	0.04	0.12
HSXBC4080 0860	8000	3500	0.08	0.2	6400	3500	0.08	0.2	4800	1460	0.05	0.16
HSXBC4080 0875	8000	3500	0.08	0.2	6400	3500	0.08	0.2	4800	1460	0.05	0.16
HSXBC4080 08100	8000	3500	0.08	0.2	6400	3500	0.08	0.2	4800	1460	0.05	0.16
HSXBC4100 1075	6800	3600	0.1	0.25	5200	3600	0.1	0.25	3800	1460	0.05	0.2
HSXBC4100 10100	6800	3600	0.1	0.25	5200	3600	0.1	0.25	3800	1460	0.05	0.2
HSXBC4120 12100	6500	4000	0.1	0.28	4680	4000	0.1	0.28	3180	1370	0.05	0.24

HSXB2L 2-Flute Long Neck Ball End Mill



∅ D	D Tol. [mm]	∅ D	R Tol. [mm]
D < 3	0 ~ +0.010	D < 1	± 0.003
3 < D < 6	0 ~ +0.012	1 < D < 6	± 0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	∅D	R	ℓ	ℓ ₁	∅d ₁	γ/°	L	∅d
HSXB2001L0.2 0450	0.1	R0.05	0.07	0.2	0.085	12	50	4
HSXB2001L0.3 0450	0.1	R0.05	0.07	0.3	0.085	12	50	4
HSXB2001L0.5 0450	0.1	R0.05	0.07	0.5	0.085	12	50	4
HSXB2001L0.75 0450	0.1	R0.05	0.07	0.75	0.085	12	50	4
HSXB2001L1 0450	0.1	R0.05	0.07	1	0.085	12	50	4
HSXB20015L0.3 0450	0.15	R0.075	0.1	0.3	0.13	12	50	4
HSXB20015L0.5 0450	0.15	R0.075	0.1	0.5	0.13	12	50	4
HSXB20015L0.75 0450	0.15	R0.075	0.1	0.75	0.13	12	50	4
HSXB20015L1 0450	0.15	R0.075	0.1	1	0.13	12	50	4
HSXB20015L1.5 0450	0.15	R0.075	0.1	1.5	0.13	12	50	4
HSXB2002L0.3 0450	0.2	R0.1	0.15	0.3	0.18	12	50	4
HSXB2002L0.5 0450	0.2	R0.1	0.15	0.5	0.18	12	50	4
HSXB2002L0.75 0450	0.2	R0.1	0.15	0.75	0.18	12	50	4
HSXB2002L1 0450	0.2	R0.1	0.15	1	0.18	12	50	4
HSXB2002L1.25 0450	0.2	R0.1	0.15	1.25	0.18	12	50	4
HSXB2002L1.5 0450	0.2	R0.1	0.15	1.5	0.18	12	50	4
HSXB2002L1.75 0450	0.2	R0.1	0.15	1.75	0.18	12	50	4
HSXB2002L2 0450	0.2	R0.1	0.15	2	0.18	12	50	4
HSXB2002L2.5 0450	0.2	R0.1	0.15	2.5	0.18	12	50	4
HSXB2003L0.6 0450	0.3	R0.15	0.2	0.6	0.28	12	50	4
HSXB2003L0.75 0450	0.3	R0.15	0.2	0.75	0.28	12	50	4
HSXB2003L1 0450	0.3	R0.15	0.2	1	0.28	12	50	4
HSXB2003L1.25 0450	0.3	R0.15	0.2	1.25	0.28	12	50	4
HSXB2003L1.5 0450	0.3	R0.15	0.2	1.5	0.28	12	50	4
HSXB2003L1.75 0450	0.3	R0.15	0.2	1.75	0.28	12	50	4
HSXB2003L2 0450	0.3	R0.15	0.2	2	0.28	12	50	4



HSXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXB2003L2.25 0450	0.3	R0.15	0.2	2.25	0.28	12	50	4
HSXB2003L2.5 0450	0.3	R0.15	0.2	2.5	0.28	12	50	4
HSXB2003L3 0450	0.3	R0.15	0.2	3	0.28	12	50	4
HSXB2004L0.5 0450	0.4	R0.2	0.3	0.5	0.37	12	50	4
HSXB2004L0.8 0450	0.4	R0.2	0.3	0.8	0.37	12	50	4
HSXB2004L1 0450	0.4	R0.2	0.3	1	0.37	12	50	4
HSXB2004L1.5 0450	0.4	R0.2	0.3	1.5	0.37	12	50	4
HSXB2004L2 0450	0.4	R0.2	0.3	2	0.37	12	50	4
HSXB2004L2.5 0450	0.4	R0.2	0.3	2.5	0.37	12	50	4
HSXB2004L3 0450	0.4	R0.2	0.3	3	0.37	12	50	4
HSXB2004L3.5 0450	0.4	R0.2	0.3	3.5	0.37	12	50	4
HSXB2004L4 0450	0.4	R0.2	0.3	4	0.37	12	50	4
HSXB2005L1 0450	0.5	R0.25	0.35	1	0.46	12	50	4
HSXB2005L1.5 0450	0.5	R0.25	0.35	1.5	0.46	12	50	4
HSXB2005L2 0450	0.5	R0.25	0.35	2	0.46	12	50	4
HSXB2005L2.5 0450	0.5	R0.25	0.35	2.5	0.46	12	50	4
HSXB2005L3 0450	0.5	R0.25	0.35	3	0.46	12	50	4
HSXB2005L4 0450	0.5	R0.25	0.35	4	0.46	12	50	4
HSXB2005L5 0450	0.5	R0.25	0.35	5	0.46	12	50	4
HSXB2005L6 0450	0.5	R0.25	0.35	6	0.46	12	50	4
HSXB2006L1 0450	0.6	R0.3	0.45	1	0.56	12	50	4
HSXB2006L1.5 0450	0.6	R0.3	0.45	1.5	0.56	12	50	4
HSXB2006L2 0450	0.6	R0.3	0.45	2	0.56	12	50	4
HSXB2006L3 0450	0.6	R0.3	0.45	3	0.56	12	50	4
HSXB2006L4 0450	0.6	R0.3	0.45	4	0.56	12	50	4
HSXB2006L6 0450	0.6	R0.3	0.45	6	0.56	12	50	4
HSXB2006L8 0450	0.6	R0.3	0.45	8	0.56	12	50	4
HSXB2007L2 0450	0.7	R0.35	0.5	2	0.66	12	50	4
HSXB2007L3 0450	0.7	R0.35	0.5	3	0.66	12	50	4
HSXB2007L4 0450	0.7	R0.35	0.5	4	0.66	12	50	4
HSXB2007L6 0450	0.7	R0.35	0.5	6	0.66	12	50	4
HSXB2008L2 0450	0.8	R0.4	0.6	2	0.76	12	50	4
HSXB2008L2.5 0450	0.8	R0.4	0.6	2.5	0.76	12	50	4
HSXB2008L3 0450	0.8	R0.4	0.6	3	0.76	12	50	4



HSXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXB2008L4 0450	0.8	R0.4	0.6	4	0.76	12	50	4
HSXB2008L6 0450	0.8	R0.4	0.6	6	0.76	12	50	4
HSXB2008L8 0450	0.8	R0.4	0.6	8	0.76	12	50	4
HSXB2008L10 0450	0.8	R0.4	0.6	10	0.76	12	50	4
HSXB2009L2 0450	0.9	R0.45	0.65	2	0.86	12	50	4
HSXB2009L4 0450	0.9	R0.45	0.65	4	0.86	12	50	4
HSXB2009L6 0450	0.9	R0.45	0.65	6	0.86	12	50	4
HSXB2009L8 0450	0.9	R0.45	0.65	8	0.86	12	50	4
HSXB2010L2.5 0450	1	R0.5	0.75	2.5	0.95	12	50	4
HSXB2010L3 0450	1	R0.5	0.75	3	0.95	12	50	4
HSXB2010L4 0450	1	R0.5	0.75	4	0.95	12	50	4
HSXB2010L4 0660	1	R0.5	0.75	4	0.95	12	60	6
HSXB2010L5 0450	1	R0.5	0.75	5	0.95	12	50	4
HSXB2010L6 0450	1	R0.5	0.75	6	0.95	12	50	4
HSXB2010L6 0660	1	R0.5	0.75	6	0.95	12	60	6
HSXB2010L7 0450	1	R0.5	0.75	7	0.95	12	50	4
HSXB2010L8 0450	1	R0.5	0.75	8	0.95	12	50	4
HSXB2010L8 0660	1	R0.5	0.75	8	0.95	12	60	6
HSXB2010L9 0450	1	R0.5	0.75	9	0.95	12	50	4
HSXB2010L10 0450	1	R0.5	0.75	10	0.95	12	50	4
HSXB2010L10 0660	1	R0.5	0.75	10	0.95	12	60	6
HSXB2010L12 0450	1	R0.5	0.75	12	0.95	12	50	4
HSXB2010L14 0450	1	R0.5	0.75	14	0.95	12	50	4
HSXB2010L16 0450	1	R0.5	0.75	16	0.95	12	50	4
HSXB2010L18 0460	1	R0.5	0.75	18	0.95	12	60	4
HSXB2010L20 0460	1	R0.5	0.75	20	0.95	12	60	4
HSXB2010L22 0460	1	R0.5	0.75	22	0.95	12	60	4
HSXB2012L4 0450	1.2	R0.6	1	4	1.14	11	50	4
HSXB2012L6 0450	1.2	R0.6	1	6	1.14	11	50	4
HSXB2012L8 0450	1.2	R0.6	1	8	1.14	11	50	4
HSXB2012L10 0450	1.2	R0.6	1	10	1.14	11	50	4
HSXB2012L12 0450	1.2	R0.6	1	12	1.14	11	50	4
HSXB2012L14 0450	1.2	R0.6	1	14	1.14	11	50	4
HSXB2014L8 0450	1.4	R0.7	1.1	8	1.34	11	50	4



HSXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXB2014L12 0450	1.4	R0.7	1.1	12	1.34	11	50	4
HSXB2015L4 0450	1.5	R0.75	1.2	4	1.42	11	50	4
HSXB2015L6 0450	1.5	R0.75	1.2	6	1.42	11	50	4
HSXB2015L6 0660	1.5	R0.75	1.2	6	1.42	11	60	6
HSXB2015L8 0450	1.5	R0.75	1.2	8	1.42	11	50	4
HSXB2015L8 0660	1.5	R0.75	1.2	8	1.42	11	60	6
HSXB2015L10 0450	1.5	R0.75	1.2	10	1.42	11	50	4
HSXB2015L10 0660	1.5	R0.75	1.2	10	1.42	11	60	6
HSXB2015L12 0450	1.5	R0.75	1.2	12	1.42	11	50	4
HSXB2015L12 0660	1.5	R0.75	1.2	12	1.42	11	60	6
HSXB2015L14 0450	1.5	R0.75	1.2	14	1.42	11	50	4
HSXB2015L16 0450	1.5	R0.75	1.2	16	1.42	11	50	4
HSXB2015L18 0460	1.5	R0.75	1.2	18	1.42	11	60	4
HSXB2016L8 0450	1.6	R0.8	1.3	8	1.52	11	50	4
HSXB2016L12 0450	1.6	R0.8	1.3	12	1.52	11	50	4
HSXB2016L16 0450	1.6	R0.8	1.3	16	1.52	11	50	4
HSXB2020L3 0450	2	R1	1.6	3	1.9	11	50	4
HSXB2020L4 0450	2	R1	1.6	4	1.9	11	50	4
HSXB2020L6 0450	2	R1	1.6	6	1.9	11	50	4
HSXB2020L8 0450	2	R1	1.6	8	1.9	11	50	4
HSXB2020L8 0660	2	R1	1.6	8	1.9	11	60	6
HSXB2020L10 0450	2	R1	1.6	10	1.9	11	50	4
HSXB2020L10 0660	2	R1	1.6	10	1.9	11	60	6
HSXB2020L12 0450	2	R1	1.6	12	1.9	11	50	4
HSXB2020L12 0660	2	R1	1.6	12	1.9	11	60	6
HSXB2020L14 0450	2	R1	1.6	14	1.9	11	50	4
HSXB2020L16 0450	2	R1	1.6	16	1.9	11	50	4
HSXB2020L16 0660	2	R1	1.6	16	1.9	11	60	6
HSXB2020L18 0460	2	R1	1.6	18	1.9	11	60	4
HSXB2020L20 0460	2	R1	1.6	20	1.9	11	60	4
HSXB2020L22 0460	2	R1	1.6	22	1.9	11	60	4
HSXB2020L25 0460	2	R1	1.6	25	1.9	11	60	4
HSXB2020L30 0475	2	R1	1.6	30	1.9	11	75	4
HSXB2025L6 0450	2.5	R1.25	2	6	2.4	11	50	4



HSXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXB2025L8 0450	2.5	R1.25	2	8	2.4	11	50	4
HSXB2025L10 0450	2.5	R1.25	2	10	2.4	11	50	4
HSXB2025L12 0450	2.5	R1.25	2	12	2.4	11	50	4
HSXB2025L16 0450	2.5	R1.25	2	16	2.4	11	50	4
HSXB2025L20 0460	2.5	R1.25	2	20	2.4	11	60	4
HSXB2025L25 0460	2.5	R1.25	2	25	2.4	11	60	4
HSXB2030L8 0450	3	R1.5	2.4	8	2.9	11	50	4
HSXB2030L8 0660	3	R1.5	2.4	8	2.9	11	60	6
HSXB2030L10 0450	3	R1.5	2.4	10	2.9	11	50	4
HSXB2030L10 0660	3	R1.5	2.4	10	2.9	11	60	6
HSXB2030L12 0450	3	R1.5	2.4	12	2.9	11	50	4
HSXB2030L12 0660	3	R1.5	2.4	12	2.9	11	60	6
HSXB2030L14 0450	3	R1.5	2.4	14	2.9	11	50	4
HSXB2030L14 0660	3	R1.5	2.4	14	2.9	11	60	6
HSXB2030L16 0450	3	R1.5	2.4	16	2.9	11	50	4
HSXB2030L16 0660	3	R1.5	2.4	16	2.9	11	60	6
HSXB2030L20 0660	3	R1.5	2.4	20	2.9	11	60	6
HSXB2030L25 0675	3	R1.5	2.4	25	2.9	11	75	6
HSXB2030L30 0675	3	R1.5	2.4	30	2.9	11	75	6
HSXB2030L35 0675	3	R1.5	2.4	35	2.9	11	75	6
HSXB2030L40 06100	3	R1.5	2.4	40	2.9	11	100	6
HSXB2035L16 0660	3.5	R1.75	2.8	16	3.4	11	60	6
HSXB2035L20 0660	3.5	R1.75	2.8	20	3.4	11	60	6
HSXB2035L25 0675	3.5	R1.75	2.8	25	3.4	11	75	6
HSXB2035L30 0675	3.5	R1.75	2.8	30	3.4	11	75	6
HSXB2035L35 0675	3.5	R1.75	2.8	35	3.4	11	75	6
HSXB2040L10 0450	4	R2	3.2	10	3.9	11	50	4
HSXB2040L10 0660	4	R2	3.2	10	3.9	11	60	6
HSXB2040L12 0660	4	R2	3.2	12	3.9	11	60	6
HSXB2040L14 0660	4	R2	3.2	14	3.9	11	60	6
HSXB2040L16 0660	4	R2	3.2	16	3.9	11	60	6
HSXB2040L20 0660	4	R2	3.2	20	3.9	11	60	6
HSXB2040L25 0675	4	R2	3.2	25	3.9	11	75	6
HSXB2040L30 0675	4	R2	3.2	30	3.9	11	75	6



HSXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXB2040L35 0675	4	R2	3.2	35	3.9	11	75	6
HSXB2040L40 06100	4	R2	3.2	40	3.9	11	100	6
HSXB2050L16 0660	5	R2.5	4	16	4.85	11	60	6
HSXB2050L20 0660	5	R2.5	4	20	4.85	11	60	6
HSXB2050L30 0675	5	R2.5	4	30	4.85	11	75	6
HSXB2050L40 06100	5	R2.5	4	40	4.85	11	100	6
HSXB2060L12 0660	6	R3	4.8	12	5.85	-	60	6
HSXB2060L20 0675	6	R3	4.8	20	5.85	-	75	6
HSXB2060L30 0675	6	R3	4.8	30	5.85	-	75	6
HSXB2060L40 06100	6	R3	4.8	40	5.85	-	100	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○	○	○	○	○	○			○	○	



Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.05	0.2	40000	120	0.003	0.005	40000	100	0.002	0.005	40000	70	0.002	0.003
	0.3	40000	100	0.003	0.005	40000	70	0.002	0.005	40000	50	0.002	0.003
	0.5	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	0.75	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1	40000	50	0.002	0.003	40000	30	0.001	0.003	40000	30	0.001	0.002
R0.075	0.3	40000	180	0.003	0.005	40000	150	0.002	0.005	40000	100	0.002	0.003
	0.5	40000	150	0.003	0.005	40000	120	0.002	0.005	40000	70	0.002	0.003
	0.75	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1.5	40000	50	0.002	0.003	40000	30	0.001	0.003	40000	30	0.001	0.002
R0.1	0.3	40000	350	0.01	0.01	40000	300	0.006	0.005	36000	200	0.003	0.003
	0.5	40000	320	0.008	0.01	39600	280	0.005	0.005	36000	180	0.003	0.003
	0.75	40000	280	0.005	0.01	39600	200	0.003	0.005	36000	150	0.002	0.003
	1	40000	250	0.003	0.005	39600	160	0.002	0.003	36000	120	0.001	0.002
	1.25	40000	180	0.003	0.005	39600	140	0.002	0.003	36000	100	0.001	0.002
	1.5	40000	150	0.003	0.005	39600	120	0.002	0.003	36000	80	0.001	0.002
	1.75	40000	120	0.002	0.003	39600	100	0.001	0.002	36000	60	0.001	0.002
	2	40000	100	0.002	0.003	39600	80	0.001	0.002	36000	50	0.001	0.001
	2.5	40000	70	0.001	0.002	39600	60	0.001	0.001	36000	40	0.001	0.001
	3	40000	50	0.001	0.001	39600	40	0.001	0.001	36000	30	0.001	0.001
	0.5	36300	350	0.01	0.015	33000	300	0.007	0.01	30000	280	0.003	0.005
R0.15	0.6	36300	350	0.007	0.01	33000	300	0.005	0.007	30000	250	0.003	0.005
	0.75	36300	330	0.007	0.01	33000	280	0.005	0.007	30000	230	0.003	0.005
	1	36300	320	0.007	0.01	33000	250	0.005	0.007	30000	200	0.003	0.005
	1.25	36300	280	0.005	0.007	33000	200	0.003	0.005	30000	160	0.002	0.003
	1.5	36300	230	0.005	0.007	33000	180	0.003	0.005	30000	120	0.002	0.003
	1.75	36300	180	0.003	0.005	33000	150	0.002	0.003	30000	100	0.002	0.002
	2	36300	150	0.003	0.005	33000	120	0.002	0.003	30000	90	0.002	0.002
	2.25	36300	120	0.002	0.003	33000	100	0.001	0.002	30000	80	0.001	0.001
	2.5	36300	100	0.002	0.003	33000	80	0.001	0.002	30000	70	0.001	0.001
	3	36300	80	0.001	0.003	33000	70	0.001	0.002	30000	60	0.001	0.001
	3.5	36300	70	0.001	0.002	33000	60	0.001	0.001	30000	50	0.001	0.001



Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.15	4	36300	60	0.001	0.002	33000	50	0.001	0.001	30000	40	0.001	0.001
	0.5	36300	800	0.03	0.05	33000	720	0.03	0.03	30000	580	0.009	0.02
	0.8	36300	800	0.02	0.05	33000	720	0.02	0.03	30000	580	0.008	0.02
	1	36300	800	0.02	0.05	33000	720	0.02	0.03	30000	580	0.008	0.02
	1.5	36300	620	0.01	0.03	33000	500	0.01	0.02	30000	400	0.005	0.01
	2	36300	500	0.01	0.02	33000	380	0.01	0.01	30000	300	0.005	0.007
R0.2	2.5	36300	420	0.007	0.01	33000	300	0.005	0.007	30000	260	0.003	0.005
	3	36300	300	0.007	0.01	33000	240	0.005	0.007	30000	200	0.003	0.005
	3.5	36300	230	0.005	0.007	33000	160	0.003	0.005	30000	120	0.002	0.003
	4	33000	160	0.005	0.005	30000	120	0.003	0.003	30000	90	0.002	0.003
	4.5	33000	100	0.003	0.005	30000	80	0.002	0.003	30000	60	0.001	0.002
	5	32000	70	0.002	0.003	30000	50	0.001	0.002	30000	40	0.001	0.002
	6	32000	50	0.001	0.002	30000	40	0.001	0.001	30000	30	0.001	0.001
	8	30000	50	0.001	0.002	30000	40	0.001	0.001	30000	30	0.001	0.001
	1	35500	650	0.01	0.025	32000	590	0.01	0.025	30000	500	0.01	0.025
	1.5	35500	650	0.009	0.02	32000	590	0.009	0.02	30000	500	0.009	0.02
R0.25	2	35500	520	0.008	0.02	32000	470	0.008	0.02	30000	400	0.008	0.02
	2.5	33000	520	0.007	0.015	31800	470	0.007	0.015	28000	400	0.007	0.015
	3	33000	468	0.007	0.01	31800	420	0.007	0.01	28000	360	0.007	0.01
	3.5	31250	468	0.006	0.01	29000	420	0.006	0.01	25000	360	0.006	0.01
	4	31250	390	0.005	0.008	29000	350	0.005	0.008	25000	300	0.005	0.008
	4.5	31250	338	0.004	0.008	29000	300	0.004	0.008	25000	260	0.004	0.008
	5	31250	338	0.004	0.008	29000	300	0.004	0.008	25000	260	0.004	0.008
	5.5	31250	312	0.004	0.006	29000	280	0.004	0.006	25000	240	0.004	0.006
	6	27500	156	0.003	0.005	25520	140	0.003	0.005	22000	120	0.003	0.005
	8	25000	104	0.003	0.003	23200	90	0.003	0.003	20000	80	0.003	0.003
	10	25000	65	0.003	0.003	23200	60	0.003	0.003	20000	50	0.003	0.003
	1	33000	975	0.02	0.03	31320	700	0.02	0.03	26000	600	0.02	0.03
	1.5	33000	975	0.02	0.03	31320	700	0.02	0.03	26000	600	0.02	0.03
R0.3	2	33000	780	0.02	0.03	31320	560	0.02	0.03	25000	480	0.02	0.03
	2.5	30800	780	0.015	0.02	29232	560	0.015	0.02	25000	480	0.015	0.02
	3	30800	702	0.015	0.02	29232	500	0.015	0.02	24000	432	0.015	0.02



Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.3	3.5	27500	702	0.01	0.02	26100	500	0.01	0.02	24000	432	0.01	0.02
	4	27500	585	0.01	0.02	26100	420	0.01	0.02	24000	360	0.01	0.02
	4.5	27500	507	0.01	0.02	26100	360	0.01	0.02	24000	312	0.01	0.02
	5	27500	507	0.01	0.02	26100	360	0.01	0.02	24000	312	0.01	0.02
	5.5	27500	468	0.008	0.01	26100	336	0.008	0.01	24000	288	0.008	0.01
	6	24200	234	0.008	0.01	22968	168	0.008	0.01	21120	144	0.008	0.01
	7	22000	156	0.006	0.008	20880	108	0.006	0.008	19200	96	0.006	0.008
	8	22000	97.5	0.005	0.008	20880	70	0.005	0.008	19200	60	0.005	0.008
	9	19040	85	0.005	0.008	18188	65	0.005	0.008	18048	50	0.005	0.008
	10	19040	80	0.003	0.005	18188	60	0.003	0.005	18000	40	0.003	0.005
	12	19040	60	0.003	0.005	18188	50	0.003	0.005	18000	30	0.003	0.005
R0.35	2	32500	1025	0.02	0.035	31200	820	0.02	0.035	26000	480	0.02	0.035
	3	30000	1000	0.02	0.03	30000	800	0.02	0.03	25000	432	0.02	0.03
	4	30000	625	0.015	0.02	30000	500	0.015	0.02	24000	360	0.015	0.02
	6	25000	325	0.006	0.01	25000	260	0.006	0.01	22000	144	0.006	0.01
	8	22000	125	0.005	0.008	22000	100	0.004	0.006	20000	80	0.004	0.006
R0.4	2	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	2.5	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	3	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24200	1600	0.03	0.05	22000	1200	0.03	0.05	20000	860	0.03	0.05
	5	24200	1600	0.02	0.03	22000	1000	0.02	0.03	20000	620	0.02	0.03
	6	21780	1200	0.02	0.03	19800	760	0.02	0.03	18000	560	0.02	0.03
	7	21780	1000	0.02	0.03	19800	680	0.02	0.03	18000	520	0.02	0.03
	8	21780	820	0.01	0.02	19800	600	0.01	0.02	18000	480	0.01	0.02
	10	19360	450	0.008	0.015	17600	380	0.008	0.015	16000	320	0.008	0.015
	12	18150	320	0.006	0.012	16500	260	0.006	0.012	15000	200	0.006	0.012
	16	18150	320	0.005	0.01	16500	260	0.005	0.01	15000	200	0.005	0.01
R0.45	2	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24200	1600	0.03	0.05	22000	1200	0.03	0.05	20000	860	0.03	0.05
	6	21780	1200	0.02	0.03	19800	760	0.02	0.03	18000	560	0.02	0.03
	8	21780	820	0.01	0.02	19800	600	0.01	0.02	18000	480	0.01	0.02
R0.5	2.5	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05



Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.5	3	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	5	24000	2000	0.03	0.05	22000	1600	0.03	0.05	20000	920	0.03	0.05
	6	21600	1800	0.05	0.05	19800	1200	0.03	0.05	18000	740	0.02	0.05
	7	21600	1200	0.04	0.05	19800	950	0.03	0.04	18000	680	0.02	0.03
	8	21600	1000	0.04	0.05	19800	860	0.03	0.04	18000	560	0.02	0.03
	9	19200	820	0.03	0.05	17600	750	0.02	0.03	16000	500	0.01	0.02
	10	18000	750	0.03	0.05	16500	620	0.02	0.03	15000	450	0.01	0.02
	12	18000	600	0.01	0.03	16500	520	0.007	0.02	15000	400	0.005	0.01
	14	16800	420	0.005	0.01	15400	360	0.003	0.007	14000	320	0.002	0.005
	16	16800	300	0.005	0.005	15400	250	0.003	0.005	14000	200	0.002	0.003
	18	16800	180	0.003	0.005	15400	120	0.002	0.005	14000	85	0.002	0.002
	20	14400	100	0.003	0.003	13200	75	0.002	0.003	12000	60	0.002	0.002
	22	12000	50	0.002	0.003	11000	40	0.002	0.002	10000	35	0.001	0.002
R0.6	4	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	6	21600	1800	0.05	0.05	19800	1200	0.04	0.05	18000	740	0.02	0.05
	8	21600	1000	0.04	0.05	19800	860	0.03	0.04	18000	560	0.02	0.03
	10	18000	750	0.03	0.05	16500	620	0.02	0.03	15000	450	0.01	0.02
	12	18000	600	0.01	0.03	16500	520	0.007	0.02	15000	400	0.005	0.01
	14	16800	420	0.005	0.01	15400	360	0.003	0.007	14000	320	0.002	0.005
R0.7	16	16800	300	0.005	0.005	15400	250	0.003	0.005	14000	200	0.002	0.003
	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
R0.75	4	21600	2500	0.03	0.05	19800	2000	0.03	0.05	18000	1600	0.03	0.05
	6	21600	2500	0.03	0.05	19800	2000	0.03	0.05	18000	1600	0.03	0.05
	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	10	21600	2500	0.02	0.05	19800	1200	0.02	0.05	18000	860	0.02	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
	14	18000	1800	0.02	0.03	16500	820	0.02	0.03	15000	650	0.02	0.03
	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
	18	16800	550	0.008	0.015	15400	400	0.008	0.015	14000	400	0.008	0.015



Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.75	20	16800	450	0.007	0.01	15400	360	0.007	0.01	14000	300	0.007	0.01
	25	14400	330	0.007	0.007	13200	250	0.007	0.007	12000	200	0.007	0.007
	30	9600	80	0.003	0.003	8800	60	0.003	0.003	8000	40	0.003	0.003
R0.8	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
	20	16800	450	0.007	0.01	15400	360	0.007	0.01	14000	300	0.007	0.01
R1	6	18000	1920	0.04	0.06	16500	1760	0.04	0.06	15000	1600	0.04	0.06
	8	18000	1440	0.03	0.05	16500	1320	0.03	0.05	15000	1200	0.03	0.05
	10	16800	1440	0.03	0.05	15400	1320	0.03	0.05	14000	1200	0.03	0.05
	12	14400	1128	0.02	0.05	13200	1034	0.02	0.05	12000	940	0.02	0.05
	14	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	16	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	18	12000	1020	0.01	0.03	11000	935	0.01	0.03	10000	850	0.01	0.03
	20	12000	864	0.01	0.03	11000	792	0.01	0.03	10000	720	0.01	0.03
	22	12000	720	0.008	0.02	11000	660	0.008	0.02	10000	600	0.008	0.02
	25	10200	504	0.008	0.02	9350	462	0.008	0.02	8500	420	0.008	0.02
	30	10200	288	0.005	0.01	9350	264	0.005	0.01	8500	240	0.005	0.01
	35	8160	120	0.005	0.007	7480	110	0.005	0.007	6800	100	0.005	0.007
	40	8160	60	0.002	0.005	7480	55	0.002	0.005	6800	50	0.002	0.005
	6	18000	1920	0.04	0.06	16500	1760	0.04	0.06	15000	1600	0.04	0.06
	8	18000	1440	0.03	0.05	16500	1320	0.03	0.05	15000	1200	0.03	0.05
R1.25	10	16800	1440	0.03	0.05	15400	1320	0.03	0.05	14000	1200	0.03	0.05
	12	15000	1320	0.02	0.05	13800	1180	0.02	0.04	13000	1080	0.02	0.04
	16	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	20	12000	864	0.01	0.03	11000	792	0.01	0.03	10000	720	0.01	0.03
	25	10200	504	0.008	0.02	9350	462	0.008	0.02	8500	420	0.008	0.02
	30	10200	288	0.005	0.01	9350	264	0.005	0.01	8500	240	0.005	0.01
	35	8160	120	0.005	0.007	7480	110	0.005	0.007	6800	100	0.005	0.007
R1.5	8	16800	2500	0.04	0.08	15400	2200	0.04	0.08	14000	2000	0.04	0.08
	10	16800	1875	0.03	0.07	15400	1650	0.03	0.07	14000	1500	0.03	0.07
	12	14400	1875	0.03	0.07	13200	1650	0.03	0.07	12000	1500	0.03	0.07



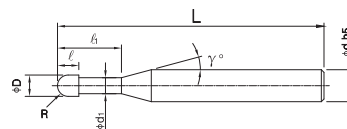
Cutting Parameter

HSXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R1.5	14	14400	1500	0.03	0.07	13200	1320	0.03	0.07	12000	1200	0.03	0.07
	16	14400	1500	0.02	0.05	13200	1320	0.02	0.05	12000	1200	0.02	0.05
	20	12000	1200	0.02	0.05	11000	1056	0.02	0.05	10000	960	0.02	0.05
	25	10320	1000	0.015	0.05	9460	880	0.015	0.05	8600	800	0.015	0.05
	30	8640	750	0.015	0.04	7920	660	0.015	0.04	7200	600	0.015	0.04
	35	7680	525	0.01	0.03	7040	462	0.01	0.03	6400	420	0.01	0.03
	40	7200	325	0.01	0.03	6600	286	0.01	0.03	6000	260	0.01	0.03
R1.75	16	14400	1500	0.02	0.05	13200	1320	0.02	0.05	12000	1200	0.02	0.05
	20	12000	1200	0.02	0.05	11000	1056	0.02	0.05	10000	960	0.02	0.05
	25	10320	1000	0.015	0.05	9460	880	0.015	0.05	8600	800	0.015	0.05
	30	8640	750	0.015	0.04	7920	660	0.015	0.04	7200	600	0.015	0.04
	35	7680	525	0.01	0.03	7040	462	0.01	0.03	6400	420	0.01	0.03
	40	7200	325	0.01	0.03	6600	286	0.01	0.03	6000	260	0.01	0.03
R2	45	6800	300	0.01	0.03	6500	264	0.01	0.03	6000	200	0.01	0.03
	12	13200	3000	0.04	0.08	12100	2500	0.04	0.08	11000	2000	0.04	0.08
	14	13200	3000	0.04	0.08	12100	2000	0.04	0.08	11000	1600	0.04	0.08
	16	12000	3000	0.03	0.06	11000	2000	0.03	0.06	10000	1600	0.03	0.06
	20	12000	2400	0.03	0.06	11000	1800	0.03	0.06	10000	1400	0.03	0.06
	25	10800	1600	0.03	0.05	9900	1200	0.03	0.05	9000	1000	0.03	0.05
	30	9600	1600	0.03	0.05	8800	1200	0.03	0.05	8000	1000	0.03	0.05
	35	9000	1200	0.03	0.05	8250	1000	0.03	0.05	7500	820	0.03	0.05
	40	8160	1200	0.02	0.04	7480	1000	0.02	0.04	6800	820	0.02	0.04
	45	7800	750	0.02	0.04	7150	620	0.02	0.04	6500	500	0.02	0.04
R2.5	50	6600	550	0.015	0.03	6050	500	0.015	0.03	5500	420	0.015	0.03
	16	12000	3000	0.03	0.06	11000	2000	0.03	0.06	10000	1600	0.03	0.06
	20	12000	2400	0.03	0.06	11000	1800	0.03	0.06	10000	1400	0.03	0.06
	25	10800	1600	0.03	0.05	9900	1200	0.03	0.05	9000	1000	0.03	0.05
	30	9600	1600	0.03	0.05	8800	1200	0.03	0.05	8000	1000	0.03	0.05
	35	8500	1450	0.025	0.045	8000	1100	0.025	0.045	7500	950	0.025	0.045
	40	8160	1200	0.02	0.04	7480	1000	0.02	0.04	6800	820	0.02	0.04
	45	7800	750	0.02	0.04	7150	620	0.02	0.04	6500	500	0.02	0.04
	50	6600	550	0.015	0.03	6050	500	0.015	0.03	5500	420	0.015	0.03



HGXB 2-Flute Ball End Mill



Ø D	D Tol. [mm]
D<3	0~-0.010
3<D≤6	0~-0.012
6<D≤10	0~-0.015
10<D≤12	0~-0.018

Ø D	R Tol. [mm]
D<1	±0.003
1<D≤12	±0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	R	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HGXB2001 0450	0.1	R0.05	0.1	—	—	12	50	4
HGXB20015 0450	0.15	R0.075	0.15	—	—	12	50	4
HGXB2002 0450	0.2	R0.1	0.2	—	—	12	50	4
HGXB2003 0450	0.3	R0.15	0.3	—	—	12	50	4
HGXB2004 0450	0.4	R0.2	0.6	—	—	12	50	4
HGXB2005 0450	0.5	R0.25	0.8	—	—	12	50	4
HGXB2006 0450	0.6	R0.3	0.9	—	—	12	50	4
HGXB2008 0450	0.8	R0.4	1.2	—	—	12	50	4
HGXB2010 0450	1	R0.5	0.75	2	0.95	12	50	4
HGXB2010 0650	1	R0.5	0.75	2.5	0.95	12	50	6
HGXB2010 0660	1	R0.5	0.75	2.5	0.95	12	60	6
HGXB2010 0675	1	R0.5	0.75	2.5	0.95	12	75	6
HGXB2012 0450	1.2	R0.6	0.9	2.4	1.14	11	50	4
HGXB2015 0450	1.5	R0.75	1.2	3	1.42	11	50	4
HGXB2015 0650	1.5	R0.75	1.2	4	1.42	11	50	6
HGXB2015 0660	1.5	R0.75	1.2	4	1.42	11	60	6
HGXB2015 0675	1.5	R0.75	1.2	4	1.42	11	75	6
HGXB2020 0450	2	R1	1.6	4	1.9	11	50	4
HGXB2020 0650	2	R1	1.6	6	1.9	11	50	6
HGXB2020 0660	2	R1	1.6	6	1.9	11	60	6
HGXB2020 0675	2	R1	1.6	6	1.9	11	75	6
HGXB2025 0450	2.5	R1.25	2	5	2.4	11	50	4
HGXB2025 0650	2.5	R1.25	2	7	2.4	11	50	6
HGXB2025 0660	2.5	R1.25	2	7	2.4	11	60	6
HGXB2025 0675	2.5	R1.25	2	7	2.4	11	75	6
HGXB2030 0450	3	R1.5	2.4	6	2.9	11	50	4
HGXB2030 0650	3	R1.5	2.4	8	2.9	11	50	6
HGXB2030 0660	3	R1.5	2.4	8	2.9	11	60	6

HGXB 2-Flute Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2030 0675	3	R1.5	2.4	8	2.9	11	75	6
HGXB2040 0450	4	R2	6	—	—	—	50	4
HGXB2040 0475	4	R2	6	—	—	—	75	4
HGXB2040 0650	4	R2	3.2	10	3.9	11	50	6
HGXB2040 0660	4	R2	3.2	10	3.9	11	60	6
HGXB2040 0675	4	R2	3.2	10	3.9	11	75	6
HGXB2050 0650	5	R2.5	4	12	4.85	11	50	6
HGXB2050 0660	5	R2.5	4	12	4.85	11	60	6
HGXB2050 0675	5	R2.5	4	12	4.85	11	75	6
HGXB2060 0650	6	R3	9	—	—	—	50	6
HGXB2060 0660	6	R3	9	—	—	—	60	6
HGXB2060 0675	6	R3	9	—	—	—	75	6
HGXB2060 06100	6	R3	9	—	—	—	100	6
HGXB2080 0860	8	R4	12	—	—	—	60	8
HGXB2080 0875	8	R4	12	—	—	—	75	8
HGXB2080 08100	8	R4	12	—	—	—	100	8
HGXB2100 1075	10	R5	15	—	—	—	75	10
HGXB2100 10100	10	R5	15	—	—	—	100	10
HGXB2100 10125	10	R5	15	—	—	—	125	10
HGXB2120 1275	12	R6	18	—	—	—	75	12
HGXB2120 12100	12	R6	18	—	—	—	100	12
HGXB2120 12125	12	R6	18	—	—	—	125	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS					STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS TOOL STEELS	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~35HRC	~350HB						
~40HRC	○	○	○			○	○	○	○		○	○	



Cutting Parameter

HGXB 2-Flute Ball End Mill 3D Milling

Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXB2001	40000	150	0.003	0.005	40000	100	0.003	0.005	40000	70	0.002	0.003
HGXB20015	40000	200	0.003	0.005	40000	180	0.003	0.005	40000	100	0.003	0.004
HGXB2002	35000	300	0.005	0.008	35000	284	0.005	0.008	32000	200	0.005	0.008
HGXB2003	32000	500	0.01	0.01	30000	400	0.01	0.01	32000	364	0.008	0.01
HGXB2004	28000	600	0.01	0.03	28000	600	0.01	0.03	28000	600	0.01	0.03
HGXB2005	25000	720	0.01	0.03	25000	720	0.01	0.03	25000	720	0.01	0.03
HGXB2006	22000	800	0.02	0.03	22000	800	0.02	0.03	22000	800	0.02	0.03
HGXB2008	20000	1000	0.02	0.03	20000	1000	0.02	0.03	20000	1000	0.02	0.03
HGXB2010	18000	1200	0.03	0.05	18000	1200	0.03	0.05	18000	1200	0.03	0.05
HGXB2012	17000	1350	0.03	0.05	17000	1350	0.03	0.05	17000	1350	0.03	0.05
HGXB2015	16000	1500	0.03	0.05	16000	1500	0.03	0.05	16000	1500	0.03	0.05
HGXB2020	14800	1560	0.04	0.06	14800	1560	0.04	0.06	14800	1560	0.04	0.06
HGXB2025	14400	1680	0.04	0.06	14400	1680	0.04	0.06	14400	1680	0.04	0.06
HGXB2030	13000	2000	0.05	0.08	13000	2000	0.05	0.08	13000	2000	0.05	0.08
HGXB2040	12000	2400	0.05	0.1	12000	2400	0.05	0.1	2000	2400	0.05	0.1
HGXB2050	10000	2500	0.05	0.1	10000	2500	0.05	0.1	1000	2500	0.05	0.1
HGXB2060	9000	2800	0.05	0.15	9000	2800	0.05	0.15	9000	2800	0.05	0.15
HGXB2080	8000	3000	0.08	0.2	8000	3000	0.08	0.2	8000	3000	0.05	0.2
HGXB2100	7200	3000	0.08	0.25	7200	3000	0.08	0.2	7200	3000	0.06	0.25
HGXB2120	6400	3200	0.1	0.25	6400	3200	0.1	0.25	6400	3200	0.08	0.25
HGXB2160	6000	3600	0.1	0.3	6000	3600	0.1	0.3	6000	3600	0.1	0.3

HGX SERIES

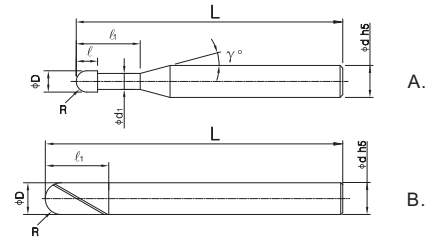
HGXB4 – Highlights

- Excellent surface finish with HGX coating
- For both roughing and finishing
- Suitable for materials up to 55HRC
- Stable milling in corner by optimized chip pocket.
- High precision thanks to dual edge chisel design.

≤55HRC



HGXB 4-Flute Ball End Mill



∅ D	D Tol. [mm]
D ≤ 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012
6 < D ≤ 10	0 ~ -0.015
10 < D ≤ 12	0 ~ -0.018

∅ D	R Tol. [mm]
1 < D ≤ 12	± 0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	
	φD	R	ℓ	ℓ₁	φd₁	γ/°	L	φd	
HGXB4010 0450	1	R0.5	0.75	2	0.95	12	50	4	A
HGXB4010 0650	1	R0.5	0.75	2	0.95	12	50	6	A
HGXB4015 0450	1.5	R0.75	1.2	3	1.42	11	50	4	A
HGXB4015 0650	1.5	R0.75	1.2	4	1.42	11	50	6	A
HGXB4020 0450	2	R1	2	4	1.9	11	50	4	A
HGXB4020 0650	2	R1	2	6	1.9	11	50	6	A
HGXB4025 0450	2.5	R1.25	2	5	2.4	11	50	4	A
HGXB4025 0650	2.5	R1.25	2	7	2.4	11	50	6	A
HGXB4030 0450	3	R1.5	2.4	6	2.9	11	50	4	A
HGXB4030 0660	3	R1.5	2.4	8	2.9	11	60	6	A
HGXB4040 0450	4	R2	3.2	—	—	—	50	4	B
HGXB4040 0660	4	R2	3.2	10	3.9	11	60	6	A
HGXB4050 0660	5	R2.5	4	12	4.85	11	60	6	A
HGXB4060 0660	6	R3	9	—	—	—	60	6	B
HGXB4060 0675	6	R3	9	—	—	—	75	6	B
HGXB4080 0875	8	R4	12	—	—	—	75	8	B
HGXB4080 08100	8	R4	12	—	—	—	100	8	B
HGXB4100 1075	10	R5	15	—	—	—	75	10	B
HGXB4100 10100	10	R5	15	—	—	—	100	10	B
HGXB4120 1275	12	R6	18	—	—	—	75	12	B
HGXB4120 12100	12	R6	18	—	—	—	100	12	B

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
○	○	○	○					○					

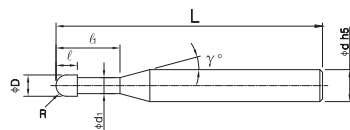


Cutting Parameter

HGXB 4-Flute Ball End Mill 3D Milling Finishing

Workpiece Type No.	Carbon Steels, Alloy Steels (30~40HRC)				Pre-Hardened Steels (35~45HRC)				High Speed Steels, Hardened Steels (46~52HRC)			
	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXEB4010 0450	27000	2160	0.03	0.05	27000	2040	0.03	0.05	24300	1920	0.02	0.02
HSXEB4010 0650	27000	2160	0.03	0.05	27000	2040	0.03	0.05	24300	1920	0.02	0.02
HSXEB4015 0450	24000	2700	0.03	0.05	24000	2550	0.03	0.05	21600	2400	0.02	0.03
HSXEB4015 0650	24000	2700	0.03	0.05	24000	2550	0.03	0.05	21600	2400	0.02	0.03
HSXEB4020 0450	22200	2808	0.04	0.06	22200	2650	0.04	0.06	19980	2496	0.03	0.04
HSXEB4020 0650	22200	2808	0.04	0.06	22200	2650	0.04	0.06	19980	2496	0.03	0.04
HSXEB4025 0650	21600	3024	0.04	0.06	21600	2856	0.04	0.06	19940	2688	0.03	0.06
HSXEB4030 0460	19500	3600	0.05	0.08	19500	3400	0.05	0.08	17550	3200	0.03	0.08
HSXEB4030 0660	19500	3600	0.05	0.08	19500	3400	0.05	0.08	17550	3200	0.03	0.08
HSXEB4040 0460	18000	4320	0.05	0.1	18000	4080	0.05	0.1	16200	3840	0.05	0.1
HSXEB4040 0660	18000	4320	0.05	0.1	18000	4080	0.05	0.1	16200	3840	0.05	0.1
HSXEB4050 0660	15000	4500	0.05	0.1	15000	4250	0.05	0.1	13500	4000	0.05	0.12
HSXEB4060 0660	13500	5040	0.05	0.15	13500	4760	0.05	0.15	12150	4480	0.05	0.15
HSXEB4060 0675	13500	5040	0.05	0.15	13500	4760	0.05	0.15	12150	4480	0.05	0.15
HSXEB4080 0875	12000	5400	0.08	0.2	12000	5100	0.08	0.2	10800	5000	0.05	0.2
HSXEB4080 08100	12000	5400	0.08	0.2	12000	5100	0.08	0.2	10800	5000	0.05	0.2
HSXEB4100 1075	10000	5400	0.08	0.25	10000	5100	0.08	0.2	9000	5000	0.05	0.25
HSXEB4100 10100	10000	5400	0.08	0.25	10000	5100	0.08	0.2	9000	5000	0.05	0.25
HSXEB4120 12100	10204	5760	0.1	0.25	10204	5440	0.1	0.25	9180	5120	0.08	0.25

HGXB2L 2-Flute Long Neck Ball End Mill



Ø D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012

Ø D	R Tol. [mm]
D < 1	±0.003
1 < D ≤ 6	±0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	R	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HGXB2001L0.2 0450	0.1	R0.05	0.07	0.2	0.085	12	50	4
HGXB2001L0.3 0450	0.1	R0.05	0.07	0.3	0.085	12	50	4
HGXB2001L0.5 0450	0.1	R0.05	0.07	0.5	0.085	12	50	4
HGXB2001L0.75 0450	0.1	R0.05	0.07	0.75	0.085	12	50	4
HGXB2001L1 0450	0.1	R0.05	0.07	1	0.085	12	50	4
HGXB20015L0.3 0450	0.15	R0.075	0.1	0.3	0.13	12	50	4
HGXB20015L0.5 0450	0.15	R0.075	0.1	0.5	0.13	12	50	4
HGXB20015L0.75 0450	0.15	R0.075	0.1	0.75	0.13	12	50	4
HGXB20015L1 0450	0.15	R0.075	0.1	1	0.13	12	50	4
HGXB20015L1.5 0450	0.15	R0.075	0.1	1.5	0.13	12	50	4
HGXB2002L0.3 0450	0.2	R0.1	0.15	0.3	0.18	12	50	4
HGXB2002L0.5 0450	0.2	R0.1	0.15	0.5	0.18	12	50	4
HGXB2002L0.75 0450	0.2	R0.1	0.15	0.75	0.18	12	50	4
HGXB2002L1 0450	0.2	R0.1	0.15	1	0.18	12	50	4
HGXB2002L1.25 0450	0.2	R0.1	0.15	1.25	0.18	12	50	4
HGXB2002L1.5 0450	0.2	R0.1	0.15	1.5	0.18	12	50	4
HGXB2002L1.75 0450	0.2	R0.1	0.15	1.75	0.18	12	50	4
HGXB2002L2 0450	0.2	R0.1	0.15	2	0.18	12	50	4
HGXB2003L0.5 0450	0.3	R0.15	0.2	0.5	0.28	12	50	4
HGXB2003L0.6 0450	0.3	R0.15	0.2	0.6	0.28	12	50	4
HGXB2003L0.75 0450	0.3	R0.15	0.2	0.75	0.28	12	50	4
HGXB2003L1 0450	0.3	R0.15	0.2	1	0.28	12	50	4
HGXB2003L1.25 0450	0.3	R0.15	0.2	1.25	0.28	12	50	4
HGXB2003L1.5 0450	0.3	R0.15	0.2	1.5	0.28	12	50	4
HGXB2003L1.75 0450	0.3	R0.15	0.2	1.75	0.28	12	50	4
HGXB2003L2 0450	0.3	R0.15	0.2	2	0.28	12	50	4

HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2003L2.25 0450	0.3	R0.15	0.2	2.25	0.28	12	50	4
HGXB2003L2.5 0450	0.3	R0.15	0.2	2.5	0.28	12	50	4
HGXB2003L3 0450	0.3	R0.15	0.2	3	0.28	12	50	4
HGXB2004L0.5 0450	0.4	R0.2	0.3	0.5	0.37	12	50	4
HGXB2004L0.8 0450	0.4	R0.2	0.3	0.8	0.37	12	50	4
HGXB2004L1 0450	0.4	R0.2	0.3	1	0.37	12	50	4
HGXB2004L1.5 0450	0.4	R0.2	0.3	1.5	0.37	12	50	4
HGXB2004L2 0450	0.4	R0.2	0.3	2	0.37	12	50	4
HGXB2004L2.5 0450	0.4	R0.2	0.3	2.5	0.37	12	50	4
HGXB2004L3 0450	0.4	R0.2	0.3	3	0.37	12	50	4
HGXB2004L3.5 0450	0.4	R0.2	0.3	3.5	0.37	12	50	4
HGXB2004L4 0450	0.4	R0.2	0.3	4	0.37	12	50	4
HGXB2004L4.5 0450	0.4	R0.2	0.3	4.5	0.37	12	50	4
HGXB2005L1 0450	0.5	R0.25	0.35	1	0.46	12	50	4
HGXB2005L1.5 0450	0.5	R0.25	0.35	1.5	0.46	12	50	4
HGXB2005L2 0450	0.5	R0.25	0.35	2	0.46	12	50	4
HGXB2005L2.5 0450	0.5	R0.25	0.35	2.5	0.46	12	50	4
HGXB2005L3 0450	0.5	R0.25	0.35	3	0.46	12	50	4
HGXB2005L3.5 0450	0.5	R0.25	0.35	3.5	0.46	12	50	4
HGXB2005L4 0450	0.5	R0.25	0.35	4	0.46	12	50	4
HGXB2005L4.5 0450	0.5	R0.25	0.35	4.5	0.46	12	50	4
HGXB2005L5 0450	0.5	R0.25	0.35	5	0.46	12	50	4
HGXB2005L5.5 0450	0.5	R0.25	0.35	5.5	0.46	12	50	4
HGXB2005L6 0450	0.5	R0.25	0.35	6	0.46	12	50	4
HGXB2006L1 0450	0.6	R0.3	0.45	1	0.56	12	50	4
HGXB2006L1.5 0450	0.6	R0.3	0.45	1.5	0.56	12	50	4
HGXB2006L2 0450	0.6	R0.3	0.45	2	0.56	12	50	4
HGXB2006L3 0450	0.6	R0.3	0.45	3	0.56	12	50	4
HGXB2006L4 0450	0.6	R0.3	0.45	4	0.56	12	50	4
HGXB2006L5 0450	0.6	R0.3	0.45	5	0.56	12	50	4
HGXB2006L6 0450	0.6	R0.3	0.45	6	0.56	12	50	4
HGXB2006L7 0450	0.6	R0.3	0.45	7	0.56	12	50	4
HGXB2006L8 0450	0.6	R0.3	0.45	8	0.56	12	50	4
HGXB2007L2 0450	0.7	R0.35	0.5	2	0.66	12	50	4





HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2007L3 0450	0.7	R0.35	0.5	3	0.66	12	50	4
HGXB2007L4 0450	0.7	R0.35	0.5	4	0.66	12	50	4
HGXB2007L6 0450	0.7	R0.35	0.5	6	0.66	12	50	4
HGXB2007L8 0450	0.7	R0.35	0.5	8	0.66	12	50	4
HGXB2008L2 0450	0.8	R0.4	0.6	2	0.76	12	50	4
HGXB2008L2.5 0450	0.8	R0.4	0.6	2.5	0.76	12	50	4
HGXB2008L3 0450	0.8	R0.4	0.6	3	0.76	12	50	4
HGXB2008L4 0450	0.8	R0.4	0.6	4	0.76	12	50	4
HGXB2008L5 0450	0.8	R0.4	0.6	5	0.76	12	50	4
HGXB2008L6 0450	0.8	R0.4	0.6	6	0.76	12	50	4
HGXB2008L7 0450	0.8	R0.4	0.6	7	0.76	12	50	4
HGXB2008L8 0450	0.8	R0.4	0.6	8	0.76	12	50	4
HGXB2008L10 0450	0.8	R0.4	0.6	10	0.76	12	50	4
HGXB2008L12 0450	0.8	R0.4	0.6	12	0.76	12	50	4
HGXB2008L16 0450	0.8	R0.4	0.6	16	0.76	12	50	4
HGXB2009L2 0450	0.9	R0.45	0.65	2	0.86	12	50	4
HGXB2009L4 0450	0.9	R0.45	0.65	4	0.86	12	50	4
HGXB2009L6 0450	0.9	R0.45	0.65	6	0.86	12	50	4
HGXB2009L8 0450	0.9	R0.45	0.65	8	0.86	12	50	4
HGXB2010L2.5 0450	1	R0.5	0.75	2.5	0.95	12	50	4
HGXB2010L3 0450	1	R0.5	0.75	3	0.95	12	50	4
HGXB2010L4 0450	1	R0.5	0.75	4	0.95	12	50	4
HGXB2010L4 0660	1	R0.5	0.75	4	0.95	12	60	6
HGXB2010L5 0450	1	R0.5	0.75	5	0.95	12	50	4
HGXB2010L6 0450	1	R0.5	0.75	6	0.95	12	50	4
HGXB2010L6 0660	1	R0.5	0.75	6	0.95	12	60	6
HGXB2010L7 0450	1	R0.5	0.75	7	0.95	12	50	4
HGXB2010L8 0450	1	R0.5	0.75	8	0.95	12	50	4
HGXB2010L8 0660	1	R0.5	0.75	8	0.95	12	60	6
HGXB2010L9 0450	1	R0.5	0.75	9	0.95	12	50	4



HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2010L10 0450	1	R0.5	0.75	10	0.95	12	50	4
HGXB2010L10 0660	1	R0.5	0.75	10	0.95	12	60	6
HGXB2010L12 0450	1	R0.5	0.75	12	0.95	12	50	4
HGXB2010L13 0450	1	R0.5	0.75	13	0.95	12	50	4
HGXB2010L14 0450	1	R0.5	0.75	14	0.95	12	50	4
HGXB2010L16 0450	1	R0.5	0.75	16	0.95	12	50	4
HGXB2010L18 0460	1	R0.5	0.75	18	0.95	12	60	4
HGXB2010L20 0460	1	R0.5	0.75	20	0.95	12	60	4
HGXB2010L22 0460	1	R0.5	0.75	22	0.95	12	60	4
HGXB2012L4 0450	1.2	R0.6	1	4	1.14	11	50	4
HGXB2012L6 0450	1.2	R0.6	1	6	1.14	11	50	4
HGXB2012L8 0450	1.2	R0.6	1	8	1.14	11	50	4
HGXB2012L10 0450	1.2	R0.6	1	10	1.14	11	50	4
HGXB2012L12 0450	1.2	R0.6	1	12	1.14	11	50	4
HGXB2012L14 0450	1.2	R0.6	1	14	1.14	11	50	4
HGXB2014L8 0450	1.4	R0.7	1.1	8	1.34	11	50	4
HGXB2014L12 0450	1.4	R0.7	1.1	12	1.34	11	50	4
HGXB2014L16 0450	1.4	R0.7	1.1	16	1.34	11	50	4
HGXB2015L4 0450	1.5	R0.75	1.2	4	1.42	11	50	4
HGXB2015L6 0450	1.5	R0.75	1.2	6	1.42	11	50	4
HGXB2015L6 0660	1.5	R0.75	1.2	6	1.42	11	60	6
HGXB2015L8 0450	1.5	R0.75	1.2	8	1.42	11	50	4
HGXB2015L8 0660	1.5	R0.75	1.2	8	1.42	11	60	6
HGXB2015L10 0450	1.5	R0.75	1.2	10	1.42	11	50	4
HGXB2015L10 0660	1.5	R0.75	1.2	10	1.42	11	60	6
HGXB2015L12 0450	1.5	R0.75	1.2	12	1.42	11	50	4
HGXB2015L12 0660	1.5	R0.75	1.2	12	1.42	11	60	6
HGXB2015L14 0450	1.5	R0.75	1.2	14	1.42	11	50	4
HGXB2015L16 0450	1.5	R0.75	1.2	16	1.42	11	50	4
HGXB2015L18 0460	1.5	R0.75	1.2	18	1.42	11	60	4



HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2015L20 0460	1.5	R0.75	1.2	20	1.42	11	60	4
HGXB2016L8 0450	1.6	R0.8	1.3	8	1.52	11	50	4
HGXB2016L12 0450	1.6	R0.8	1.3	12	1.52	11	50	4
HGXB2016L16 0450	1.6	R0.8	1.3	16	1.52	11	50	4
HGXB2020L6 0450	2	R1	1.6	6	1.9	11	50	4
HGXB2020L8 0450	2	R1	1.6	8	1.9	11	50	4
HGXB2020L8 0660	2	R1	1.6	8	1.9	11	60	6
HGXB2020L10 0450	2	R1	1.6	10	1.9	11	50	4
HGXB2020L10 0660	2	R1	1.6	10	1.9	11	60	6
HGXB2020L12 0450	2	R1	1.6	12	1.9	11	50	4
HGXB2020L12 0660	2	R1	1.6	12	1.9	11	60	6
HGXB2020L14 0450	2	R1	1.6	14	1.9	11	50	4
HGXB2020L16 0450	2	R1	1.6	16	1.9	11	50	4
HGXB2020L16 0660	2	R1	1.6	16	1.9	11	60	6
HGXB2020L18 0460	2	R1	1.6	18	1.9	11	60	4
HGXB2020L20 0460	2	R1	1.6	20	1.9	11	60	4
HGXB2020L22 0460	2	R1	1.6	22	1.9	11	60	4
HGXB2020L25 0460	2	R1	1.6	25	1.9	11	60	4
HGXB2020L30 0475	2	R1	1.6	30	1.9	11	75	4
HGXB2020L35 0475	2	R1	1.6	35	1.9	11	75	4
HGXB2020L40 0475	2	R1	1.6	40	1.9	11	75	4
HGXB2025L6 0450	2.5	R1.25	2	6	2.4	11	50	4
HGXB2025L8 0450	2.5	R1.25	2	8	2.4	11	50	4
HGXB2025L10 0450	2.5	R1.25	2	10	2.4	11	50	4
HGXB2025L12 0450	2.5	R1.25	2	12	2.4	11	50	4
HGXB2025L16 0450	2.5	R1.25	2	16	2.4	11	50	4
HGXB2025L20 0460	2.5	R1.25	2	20	2.4	11	60	4
HGXB2025L25 0460	2.5	R1.25	2	25	2.4	11	60	4
HGXB2025L30 0475	2.5	R1.25	2	30	2.4	11	75	4
HGXB2025L35 0475	2.5	R1.25	2	35	2.4	11	75	4



HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2030L8 0450	3	R1.5	2.4	8	2.9	11	50	4
HGXB2030L10 0450	3	R1.5	2.4	10	2.9	11	50	4
HGXB2030L10 0660	3	R1.5	2.4	10	2.9	11	60	6
HGXB2030L12 0450	3	R1.5	2.4	12	2.9	11	50	4
HGXB2030L12 0660	3	R1.5	2.4	12	2.9	11	60	6
HGXB2030L14 0450	3	R1.5	2.4	14	2.9	11	50	4
HGXB2030L14 0660	3	R1.5	2.4	14	2.9	11	60	6
HGXB2030L16 0450	3	R1.5	2.4	16	2.9	11	50	4
HGXB2030L16 0660	3	R1.5	2.4	16	2.9	11	60	6
HGXB2030L20 0660	3	R1.5	2.4	20	2.9	11	60	6
HGXB2030L25 0675	3	R1.5	2.4	25	2.9	11	75	6
HGXB2030L30 0675	3	R1.5	2.4	30	2.9	11	75	6
HGXB2030L35 0675	3	R1.5	2.4	35	2.9	11	75	6
HGXB2030L40 06100	3	R1.5	2.4	40	2.9	11	100	6
HGXB2035L16 0660	3.5	R1.75	2.8	16	3.4	11	60	6
HGXB2035L20 0660	3.5	R1.75	2.8	20	3.4	11	60	6
HGXB2035L25 0675	3.5	R1.75	2.8	25	3.4	11	75	6
HGXB2035L30 0675	3.5	R1.75	2.8	30	3.4	11	75	6
HGXB2035L35 0675	3.5	R1.75	2.8	35	3.4	11	75	6
HGXB2040L12 0660	4	R2	3.2	12	3.9	11	60	6
HGXB2040L14 0660	4	R2	3.2	14	3.9	11	60	6
HGXB2040L16 0660	4	R2	3.2	16	3.9	11	60	6
HGXB2040L20 0660	4	R2	3.2	20	3.9	11	60	6
HGXB2040L20 0675	4	R2	3.2	20	3.9	11	75	6
HGXB2040L25 0675	4	R2	3.2	25	3.9	11	75	6
HGXB2040L30 0675	4	R2	3.2	30	3.9	11	75	6
HGXB2040L35 0675	4	R2	3.2	35	3.9	11	75	6
HGXB2040L40 06100	4	R2	3.2	40	3.9	11	100	6
HGXB2040L45 06100	4	R2	3.2	45	3.9	11	100	6
HGXB2040L50 06100	4	R2	3.2	50	3.9	11	100	6

HGXB2L 2-Flute Long Neck Ball End Mill

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXB2050L16 0660	5	R2.5	4	16	4.85	11	60	6
HGXB2050L20 0660	5	R2.5	4	20	4.85	11	60	6
HGXB2050L25 0675	5	R2.5	4	25	4.85	11	75	6
HGXB2050L30 0675	5	R2.5	4	30	4.85	11	75	6
HGXB2050L35 0675	5	R2.5	4	35	4.85	11	75	6
HGXB2050L40 06100	5	R2.5	4	40	4.85	11	100	6
HGXB2050L45 06100	5	R2.5	4	45	4.85	11	100	6
HGXB2050L50 06100	5	R2.5	4	50	4.85	11	100	6
HGXB2060L12 0660	6	R3	4.8	12	5.85	-	60	6
HGXB2060L20 0675	6	R3	4.8	20	5.85	-	75	6
HGXB2060L30 0675	6	R3	4.8	30	5.85	-	75	6
HGXB2060L40 06100	6	R3	4.8	40	5.85	-	100	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○			○	○	○	○		○	○	



Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Radius mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.05	0.2	40000	120	0.003	0.005	40000	100	0.002	0.005	40000	70	0.002	0.003
	0.3	40000	100	0.003	0.005	40000	70	0.002	0.005	40000	50	0.002	0.003
	0.5	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	0.75	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1	40000	50	0.002	0.003	40000	30	0.001	0.003	40000	30	0.001	0.002
R0.075	0.3	40000	180	0.003	0.005	40000	150	0.002	0.005	40000	100	0.002	0.003
	0.5	40000	150	0.003	0.005	40000	120	0.002	0.005	40000	70	0.002	0.003
	0.75	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1	40000	70	0.002	0.003	40000	50	0.001	0.003	40000	30	0.001	0.002
	1.5	40000	50	0.002	0.003	40000	30	0.001	0.003	40000	30	0.001	0.002
R0.1	0.3	40000	350	0.01	0.01	40000	300	0.006	0.005	36000	200	0.003	0.003
	0.5	40000	320	0.008	0.01	39600	280	0.005	0.005	36000	180	0.003	0.003
	0.75	40000	280	0.005	0.01	39600	200	0.003	0.005	36000	150	0.002	0.003
	1	40000	250	0.003	0.005	39600	160	0.002	0.003	36000	120	0.001	0.002
	1.25	40000	180	0.003	0.005	39600	140	0.002	0.003	36000	100	0.001	0.002
	1.5	40000	150	0.003	0.005	39600	120	0.002	0.003	36000	80	0.001	0.002
	1.75	40000	120	0.002	0.003	39600	100	0.001	0.002	36000	60	0.001	0.002
	2	40000	100	0.002	0.003	39600	80	0.001	0.002	36000	50	0.001	0.001
	2.5	40000	70	0.001	0.002	39600	60	0.001	0.001	36000	40	0.001	0.001
	3	40000	50	0.001	0.001	39600	40	0.001	0.001	36000	30	0.001	0.001
R0.15	0.5	36300	350	0.01	0.015	33000	300	0.007	0.01	30000	280	0.003	0.005
	0.6	36300	350	0.007	0.01	33000	300	0.005	0.007	30000	250	0.003	0.005
	0.75	36300	330	0.007	0.01	33000	280	0.005	0.007	30000	230	0.003	0.005
	1	36300	320	0.007	0.01	33000	250	0.005	0.007	30000	200	0.003	0.005
	1.25	36300	280	0.005	0.007	33000	200	0.003	0.005	30000	160	0.002	0.003
	1.5	36300	230	0.005	0.007	33000	180	0.003	0.005	30000	120	0.002	0.003
	1.75	36300	180	0.003	0.005	33000	150	0.002	0.003	30000	100	0.002	0.002
	2	36300	150	0.003	0.005	33000	120	0.002	0.003	30000	90	0.002	0.002
	2.25	36300	120	0.002	0.003	33000	100	0.001	0.002	30000	80	0.001	0.001
	2.5	36300	100	0.002	0.003	33000	80	0.001	0.002	30000	70	0.001	0.001
	3	36300	80	0.001	0.003	33000	70	0.001	0.002	30000	60	0.001	0.001
	3.5	36300	70	0.001	0.002	33000	60	0.001	0.001	30000	50	0.001	0.001



Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.15	4	36300	60	0.001	0.002	33000	50	0.001	0.001	30000	40	0.001	0.001
	0.5	36300	800	0.03	0.05	33000	720	0.03	0.03	30000	580	0.009	0.02
	0.8	36300	800	0.02	0.05	33000	720	0.02	0.03	30000	580	0.008	0.02
	1	36300	800	0.02	0.05	33000	720	0.02	0.03	30000	580	0.008	0.02
	1.5	36300	620	0.01	0.03	33000	500	0.01	0.02	30000	400	0.005	0.01
	2	36300	500	0.01	0.02	33000	380	0.01	0.01	30000	300	0.005	0.007
R0.2	2.5	36300	420	0.007	0.01	33000	300	0.005	0.007	30000	260	0.003	0.005
	3	36300	300	0.007	0.01	33000	240	0.005	0.007	30000	200	0.003	0.005
	3.5	36300	230	0.005	0.007	33000	160	0.003	0.005	30000	120	0.002	0.003
	4	33000	160	0.005	0.005	30000	120	0.003	0.003	30000	90	0.002	0.003
	4.5	33000	100	0.003	0.005	30000	80	0.002	0.003	30000	60	0.001	0.002
	5	32000	70	0.002	0.003	30000	50	0.001	0.002	30000	40	0.001	0.002
	6	32000	50	0.001	0.002	30000	40	0.001	0.001	30000	30	0.001	0.001
	8	30000	50	0.001	0.002	30000	40	0.001	0.001	30000	30	0.001	0.001
R0.25	1	35500	650	0.01	0.025	32000	590	0.01	0.025	30000	500	0.01	0.025
	1.5	35500	650	0.009	0.02	32000	590	0.009	0.02	30000	500	0.009	0.02
	2	35500	520	0.008	0.02	32000	470	0.008	0.02	30000	400	0.008	0.02
	2.5	33000	520	0.007	0.015	31800	470	0.007	0.015	28000	400	0.007	0.015
	3	33000	468	0.007	0.01	31800	420	0.007	0.01	28000	360	0.007	0.01
	3.5	31250	468	0.006	0.01	29000	420	0.006	0.01	25000	360	0.006	0.01
	4	31250	390	0.005	0.008	29000	350	0.005	0.008	25000	300	0.005	0.008
	4.5	31250	338	0.004	0.008	29000	300	0.004	0.008	25000	260	0.004	0.008
	5	31250	338	0.004	0.008	29000	300	0.004	0.008	25000	260	0.004	0.008
	5.5	31250	312	0.004	0.006	29000	280	0.004	0.006	25000	240	0.004	0.006
	6	27500	156	0.003	0.005	25520	140	0.003	0.005	22000	120	0.003	0.005
	8	25000	104	0.003	0.003	23200	90	0.003	0.003	20000	80	0.003	0.003
R0.3	10	25000	65	0.003	0.003	23200	60	0.003	0.003	20000	50	0.003	0.003
	1	33000	975	0.02	0.03	31320	700	0.02	0.03	26000	600	0.02	0.03
	1.5	33000	975	0.02	0.03	31320	700	0.02	0.03	26000	600	0.02	0.03
	2	33000	780	0.02	0.03	31320	560	0.02	0.03	25000	480	0.02	0.03
	2.5	30800	780	0.015	0.02	29232	560	0.015	0.02	25000	480	0.015	0.02
	3	30800	702	0.015	0.02	29232	500	0.015	0.02	24000	432	0.015	0.02



Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.3	3.5	27500	702	0.01	0.02	26100	500	0.01	0.02	24000	432	0.01	0.02
	4	27500	585	0.01	0.02	26100	420	0.01	0.02	24000	360	0.01	0.02
	4.5	27500	507	0.01	0.02	26100	360	0.01	0.02	24000	312	0.01	0.02
	5	27500	507	0.01	0.02	26100	360	0.01	0.02	24000	312	0.01	0.02
	5.5	27500	468	0.008	0.01	26100	336	0.008	0.01	24000	288	0.008	0.01
	6	24200	234	0.008	0.01	22968	168	0.008	0.01	21120	144	0.008	0.01
	7	22000	156	0.006	0.008	20880	108	0.006	0.008	19200	96	0.006	0.008
	8	22000	97.5	0.005	0.008	20880	70	0.005	0.008	19200	60	0.005	0.008
	9	19040	85	0.005	0.008	18188	65	0.005	0.008	18048	50	0.005	0.008
	10	19040	80	0.003	0.005	18188	60	0.003	0.005	18000	40	0.003	0.005
R0.35	12	19040	60	0.003	0.005	18188	50	0.003	0.005	18000	30	0.003	0.005
	2	32500	1025	0.02	0.035	31200	820	0.02	0.035	26000	480	0.02	0.035
	3	30000	1000	0.02	0.03	30000	800	0.02	0.03	25000	432	0.02	0.03
	4	30000	625	0.015	0.02	30000	500	0.015	0.02	24000	360	0.015	0.02
	6	25000	325	0.006	0.01	25000	260	0.006	0.01	22000	144	0.006	0.01
R0.4	8	22000	125	0.005	0.008	22000	100	0.004	0.006	20000	80	0.004	0.006
	2	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	2.5	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	3	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24200	1600	0.03	0.05	22000	1200	0.03	0.05	20000	860	0.03	0.05
	5	24200	1600	0.02	0.03	22000	1000	0.02	0.03	20000	620	0.02	0.03
	6	21780	1200	0.02	0.03	19800	760	0.02	0.03	18000	560	0.02	0.03
	7	21780	1000	0.02	0.03	19800	680	0.02	0.03	18000	520	0.02	0.03
	8	21780	820	0.01	0.02	19800	600	0.01	0.02	18000	480	0.01	0.02
	10	19360	450	0.008	0.015	17600	380	0.008	0.015	16000	320	0.008	0.015
R0.45	12	18150	320	0.006	0.012	16500	260	0.006	0.012	15000	200	0.006	0.012
	16	18150	320	0.005	0.01	16500	260	0.005	0.01	15000	200	0.005	0.01
	2	24200	2000	0.03	0.05	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24200	1600	0.03	0.05	22000	1200	0.03	0.05	20000	860	0.03	0.05
	6	21780	1200	0.02	0.03	19800	760	0.02	0.03	18000	560	0.02	0.03
R0.5	8	21780	820	0.01	0.02	19800	600	0.01	0.02	18000	480	0.01	0.02
	2.5	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05

Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45~55HRC)			
Radius mm	Underneck mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
R0.5	3	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	4	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	5	24000	2000	0.03	0.05	22000	1600	0.03	0.05	20000	920	0.03	0.05
	6	21600	1800	0.05	0.05	19800	1200	0.03	0.05	18000	740	0.02	0.05
	7	21600	1200	0.04	0.05	19800	950	0.03	0.04	18000	680	0.02	0.03
	8	21600	1000	0.04	0.05	19800	860	0.03	0.04	18000	560	0.02	0.03
	9	19200	820	0.03	0.05	17600	750	0.02	0.03	16000	500	0.01	0.02
	10	18000	750	0.03	0.05	16500	620	0.02	0.03	15000	450	0.01	0.02
	12	18000	600	0.01	0.03	16500	520	0.007	0.02	15000	400	0.005	0.01
	14	16800	420	0.005	0.01	15400	360	0.003	0.007	14000	320	0.002	0.005
	16	16800	300	0.005	0.005	15400	250	0.003	0.005	14000	200	0.002	0.003
	18	16800	180	0.003	0.005	15400	120	0.002	0.005	14000	85	0.002	0.002
	20	14400	100	0.003	0.003	13200	75	0.002	0.003	12000	60	0.002	0.002
	22	12000	50	0.002	0.003	11000	40	0.002	0.002	10000	35	0.001	0.002
R0.6	4	24000	2000	0.03	0.06	22000	1600	0.03	0.05	20000	1200	0.03	0.05
	6	21600	1800	0.05	0.05	19800	1200	0.04	0.05	18000	740	0.02	0.05
	8	21600	1000	0.04	0.05	19800	860	0.03	0.04	18000	560	0.02	0.03
	10	18000	750	0.03	0.05	16500	620	0.02	0.03	15000	450	0.01	0.02
	12	18000	600	0.01	0.03	16500	520	0.007	0.02	15000	400	0.005	0.01
	14	16800	420	0.005	0.01	15400	360	0.003	0.007	14000	320	0.002	0.005
R0.7	16	16800	300	0.005	0.005	15400	250	0.003	0.005	14000	200	0.002	0.003
	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
R0.75	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
	4	21600	2500	0.03	0.05	19800	2000	0.03	0.05	18000	1600	0.03	0.05
	6	21600	2500	0.03	0.05	19800	2000	0.03	0.05	18000	1600	0.03	0.05
	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	10	21600	2500	0.02	0.05	19800	1200	0.02	0.05	18000	860	0.02	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
	14	18000	1800	0.02	0.03	16500	820	0.02	0.03	15000	650	0.02	0.03
	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
	18	16800	550	0.008	0.015	15400	400	0.008	0.015	14000	400	0.008	0.015



Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
R0.75	20	16800	450	0.007	0.01	15400	360	0.007	0.01	14000	300	0.007	0.01
	25	14400	330	0.007	0.007	13200	250	0.007	0.007	12000	200	0.007	0.007
	30	9600	80	0.003	0.003	8800	60	0.003	0.003	8000	40	0.003	0.003
R0.8	8	21600	2500	0.03	0.05	19800	1600	0.03	0.05	18000	1200	0.03	0.05
	12	18000	1800	0.02	0.05	16500	920	0.02	0.05	15000	780	0.02	0.05
	16	18000	720	0.01	0.02	16500	650	0.01	0.02	15000	580	0.01	0.02
R1	20	16800	450	0.007	0.01	15400	360	0.007	0.01	14000	300	0.007	0.01
	6	18000	1920	0.04	0.06	16500	1760	0.04	0.06	15000	1600	0.04	0.06
	8	18000	1440	0.03	0.05	16500	1320	0.03	0.05	15000	1200	0.03	0.05
	10	16800	1440	0.03	0.05	15400	1320	0.03	0.05	14000	1200	0.03	0.05
	12	14400	1128	0.02	0.05	13200	1034	0.02	0.05	12000	940	0.02	0.05
	14	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	16	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	18	12000	1020	0.01	0.03	11000	935	0.01	0.03	10000	850	0.01	0.03
	20	12000	864	0.01	0.03	11000	792	0.01	0.03	10000	720	0.01	0.03
	22	12000	720	0.008	0.02	11000	660	0.008	0.02	10000	600	0.008	0.02
	25	10200	504	0.008	0.02	9350	462	0.008	0.02	8500	420	0.008	0.02
	30	10200	288	0.005	0.01	9350	264	0.005	0.01	8500	240	0.005	0.01
	35	8160	120	0.005	0.007	7480	110	0.005	0.007	6800	100	0.005	0.007
	40	8160	60	0.002	0.005	7480	55	0.002	0.005	6800	50	0.002	0.005
R1.25	6	18000	1920	0.04	0.06	16500	1760	0.04	0.06	15000	1600	0.04	0.06
	8	18000	1440	0.03	0.05	16500	1320	0.03	0.05	15000	1200	0.03	0.05
	10	16800	1440	0.03	0.05	15400	1320	0.03	0.05	14000	1200	0.03	0.05
	12	15000	1320	0.02	0.05	13800	1180	0.02	0.04	13000	1080	0.02	0.04
	16	14400	1128	0.015	0.04	13200	1034	0.015	0.04	12000	940	0.015	0.04
	20	12000	864	0.01	0.03	11000	792	0.01	0.03	10000	720	0.01	0.03
	25	10200	504	0.008	0.02	9350	462	0.008	0.02	8500	420	0.008	0.02
	30	10200	288	0.005	0.01	9350	264	0.005	0.01	8500	240	0.005	0.01
R1.5	35	8160	120	0.005	0.007	7480	110	0.005	0.007	6800	100	0.005	0.007
	8	16800	2500	0.04	0.08	15400	2200	0.04	0.08	14000	2000	0.04	0.08
	10	16800	1875	0.03	0.07	15400	1650	0.03	0.07	14000	1500	0.03	0.07
	12	14400	1875	0.03	0.07	13200	1650	0.03	0.07	12000	1500	0.03	0.07



Cutting Parameter

HGXB2L 2-Flute Long Neck Ball End Mill 3D Milling

Workpiece		Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Radius mm	Underneck mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
R1.5	14	14400	1500	0.03	0.07	13200	1320	0.03	0.07	12000	1200	0.03	0.07
	16	14400	1500	0.02	0.05	13200	1320	0.02	0.05	12000	1200	0.02	0.05
	20	12000	1200	0.02	0.05	11000	1056	0.02	0.05	10000	960	0.02	0.05
	25	10320	1000	0.015	0.05	9460	880	0.015	0.05	8600	800	0.015	0.05
	30	8640	750	0.015	0.04	7920	660	0.015	0.04	7200	600	0.015	0.04
	35	7680	525	0.01	0.03	7040	462	0.01	0.03	6400	420	0.01	0.03
	40	7200	325	0.01	0.03	6600	286	0.01	0.03	6000	260	0.01	0.03
R1.75	16	14400	1500	0.02	0.05	13200	1320	0.02	0.05	12000	1200	0.02	0.05
	20	12000	1200	0.02	0.05	11000	1056	0.02	0.05	10000	960	0.02	0.05
	25	10320	1000	0.015	0.05	9460	880	0.015	0.05	8600	800	0.015	0.05
	30	8640	750	0.015	0.04	7920	660	0.015	0.04	7200	600	0.015	0.04
	35	7680	525	0.01	0.03	7040	462	0.01	0.03	6400	420	0.01	0.03
	40	7200	325	0.01	0.03	6600	286	0.01	0.03	6000	260	0.01	0.03
	45	6800	300	0.01	0.03	6500	264	0.01	0.03	6000	200	0.01	0.03
R2	12	13200	3000	0.04	0.08	12100	2500	0.04	0.08	11000	2000	0.04	0.08
	14	13200	3000	0.04	0.08	12100	2000	0.04	0.08	11000	1600	0.04	0.08
	16	12000	3000	0.03	0.06	11000	2000	0.03	0.06	10000	1600	0.03	0.06
	20	12000	2400	0.03	0.06	11000	1800	0.03	0.06	10000	1400	0.03	0.06
	25	10800	1600	0.03	0.05	9900	1200	0.03	0.05	9000	1000	0.03	0.05
	30	9600	1600	0.03	0.05	8800	1200	0.03	0.05	8000	1000	0.03	0.05
	35	9000	1200	0.03	0.05	8250	1000	0.03	0.05	7500	820	0.03	0.05
	40	8160	1200	0.02	0.04	7480	1000	0.02	0.04	6800	820	0.02	0.04
	45	7800	750	0.02	0.04	7150	620	0.02	0.04	6500	500	0.02	0.04
	50	6600	550	0.015	0.03	6050	500	0.015	0.03	5500	420	0.015	0.03
R2.5	16	12000	3000	0.03	0.06	11000	2000	0.03	0.06	10000	1600	0.03	0.06
	20	12000	2400	0.03	0.06	11000	1800	0.03	0.06	10000	1400	0.03	0.06
	25	10800	1600	0.03	0.05	9900	1200	0.03	0.05	9000	1000	0.03	0.05
	30	9600	1600	0.03	0.05	8800	1200	0.03	0.05	8000	1000	0.03	0.05
	35	8500	1450	0.025	0.045	8000	1100	0.025	0.045	7500	950	0.025	0.045
	40	8160	1200	0.02	0.04	7480	1000	0.02	0.04	6800	820	0.02	0.04
	45	7800	750	0.02	0.04	7150	620	0.02	0.04	6500	500	0.02	0.04
	50	6600	550	0.015	0.03	6050	500	0.015	0.03	5500	420	0.015	0.03

HGX SERIES

HGXPB2 – Highlights

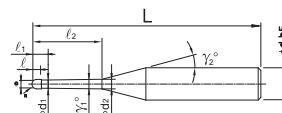
- Two tapered angles available
- Excellent chip evacuation in deep areas
- Stable milling with optimized neck design
- Smooth coating for superior surface finish
- High precision for tight tolerances

≤55HRC





HGXPB 2-Flute Taper Neck Ball End Mill



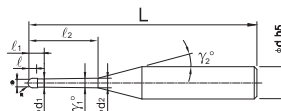
∅ D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012

∅ D	R Tol. [mm]
D < 1	±0.003
1 < D ≤ 6	±0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Straight Under Neck	Taper Angle	Neck Taper Angle	Tip Dia.	Shank Dia.	Overall Length	Shank Dia.
	φD	R	ℓ	ℓ ₂	ℓ ₁	γ ₁ / °	γ ₂ / °	φd ₁	φd ₂	L	φd
HGXPB2006-2-T0.4 0450	0.6	R0.3	0.36	2	0.6	0.4	12	0.56	0.58	50	4
HGXPB2006-4-T0.4 0450	0.6	R0.3	0.36	4	0.6	0.4	12	0.56	0.607	50	4
HGXPB2006-6-T0.9 0450	0.6	R0.3	0.36	6	0.6	0.9	12	0.56	0.635	50	4
HGXPB2008-4-T0.4 0450	0.8	R0.4	0.48	4	0.7	0.4	12	0.76	0.806	50	4
HGXPB2008-6-T0.4 0450	0.8	R0.4	0.48	6	0.7	0.4	12	0.76	0.834	50	4
HGXPB2010-6-T0.4 0450	1	R0.5	0.6	6	0.8	0.4	12	0.95	1.023	50	4
HGXPB2010-6-T0.4 0650	1	R0.5	0.6	6	0.8	0.4	12	0.95	1.023	50	6
HGXPB2010-8-T0.4 0450	1	R0.5	0.6	8	0.8	0.4	12	0.95	1.051	50	4
HGXPB2010-8-T0.4 0660	1	R0.5	0.6	8	0.8	0.4	12	0.95	1.051	60	6
HGXPB2010-10-T0.4 0450	1	R0.5	0.6	10	0.8	0.4	12	0.95	1.078	50	4
HGXPB2010-10-T0.4 0660	1	R0.5	0.6	10	0.8	0.4	12	0.95	1.078	60	6
HGXPB2010-15-T0.4 0450	1	R0.5	0.6	15	0.8	0.4	12	0.95	1.148	50	4
HGXPB2010-15-T0.4 0660	1	R0.5	0.6	15	0.8	0.4	12	0.95	1.148	60	6
HGXPB2010-6-T0.9 0450	1	R0.5	0.6	6	0.8	0.9	12	0.95	1.113	50	4
HGXPB2010-6-T0.9 0650	1	R0.5	0.6	6	0.8	0.9	12	0.95	1.113	50	6
HGXPB2010-10-T0.9 0450	1	R0.5	0.6	10	0.8	0.9	12	0.95	1.239	50	4
HGXPB2010-10-T0.9 0660	1	R0.5	0.6	10	0.8	0.9	12	0.95	1.239	60	6
HGXPB2010-15-T0.9 0450	1	R0.5	0.6	15	0.8	0.9	12	0.95	1.396	50	4
HGXPB2010-15-T0.9 0660	1	R0.5	0.6	15	0.8	0.9	12	0.95	1.396	60	6
HGXPB2010-20-T0.9 0460	1	R0.5	0.6	20	0.8	0.9	12	0.95	1.553	60	4
HGXPB2010-20-T0.9 0675	1	R0.5	0.6	20	0.8	0.9	12	0.95	1.553	75	6
HGXPB2015-8-T0.4 0660	1.5	R0.75	0.9	8	1.35	0.4	12	1.42	1.513	60	6
HGXPB2015-10-T0.4 0660	1.5	R0.75	0.9	10	1.35	0.4	12	1.42	1.541	60	6
HGXPB2015-12-T0.4 0660	1.5	R0.75	0.9	12	1.35	0.4	12	1.42	1.569	60	6
HGXPB2015-15-T0.9 0660	1.5	R0.75	0.9	15	1.35	0.9	12	1.42	1.848	60	6
HGXPB2015-20-T0.9 0675	1.5	R0.75	0.9	20	1.35	0.9	12	1.42	2.006	75	6
HGXPB2020-8-T0.4 0650	2	R1	1.2	8	1.7	0.4	12	1.9	1.988	50	6
HGXPB2020-12-T0.4 0660	2	R1	1.2	12	1.7	0.4	12	1.9	2.044	60	6

HGXPB 2-Flute Taper Neck Ball End Mill



Ø D	D Tol. [mm]	Ø D	R Tol. [mm]
D < 3	0 ~ -0.010	D < 1	±0.003
3 < D ≤ 6	0 ~ -0.012	1 < D ≤ 6	±0.005

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Straight Under Neck	Taper Angle	Neck Taper Angle	Tip Dia.	Shank Dia.	Overall Length	Shank Dia.
	φD	R	ℓ	ℓ ₂	ℓ ₁	γ ₁ / °	γ ₂ / °	φd ₁	φd ₂	L	φd
HGXPB2020-16-T0.4 0660	2	R1	1.2	16	1.7	0.4	12	1.9	2.1	60	6
HGXPB2020-20-T0.4 0675	2	R1	1.2	20	1.7	0.4	12	1.9	2.156	75	6
HGXPB2020-12-T0.9 0660	2	R1	1.2	12	1.7	0.9	12	1.9	2.224	60	6
HGXPB2020-16-T0.9 0660	2	R1	1.2	16	1.7	0.9	12	1.9	2.349	60	6
HGXPB2020-20-T0.9 0675	2	R1	1.2	20	1.7	0.9	12	1.9	2.475	75	6
HGXPB2020-25-T0.9 0675	2	R1	1.2	25	1.7	0.9	12	1.9	2.631	75	6
HGXPB2020-30-T0.9 0675	2	R1	1.2	30	1.7	0.9	12	1.9	2.699	75	6
HGXPB2020-40-T0.9 06100	2	R1	1.2	40	1.7	0.9	12	1.9	3.103	100	6
HGXPB2030-8-T0.4 0650	3	R1.5	1.8	8	2.5	0.4	12	2.9	2.977	50	6
HGXPB2030-16-T0.4 0660	3	R1.5	1.8	16	2.5	0.4	12	2.9	3.088	60	6
HGXPB2030-20-T0.4 0660	3	R1.5	1.8	20	2.5	0.4	12	2.9	3.144	60	6
HGXPB2030-16-T0.9 0660	3	R1.5	1.8	16	2.5	0.9	12	2.9	3.292	60	6
HGXPB2030-20-T0.9 0660	3	R1.5	1.8	20	2.5	0.9	12	2.9	3.45	60	6
HGXPB2030-30-T0.9 0675	3	R1.5	1.8	30	2.5	0.9	12	2.9	3.764	75	6
HGXPB2030-40-T0.9 06100	3	R1.5	1.8	40	2.5	0.9	12	2.9	4.392	100	6
HGXPB2040-20-T0.9 0875	4	R2	6	20	8	0.9	12	2.9	4.277	75	8
HGXPB2040-30-T0.9 08100	4	R2	6	30	8	0.9	12	3.9	4.591	100	8
HGXPB2040-40-T0.9 08100	4	R2	6	40	8	0.9	12	3.9	4.905	100	8
HGXPB2060-30-T0.9 08100	6	R3	9	30	12	0.9	12	5.85	6.416	100	8
HGXPB2060-45-T0.9 08100	6	R3	9	45	12	0.9	12	5.85	6.887	100	8

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PRE-HARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
○	○	○	○					○					

Cutting Parameter

HGXPB 2-Flute Taper Neck Ball End Mill

Workpiece					Carbon Steels, Alloy Steels (30~40HRC)				Pre-Hardened Steels (35~45HRC)				High Speed Steels, Hardened Steels (46-55HRC)			
Type No.	Ball radius mm	Tool dia. mm	BH2A Neck Angle	Under Neck Length	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXPB2006-2-T0.4 0450	0.3	0.6	0.4	2	32500	1480	0.03	0.035	29250	1332	0.025	0.025	26000	1184	0.015	0.02
HGXPB2006-4-T0.4 0450	0.3	0.6	0.4	4	31800	1420	0.025	0.033	28626	1278	0.02	0.03	26000	1136	0.012	0.018
HGXPB2006-6-T0.9 0450	0.3	0.6	0.9	6	31800	1420	0.025	0.033	28626	1278	0.02	0.03	20800	1136	0.012	0.018
HGXPB2008-4-T0.4 0450	0.4	0.8	0.4	4	26980	1523	0.032	0.04	24282	1370	0.03	0.035	21584	1218	0.025	0.03
HGXPB2008-6-T0.4 0450	0.4	0.8	0.4	6	25386	1269	0.028	0.038	22847	1142	0.025	0.033	20308	1015	0.02	0.028
HGXPB2010-6-T0.4 0450	0.5	1	0.4	6	21252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.04
HGXPB2010-6-T0.4 0650	0.5	1	0.4	6	21252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.04
HGXPB2010-8-T0.4 0450	0.5	1	0.4	8	20252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.035
HGXPB2010-8-T0.4 0660	0.5	1	0.4	8	20252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.035
HGXPB2010-10-T0.4 0450	0.5	1	0.4	10	17688	1114	0.035	0.04	14560	1000	0.032	0.04	13520	890	0.028	0.032
HGXPB2010-10-T0.4 0660	0.5	1	0.4	10	17688	1114	0.035	0.04	14560	1000	0.032	0.04	13520	890	0.028	0.032
HGXPB2010-15-T0.4 0450	0.5	1	0.4	15	15240	792	0.025	0.038	11650	712	0.022	0.038	10820	632	0.02	0.03
HGXPB2010-15-T0.4 0660	0.5	1	0.4	15	15240	792	0.025	0.038	11650	712	0.022	0.038	10820	632	0.02	0.03
HGXPB2010-6-T0.9 0450	0.5	1	0.9	6	21252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.04
HGXPB2010-6-T0.9 0650	0.5	1	0.9	6	21252	1523	0.05	0.045	17920	1368	0.04	0.045	16640	1218	0.03	0.04
HGXPB2010-10-T0.9 0450	0.5	1	0.9	10	17688	1114	0.035	0.04	14560	1000	0.032	0.04	13520	890	0.028	0.032
HGXPB2010-10-T0.9 0660	0.5	1	0.9	10	17688	1114	0.035	0.04	14560	1000	0.032	0.04	13520	890	0.028	0.032
HGXPB2010-15-T0.9 0450	0.5	1	0.9	15	15240	792	0.025	0.038	11650	712	0.022	0.038	10820	632	0.02	0.03
HGXPB2010-15-T0.9 0660	0.5	1	0.9	15	15240	792	0.025	0.038	11650	712	0.022	0.038	10820	632	0.02	0.03
HGXPB2010-20-T0.9 0460	0.5	1	0.9	20	14340	792	0.02	0.035	11650	712	0.018	0.035	10820	632	0.015	0.025
HGXPB2010-20-T0.9 0675	0.5	1	0.9	20	14340	792	0.02	0.035	11650	712	0.018	0.035	10820	632	0.015	0.025
HGXPB2015-8-T0.4 0660	0.75	1.5	0.4	8	18200	1680	0.05	0.05	16380	1512	0.04	0.05	14560	1344	0.03	0.05
HGXPB2015-10-T0.4 0660	0.75	1.5	0.4	10	17230	1650	0.05	0.05	15508	1485	0.04	0.05	13784	1320	0.03	0.05
HGXPB2015-12-T0.4 0660	0.75	1.5	0.4	12	16800	1520	0.05	0.05	15120	1368	0.04	0.05	13440	1216	0.03	0.05
HGXPB2015-15-T0.9 0660	0.75	1.5	0.9	15	15200	1480	0.04	0.04	13680	1332	0.035	0.04	12160	1184	0.025	0.04
HGXPB2015-20-T0.9 0675	0.75	1.5	0.9	20	13650	1200	0.04	0.04	12285	1080	0.03	0.04	10926	960	0.02	0.04
HGXPB2020-8-T0.4 0650	1	2	0.4	8	15200	1800	0.08	0.08	13680	1620	0.08	0.06	12160	1440	0.05	0.05
HGXPB2020-12-T0.4 0660	1	2	0.4	12	13820	1780	0.07	0.08	12438	1602	0.07	0.06	11050	1424	0.05	0.05
HGXPB2020-16-T0.4 0660	1	2	0.4	16	12680	1660	0.063	0.07	11412	1494	0.063	0.06	10144	1328	0.04	0.05
HGXPB2020-20-T0.4 0675	1	2	0.4	20	10500	1320	0.043	0.07	9450	1188	0.043	0.05	8400	1056	0.03	0.04
HGXPB2020-12-T0.9 0660	1	2	0.9	12	15200	1850	0.08	0.08	13680	1660	0.08	0.06	12160	1470	0.05	0.05

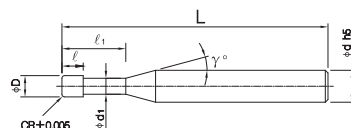


Cutting Parameter

HGXPB 2-Flute Taper Neck Ball End Mill

Workpiece					Carbon Steels, Alloy Steels (30~40HRC)				Pre-Hardened Steels (35~45HRC)				High Speed Steels, Hardened Steels (46~55HRC)			
Type No.	Ball radius mm	Tool dia. mm	BHTA2 Neck Angle	Under Neck Length	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXPB2020-16-T0.9 0660	1	2	0.9	16	13820	1830	0.07	0.08	12438	1642	0.07	0.06	11050	1454	0.05	0.05
HGXPB2020-20-T0.9 0675	1	2	0.9	20	12680	1710	0.063	0.07	11412	1534	0.063	0.06	10144	1358	0.04	0.05
HGXPB2020-25-T0.9 0675	1	2	0.9	25	10500	1380	0.043	0.07	9450	1228	0.043	0.05	8400	1086	0.03	0.04
HGXPB2020-30-T0.9 0675	1	2	0.9	30	9500	1020	0.042	0.06	8550	909	0.042	0.05	7600	807	0.03	0.04
HGXPB2020-40-T0.9 06100	1	2	0.9	40	7800	738	0.026	0.05	7020	659	0.026	0.04	6240	590	0.025	0.03
HGXPB2030-8-T0.4 0650	1.5	3	0.4	8	12,738	2,200	0.08	0.1	11,464	1,980	0.08	0.1	10,190	1,760	0.05	0.1
HGXPB2030-16-T0.4 0660	1.5	3	0.4	16	11,354	2,000	0.07	0.1	10,219	1,800	0.07	0.1	9,083	1,600	0.05	0.1
HGXPB2030-20-T0.4 0660	1.5	3	0.4	20	10,386	1,800	0.063	0.1	9,374	1,620	0.063	0.1	8,309	1,440	0.05	0.1
HGXPB2030-16-T0.9 0660	1.5	3	0.9	16	12,738	2,250	0.08	0.1	11,464	2,020	0.08	0.1	10,190	1,780	0.05	0.1
HGXPB2030-20-T0.9 0660	1.5	3	0.9	20	11,354	2,050	0.07	0.1	10,219	1,840	0.07	0.1	9,083	1,620	0.05	0.1
HGXPB2030-30-T0.9 0675	1.5	3	0.9	30	10,386	1,850	0.063	0.1	9,374	1,660	0.063	0.1	8,309	1,460	0.05	0.1
HGXPB2030-40-T0.9 06100	1.5	3	0.9	40	7,680	1,250	0.042	0.08	6,912	1,120	0.042	0.08	6,144	980	0.04	0.08
HGXPB2040-20-T0.9 0875	2	4	0.9	20	12,000	2400	0.03	0.06	11,000	1800	0.03	0.06	10,000	1400	0.03	0.06
HGXPB2040-30-T0.9 08100	2	4	0.9	30	10,100	1,526	0.065	0.1	9,000	1,295	0.065	0.1	7,800	1,064	0.05	0.08
HGXPB2040-40-T0.9 08100	2	4	0.9	40	8,100	1,155	0.05	0.08	7,200	980	0.05	0.08	6,200	798	0.04	0.08
HGXPB2060-30-T0.9 08100	3	6	0.9	30	9,000	3,000	0.08	0.15	9,000	2,800	0.08	0.15	9,000	2,500	0.06	0.15
HGXPB2060-45-T0.9 08100	3	6	0.9	45	7,600	1,800	0.06	0.12	6,000	1,800	0.06	0.12	5,200	735	0.05	0.1

HSXR2L 2-Flute Long Neck Corner Radius End Mill



φD	D Tol. (mm)
D<3	0~0.010
3<D≤6	0~0.012

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HSXR2002R0.05L0.5 0450	0.2	R0.05	0.15	0.5	0.18	12	50	4
HSXR2002R0.05L1 0450	0.2	R0.05	0.15	1	0.18	12	50	4
HSXR2002R0.05L1.5 0450	0.2	R0.05	0.15	1.5	0.18	12	50	4
HSXR2002R0.05L2 0450	0.2	R0.05	0.15	2	0.18	12	50	4
HSXR2003R0.05L1 0450	0.3	R0.05	0.2	1	0.28	12	50	4
HSXR2003R0.05L1.5 0450	0.3	R0.05	0.2	1.5	0.28	12	50	4
HSXR2003R0.05L2 0450	0.3	R0.05	0.2	2	0.28	12	50	4
HSXR2003R0.05L2.5 0450	0.3	R0.05	0.2	2.5	0.28	12	50	4
HSXR2003R0.05L3 0450	0.3	R0.05	0.2	3	0.28	12	50	4
HSXR2004R0.05L1 0450	0.4	R0.05	0.3	1	0.37	12	50	4
HSXR2004R0.05L1.5 0450	0.4	R0.05	0.3	1.5	0.37	12	50	4
HSXR2004R0.05L2 0450	0.4	R0.05	0.3	2	0.37	12	50	4
HSXR2004R0.05L2.5 0450	0.4	R0.05	0.3	2.5	0.37	12	50	4
HSXR2004R0.05L3 0450	0.4	R0.05	0.3	3	0.37	12	50	4
HSXR2004R0.05L4 0450	0.4	R0.05	0.3	4	0.37	12	50	4
HSXR2004R0.1L1 0450	0.4	R0.1	0.3	1	0.37	12	50	4
HSXR2004R0.1L1.5 0450	0.4	R0.1	0.3	1.5	0.37	12	50	4
HSXR2004R0.1L2 0450	0.4	R0.1	0.3	2	0.37	12	50	4
HSXR2004R0.1L2.5 0450	0.4	R0.1	0.3	2.5	0.37	12	50	4
HSXR2004R0.1L3 0450	0.4	R0.1	0.3	3	0.37	12	50	4
HSXR2004R0.1L4 0450	0.4	R0.1	0.3	4	0.37	12	50	4
HSXR2005R0.05L1 0450	0.5	R0.05	0.35	1	0.46	12	50	4
HSXR2005R0.05L1.5 0450	0.5	R0.05	0.35	1.5	0.46	12	50	4
HSXR2005R0.05L2 0450	0.5	R0.05	0.35	2	0.46	12	50	4
HSXR2005R0.05L2.5 0450	0.5	R0.05	0.35	2.5	0.46	12	50	4
HSXR2005R0.05L3 0450	0.5	R0.05	0.35	3	0.46	12	50	4

HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2005R0.05L4 0450	0.5	R0.05	0.35	4	0.46	12	50	4
HSXR2005R0.05L5 0450	0.5	R0.05	0.35	5	0.46	12	50	4
HSXR2005R0.05L6 0450	0.5	R0.05	0.35	6	0.46	12	50	4
HSXR2005R0.1L1 0450	0.5	R0.1	0.35	1	0.46	12	50	4
HSXR2005R0.1L1.5 0450	0.5	R0.1	0.35	1.5	0.46	12	50	4
HSXR2005R0.1L2 0450	0.5	R0.1	0.35	2	0.46	12	50	4
HSXR2005R0.1L2.5 0450	0.5	R0.1	0.35	2.5	0.46	12	50	4
HSXR2005R0.1L3 0450	0.5	R0.1	0.35	3	0.46	12	50	4
HSXR2005R0.1L4 0450	0.5	R0.1	0.35	4	0.46	12	50	4
HSXR2005R0.1L5 0450	0.5	R0.1	0.35	5	0.46	12	50	4
HSXR2005R0.1L6 0450	0.5	R0.1	0.35	6	0.46	12	50	4
HSXR2006R0.05L2 0450	0.6	R0.05	0.45	2	0.56	12	50	4
HSXR2006R0.05L3 0450	0.6	R0.05	0.45	3	0.56	12	50	4
HSXR2006R0.05L4 0450	0.6	R0.05	0.45	4	0.56	12	50	4
HSXR2006R0.05L6 0450	0.6	R0.05	0.45	6	0.56	12	50	4
HSXR2006R0.05L8 0450	0.6	R0.05	0.45	8	0.56	12	50	4
HSXR2006R0.05L10 0450	0.6	R0.05	0.45	10	0.56	12	50	4
HSXR2006R0.1L2 0450	0.6	R0.1	0.45	2	0.56	12	50	4
HSXR2006R0.1L3 0450	0.6	R0.1	0.45	3	0.56	12	50	4
HSXR2006R0.1L4 0450	0.6	R0.1	0.45	4	0.56	12	50	4
HSXR2006R0.1L6 0450	0.6	R0.1	0.45	6	0.56	12	50	4
HSXR2006R0.1L8 0450	0.6	R0.1	0.45	8	0.56	12	50	4
HSXR2006R0.1L10 0450	0.6	R0.1	0.45	10	0.56	12	50	4
HSXR2007R0.05L2 0450	0.7	R0.05	0.5	2	0.66	12	50	4
HSXR2007R0.05L3 0450	0.7	R0.05	0.5	3	0.66	12	50	4
HSXR2007R0.05L4 0450	0.7	R0.05	0.5	4	0.66	12	50	4
HSXR2007R0.05L6 0450	0.7	R0.05	0.5	6	0.66	12	50	4
HSXR2007R0.05L8 0450	0.7	R0.05	0.5	8	0.66	12	50	4
HSXR2007R0.05L10 0450	0.7	R0.05	0.5	10	0.66	12	50	4
HSXR2007R0.1L2 0450	0.7	R0.1	0.5	2	0.66	12	50	4
HSXR2007R0.1L3 0450	0.7	R0.1	0.5	3	0.66	12	50	4
HSXR2007R0.1L4 0450	0.7	R0.1	0.5	4	0.66	12	50	4
HSXR2007R0.1L6 0450	0.7	R0.1	0.5	6	0.66	12	50	4
HSXR2007R0.1L8 0450	0.7	R0.1	0.5	8	0.66	12	50	4

HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2007R0.1L10 0450	0.7	R0.1	0.5	10	0.66	12	50	4
HSXR2008R0.05L2 0450	0.8	R0.05	0.6	2	0.76	12	50	4
HSXR2008R0.05L3 0450	0.8	R0.05	0.6	3	0.76	12	50	4
HSXR2008R0.05L4 0450	0.8	R0.05	0.6	4	0.76	12	50	4
HSXR2008R0.05L6 0450	0.8	R0.05	0.6	6	0.76	12	50	4
HSXR2008R0.05L8 0450	0.8	R0.05	0.6	8	0.76	12	50	4
HSXR2008R0.05L10 0450	0.8	R0.05	0.6	10	0.76	12	50	4
HSXR2008R0.05L12 0450	0.8	R0.05	0.6	12	0.76	12	50	4
HSXR2008R0.1L2 0450	0.8	R0.1	0.6	2	0.76	12	50	4
HSXR2008R0.1L3 0450	0.8	R0.1	0.6	3	0.76	12	50	4
HSXR2008R0.1L4 0450	0.8	R0.1	0.6	4	0.76	12	50	4
HSXR2008R0.1L6 0450	0.8	R0.1	0.6	6	0.76	12	50	4
HSXR2008R0.1L8 0450	0.8	R0.1	0.6	8	0.76	12	50	4
HSXR2008R0.1L10 0450	0.8	R0.1	0.6	10	0.76	12	50	4
HSXR2008R0.1L12 0450	0.8	R0.1	0.6	12	0.76	12	50	4
HSXR2008R0.2L2 0450	0.8	R0.2	0.6	2	0.76	12	50	4
HSXR2008R0.2L3 0450	0.8	R0.2	0.6	3	0.76	12	50	4
HSXR2008R0.2L4 0450	0.8	R0.2	0.6	4	0.76	12	50	4
HSXR2008R0.2L6 0450	0.8	R0.2	0.6	6	0.76	12	50	4
HSXR2008R0.2L8 0450	0.8	R0.2	0.6	8	0.76	12	50	4
HSXR2008R0.2L10 0450	0.8	R0.2	0.6	10	0.76	12	50	4
HSXR2008R0.2L12 0450	0.8	R0.2	0.6	12	0.76	12	50	4
HSXR2009R0.1L4 0450	0.9	R0.1	0.65	4	0.86	12	50	4
HSXR2009R0.1L8 0450	0.9	R0.1	0.65	8	0.86	12	50	4
HSXR2009R0.2L4 0450	0.9	R0.2	0.65	4	0.86	12	50	4
HSXR2009R0.2L8 0450	0.9	R0.2	0.65	8	0.86	12	50	4
HSXR2010R0.05L3 0450	1	R0.05	0.75	3	0.95	12	50	4
HSXR2010R0.05L4 0450	1	R0.05	0.75	4	0.95	12	50	4
HSXR2010R0.05L5 0450	1	R0.05	0.75	5	0.95	12	50	4
HSXR2010R0.05L6 0450	1	R0.05	0.75	6	0.95	12	50	4
HSXR2010R0.05L8 0450	1	R0.05	0.75	8	0.95	12	50	4
HSXR2010R0.05L10 0450	1	R0.05	0.75	10	0.95	12	50	4
HSXR2010R0.05L12 0450	1	R0.05	0.75	12	0.95	12	50	4
HSXR2010R0.05L16 0450	1	R0.05	0.75	16	0.95	12	50	4

HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2010R0.05L20 0460	1	R0.05	0.75	20	0.95	12	60	4
HSXR2010R0.1L2 0450	1	R0.1	0.75	2	0.95	12	50	4
HSXR2010R0.1L3 0450	1	R0.1	0.75	3	0.95	12	50	4
HSXR2010R0.1L4 0450	1	R0.1	0.75	4	0.95	12	50	4
HSXR2010R0.1L5 0450	1	R0.1	0.75	5	0.95	12	50	4
HSXR2010R0.1L6 0450	1	R0.1	0.75	6	0.95	12	50	4
HSXR2010R0.1L8 0450	1	R0.1	0.75	8	0.95	12	50	4
HSXR2010R0.1L10 0450	1	R0.1	0.75	10	0.95	12	50	4
HSXR2010R0.1L12 0450	1	R0.1	0.75	12	0.95	12	50	4
HSXR2010R0.1L16 0450	1	R0.1	0.75	16	0.95	12	50	4
HSXR2010R0.1L20 0460	1	R0.1	0.75	20	0.95	12	60	4
HSXR2010R0.2L2 0450	1	R0.2	0.75	2	0.95	12	50	4
HSXR2010R0.2L3 0450	1	R0.2	0.75	3	0.95	12	50	4
HSXR2010R0.2L4 0450	1	R0.2	0.75	4	0.95	12	50	4
HSXR2010R0.2L5 0450	1	R0.2	0.75	5	0.95	12	50	4
HSXR2010R0.2L6 0450	1	R0.2	0.75	6	0.95	12	50	4
HSXR2010R0.2L8 0450	1	R0.2	0.75	8	0.95	12	50	4
HSXR2010R0.2L10 0450	1	R0.2	0.75	10	0.95	12	50	4
HSXR2010R0.2L12 0450	1	R0.2	0.75	12	0.95	12	50	4
HSXR2010R0.2L16 0450	1	R0.2	0.75	16	0.95	12	50	4
HSXR2010R0.2L20 0460	1	R0.2	0.75	20	0.95	12	60	4
HSXR2010R0.3L3 0450	1	R0.3	0.75	3	0.95	12	50	4
HSXR2010R0.3L4 0450	1	R0.3	0.75	4	0.95	12	50	4
HSXR2010R0.3L5 0450	1	R0.3	0.75	5	0.95	12	50	4
HSXR2010R0.3L6 0450	1	R0.3	0.75	6	0.95	12	50	4
HSXR2010R0.3L8 0450	1	R0.3	0.75	8	0.95	12	50	4
HSXR2010R0.3L10 0450	1	R0.3	0.75	10	0.95	12	50	4
HSXR2010R0.3L12 0450	1	R0.3	0.75	12	0.95	12	50	4
HSXR2010R0.3L16 0450	1	R0.3	0.75	16	0.95	12	50	4
HSXR2010R0.3L20 0460	1	R0.3	0.75	20	0.95	12	60	4
HSXR2015R0.05L4 0450	1.5	R0.05	1.2	4	1.42	11	50	4
HSXR2015R0.05L6 0450	1.5	R0.05	1.2	6	1.42	11	50	4
HSXR2015R0.05L8 0450	1.5	R0.05	1.2	8	1.42	11	50	4
HSXR2015R0.05L10 0450	1.5	R0.05	1.2	10	1.42	11	50	4

HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2015R0.05L12 0450	1.5	R0.05	1.2	12	1.42	11	50	4
HSXR2015R0.05L16 0450	1.5	R0.05	1.2	16	1.42	11	50	4
HSXR2015R0.05L20 0460	1.5	R0.05	1.2	20	1.42	11	60	4
HSXR2015R0.1L4 0450	1.5	R0.1	1.2	4	1.42	11	50	4
HSXR2015R0.1L6 0450	1.5	R0.1	1.2	6	1.42	11	50	4
HSXR2015R0.1L8 0450	1.5	R0.1	1.2	8	1.42	11	50	4
HSXR2015R0.1L10 0450	1.5	R0.1	1.2	10	1.42	11	50	4
HSXR2015R0.1L12 0450	1.5	R0.1	1.2	12	1.42	11	50	4
HSXR2015R0.1L16 0450	1.5	R0.1	1.2	16	1.42	11	50	4
HSXR2015R0.1L20 0460	1.5	R0.1	1.2	20	1.42	11	60	4
HSXR2015R0.2L4 0450	1.5	R0.2	1.2	4	1.42	11	50	4
HSXR2015R0.2L6 0450	1.5	R0.2	1.2	6	1.42	11	50	4
HSXR2015R0.2L8 0450	1.5	R0.2	1.2	8	1.42	11	50	4
HSXR2015R0.2L10 0450	1.5	R0.2	1.2	10	1.42	11	50	4
HSXR2015R0.2L12 0450	1.5	R0.2	1.2	12	1.42	11	50	4
HSXR2015R0.2L15 0450	1.5	R0.2	1.2	15	1.42	11	50	4
HSXR2015R0.2L16 0450	1.5	R0.2	1.2	16	1.42	11	50	4
HSXR2015R0.2L20 0460	1.5	R0.2	1.2	20	1.42	11	60	4
HSXR2015R0.3L4 0450	1.5	R0.3	1.2	4	1.42	11	50	4
HSXR2015R0.3L6 0450	1.5	R0.3	1.2	6	1.42	11	50	4
HSXR2015R0.3L8 0450	1.5	R0.3	1.2	8	1.42	11	50	4
HSXR2015R0.3L10 0450	1.5	R0.3	1.2	10	1.42	11	50	4
HSXR2015R0.3L12 0450	1.5	R0.3	1.2	12	1.42	11	50	4
HSXR2015R0.3L16 0450	1.5	R0.3	1.2	16	1.42	11	50	4
HSXR2015R0.3L20 0460	1.5	R0.3	1.2	20	1.42	11	60	4
HSXR2015R0.5L4 0450	1.5	R0.5	1.2	4	1.42	11	50	4
HSXR2015R0.5L6 0450	1.5	R0.5	1.2	6	1.42	11	50	4
HSXR2015R0.5L8 0450	1.5	R0.5	1.2	8	1.42	11	50	4
HSXR2015R0.5L10 0450	1.5	R0.5	1.2	10	1.42	11	50	4
HSXR2015R0.5L12 0450	1.5	R0.5	1.2	12	1.42	11	50	4
HSXR2015R0.5L16 0450	1.5	R0.5	1.2	16	1.42	11	50	4
HSXR2015R0.5L20 0460	1.5	R0.5	1.2	20	1.42	11	60	4
HSXR20175R0.2L5 0450	1.75	R0.2	1.4	5	1.67	11	50	4
HSXR20175R0.2L10 0450	1.75	R0.2	1.4	10	1.67	11	50	4



HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR20175R0.2L15 0450	1.75	R0.2	1.4	15	1.67	11	50	4
HSXR2020R0.05L6 0450	2	R0.05	1.6	6	1.9	11	50	4
HSXR2020R0.05L8 0450	2	R0.05	1.6	8	1.9	11	50	4
HSXR2020R0.05L10 0450	2	R0.05	1.6	10	1.9	11	50	4
HSXR2020R0.05L12 0450	2	R0.05	1.6	12	1.9	11	50	4
HSXR2020R0.05L16 0450	2	R0.05	1.6	16	1.9	11	50	4
HSXR2020R0.05L20 0460	2	R0.05	1.6	20	1.9	11	60	4
HSXR2020R0.05L25 0460	2	R0.05	1.6	25	1.9	11	60	4
HSXR2020R0.05L30 0475	2	R0.05	1.6	30	1.9	11	75	4
HSXR2020R0.1L6 0450	2	R0.1	1.6	6	1.9	11	50	4
HSXR2020R0.1L8 0450	2	R0.1	1.6	8	1.9	11	50	4
HSXR2020R0.1L10 0450	2	R0.1	1.6	10	1.9	11	50	4
HSXR2020R0.1L12 0450	2	R0.1	1.6	12	1.9	11	50	4
HSXR2020R0.1L16 0450	2	R0.1	1.6	16	1.9	11	50	4
HSXR2020R0.1L20 0460	2	R0.1	1.6	20	1.9	11	60	4
HSXR2020R0.1L25 0460	2	R0.1	1.6	25	1.9	11	60	4
HSXR2020R0.1L30 0475	2	R0.1	1.6	30	1.9	11	75	4
HSXR2020R0.2L4 0450	2	R0.2	1.6	4	1.9	11	50	4
HSXR2020R0.2L6 0450	2	R0.2	1.6	6	1.9	11	50	4
HSXR2020R0.2L8 0450	2	R0.2	1.6	8	1.9	11	50	4
HSXR2020R0.2L10 0450	2	R0.2	1.6	10	1.9	11	50	4
HSXR2020R0.2L12 0450	2	R0.2	1.6	12	1.9	11	50	4
HSXR2020R0.2L16 0450	2	R0.2	1.6	16	1.9	11	50	4
HSXR2020R0.2L20 0450	2	R0.2	1.6	20	1.9	11	50	4
HSXR2020R0.2L20 0460	2	R0.2	1.6	20	1.9	11	60	4
HSXR2020R0.2L25 0460	2	R0.2	1.6	25	1.9	11	60	4
HSXR2020R0.2L30 0475	2	R0.2	1.6	30	1.9	11	75	4
HSXR2020R0.3L6 0450	2	R0.3	1.6	6	1.9	11	50	4
HSXR2020R0.3L8 0450	2	R0.3	1.6	8	1.9	11	50	4
HSXR2020R0.3L10 0450	2	R0.3	1.6	10	1.9	11	50	4
HSXR2020R0.3L12 0450	2	R0.3	1.6	12	1.9	11	50	4
HSXR2020R0.3L16 0450	2	R0.3	1.6	16	1.9	11	50	4
HSXR2020R0.3L20 0460	2	R0.3	1.6	20	1.9	11	60	4
HSXR2020R0.3L25 0460	2	R0.3	1.6	25	1.9	11	60	4



HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2020R0.3L30 0475	2	R0.3	1.6	30	1.9	11	75	4
HSXR2020R0.5L6 0450	2	R0.5	1.6	6	1.9	11	50	4
HSXR2020R0.5L8 0450	2	R0.5	1.6	8	1.9	11	50	4
HSXR2020R0.5L10 0450	2	R0.5	1.6	10	1.9	11	50	4
HSXR2020R0.5L12 0450	2	R0.5	1.6	12	1.9	11	50	4
HSXR2020R0.5L16 0450	2	R0.5	1.6	16	1.9	11	50	4
HSXR2020R0.5L20 0460	2	R0.5	1.6	20	1.9	11	60	4
HSXR2020R0.5L25 0460	2	R0.5	1.6	25	1.9	11	60	4
HSXR2020R0.5L30 0475	2	R0.5	1.6	30	1.9	11	75	4
HSXR2025R0.2L10 0450	2.5	R0.2	2	10	2.4	11	50	4
HSXR2025R0.2L20 0460	2.5	R0.2	2	20	2.4	11	60	4
HSXR2025R0.2L30 0475	2.5	R0.2	2	30	2.4	11	75	4
HSXR2025R0.5L10 0450	2.5	R0.5	2	10	2.4	11	50	4
HSXR2025R0.5L20 0460	2.5	R0.5	2	20	2.4	11	60	4
HSXR2025R0.5L30 0475	2.5	R0.5	2	30	2.4	11	75	4
HSXR2030R0.1L8 0660	3	R0.1	2.4	8	2.9	11	60	6
HSXR2030R0.1L10 0660	3	R0.1	2.4	10	2.9	11	60	6
HSXR2030R0.1L12 0660	3	R0.1	2.4	12	2.9	11	60	6
HSXR2030R0.1L16 0660	3	R0.1	2.4	16	2.9	11	60	6
HSXR2030R0.1L20 0660	3	R0.1	2.4	20	2.9	11	60	6
HSXR2030R0.1L25 0675	3	R0.1	2.4	25	2.9	11	75	6
HSXR2030R0.1L30 0675	3	R0.1	2.4	30	2.9	11	75	6
HSXR2030R0.1L35 0675	3	R0.1	2.4	35	2.9	11	75	6
HSXR2030R0.1L40 06100	3	R0.1	2.4	40	2.9	11	100	6
HSXR2030R0.2L8 0660	3	R0.2	2.4	8	2.9	11	60	6
HSXR2030R0.2L10 0660	3	R0.2	2.4	10	2.9	11	60	6
HSXR2030R0.2L12 0660	3	R0.2	2.4	12	2.9	11	60	6
HSXR2030R0.2L16 0660	3	R0.2	2.4	16	2.9	11	60	6
HSXR2030R0.2L20 0660	3	R0.2	2.4	20	2.9	11	60	6
HSXR2030R0.2L25 0675	3	R0.2	2.4	25	2.9	11	75	6
HSXR2030R0.2L30 0675	3	R0.2	2.4	30	2.9	11	75	6
HSXR2030R0.2L35 0675	3	R0.2	2.4	35	2.9	11	75	6
HSXR2030R0.2L40 06100	3	R0.2	2.4	40	2.9	11	100	6
HSXR2030R0.3L8 0660	3	R0.3	2.4	8	2.9	11	60	6



HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2030R0.3L10 0660	3	R0.3	2.4	10	2.9	11	60	6
HSXR2030R0.3L12 0660	3	R0.3	2.4	12	2.9	11	60	6
HSXR2030R0.3L16 0660	3	R0.3	2.4	16	2.9	11	60	6
HSXR2030R0.3L20 0660	3	R0.3	2.4	20	2.9	11	60	6
HSXR2030R0.3L25 0675	3	R0.3	2.4	25	2.9	11	75	6
HSXR2030R0.3L30 0675	3	R0.3	2.4	30	2.9	11	75	6
HSXR2030R0.3L35 0675	3	R0.3	2.4	35	2.9	11	75	6
HSXR2030R0.3L40 06100	3	R0.3	2.4	40	2.9	11	100	6
HSXR2030R0.5L8 0660	3	R0.5	2.4	8	2.9	11	60	6
HSXR2030R0.5L10 0660	3	R0.5	2.4	10	2.9	11	60	6
HSXR2030R0.5L12 0660	3	R0.5	2.4	12	2.9	11	60	6
HSXR2030R0.5L16 0660	3	R0.5	2.4	16	2.9	11	60	6
HSXR2030R0.5L20 0660	3	R0.5	2.4	20	2.9	11	60	6
HSXR2030R0.5L25 0675	3	R0.5	2.4	25	2.9	11	75	6
HSXR2030R0.5L30 0675	3	R0.5	2.4	30	2.9	11	75	6
HSXR2030R0.5L35 0675	3	R0.5	2.4	35	2.9	11	75	6
HSXR2030R0.5L40 06100	3	R0.5	2.4	40	2.9	11	100	6
HSXR2040R0.1L10 0660	4	R0.1	3.2	10	3.9	11	60	6
HSXR2040R0.1L12 0660	4	R0.1	3.2	12	3.9	11	60	6
HSXR2040R0.1L16 0660	4	R0.1	3.2	16	3.9	11	60	6
HSXR2040R0.1L20 0660	4	R0.1	3.2	20	3.9	11	60	6
HSXR2040R0.1L25 0675	4	R0.1	3.2	25	3.9	11	75	6
HSXR2040R0.1L30 0675	4	R0.1	3.2	30	3.9	11	75	6
HSXR2040R0.1L35 0675	4	R0.1	3.2	35	3.9	11	75	6
HSXR2040R0.1L40 06100	4	R0.1	3.2	40	3.9	11	100	6
HSXR2040R0.1L45 06100	4	R0.1	3.2	45	3.9	11	100	6
HSXR2040R0.1L50 06100	4	R0.1	3.2	50	3.9	11	100	6
HSXR2040R0.2L10 0660	4	R0.2	3.2	10	3.9	11	60	6
HSXR2040R0.2L12 0660	4	R0.2	3.2	12	3.9	11	60	6
HSXR2040R0.2L16 0660	4	R0.2	3.2	16	3.9	11	60	6
HSXR2040R0.2L20 0660	4	R0.2	3.2	20	3.9	11	60	6
HSXR2040R0.2L25 0675	4	R0.2	3.2	25	3.9	11	75	6
HSXR2040R0.2L30 0675	4	R0.2	3.2	30	3.9	11	75	6
HSXR2040R0.2L35 0675	4	R0.2	3.2	35	3.9	11	75	6

HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2040R0.2L40 06100	4	R0.2	3.2	40	3.9	11	100	6
HSXR2040R0.2L45 06100	4	R0.2	3.2	45	3.9	11	100	6
HSXR2040R0.2L50 06100	4	R0.2	3.2	50	3.9	11	100	6
HSXR2040R0.3L10 0660	4	R0.3	3.2	10	3.9	11	60	6
HSXR2040R0.3L12 0660	4	R0.3	3.2	12	3.9	11	60	6
HSXR2040R0.3L16 0660	4	R0.3	3.2	16	3.9	11	60	6
HSXR2040R0.3L20 0660	4	R0.3	3.2	20	3.9	11	60	6
HSXR2040R0.3L25 0675	4	R0.3	3.2	25	3.9	11	75	6
HSXR2040R0.3L30 0675	4	R0.3	3.2	30	3.9	11	75	6
HSXR2040R0.3L35 0675	4	R0.3	3.2	35	3.9	11	75	6
HSXR2040R0.3L40 06100	4	R0.3	3.2	40	3.9	11	100	6
HSXR2040R0.3L45 06100	4	R0.3	3.2	45	3.9	11	100	6
HSXR2040R0.3L50 06100	4	R0.3	3.2	50	3.9	11	100	6
HSXR2040R0.5L10 0660	4	R0.5	3.2	10	3.9	11	60	6
HSXR2040R0.5L12 0660	4	R0.5	3.2	12	3.9	11	60	6
HSXR2040R0.5L16 0660	4	R0.5	3.2	16	3.9	11	60	6
HSXR2040R0.5L20 0660	4	R0.5	3.2	20	3.9	11	60	6
HSXR2040R0.5L25 0675	4	R0.5	3.2	25	3.9	11	75	6
HSXR2040R0.5L30 0675	4	R0.5	3.2	30	3.9	11	75	6
HSXR2040R0.5L35 0675	4	R0.5	3.2	35	3.9	11	75	6
HSXR2040R0.5L40 06100	4	R0.5	3.2	40	3.9	11	100	6
HSXR2040R0.5L45 06100	4	R0.5	3.2	45	3.9	11	100	6
HSXR2040R0.5L50 06100	4	R0.5	3.2	50	3.9	11	100	6
HSXR2040R1.0L10 0660	4	R1	3.2	10	3.9	11	60	6
HSXR2040R1.0L12 0660	4	R1	3.2	12	3.9	11	60	6
HSXR2040R1.0L16 0660	4	R1	3.2	16	3.9	11	60	6
HSXR2040R1.0L20 0660	4	R1	3.2	20	3.9	11	60	6
HSXR2040R1.0L25 0675	4	R1	3.2	25	3.9	11	75	6
HSXR2040R1.0L30 0675	4	R1	3.2	30	3.9	11	75	6
HSXR2040R1.0L35 0675	4	R1	3.2	35	3.9	11	75	6
HSXR2040R1.0L40 06100	4	R1	3.2	40	3.9	11	100	6
HSXR2040R1.0L45 06100	4	R1	3.2	45	3.9	11	100	6
HSXR2040R1.0L50 06100	4	R1	3.2	50	3.9	11	100	6



HSXR2L 2-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR2060R0.5L18 0660	6	R0.5	4.8	18	5.85	—	60	6
HSXR2060R0.5L24 0675	6	R0.5	4.8	24	5.85	—	75	6
HSXR2060R0.5L36 0675	6	R0.5	4.8	36	5.85	—	75	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable
 ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
		○	○	○	○	○	○	○			○	○	

Cutting Parameter

HSXR2L 2-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.2	R0.02	0.5	36000	360	0.006	0.12	30000	300	0.005	0.12	24000	200	0.003	0.1
		1	36000	300	0.006	0.12	30000	240	0.005	0.12	24000	150	0.003	0.1
		1.5	36000	240	0.004	0.12	30000	180	0.003	0.12	24000	100	0.002	0.1
		2	36000	180	0.004	0.12	30000	120	0.003	0.12	24000	50	0.002	0.1
	R0.05	0.5	36000	440	0.006	0.12	30000	400	0.005	0.12	24000	300	0.003	0.1
		1	36000	360	0.006	0.12	30000	300	0.005	0.12	24000	200	0.003	0.1
		1.5	36000	240	0.004	0.12	30000	200	0.003	0.12	24000	150	0.002	0.1
		2	36000	200	0.004	0.12	30000	150	0.003	0.12	24000	100	0.002	0.1
0.3	R0.02	1	36000	350	0.006	0.18	30000	350	0.006	0.18	24000	300	0.003	0.15
		1.5	36000	260	0.006	0.18	30000	260	0.006	0.18	24000	200	0.003	0.15
		2	36000	180	0.004	0.18	30000	180	0.004	0.18	24000	150	0.003	0.15
		2.5	36000	150	0.004	0.18	30000	150	0.004	0.18	24000	100	0.002	0.15
		3	36000	70	0.004	0.18	30000	70	0.004	0.18	24000	50	0.002	0.15
	R0.05	1	36000	450	0.008	0.18	30000	400	0.007	0.18	24000	350	0.003	0.15
		1.5	36000	330	0.008	0.18	30000	300	0.007	0.18	24000	250	0.003	0.15
		2	36000	280	0.006	0.18	30000	250	0.005	0.18	24000	200	0.003	0.15
		2.5	36000	250	0.005	0.18	30000	200	0.004	0.18	24000	150	0.002	0.15
		3	36000	150	0.005	0.18	30000	100	0.004	0.18	24000	80	0.002	0.15
0.4	R0.02	1	36000	500	0.006	0.28	30000	450	0.006	0.24	24000	400	0.005	0.2
		1.5	36000	440	0.006	0.28	30000	400	0.006	0.24	24000	360	0.005	0.2
		2	36000	400	0.004	0.28	30000	360	0.004	0.24	24000	320	0.004	0.2
		2.5	36000	370	0.004	0.28	30000	340	0.004	0.24	24000	280	0.004	0.2
		3	36000	350	0.004	0.28	30000	320	0.004	0.24	24000	260	0.004	0.2
		4	36000	275	0.004	0.28	30000	250	0.004	0.24	24000	200	0.003	0.2
	R0.05	1	36000	600	0.012	0.28	30000	500	0.01	0.24	24000	400	0.005	0.2
		1.5	36000	540	0.012	0.28	30000	450	0.01	0.24	24000	360	0.005	0.2
		2	36000	490	0.012	0.28	30000	410	0.01	0.24	24000	328	0.005	0.2
		2.5	36000	450	0.01	0.28	30000	380	0.008	0.24	24000	304	0.005	0.2
		3	36000	430	0.01	0.28	30000	360	0.008	0.24	24000	288	0.004	0.2
		4	36000	360	0.008	0.28	30000	300	0.006	0.24	24000	240	0.003	0.2
	R0.1	1	36000	660	0.012	0.28	30000	550	0.01	0.24	24000	440	0.005	0.2
		1.5	36000	600	0.012	0.28	30000	500	0.01	0.24	24000	400	0.005	0.2



Cutting Parameter

HSXR2L 2-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.4	R0.1	2	36000	550	0.012	0.28	30000	460	0.01	0.24	24000	360	0.005	0.2
		2.5	36000	500	0.01	0.28	30000	420	0.008	0.24	24000	340	0.005	0.2
		3	36000	450	0.01	0.28	30000	380	0.008	0.24	24000	300	0.004	0.2
		4	36000	420	0.008	0.28	30000	350	0.006	0.24	24000	280	0.003	0.2
0.5	R0.02	1	30000	600	0.006	0.14	25000	500	0.006	0.15	23000	400	0.006	0.1
		1.5	30000	550	0.006	0.14	25000	460	0.006	0.15	23000	370	0.006	0.1
		2	30000	500	0.005	0.14	25000	420	0.005	0.15	23000	340	0.005	0.1
		2.5	30000	450	0.005	0.14	25000	380	0.005	0.15	23000	300	0.005	0.1
		3	30000	420	0.004	0.14	25000	350	0.004	0.15	23000	280	0.004	0.1
		4	25000	360	0.003	0.14	25000	300	0.003	0.15	23000	240	0.002	0.1
		5	25000	240	0.003	0.14	20000	200	0.003	0.15	18000	160	0.002	0.1
		6	25000	190	0.003	0.14	20000	160	0.003	0.15	18000	130	0.001	0.1
	R0.05 R0.1	1	30000	720	0.03	0.14	25000	600	0.01	0.15	23000	480	0.007	0.1
		1.5	30000	660	0.03	0.14	25000	550	0.01	0.15	23000	440	0.007	0.1
		2	30000	576	0.025	0.14	25000	480	0.01	0.15	23000	384	0.007	0.1
		2.5	30000	540	0.025	0.14	25000	450	0.01	0.15	23000	360	0.007	0.1
		3	30000	480	0.02	0.14	25000	400	0.008	0.15	23000	320	0.005	0.1
		4	25000	420	0.015	0.14	25000	350	0.005	0.15	23000	280	0.003	0.1
		5	25000	300	0.01	0.14	20000	250	0.004	0.15	18000	200	0.003	0.1
		6	25000	240	0.008	0.14	20000	200	0.003	0.15	18000	160	0.002	0.1
0.6	R0.02	2	30000	600	0.006	0.2	25000	500	0.006	0.2	23000	400	0.006	0.15
		3	28000	540	0.006	0.2	24000	450	0.006	0.2	21000	360	0.005	0.15
		4	25000	480	0.005	0.2	23000	400	0.005	0.2	20000	320	0.004	0.15
		6	23000	240	0.005	0.2	20000	200	0.004	0.2	18000	160	0.003	0.15
		8	18000	180	0.004	0.2	16000	150	0.004	0.2	14000	120	0.001	0.15
		10	16000	120	0.004	0.2	14000	100	0.003	0.2	12000	80	0.001	0.15
	R0.05 R0.1	2	30000	720	0.035	0.2	25000	600	0.02	0.2	23000	480	0.01	0.15
		3	28000	600	0.03	0.2	24000	500	0.02	0.2	21000	400	0.008	0.15
		4	25000	480	0.025	0.2	23000	400	0.015	0.2	20000	320	0.007	0.15
		6	23000	264	0.015	0.2	20000	220	0.008	0.2	18000	180	0.005	0.15
		8	18000	216	0.01	0.2	16000	180	0.005	0.2	14000	140	0.002	0.15
		10	16000	144	0.005	0.2	14000	120	0.002	0.2	12000	100	0.001	0.15

Cutting Parameter

HSXR2L 2-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.7	R0.02	2	30000	840	0.006	0.25	25000	700	0.006	0.25	23000	560	0.006	0.15
		3	30000	840	0.006	0.25	25000	700	0.006	0.25	23000	560	0.006	0.15
		4	28000	720	0.005	0.25	25000	600	0.005	0.25	23000	480	0.005	0.15
		6	25000	480	0.005	0.25	20000	400	0.005	0.25	18000	320	0.005	0.15
		8	18000	240	0.004	0.2	16000	200	0.004	0.2	14000	160	0.004	0.15
		10	16000	216	0.003	0.2	14000	180	0.003	0.2	12000	140	0.003	0.15
	R0.05 R0.1	2	30000	840	0.05	0.25	25000	700	0.03	0.25	23000	560	0.02	0.15
		3	30000	780	0.04	0.25	25000	650	0.03	0.25	23000	520	0.015	0.15
		4	28000	720	0.03	0.25	25000	600	0.02	0.25	23000	480	0.01	0.15
		6	25000	480	0.02	0.25	20000	400	0.01	0.25	18000	320	0.01	0.15
0.8	R0.02	8	18000	360	0.02	0.25	16000	300	0.01	0.25	14000	240	0.008	0.15
		10	16000	240	0.015	0.25	14000	200	0.01	0.25	12000	160	0.006	0.15
	R0.05 R0.1	2	28000	1020	0.006	0.3	25000	850	0.006	0.25	23000	680	0.006	0.16
		3	28000	960	0.006	0.3	25000	800	0.006	0.25	23000	640	0.006	0.16
		4	28000	840	0.005	0.3	25000	700	0.005	0.25	23000	560	0.005	0.16
		6	23000	660	0.005	0.3	20000	550	0.005	0.25	18000	440	0.005	0.15
	R0.05 R0.1	8	18000	480	0.004	0.3	16000	400	0.004	0.25	14000	320	0.004	0.15
		10	16000	360	0.004	0.25	15000	300	0.004	0.20	13500	240	0.004	0.12
		12	14000	240	0.003	0.2	13000	200	0.003	0.15	12000	160	0.003	0.12
	R0.05 R0.1	2	28000	1200	0.02	0.3	25000	1000	0.014	0.25	23000	800	0.012	0.16
		3	28000	1080	0.02	0.3	25000	900	0.014	0.25	23000	720	0.012	0.16
		4	28000	960	0.015	0.3	25000	800	0.012	0.25	23000	640	0.01	0.16
0.9	R0.1	6	23000	720	0.012	0.3	20000	600	0.01	0.25	18000	480	0.01	0.15
		8	18000	600	0.012	0.3	16000	500	0.01	0.25	14000	400	0.008	0.15
1	R0.05	10	16000	480	0.01	0.25	15000	400	0.008	0.20	13500	320	0.006	0.12
		12	14000	360	0.01	0.2	13000	300	0.008	0.15	12000	240	0.006	0.12
		4	25000	1200	0.05	0.3	25000	900	0.03	0.3	20000	800	0.02	0.2
		8	18000	800	0.03	0.3	16000	500	0.01	0.3	14000	400	0.008	0.2
1	R0.05	3	30000	1450	0.04	0.35	25000	1300	0.03	0.3	22000	1000	0.025	0.3
		4	30000	1440	0.03	0.35	25000	1200	0.025	0.3	21000	960	0.02	0.25
		5	28000	1200	0.03	0.35	23000	1000	0.025	0.3	20000	800	0.02	0.25
		6	25000	1080	0.02	0.35	21000	900	0.02	0.3	18000	720	0.015	0.25



Cutting Parameter

HSXR2L 2-Flute Long Neck Corner Radius End Mill Z-Level Milling

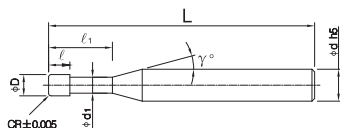
Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
1	R0.05	8	23000	960	0.02	0.35	19000	800	0.02	0.3	16000	640	0.015	0.25
		10	20000	840	0.02	0.35	16000	700	0.015	0.3	14000	560	0.010	0.25
		12	18000	720	0.015	0.35	15000	600	0.015	0.3	13000	480	0.010	0.25
		16	16000	480	0.015	0.35	13000	400	0.01	0.3	11000	320	0.008	0.25
		20	14000	400	0.015	0.35	13000	300	0.01	0.3	11000	240	0.008	0.25
	R0.1 R0.2 R0.3	3	30000	1500	0.04	0.35	25000	1350	0.03	0.3	22000	1080	0.025	0.3
		4	30000	1440	0.07	0.35	25000	1200	0.05	0.3	21000	960	0.04	0.25
		5	28000	1200	0.06	0.35	23000	1000	0.05	0.3	20000	800	0.04	0.25
		6	25000	1080	0.055	0.35	21000	900	0.04	0.3	18000	720	0.03	0.25
		8	23000	960	0.05	0.35	19000	800	0.03	0.3	16000	640	0.02	0.25
		10	20000	840	0.045	0.35	16000	700	0.02	0.3	14000	560	0.01	0.25
		12	18000	720	0.035	0.35	15000	600	0.015	0.3	13000	480	0.008	0.25
		16	18000	480	0.035	0.35	15000	400	0.015	0.3	13000	320	0.008	0.25
		20	14000	450	0.015	0.35	13000	350	0.01	0.3	11000	280	0.008	0.25
		4	28000	1500	0.1	0.55	24000	1250	0.05	0.5	22000	1000	0.04	0.4
1.5	R0.05 R0.1 R0.2 R0.3	6	28000	1440	0.1	0.55	23000	1200	0.05	0.5	20000	960	0.04	0.4
		8	25000	1200	0.08	0.55	21000	1000	0.05	0.5	18000	800	0.04	0.4
		10	23000	1080	0.08	0.55	19000	900	0.045	0.5	16000	720	0.03	0.4
		12	20000	960	0.06	0.55	16000	800	0.04	0.5	14000	640	0.025	0.4
		16	16000	720	0.06	0.55	13000	600	0.03	0.5	11000	480	0.02	0.4
		20	12000	480	0.03	0.55	11000	400	0.02	0.5	9000	320	0.007	0.4
2	R0.05 R0.1 R0.2 R0.3 R0.5	6	24000	1320	0.13	0.7	20000	1100	0.06	0.6	17000	880	0.05	0.5
		8	24000	1320	0.13	0.7	20000	1100	0.06	0.6	17000	880	0.05	0.5
		10	22000	1200	0.12	0.7	18000	1000	0.06	0.6	15000	800	0.05	0.5
		12	20000	1080	0.11	0.7	16000	900	0.05	0.6	14000	720	0.04	0.5
		16	16000	840	0.09	0.7	13000	700	0.04	0.6	11000	560	0.03	0.5
		20	14000	720	0.07	0.7	11000	600	0.03	0.6	9500	480	0.02	0.5
		25	12000	600	0.06	0.7	9000	500	0.03	0.6	8000	400	0.02	0.5
		30	10000	480	0.05	0.7	8000	400	0.02	0.6	7000	320	0.01	0.5
3	R0.1 R0.2 R0.3 R0.5	8	18000	1440	0.18	1	15000	1200	0.1	0.8	13000	960	0.07	0.7
		10	18000	1440	0.18	1	15000	1200	0.1	0.8	13000	960	0.07	0.7
		12	16000	1320	0.17	1	13000	1100	0.1	0.8	11000	880	0.07	0.7

Cutting Parameter

HSXR2L 2-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
3	R0.1 R0.2 R0.3 R0.5	16	14000	1200	0.16	1	11000	1000	0.1	0.8	9500	800	0.07	0.7
		20	13500	1080	0.16	1	11000	900	0.08	0.8	9500	720	0.06	0.7
		25	12000	900	0.14	1	10000	750	0.07	0.8	8500	600	0.05	0.7
		30	10000	780	0.12	1	8000	650	0.05	0.8	7000	520	0.04	0.7
		35	9000	600	0.08	1	7500	500	0.04	0.8	6500	400	0.02	0.7
		40	8000	480	0.06	1	6500	400	0.03	0.8	5500	320	0.02	0.7
4	R0.1 R0.2 R0.3 R0.5 R1	10	14000	1800	0.3	2.5	13000	1500	0.15	2	12000	1200	0.12	1.5
		12	13000	1500	0.3	2.5	12000	1300	0.15	2	10000	1000	0.12	1.5
		16	12000	1300	0.25	1.4	10000	1100	0.15	1.2	8500	900	0.1	1
		20	12000	1300	0.25	1.4	10000	1000	0.15	1.2	8500	900	0.1	1
		25	10000	1100	0.17	1.4	8000	900	0.1	1.2	7000	800	0.08	1
		30	8000	800	0.14	1.4	6500	800	0.08	1.2	5500	660	0.08	1
		35	6500	700	0.08	1.4	5500	700	0.06	1.2	4500	540	0.05	1
		40	5800	660	0.06	1.2	5200	600	0.05	1	4000	480	0.05	0.8
		45	5200	550	0.05	1.2	4800	500	0.04	1	3800	420	0.04	0.8
		50	4800	450	0.04	1.2	4500	400	0.03	1	3200	360	0.04	0.8

HSXR4L 4-Flute Long Neck Corner Radius End Mill



Ø D	D Tol. (mm)
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HSXR4008R0.05L2 0450	0.8	R0.05	0.6	2	0.76	12	50	4
HSXR4008R0.05L4 0450	0.8	R0.05	0.6	4	0.76	12	50	4
HSXR4008R0.05L6 0450	0.8	R0.05	0.6	6	0.76	12	50	4
HSXR4008R0.05L8 0450	0.8	R0.05	0.6	8	0.76	12	50	4
HSXR4008R0.05L10 0450	0.8	R0.05	0.6	10	0.76	12	50	4
HSXR4008R0.05L12 0450	0.8	R0.05	0.6	12	0.76	12	50	4
HSXR4008R0.1L2 0450	0.8	R0.1	0.6	2	0.76	12	50	4
HSXR4008R0.1L4 0450	0.8	R0.1	0.6	4	0.76	12	50	4
HSXR4008R0.1L6 0450	0.8	R0.1	0.6	6	0.76	12	50	4
HSXR4008R0.1L8 0450	0.8	R0.1	0.6	8	0.76	12	50	4
HSXR4008R0.1L10 0450	0.8	R0.1	0.6	10	0.76	12	50	4
HSXR4008R0.1L12 0450	0.8	R0.1	0.6	12	0.76	12	50	4
HSXR4010R0.05L4 0450	1	R0.05	0.75	4	0.95	12	50	4
HSXR4010R0.05L6 0450	1	R0.05	0.75	6	0.95	12	50	4
HSXR4010R0.05L8 0450	1	R0.05	0.75	8	0.95	12	50	4
HSXR4010R0.05L10 0450	1	R0.05	0.75	10	0.95	12	50	4
HSXR4010R0.05L12 0450	1	R0.05	0.75	12	0.95	12	50	4
HSXR4010R0.05L16 0450	1	R0.05	0.75	16	0.95	12	50	4
HSXR4010R0.05L20 0460	1	R0.05	0.75	20	0.95	12	60	4
HSXR4010R0.1L4 0450	1	R0.1	0.75	4	0.95	12	50	4
HSXR4010R0.1L6 0450	1	R0.1	0.75	6	0.95	12	50	4
HSXR4010R0.1L8 0450	1	R0.1	0.75	8	0.95	12	50	4
HSXR4010R0.1L10 0450	1	R0.1	0.75	10	0.95	12	50	4
HSXR4010R0.1L12 0450	1	R0.1	0.75	12	0.95	12	50	4
HSXR4010R0.1L16 0450	1	R0.1	0.75	16	0.95	12	50	4
HSXR4010R0.1L20 0460	1	R0.1	0.75	20	0.95	12	60	4

HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4010R0.2L4 0450	1	R0.2	0.75	4	0.95	12	50	4
HSXR4010R0.2L6 0450	1	R0.2	0.75	6	0.95	12	50	4
HSXR4010R0.2L8 0450	1	R0.2	0.75	8	0.95	12	50	4
HSXR4010R0.2L10 0450	1	R0.2	0.75	10	0.95	12	50	4
HSXR4010R0.2L12 0450	1	R0.2	0.75	12	0.95	12	50	4
HSXR4010R0.2L16 0450	1	R0.2	0.75	16	0.95	12	50	4
HSXR4010R0.2L20 0460	1	R0.2	0.75	20	0.95	12	60	4
HSXR4010R0.3L4 0450	1	R0.3	0.75	4	0.95	12	50	4
HSXR4010R0.3L6 0450	1	R0.3	0.75	6	0.95	12	50	4
HSXR4010R0.3L8 0450	1	R0.3	0.75	8	0.95	12	50	4
HSXR4010R0.3L10 0450	1	R0.3	0.75	10	0.95	12	50	4
HSXR4010R0.3L12 0450	1	R0.3	0.75	12	0.95	12	50	4
HSXR4010R0.3L16 0450	1	R0.3	0.75	16	0.95	12	50	4
HSXR4010R0.3L20 0460	1	R0.3	0.75	20	0.95	12	60	4
HSXR4012R0.05L5 0450	1.2	R0.05	1	5	1.14	11	50	4
HSXR4012R0.05L10 0450	1.2	R0.05	1	10	1.14	11	50	4
HSXR4012R0.1L5 0450	1.2	R0.1	1	5	1.14	11	50	4
HSXR4012R0.1L10 0450	1.2	R0.1	1	10	1.14	11	50	4
HSXR4012R0.2L5 0450	1.2	R0.2	1	5	1.14	11	50	4
HSXR4012R0.2L10 0450	1.2	R0.2	1	10	1.14	11	50	4
HSXR4012R0.3L5 0450	1.2	R0.3	1	5	1.14	11	50	4
HSXR4012R0.3L10 0450	1.2	R0.3	1	10	1.14	11	50	4
HSXR4015R0.05L6 0450	1.5	R0.05	1.2	6	1.42	11	50	4
HSXR4015R0.05L8 0450	1.5	R0.05	1.2	8	1.42	11	50	4
HSXR4015R0.05L10 0450	1.5	R0.05	1.2	10	1.42	11	50	4
HSXR4015R0.05L12 0450	1.5	R0.05	1.2	12	1.42	11	50	4
HSXR4015R0.05L16 0450	1.5	R0.05	1.2	16	1.42	11	50	4
HSXR4015R0.05L20 0460	1.5	R0.05	1.2	20	1.42	11	60	4
HSXR4015R0.1L4 0450	1.5	R0.1	1.2	4	1.42	11	50	4
HSXR4015R0.1L6 0450	1.5	R0.1	1.2	6	1.42	11	50	4
HSXR4015R0.1L8 0450	1.5	R0.1	1.2	8	1.42	11	50	4
HSXR4015R0.1L10 0450	1.5	R0.1	1.2	10	1.42	11	50	4
HSXR4015R0.1L12 0450	1.5	R0.1	1.2	12	1.42	11	50	4
HSXR4015R0.1L16 0450	1.5	R0.1	1.2	16	1.42	11	50	4



HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4015R0.1L20 0460	1.5	R0.1	1.2	20	1.42	11	60	4
HSXR4015R0.2L4 0450	1.5	R0.2	1.2	4	1.42	11	50	4
HSXR4015R0.2L6 0450	1.5	R0.2	1.2	6	1.42	11	50	4
HSXR4015R0.2L8 0450	1.5	R0.2	1.2	8	1.42	11	50	4
HSXR4015R0.2L10 0450	1.5	R0.2	1.2	10	1.42	11	50	4
HSXR4015R0.2L12 0450	1.5	R0.2	1.2	12	1.42	11	50	4
HSXR4015R0.2L16 0450	1.5	R0.2	1.2	16	1.42	11	50	4
HSXR4015R0.2L20 0460	1.5	R0.2	1.2	20	1.42	11	60	4
HSXR4015R0.3L4 0450	1.5	R0.3	1.2	4	1.42	11	50	4
HSXR4015R0.3L6 0450	1.5	R0.3	1.2	6	1.42	11	50	4
HSXR4015R0.3L8 0450	1.5	R0.3	1.2	8	1.42	11	50	4
HSXR4015R0.3L10 0450	1.5	R0.3	1.2	10	1.42	11	50	4
HSXR4015R0.3L12 0450	1.5	R0.3	1.2	12	1.42	11	50	4
HSXR4015R0.3L16 0450	1.5	R0.3	1.2	16	1.42	11	50	4
HSXR4015R0.3L20 0460	1.5	R0.3	1.2	20	1.42	11	60	4
HSXR4020R0.05L8 0450	2	R0.05	1.6	8	1.9	11	50	4
HSXR4020R0.05L10 0450	2	R0.05	1.6	10	1.9	11	50	4
HSXR4020R0.05L12 0450	2	R0.05	1.6	12	1.9	11	50	4
HSXR4020R0.05L16 0450	2	R0.05	1.6	16	1.9	11	50	4
HSXR4020R0.05L20 0460	2	R0.05	1.6	20	1.9	11	60	4
HSXR4020R0.05L25 0460	2	R0.05	1.6	25	1.9	11	60	4
HSXR4020R0.05L30 0475	2	R0.05	1.6	30	1.9	11	75	4
HSXR4020R0.1L4 0450	2	R0.1	1.6	4	1.9	11	50	4
HSXR4020R0.1L6 0450	2	R0.1	1.6	6	1.9	11	50	4
HSXR4020R0.1L8 0450	2	R0.1	1.6	8	1.9	11	50	4
HSXR4020R0.1L10 0450	2	R0.1	1.6	10	1.9	11	50	4
HSXR4020R0.1L12 0450	2	R0.1	1.6	12	1.9	11	50	4
HSXR4020R0.1L16 0450	2	R0.1	1.6	16	1.9	11	50	4
HSXR4020R0.1L20 0460	2	R0.1	1.6	20	1.9	11	60	4
HSXR4020R0.1L25 0460	2	R0.1	1.6	25	1.9	11	60	4
HSXR4020R0.1L30 0475	2	R0.1	1.6	30	1.9	11	75	4
HSXR4020R0.2L4 0450	2	R0.2	1.6	4	1.9	11	50	4
HSXR4020R0.2L6 0450	2	R0.2	1.6	6	1.9	11	50	4
HSXR4020R0.2L8 0450	2	R0.2	1.6	8	1.9	11	50	4



HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4020R0.2L10 0450	2	R0.2	1.6	10	1.9	11	50	4
HSXR4020R0.2L12 0450	2	R0.2	1.6	12	1.9	11	50	4
HSXR4020R0.2L16 0450	2	R0.2	1.6	16	1.9	11	50	4
HSXR4020R0.2L20 0460	2	R0.2	1.6	20	1.9	11	60	4
HSXR4020R0.2L25 0460	2	R0.2	1.6	25	1.9	11	60	4
HSXR4020R0.2L30 0475	2	R0.2	1.6	30	1.9	11	75	4
HSXR4020R0.3L6 0450	2	R0.3	1.6	6	1.9	11	50	4
HSXR4020R0.3L8 0450	2	R0.3	1.6	8	1.9	11	50	4
HSXR4020R0.3L10 0450	2	R0.3	1.6	10	1.9	11	50	4
HSXR4020R0.3L12 0450	2	R0.3	1.6	12	1.9	11	50	4
HSXR4020R0.3L16 0450	2	R0.3	1.6	16	1.9	11	50	4
HSXR4020R0.3L20 0460	2	R0.3	1.6	20	1.9	11	60	4
HSXR4020R0.3L25 0460	2	R0.3	1.6	25	1.9	11	60	4
HSXR4020R0.3L30 0475	2	R0.3	1.6	30	1.9	11	75	4
HSXR4020R0.5L6 0450	2	R0.5	1.6	6	1.9	11	50	4
HSXR4020R0.5L8 0450	2	R0.5	1.6	8	1.9	11	50	4
HSXR4020R0.5L10 0450	2	R0.5	1.6	10	1.9	11	50	4
HSXR4020R0.5L12 0450	2	R0.5	1.6	12	1.9	11	50	4
HSXR4020R0.5L16 0450	2	R0.5	1.6	16	1.9	11	50	4
HSXR4020R0.5L20 0460	2	R0.5	1.6	20	1.9	11	60	4
HSXR4020R0.5L25 0460	2	R0.5	1.6	25	1.9	11	60	4
HSXR4020R0.5L30 0475	2	R0.5	1.6	30	1.9	11	75	4
HSXR4025R0.1L10 0450	2.5	R0.1	2	10	2.4	11	50	4
HSXR4025R0.1L20 0460	2.5	R0.1	2	20	2.4	11	60	4
HSXR4025R0.1L30 0475	2.5	R0.1	2	30	2.4	11	75	4
HSXR4025R0.2L10 0450	2.5	R0.2	2	10	2.4	11	50	4
HSXR4025R0.2L20 0460	2.5	R0.2	2	20	2.4	11	60	4
HSXR4025R0.2L30 0475	2.5	R0.2	2	30	2.4	11	75	4
HSXR4025R0.3L10 0450	2.5	R0.3	2	10	2.4	11	50	4
HSXR4025R0.3L20 0460	2.5	R0.3	2	20	2.4	11	60	4
HSXR4025R0.3L30 0475	2.5	R0.3	2	30	2.4	11	75	4
HSXR4025R0.5L10 0450	2.5	R0.5	2	10	2.4	11	50	4
HSXR4025R0.5L20 0460	2.5	R0.5	2	20	2.4	11	60	4
HSXR4025R0.5L30 0475	2.5	R0.5	2	30	2.4	11	75	4

HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4030R0.1L10 0450	3	R0.1	2.4	10	2.9	11	50	4
HSXR4030R0.1L10 0660	3	R0.1	2.4	10	2.9	11	60	6
HSXR4030R0.1L12 0450	3	R0.1	2.4	12	2.9	11	50	4
HSXR4030R0.1L12 0660	3	R0.1	2.4	12	2.9	11	60	6
HSXR4030R0.1L16 0450	3	R0.1	2.4	16	2.9	11	50	4
HSXR4030R0.1L16 0660	3	R0.1	2.4	16	2.9	11	60	6
HSXR4030R0.1L20 0660	3	R0.1	2.4	20	2.9	11	60	6
HSXR4030R0.1L25 0675	3	R0.1	2.4	25	2.9	11	75	6
HSXR4030R0.1L30 0675	3	R0.1	2.4	30	2.9	11	75	6
HSXR4030R0.1L35 0675	3	R0.1	2.4	35	2.9	11	75	6
HSXR4030R0.1L40 06100	3	R0.1	2.4	40	2.9	11	100	6
HSXR4030R0.2L8 0450	3	R0.2	2.4	8	2.9	11	50	4
HSXR4030R0.2L10 0450	3	R0.2	2.4	10	2.9	11	50	4
HSXR4030R0.2L10 0660	3	R0.2	2.4	10	2.9	11	60	6
HSXR4030R0.2L12 0450	3	R0.2	2.4	12	2.9	11	50	4
HSXR4030R0.2L12 0660	3	R0.2	2.4	12	2.9	11	60	6
HSXR4030R0.2L16 0450	3	R0.2	2.4	16	2.9	11	50	4
HSXR4030R0.2L16 0660	3	R0.2	2.4	16	2.9	11	60	6
HSXR4030R0.2L20 0660	3	R0.2	2.4	20	2.9	11	60	6
HSXR4030R0.2L25 0675	3	R0.2	2.4	25	2.9	11	75	6
HSXR4030R0.2L30 0675	3	R0.2	2.4	30	2.9	11	75	6
HSXR4030R0.2L35 0675	3	R0.2	2.4	35	2.9	11	75	6
HSXR4030R0.2L40 06100	3	R0.2	2.4	40	2.9	11	100	6
HSXR4030R0.3L10 0450	3	R0.3	2.4	10	2.9	11	50	4
HSXR4030R0.3L10 0660	3	R0.3	2.4	10	2.9	11	60	6
HSXR4030R0.3L12 0450	3	R0.3	2.4	12	2.9	11	50	4
HSXR4030R0.3L12 0660	3	R0.3	2.4	12	2.9	11	60	6
HSXR4030R0.3L16 0450	3	R0.3	2.4	16	2.9	11	50	4
HSXR4030R0.3L16 0660	3	R0.3	2.4	16	2.9	11	60	6
HSXR4030R0.3L20 0660	3	R0.3	2.4	20	2.9	11	60	6
HSXR4030R0.3L25 0675	3	R0.3	2.4	25	2.9	11	75	6
HSXR4030R0.3L30 0675	3	R0.3	2.4	30	2.9	11	75	6
HSXR4030R0.3L35 0675	3	R0.3	2.4	35	2.9	11	75	6
HSXR4030R0.3L40 06100	3	R0.3	2.4	40	2.9	11	100	6

HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4030R0.5L8 0450	3	R0.5	2.4	8	2.9	11	50	4
HSXR4030R0.5L10 0450	3	R0.5	2.4	10	2.9	11	50	4
HSXR4030R0.5L10 0660	3	R0.5	2.4	10	2.9	11	60	6
HSXR4030R0.5L12 0450	3	R0.5	2.4	12	2.9	11	50	4
HSXR4030R0.5L12 0660	3	R0.5	2.4	12	2.9	11	60	6
HSXR4030R0.5L16 0450	3	R0.5	2.4	16	2.9	11	50	4
HSXR4030R0.5L16 0660	3	R0.5	2.4	16	2.9	11	60	6
HSXR4030R0.5L20 0660	3	R0.5	2.4	20	2.9	11	60	6
HSXR4030R0.5L25 0675	3	R0.5	2.4	25	2.9	11	75	6
HSXR4030R0.5L30 0675	3	R0.5	2.4	30	2.9	11	75	6
HSXR4030R0.5L35 0675	3	R0.5	2.4	35	2.9	11	75	6
HSXR4030R0.5L40 06100	3	R0.5	2.4	40	2.9	11	100	6
HSXR4040R0.1L12 0660	4	R0.1	3.2	12	3.9	11	60	6
HSXR4040R0.1L16 0660	4	R0.1	3.2	16	3.9	11	60	6
HSXR4040R0.1L20 0660	4	R0.1	3.2	20	3.9	11	60	6
HSXR4040R0.1L25 0675	4	R0.1	3.2	25	3.9	11	75	6
HSXR4040R0.1L30 0675	4	R0.1	3.2	30	3.9	11	75	6
HSXR4040R0.1L35 0675	4	R0.1	3.2	35	3.9	11	75	6
HSXR4040R0.1L40 06100	4	R0.1	3.2	40	3.9	11	100	6
HSXR4040R0.1L45 06100	4	R0.1	3.2	45	3.9	11	100	6
HSXR4040R0.1L50 06100	4	R0.1	3.2	50	3.9	11	100	6
HSXR4040R0.2L12 0660	4	R0.2	3.2	12	3.9	11	60	6
HSXR4040R0.2L16 0660	4	R0.2	3.2	16	3.9	11	60	6
HSXR4040R0.2L20 0660	4	R0.2	3.2	20	3.9	11	60	6
HSXR4040R0.2L25 0675	4	R0.2	3.2	25	3.9	11	75	6
HSXR4040R0.2L30 0675	4	R0.2	3.2	30	3.9	11	75	6
HSXR4040R0.2L35 0675	4	R0.2	3.2	35	3.9	11	75	6
HSXR4040R0.2L40 06100	4	R0.2	3.2	40	3.9	11	100	6
HSXR4040R0.2L45 06100	4	R0.2	3.2	45	3.9	11	100	6
HSXR4040R0.2L50 06100	4	R0.2	3.2	50	3.9	11	100	6
HSXR4040R0.3L12 0660	4	R0.3	3.2	12	3.9	11	60	6
HSXR4040R0.3L16 0660	4	R0.3	3.2	16	3.9	11	60	6
HSXR4040R0.3L20 0660	4	R0.3	3.2	20	3.9	11	60	6
HSXR4040R0.3L25 0675	4	R0.3	3.2	25	3.9	11	75	6

HSXR4L 4-Flute Long Neck Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXR4040R0.3L30 0675	4	R0.3	3.2	30	3.9	11	75	6
HSXR4040R0.3L35 0675	4	R0.3	3.2	35	3.9	11	75	6
HSXR4040R0.3L40 06100	4	R0.3	3.2	40	3.9	11	100	6
HSXR4040R0.3L45 06100	4	R0.3	3.2	45	3.9	11	100	6
HSXR4040R0.3L50 06100	4	R0.3	3.2	50	3.9	11	100	6
HSXR4040R0.5L12 0660	4	R0.5	3.2	12	3.9	11	60	6
HSXR4040R0.5L16 0660	4	R0.5	3.2	16	3.9	11	60	6
HSXR4040R0.5L20 0660	4	R0.5	3.2	20	3.9	11	60	6
HSXR4040R0.5L25 0675	4	R0.5	3.2	25	3.9	11	75	6
HSXR4040R0.5L30 0675	4	R0.5	3.2	30	3.9	11	75	6
HSXR4040R0.5L35 0675	4	R0.5	3.2	35	3.9	11	75	6
HSXR4040R0.5L40 06100	4	R0.5	3.2	40	3.9	11	100	6
HSXR4040R0.5L45 06100	4	R0.5	3.2	45	3.9	11	100	6
HSXR4040R0.5L50 06100	4	R0.5	3.2	50	3.9	11	100	6
HSXR4040R1.0L12 0660	4	R1	3.2	12	3.9	11	60	6
HSXR4040R1.0L16 0660	4	R1	3.2	16	3.9	11	60	6
HSXR4040R1.0L20 0660	4	R1	3.2	20	3.9	11	60	6
HSXR4040R1.0L25 0675	4	R1	3.2	25	3.9	11	75	6
HSXR4040R1.0L30 0675	4	R1	3.2	30	3.9	11	75	6
HSXR4040R1.0L35 0675	4	R1	3.2	35	3.9	11	75	6
HSXR4040R1.0L40 06100	4	R1	3.2	40	3.9	11	100	6
HSXR4040R1.0L45 06100	4	R1	3.2	45	3.9	11	100	6
HSXR4040R1.0L50 06100	4	R1	3.2	50	3.9	11	100	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
ALLOY STEELS						DUCTILE CAST IRON						
~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○	○	○	○	○	○	○	○			○	○	

Cutting Parameter

HSXR4L 4-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.5	R0.02	1	30000	1200	0.006	0.14	25000	1000	0.006	0.15	23000	800	0.006	0.1
		1.5	30000	1100	0.006	0.14	25000	920	0.006	0.15	23000	740	0.006	0.1
		2	30000	1000	0.005	0.14	25000	840	0.005	0.15	23000	670	0.005	0.1
		2.5	30000	910	0.005	0.14	25000	760	0.005	0.15	23000	610	0.005	0.1
		3	30000	840	0.004	0.14	25000	700	0.004	0.15	23000	560	0.004	0.1
		4	25000	720	0.003	0.14	25000	600	0.003	0.15	23000	480	0.002	0.1
		5	25000	480	0.003	0.14	20000	400	0.003	0.15	18000	320	0.002	0.1
		6	25000	280	0.003	0.14	20000	230	0.003	0.15	18000	180	0.001	0.1
	R0.05 R0.1	1	30000	1440	0.03	0.14	25000	1200	0.01	0.15	23000	960	0.007	0.1
		1.5	30000	1300	0.03	0.14	25000	1100	0.01	0.15	23000	880	0.007	0.1
		2	30000	1150	0.025	0.14	25000	960	0.01	0.15	23000	770	0.007	0.1
		2.5	30000	1100	0.025	0.14	25000	900	0.01	0.15	23000	720	0.007	0.1
		3	30000	960	0.02	0.14	25000	800	0.008	0.15	23000	640	0.005	0.1
		4	25000	840	0.015	0.14	25000	700	0.005	0.15	23000	560	0.003	0.1
		5	25000	600	0.01	0.14	20000	500	0.004	0.15	18000	400	0.003	0.1
		6	25000	480	0.008	0.14	20000	400	0.003	0.15	18000	320	0.002	0.1
0.6	R0.02	2	30000	1200	0.006	0.2	25000	1000	0.006	0.2	23000	800	0.006	0.15
		3	28000	1080	0.006	0.2	24000	900	0.006	0.2	21000	720	0.005	0.15
		4	25000	960	0.005	0.2	23000	800	0.005	0.2	20000	640	0.004	0.15
		6	23000	480	0.005	0.2	20000	400	0.004	0.2	18000	320	0.003	0.15
		8	18000	360	0.004	0.2	16000	300	0.004	0.2	14000	240	0.001	0.15
		10	16000	240	0.004	0.2	14000	200	0.003	0.2	12000	160	0.001	0.15
	R0.05 R0.1	2	30000	1440	0.035	0.2	25000	1200	0.02	0.2	23000	960	0.01	0.15
		3	28000	1200	0.030	0.2	24000	1000	0.02	0.2	21000	800	0.008	0.15
		4	25000	960	0.025	0.2	23000	800	0.015	0.2	20000	640	0.007	0.15
		6	23000	530	0.015	0.2	20000	440	0.008	0.2	18000	350	0.005	0.15
		8	18000	430	0.01	0.2	16000	360	0.005	0.2	14000	290	0.002	0.15
		10	16000	290	0.005	0.2	14000	240	0.002	0.2	12000	190	0.001	0.15
0.7	R0.02	2	30000	1680	0.006	0.25	25000	1400	0.006	0.25	23000	1120	0.006	0.15
		3	30000	1680	0.006	0.25	25000	1400	0.006	0.25	23000	1120	0.006	0.15
		4	28000	1440	0.005	0.25	25000	1200	0.005	0.25	23000	960	0.005	0.15
		6	25000	960	0.005	0.25	20000	800	0.005	0.25	18000	640	0.005	0.15



Cutting Parameter

HSXR4L 4-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.7	R0.02	8	18000	480	0.004	0.2	16000	400	0.004	0.2	14000	320	0.004	0.15
		10	16000	430	0.003	0.2	14000	360	0.003	0.2	12000	290	0.003	0.15
	R0.05 R0.1	2	30000	1680	0.05	0.25	25000	1400	0.03	0.25	23000	1120	0.02	0.15
		3	30000	1560	0.04	0.25	25000	1300	0.03	0.25	23000	1040	0.015	0.15
		4	28000	1440	0.03	0.25	25000	1200	0.02	0.25	23000	960	0.01	0.15
		6	25000	960	0.02	0.25	20000	800	0.01	0.25	18000	640	0.01	0.15
		8	18000	720	0.02	0.25	16000	600	0.01	0.25	14000	480	0.008	0.15
		10	16000	480	0.02	0.25	14000	400	0.01	0.25	12000	320	0.006	0.15
0.8	R0.02	2	28000	2040	0.006	0.3	25000	1700	0.006	0.25	23000	1360	0.006	0.16
		4	28000	1680	0.005	0.3	25000	1400	0.005	0.25	23000	1120	0.005	0.16
		6	23000	1320	0.005	0.3	20000	1100	0.005	0.25	18000	880	0.005	0.15
		8	18000	960	0.004	0.3	16000	800	0.004	0.25	14000	640	0.004	0.15
		10	16000	720	0.004	0.25	15000	600	0.004	0.20	13500	480	0.004	0.12
		12	14000	480	0.003	0.2	13000	400	0.003	0.15	12000	320	0.003	0.12
	R0.05 R0.1 R0.2	2	28000	2400	0.020	0.3	25000	2000	0.014	0.25	23000	1600	0.012	0.16
		4	28000	1920	0.015	0.3	25000	1600	0.012	0.25	23000	1280	0.01	0.16
		6	23000	1440	0.012	0.3	20000	1200	0.01	0.25	18000	960	0.01	0.15
		8	18000	1200	0.012	0.3	16000	1000	0.01	0.25	14000	800	0.008	0.15
		10	16000	960	0.010	0.25	15000	800	0.008	0.20	13500	640	0.006	0.12
		12	14000	720	0.010	0.2	13000	600	0.008	0.15	12000	480	0.006	0.12
0.9	R0.1	4	25000	2200	0.05	0.3	25000	1700	0.03	0.3	20000	1400	0.02	0.2
		8	18000	1000	0.03	0.3	16000	800	0.01	0.3	14000	700	0.008	0.2
1	R0.02	4	30000	2880	0.030	0.35	25000	2400	0.025	0.3	21000	1920	0.02	0.25
		5	28000	2400	0.030	0.35	23000	2000	0.025	0.3	20000	1600	0.02	0.25
		6	25000	2160	0.020	0.35	21000	1800	0.02	0.3	18000	1440	0.015	0.25
		8	23000	1920	0.020	0.35	19000	1600	0.020	0.3	16000	1280	0.015	0.25
		10	20000	1680	0.02	0.35	16000	1400	0.015	0.3	14000	1120	0.010	0.25
		12	18000	1440	0.015	0.35	15000	1200	0.015	0.3	13000	960	0.010	0.25
		16	16000	960	0.015	0.35	13000	800	0.010	0.3	11000	640	0.008	0.25
		20	14000	720	0.015	0.35	13000	600	0.010	0.3	11000	480	0.008	0.25
	R0.05 R0.1 R0.2 R0.3	4	30000	2880	0.065	0.35	25000	2400	0.05	0.3	21000	1920	0.04	0.25
		5	28000	2400	0.06	0.35	23000	2000	0.05	0.3	20000	1600	0.04	0.25

Cutting Parameter

HSXR4L 4-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
1	R0.05 R0.1 R0.2 R0.3	6	25000	2160	0.055	0.35	21000	1800	0.04	0.3	18000	1440	0.03	0.25
		8	23000	1920	0.05	0.35	19000	1600	0.03	0.3	16000	1280	0.02	0.25
		10	20000	1680	0.045	0.35	16000	1400	0.02	0.3	14000	1120	0.01	0.25
		12	18000	1440	0.035	0.35	15000	1200	0.015	0.3	13000	960	0.008	0.25
		16	18000	960	0.035	0.35	15000	800	0.015	0.3	13000	640	0.008	0.25
		20	14000	840	0.015	0.35	13000	700	0.010	0.3	11000	560	0.008	0.25
1.2	R0.05 R0.1 R0.2 R0.3	5	24000	2200	0.06	0.45	20000	1800	0.045	0.4	17000	1500	0.03	0.3
		10	16000	1400	0.04	0.45	13000	1100	0.03	0.4	11000	950	0.01	0.3
1.5	R0.02	6	28000	2800	0.016	0.55	23000	2300	0.012	0.5	20000	2000	0.01	0.4
		8	25000	2400	0.016	0.55	21000	2000	0.012	0.5	18000	1700	0.01	0.4
		10	23000	2200	0.014	0.55	19000	1800	0.01	0.5	16000	1500	0.008	0.4
		12	20000	1800	0.014	0.55	16000	1500	0.01	0.5	14000	1300	0.008	0.4
		16	16000	1400	0.012	0.55	13000	1100	0.008	0.5	11000	950	0.005	0.4
		20	14000	1000	0.008	0.55	11000	800	0.005	0.5	9000	700	0.003	0.4
	R0.05 R0.1 R0.2 R0.3 R0.5	6	28000	2800	0.1	0.55	23000	2300	0.05	0.5	20000	2000	0.04	0.4
		8	25000	2400	0.08	0.55	21000	2000	0.05	0.5	18000	1700	0.04	0.4
		10	23000	2200	0.08	0.55	19000	1800	0.045	0.5	16000	1500	0.03	0.4
		12	20000	1800	0.06	0.55	16000	1500	0.04	0.5	14000	1300	0.025	0.4
		16	16000	1400	0.06	0.55	13000	1100	0.03	0.5	11000	950	0.02	0.4
		20	14000	1000	0.03	0.55	11000	800	0.02	0.5	9000	700	0.007	0.4
2	R0.02	8	24000	2800	0.02	0.7	20000	2300	0.015	0.6	17000	2000	0.012	0.5
		10	22000	2500	0.018	0.7	18000	2100	0.015	0.6	15000	1800	0.012	0.5
		12	20000	2200	0.016	0.7	16000	1800	0.012	0.6	14000	1500	0.01	0.5
		16	16000	1700	0.014	0.7	13000	1400	0.01	0.6	11000	1200	0.008	0.5
		20	14000	1400	0.012	0.7	11000	1100	0.008	0.6	9500	950	0.005	0.5
		25	10000	800	0.01	0.7	8000	650	0.005	0.6	7000	550	0.003	0.5
	R0.05 R0.1 R0.2 R0.3 R0.5	30	10000	480	0.005	0.7	8000	400	0.002	0.6	7000	320	0.002	0.5
		8	24000	2800	0.13	0.7	20000	2300	0.06	0.6	17000	2000	0.05	0.5
		10	22000	2500	0.12	0.7	18000	2100	0.06	0.6	15000	1800	0.05	0.5
		12	20000	2200	0.11	0.7	16000	1800	0.05	0.6	14000	1500	0.04	0.5
		16	16000	1700	0.09	0.7	13000	1400	0.04	0.6	11000	1200	0.03	0.5
		20	14000	1400	0.07	0.7	11000	1100	0.03	0.6	9500	950	0.02	0.5



Cutting Parameter

HSXR4L 4-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
2	R0.05 R0.1 R0.2 R0.3 R0.5	25	12000	960	0.06	0.7	9000	800	0.03	0.6	8000	640	0.02	0.5
		30	10000	800	0.05	0.7	8000	650	0.02	0.6	7000	550	0.01	0.5
2.5	R0.05 R0.1 R0.2 R0.3 R0.5	10	16000	2200	0.14	0.85	13000	1800	0.07	0.7	11000	1500	0.05	0.5
		20	11000	1400	0.08	0.85	9000	1100	0.04	0.7	7500	950	0.02	0.5
		30	7000	800	0.03	0.85	5500	650	0.01	0.7	4500	550	0.01	0.5
3	R0.05	10	18000	2800	0.18	1	15000	2300	0.1	0.8	13000	2000	0.07	0.7
		12	16000	2500	0.17	1	13000	2100	0.1	0.8	11000	1800	0.07	0.7
		16	14000	2200	0.16	1	11000	1800	0.1	0.8	9500	1500	0.07	0.7
		20	13500	2000	0.16	1	11000	1600	0.08	0.8	9500	1400	0.06	0.7
		25	12000	1800	0.14	1	10000	1500	0.07	0.8	8500	1300	0.05	0.7
		30	10000	1400	0.12	1	8000	1100	0.05	0.8	7000	950	0.04	0.7
		35	9000	1200	0.08	1	7500	1000	0.04	0.8	6500	800	0.02	0.7
		40	8000	960	0.06	1	6500	800	0.03	0.8	5500	640	0.02	0.7
	R0.1 R0.2 R0.3 R0.5	10	18000	2800	0.18	1	15000	2300	0.1	0.8	13000	2000	0.07	0.7
		12	16000	2500	0.17	1	13000	2100	0.1	0.8	11000	1800	0.07	0.7
		16	14000	2200	0.16	1	11000	1800	0.1	0.8	9500	1500	0.07	0.7
		20	13500	2000	0.16	1	11000	1600	0.08	0.8	9500	1400	0.06	0.7
		25	12000	1800	0.14	1	10000	1500	0.07	0.8	8500	1300	0.05	0.7
		30	10000	1400	0.12	1	8000	1100	0.05	0.8	7000	950	0.04	0.7
		35	9000	1200	0.08	1	7500	1050	0.04	0.8	6500	850	0.02	0.7
		40	8000	1000	0.06	1	6500	800	0.03	0.8	5500	700	0.02	0.7
	R1	10	14000	2200	0.16	1	11000	1800	0.1	0.8	9500	1500	0.07	0.7
		12	13500	2000	0.16	1	11000	1600	0.08	0.8	9500	1400	0.06	0.7
		16	12000	1800	0.14	1	10000	1500	0.07	0.8	8500	1300	0.05	0.7
		20	10000	1400	0.12	1	8000	1100	0.05	0.8	7000	950	0.04	0.7
		25	9000	1200	0.08	1	7500	1100	0.04	0.8	6500	850	0.02	0.7
		30	9000	1200	0.08	1	7500	1100	0.04	0.8	6500	800	0.02	0.7
		35	9000	1200	0.08	1	7500	1050	0.04	0.8	6500	750	0.02	0.7
		40	8000	1000	0.06	1	6500	800	0.03	0.8	5500	700	0.02	0.7
4	R0.1 R0.2 R0.3 R0.5 R1	16	12000	2650	0.25	1.4	10000	2200	0.15	1.2	8500	1760	0.1	1
		20	12000	2400	0.25	1.4	10000	2000	0.15	1.2	8500	1600	0.1	1
		25	10000	2160	0.17	1.4	8000	1800	0.1	1.2	7000	1440	0.08	1



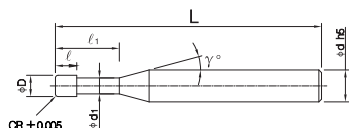
Cutting Parameter

HSXR4L 4-Flute Long Neck Corner Radius End Mill Z-Level Milling

Workpiece			Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Radius mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
4	R0.1	30	8000	1900	0.14	1.4	6500	1600	0.08	1.2	5500	1280	0.08	1
	R0.2	35	6500	1680	0.08	1.4	5500	1400	0.06	1.2	4500	1100	0.05	1
	R0.3	40	5800	1440	0.06	1.2	5200	1200	0.05	1	4000	960	0.05	0.8
	R0.5	45	5200	1200	0.05	1.2	4800	1000	0.04	1	3800	800	0.04	0.8
	R1	50	4800	960	0.04	1.2	4500	800	0.03	1	3200	640	0.04	0.8
5	R0.1	16	9500	2400	0.25	2.2	8000	2000	0.15	2	7000	1700	0.08	1.6
	R0.2	20	8000	2000	0.18	2.2	6500	1600	0.1	2	5500	1400	0.07	1.6
	R0.3 R0.5 R1	40	5000	1200	0.09	2.2	4000	1000	0.05	2	3500	850	0.02	1.6

● For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times CR$.

HSXRP 4-Flute Short Corner Radius End Mill



Ø D	D Tol. (mm)
D < 3	0 ~ -0.010
3 < D < 6	0 ~ -0.012
6 < D < 10	0 ~ -0.015
10 < D < 12	0 ~ -0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HSXRP4008R0.05 0450	0.8	R0.05	0.8	2.4	0.76	12	50	4
HSXRP4008R0.1 0450	0.8	R0.1	0.8	2.4	0.76	12	50	4
HSXRP4010R0.05 0450	1	R0.05	1	3	0.95	12	50	4
HSXRP4010R0.1 0450	1	R0.1	1	3	0.95	12	50	4
HSXRP4010R0.2 0450	1	R0.2	1	3	0.95	12	50	4
HSXRP4010R0.3 0450	1	R0.3	1	3	0.95	12	50	4
HSXRP4015R0.05 0450	1.5	R0.05	1.5	4.5	1.42	11	50	4
HSXRP4015R0.1 0450	1.5	R0.1	1.5	4.5	1.42	11	50	4
HSXRP4015R0.2 0450	1.5	R0.2	1.5	4.5	1.42	11	50	4
HSXRP4015R0.3 0450	1.5	R0.3	1.5	4.5	1.42	11	50	4
HSXRP4020R0.05 0450	2	R0.05	2	6	1.9	11	50	4
HSXRP4020R0.1 0450	2	R0.1	2	6	1.9	11	50	4
HSXRP4020R0.2 0450	2	R0.2	2	6	1.9	11	50	4
HSXRP4020R0.3 0450	2	R0.3	2	6	1.9	11	50	4
HSXRP4020R0.5 0450	2	R0.5	2	6	1.9	11	50	4
HSXRP4030R0.1 0450	3	R0.1	3	9	2.9	11	50	4
HSXRP4030R0.1 0660	3	R0.1	3	9	2.9	11	60	6
HSXRP4030R0.1 0675	3	R0.1	3	9	2.9	11	75	6
HSXRP4030R0.2 0450	3	R0.2	3	9	2.9	11	50	4
HSXRP4030R0.2 0650	3	R0.2	3	9	2.9	11	50	6
HSXRP4030R0.2 0660	3	R0.2	3	9	2.9	11	60	6
HSXRP4030R0.2 0675	3	R0.2	3	9	2.9	11	75	6
HSXRP4030R0.3 0450	3	R0.3	3	9	2.9	11	50	4
HSXRP4030R0.3 0660	3	R0.3	3	9	2.9	11	60	6
HSXRP4030R0.3 0675	3	R0.3	3	9	2.9	11	75	6
HSXRP4030R0.5 0450	3	R0.5	3	9	2.9	11	50	4
HSXRP4030R0.5 0650	3	R0.5	3	9	2.9	11	50	6

HSXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXRP4030R0.5 0660	3	R0.5	3	9	2.9	11	60	6
HSXRP4030R0.5 0675	3	R0.5	3	9	2.9	11	75	6
HSXRP4040R0.1 0450	4	R0.1	4	12	3.9	—	50	4
HSXRP4040R0.1 0660	4	R0.1	4	12	3.9	11	60	6
HSXRP4040R0.1 0675	4	R0.1	4	12	3.9	11	75	6
HSXRP4040R0.2 0450	4	R0.2	4	12	3.9	—	50	4
HSXRP4040R0.2 0650	4	R0.2	4	12	3.9	11	50	6
HSXRP4040R0.2 0660	4	R0.2	4	12	3.9	11	60	6
HSXRP4040R0.2 0675	4	R0.2	4	12	3.9	11	75	6
HSXRP4040R0.3 0450	4	R0.3	4	12	3.9	—	50	4
HSXRP4040R0.3 0660	4	R0.3	4	12	3.9	11	60	6
HSXRP4040R0.3 0675	4	R0.3	4	12	3.9	11	75	6
HSXRP4040R0.5 0450	4	R0.5	4	12	3.9	—	50	4
HSXRP4040R0.5 0650	4	R0.5	4	12	3.9	11	50	6
HSXRP4040R0.5 0660	4	R0.5	4	12	3.9	11	60	6
HSXRP4040R0.5 0675	4	R0.5	4	12	3.9	11	75	6
HSXRP4040R1.0 0450	4	R1	4	12	3.9	—	50	4
HSXRP4040R1.0 0660	4	R1	4	12	3.9	11	60	6
HSXRP4040R1.0 0675	4	R1	4	12	3.9	11	75	6
HSXRP4060R0.1 0650	6	R0.1	6	18	5.85	—	50	6
HSXRP4060R0.1 0660	6	R0.1	6	18	5.85	—	60	6
HSXRP4060R0.1 0675	6	R0.1	6	18	5.85	—	75	6
HSXRP4060R0.2 0650	6	R0.2	6	18	5.85	—	50	6
HSXRP4060R0.2 0660	6	R0.2	6	18	5.85	—	60	6
HSXRP4060R0.2 0675	6	R0.2	6	18	5.85	—	75	6
HSXRP4060R0.2 06100	6	R0.2	6	18	5.85	—	100	6
HSXRP4060R0.3 0650	6	R0.3	6	18	5.85	—	50	6
HSXRP4060R0.3 0660	6	R0.3	6	18	5.85	—	60	6
HSXRP4060R0.3 0675	6	R0.3	6	18	5.85	—	75	6
HSXRP4060R0.3 06100	6	R0.3	6	18	5.85	—	100	6
HSXRP4060R0.5 0650	6	R0.5	6	18	5.85	—	50	6
HSXRP4060R0.5 0660	6	R0.5	6	18	5.85	—	60	6
HSXRP4060R0.5 0675	6	R0.5	6	18	5.85	—	75	6



HSXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXRP4060R0.5 06100	6	R0.5	6	18	5.85	—	100	6
HSXRP4060R1.0 0650	6	R1	6	18	5.85	—	50	6
HSXRP4060R1.0 0660	6	R1	6	18	5.85	—	60	6
HSXRP4060R1.0 0675	6	R1	6	18	5.85	—	75	6
HSXRP4060R1.0 06100	6	R1	6	18	5.85	—	100	6
HSXRP4080R0.1 0860	8	R0.1	8	24	7.8	—	60	8
HSXRP4080R0.1 0875	8	R0.1	8	24	7.8	—	75	8
HSXRP4080R0.1 08100	8	R0.1	8	24	7.8	—	100	8
HSXRP4080R0.2 0860	8	R0.2	8	24	7.8	—	60	8
HSXRP4080R0.2 0875	8	R0.2	8	24	7.8	—	75	8
HSXRP4080R0.2 08100	8	R0.2	8	24	7.8	—	100	8
HSXRP4080R0.3 0860	8	R0.3	8	24	7.8	—	60	8
HSXRP4080R0.3 0875	8	R0.3	8	24	7.8	—	75	8
HSXRP4080R0.3 08100	8	R0.3	8	24	7.8	—	100	8
HSXRP4080R0.5 0860	8	R0.5	8	24	7.8	—	60	8
HSXRP4080R0.5 0875	8	R0.5	8	24	7.8	—	75	8
HSXRP4080R0.5 08100	8	R0.5	8	24	7.8	—	100	8
HSXRP4080R0.5 08125	8	R0.5	8	24	7.8	—	125	8
HSXRP4080R1.0 0860	8	R1	8	24	7.8	—	60	8
HSXRP4080R1.0 0875	8	R1	8	24	7.8	—	75	8
HSXRP4080R1.0 08100	8	R1	8	24	7.8	—	100	8
HSXRP4080R1.0 08125	8	R1	8	24	7.8	—	125	8
HSXRP4100R0.2 1075	10	R0.2	10	30	9.8	—	75	10
HSXRP4100R0.2 10100	10	R0.2	10	30	9.8	—	100	10
HSXRP4100R0.5 1075	10	R0.5	10	30	9.8	—	75	10
HSXRP4100R0.5 10100	10	R0.5	10	30	9.8	—	100	10
HSXRP4100R0.5 10125	10	R0.5	10	30	9.8	—	125	10
HSXRP4100R1.0 1075	10	R1	10	30	9.8	—	75	10
HSXRP4100R1.0 10100	10	R1	10	30	9.8	—	100	10
HSXRP4100R1.0 10125	10	R1	10	30	9.8	—	125	10
HSXRP4100R2.0 1075	10	R2	10	30	9.8	—	75	10
HSXRP4120R0.5 1275	12	R0.5	12	36	11.7	—	75	12
HSXRP4120R0.5 12100	12	R0.5	12	36	11.7	—	100	12

HSXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXRP4120R0.5 12125	12	R0.5	12	36	11.7	—	125	12
HSXRP4120R1.0 1275	12	R1	12	36	11.7	—	75	12
HSXRP4120R1.0 12100	12	R1	12	36	11.7	—	100	12
HSXRP4120R1.0 12125	12	R1	12	36	11.7	—	125	12
HSXRP4120R2.0 1275	12	R2	12	36	11.7	—	75	12
HSXRP4120R2.0 12100	12	R2	12	36	11.7	—	100	12
HSXRP4120R2.0 12125	12	R2	12	36	11.7	—	125	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable
 ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CARBON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
		○	○	○	○	○	○	○			○	○	



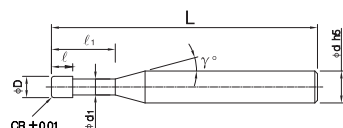
Cutting Parameter

HSXRP 4-Flute Short Corner Radius End Mill Z-Level Milling

Workpiece	Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXRP4008R_	28000	1450	0.03	0.05	25000	1305	0.03	0.03	23000	420	0.03	0.02
HSXRP4009R_	25000	1500	0.05	0.05	25000	1350	0.05	0.03	20000	450	0.05	0.02
HSXRP4010R_	18000	1500	0.05	0.05	16000	1350	0.05	0.05	15000	500	0.05	0.02
HSXRP4015R_	16155	1700	0.05	0.05	14360	1530	0.05	0.05	13500	600	0.05	0.02
HSXRP4025R_	15200	1880	0.05	0.1	13500	1680	0.05	0.08	12000	700	0.05	0.02
HSXRP4020R_	14301	2000	0.1	0.1	12712	1800	0.1	0.08	10000	800	0.1	0.03
HSXRP4030R_	11056	2200	0.1	0.1	9828	1980	0.1	0.08	7200	800	0.1	0.03
HSXRP4040R_	8712	2500	0.2	0.1	7744	2250	0.2	0.1	6000	1000	0.2	0.05
HSXRP4060R_	6543	2800	0.2	0.2	5808	2520	0.2	0.1	4500	1200	0.2	0.05
HSXRP4080R_	5445	3000	0.2	0.2	4840	2700	0.2	0.1	4000	1500	0.2	0.05
HSXRP4100R_	4900	3600	0.2	0.2	4356	3200	0.2	0.1	3500	1800	0.2	0.05
HSXRP4120R_	4356	3600	0.2	0.2	3872	3200	0.2	0.1	3200	2000	0.2	0.05

- For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times CR$.
- This item can be used for side milling and slotting applications.

HSXRT 4 Flutes Power Corner Radius End Mill



ϕD	D Tol. [mm]
$2 < D \leq 8$	$0 \sim -0.02$
$8 < D \leq 12$	$0 \sim -0.022$

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	l	l_1	ϕd_1	$\gamma / ^\circ$	L	ϕd
HSXRT4020R0.5 0650	2	R0.5	0.8	6	1.9	20	50	6
HSXRT4020R0.5-10 0650	2	R0.5	0.8	10	1.9	20	50	6
HSXRT4030R0.5 0650	3	R0.5	1.2	9	2.9	20	50	6
HSXRT4030R1.0 0650	3	R1.0	1.2	9	2.9	20	50	6
HSXRT4030R1.0-15 0660	3	R1.0	1.2	15	2.9	20	60	6
HSXRT4040R0.5 0650	4	R0.5	1.6	12	3.8	20	50	6
HSXRT4040R1.0 0650	4	R1.0	1.6	12	3.8	20	50	6
HSXRT4040R1.0-20 0660	4	R1.0	1.6	20	3.8	20	60	6
HSXRT4050R1.0 0660	5	R1.0	2	15	4.7	20	60	6
HSXRT4050R1.0-25 0675	5	R1.0	2	25	4.7	20	75	6
HSXRT4060R1.0 0660	6	R1.0	2.5	18	5.6	—	60	6
HSXRT4060R1.5 0660	6	R1.5	2.5	18	5.6	—	60	6
HSXRT4060R1.5-30 0675	6	R1.5	2.5	30	5.6	—	75	6
HSXRT4080R1.0 0875	8	R1.0	3.5	24	7.6	—	75	8
HSXRT4080R1.0 08100	8	R1.0	3.5	24	7.6	—	100	8
HSXRT4080R2.0 0875	8	R2.0	3.5	24	7.6	—	75	8
HSXRT4080R2.0 08100	8	R2.0	3.5	24	7.6	—	100	8
HSXRT4080R2.0-40 08100	8	R2.0	3.5	40	7.6	—	100	8
HSXRT4100R1.0 1075	10	R1.0	4	30	9.5	—	75	10
HSXRT4100R1.0 10100	10	R1.0	4	30	9.5	—	100	10
HSXRT4100R2.0 1075	10	R2.0	4	30	9.5	—	75	10
HSXRT4100R2.0 10100	10	R2.0	4	30	9.5	—	100	10
HSXRT4100R2.0-50 10100	10	R2.0	4	50	9.5	—	100	10
HSXRT4120R2.0 12100	12	R2.0	5	36	11.5	—	100	12
HSXRT4120R3.0 12100	12	R3.0	5	36	11.5	—	100	12
HSXRT4120R2.0-60 12125	12	R2.0	5	60	11.5	—	125	12



Cutting Parameter

HSXRT 4 Flutes Power Corner Radius End Mill Face Milling Roughing

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXRT4020R0.5 0650	12600	2200	0.1	0.5	11520	2000	0.08	0.5	8000	1000	0.05	0.5
HSXRT4030R1.0 0650	11056	2500	0.1	0.8	9828	2500	0.1	0.8	7200	1200	0.1	0.8
HSXRT4040R1.0 0650	8712	2800	0.15	1.5	7744	2800	0.1	1.5	6000	1400	0.1	1.5
HSXRT4050R1.0 0660	7200	3500	0.2	2	6400	3000	0.1	2	5600	1500	0.1	2
HSXRT4060R1.5 0660	6543	4000	0.2	2	5808	3200	0.2	2	4500	1800	0.1	2
HSXRT4080R2.0 0875	5445	4500	0.2	2.7	5000	3500	0.2	2.7	3500	1600	0.1	2.7
HSXRT4100R2.0 1075	4900	4200	0.3	4	4500	3500	0.2	4	2860	1600	0.1	4
HSXRT4120R2.0 12100	4356	4000	0.3	5	4000	3200	0.2	5	2200	1500	0.1	5

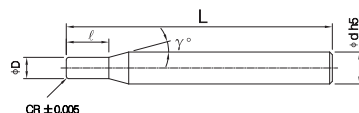
● For Z-level and face milling, the recommended axial depth of cut (ap) is 0.3 × CR.

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
		○	○	○	○	○	○						

HSXEF-CR 4-Flute Power Corner Radius End Mill



Ø D	D Tol. [mm]
3 < D < 4	0 ~ -0.012
4 < D < 8	0 ~ -0.015
8 < D < 12	0 ~ -0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	γ/°	L	φd
HSXEF4030R0.2 0650	3	R0.2	8	20	50	6
HSXEF4030R0.5 0650	3	R0.5	8	20	50	6
HSXEF4040R0.2 0660	4	R0.2	11	20	50	6
HSXEF4040R0.5 0660	4	R0.5	11	20	50	6
HSXEF4050R0.2 0660	5	R0.2	13	20	60	6
HSXEF4050R0.5 0660	5	R0.5	13	20	60	6
HSXEF4060R0.3 0660	6	R0.3	16	-	60	6
HSXEF4060R0.5 0660	6	R0.5	16	-	60	6
HSXEF4060R1.0 0660	6	R1	16	-	60	6
HSXEF4080R0.3 0875	8	R0.3	20	-	75	8
HSXEF4080R0.5 0875	8	R0.5	20	-	75	8
HSXEF4080R1.0 0875	8	R1	20	-	75	8
HSXEF4100R0.5 1075	10	R0.5	25	-	75	10
HSXEF4100R1.0 1075	10	R1	25	-	75	10
HSXEF4100R2.0 1075	10	R2	25	-	75	10
HSXEF4120R0.5 12100	12	R0.5	35	-	100	12
HSXEF4120R1.0 12100	12	R1	35	-	100	12
HSXEF4120R2.0 12100	12	R2	35	-	100	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○	○	○	○	○	○			○	○	



Cutting Parameter

HSXEF-CR 4-Flute Power Corner Radius End Mill Side Milling

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HSXEF4030R_	7500	900	6	0.05	6000	720	6	0.03	5250	400	3	0.03
HSXEF4040R_	6800	1000	8	0.1	5440	800	8	0.03	4760	440	4	0.03
HSXEF4050R_	6000	1200	10	0.1	4800	960	10	0.05	4200	500	5	0.05
HSXEF4060R_	5000	1500	12	0.1	4000	1200	12	0.05	3500	550	6	0.05
HSXEF4080R_	4200	2000	16	0.1	3360	1600	16	0.05	2940	600	8	0.05
HSXEF4100R_	4000	2500	20	0.1	3200	2000	20	0.05	2800	600	10	0.05
HSXEF4120R_	3800	3000	24	0.2	3040	2400	24	0.1	2660	500	12	0.05

● For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times \text{CR}$.

HSXEF-CR 4-Flute Power Corner Radius End Mill Face Milling

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HSXEF4030R_	9000	480	0.03	1.5	8000	400	0.03	1.5	7200	300	0.02	1.5
HSXEF4040R_	7500	600	0.05	2	7000	500	0.05	2	6000	400	0.03	2
HSXEF4050R_	7000	600	0.06	2.5	6500	550	0.05	2.5	5200	500	0.03	2.5
HSXEF4060R_	6600	660	0.08	3.5	6000	600	0.05	3.5	4500	500	0.04	3.5
HSXEF4080R_	5500	880	0.08	4.5	5000	800	0.05	4.5	4200	600	0.04	4.5
HSXEF4100R_	4950	1100	0.08	6	4500	1000	0.06	6	2800	700	0.05	6
HSXEF4120R_	4400	1320	0.08	8	4000	1200	0.06	8	2400	800	0.05	8

● For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times \text{CR}$.

Cutting Parameter

HSXEF-CR 4-Flute Power Corner Radius End Mill Z-Level Milling

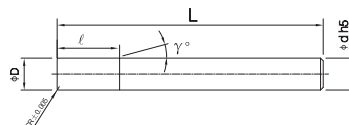
Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXEF4030R_	11056	2200	0.08	0.1	9828	1980	0.05	0.08	7200	800	0.03	0.03
HSXEF4040R_	8712	2500	0.1	0.1	7744	2250	0.1	0.1	6000	1000	0.1	0.05
HSXEF4050R_	7600	2600	0.1	0.15	6800	2400	0.1	0.1	5000	1100	0.15	0.05
HSXEF4060R_	6543	2800	0.15	0.2	5808	2520	0.15	0.1	4500	1200	0.15	0.05
HSXEF4080R_	5445	3000	0.15	0.2	4840	2700	0.15	0.1	4000	1500	0.15	0.05
HSXEF4100R_	4900	3600	0.2	0.2	4356	3200	0.2	0.1	3500	1800	0.2	0.05
HSXEF4120R_	4356	3600	0.2	0.2	3872	3200	0.2	0.1	3200	2000	0.2	0.05

HSXEF-CR 4-Flute Power Corner Radius End Mill Face Milling Roughing

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXEF4030R_	11056	2200	0.05	2.1	9828	1980	0.05	1.8	7200	800	0.02	1.5
HSXEF4040R_	8712	2500	0.05	2.8	7744	2250	0.05	2.4	6000	1000	0.02	2
HSXEF4050R_	7650	2680	0.05	3.6	6250	2360	0.05	3	5280	1100	0.03	2.5
HSXEF4060R_	6543	2800	0.15	4.2	5808	2520	0.15	3.6	4500	1200	0.03	3
HSXEF4080R_	5445	3000	0.15	5.6	4840	2700	0.2	4.8	4000	1500	0.08	4
HSXEF4100R_	4900	3600	0.2	7	4356	3200	0.2	6	3500	1800	0.1	4
HSXEF4120R_	4356	3600	0.2	8.4	3872	3200	0.2	7.2	3200	2000	0.15	4

● For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times \text{CR}$.

HSXHE-CR 6-Flute Hard Milling Corner Radius End Mill



ϕD	D Tolerance
$6 < D \leq 8$	$0 \sim -0.015$
$8 < D \leq 12$	$0 \sim -0.018$
$12 < D \leq 20$	$0 \sim -0.02$

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Overall Length	Shank Dia.
	ϕD	CR	ℓ	L	ϕd
HSXHE6060R0.3 0660	6	R0.3	16	60	6
HSXHE6060R0.5 0660	6	R0.5	16	60	6
HSXHE6060R1.0 0660	6	R1	16	60	6
HSXHE6080R0.3 0875	8	R0.3	20	75	8
HSXHE6080R0.5 0875	8	R0.5	20	75	8
HSXHE6080R1.0 0875	8	R1	20	75	8
HSXHE6100R0.5 1075	10	R0.5	25	75	10
HSXHE6100R1.0 1075	10	R1	25	75	10
HSXHE6100R1.5 1075	10	R1.5	25	75	10
HSXHE6100R2.0 1075	10	R2	25	75	10
HSXHE6120R0.5 12100	12	R0.5	35	100	12
HSXHE6120R1.0 12100	12	R1	35	100	12
HSXHE6120R1.5 12100	12	R1.5	35	100	12
HSXHE6120R2.0 12100	12	R2	35	100	12
HSXHE6160R1.0 16100	16	R1	40	100	16
HSXHE6160R2.0 16100	16	R2	40	100	16
HSXHE6200R1.0 20125	20	R1	45	125	20
HSXHE6200R2.0 20125	20	R2	45	125	20



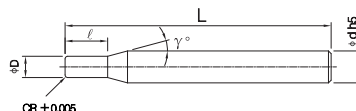
Cutting Parameter

HSXHE-CR 6-Flute Hard Milling Corner Radius End Mill Side Milling

Workpiece	Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)				Hardened Steels (65-70HRC)			
Type No.	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm
HSXHE4010 0650	15000	600	2	0.05	12000	480	2	0.03	10500	200	1	0.01
HSXHE4015 0650	12000	720	3	0.05	9600	576	3	0.03	8400	220	1.5	0.01
HSXHE4020 0650	10000	800	4	0.05	8000	640	4	0.03	7000	240	2	0.02
HSXHE4025 0650	8500	850	5	0.05	6800	680	5	0.03	5950	240	2.5	0.02
HSXHE4030 0650	7500	900	6	0.05	6000	720	6	0.03	5250	240	3	0.03
HSXHE4040 0660	6800	1000	8	0.1	5440	800	8	0.03	4760	280	4	0.03
HSXHE4050 0660	6000	1200	10	0.1	4800	960	10	0.05	4200	300	5	0.03

Workpiece	Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)				Hardened Steels (65-70HRC)			
Type No.	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm
HSXHE6060 0660	4000	870	15	0.1	3200	700	15	0.05	2100	360	15	0.03
HSXHE6080 0875	3500	900	18	0.1	2800	700	18	0.05	1600	360	18	0.03
HSXHE6100 1075	2800	850	25	0.1	2240	680	25	0.05	1500	340	25	0.03
HSXHE6120 12100	2500	800	30	0.1	2000	650	30	0.05	1200	325	30	0.03
HSXHE6160 16100	2200	750	35	0.1	1760	650	35	0.05	1000	325	35	0.03
HSXHE6200 20100	2000	700	40	0.1	1600	600	40	0.05	800	300	40	0.03

HSXR 4-Flute Corner Radius End Mill



Ø D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D < 6	0 ~ -0.012
6 < D < 10	0 ~ -0.015
10 < D < 12	0 ~ -0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	γ/°	L	φd
HSXR4008R0.05 0450	0.8	R0.05	1.6	12	50	4
HSXR4008R0.1 0450	0.8	R0.1	1.6	12	50	4
HSXR4010R0.05 0450	1	R0.05	2	12	50	4
HSXR4010R0.1 0450	1	R0.1	2	12	50	4
HSXR4010R0.2 0450	1	R0.2	2	12	50	4
HSXR4010R0.3 0450	1	R0.3	2	12	50	4
HSXR4015R0.05 0450	1.5	R0.05	3	11	50	4
HSXR4015R0.1 0450	1.5	R0.1	3	11	50	4
HSXR4015R0.2 0450	1.5	R0.2	3	11	50	4
HSXR4015R0.3 0450	1.5	R0.3	3	11	50	4
HSXR4020R0.05 0450	2	R0.05	4	11	50	4
HSXR4020R0.1 0450	2	R0.1	4	11	50	4
HSXR4020R0.2 0450	2	R0.2	4	11	50	4
HSXR4020R0.3 0450	2	R0.3	4	11	50	4
HSXR4020R0.5 0450	2	R0.5	4	11	50	4
HSXR4025R0.1 0450	2.5	R0.1	5	11	50	4
HSXR4025R0.2 0450	2.5	R0.2	5	11	50	4
HSXR4025R0.3 0450	2.5	R0.3	5	11	50	4
HSXR4025R0.5 0450	2.5	R0.5	5	11	50	4
HSXR4030R0.1 0450	3	R0.1	6	11	50	4
HSXR4030R0.1 0660	3	R0.1	6	11	60	6
HSXR4030R0.1 0675	3	R0.1	6	11	75	6
HSXR4030R0.2 0450	3	R0.2	6	11	50	4
HSXR4030R0.2 0660	3	R0.2	6	11	60	6
HSXR4030R0.2 0675	3	R0.2	6	11	75	6
HSXR4030R0.3 0450	3	R0.3	6	11	50	4
HSXR4030R0.3 0660	3	R0.3	6	11	60	6
HSXR4030R0.3 0675	3	R0.3	6	11	75	6



HSXR 4-Flute Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HSXR4030R0.5 0450	3	R0.5	6	11	50	4
HSXR4030R0.5 0660	3	R0.5	6	11	60	6
HSXR4030R0.5 0675	3	R0.5	6	11	75	6
HSXR4040R0.1 0450	4	R0.1	8	—	50	4
HSXR4040R0.1 0475	4	R0.1	8	—	75	4
HSXR4040R0.1 0660	4	R0.1	8	11	60	6
HSXR4040R0.1 0675	4	R0.1	8	11	75	6
HSXR4040R0.2 0450	4	R0.2	8	—	50	4
HSXR4040R0.2 0475	4	R0.2	8	—	75	4
HSXR4040R0.2 0660	4	R0.2	8	11	60	6
HSXR4040R0.2 0675	4	R0.2	8	11	75	6
HSXR4040R0.3 0450	4	R0.3	8	—	50	4
HSXR4040R0.3 0475	4	R0.3	8	—	75	4
HSXR4040R0.3 0660	4	R0.3	8	11	60	6
HSXR4040R0.3 0675	4	R0.3	8	11	75	6
HSXR4040R0.5 0450	4	R0.5	8	—	50	4
HSXR4040R0.5 0475	4	R0.5	8	—	75	4
HSXR4040R0.5 0660	4	R0.5	8	11	60	6
HSXR4040R0.5 0675	4	R0.5	8	11	75	6
HSXR4040R1.0 0450	4	R1	8	—	50	4
HSXR4040R1.0 0475	4	R1	8	—	75	4
HSXR4040R1.0 0660	4	R1	8	11	60	6
HSXR4040R1.0 0675	4	R1	8	11	75	6
HSXR4060R0.1 0650	6	R0.1	12	—	50	6
HSXR4060R0.1 0660	6	R0.1	12	—	60	6
HSXR4060R0.1 0675	6	R0.1	12	—	75	6
HSXR4060R0.1 06100	6	R0.1	12	—	100	6
HSXR4060R0.2 0650	6	R0.2	12	—	50	6
HSXR4060R0.2 0660	6	R0.2	12	—	60	6
HSXR4060R0.2 0675	6	R0.2	12	—	75	6
HSXR4060R0.2 06100	6	R0.2	12	—	100	6
HSXR4060R0.3 0650	6	R0.3	12	—	50	6
HSXR4060R0.3 0660	6	R0.3	12	—	60	6
HSXR4060R0.3 0675	6	R0.3	12	—	75	6

HSXR 4-Flute Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HSXR4060R0.3 06100	6	R0.3	12	—	100	6
HSXR4060R0.5 0650	6	R0.5	12	—	50	6
HSXR4060R0.5 0660	6	R0.5	12	—	60	6
HSXR4060R0.5 0675	6	R0.5	12	—	75	6
HSXR4060R0.5 06100	6	R0.5	12	—	100	6
HSXR4060R1.0 0650	6	R1	12	—	50	6
HSXR4060R1.0 0660	6	R1	12	—	60	6
HSXR4060R1.0 0675	6	R1	12	—	75	6
HSXR4060R1.0 06100	6	R1	12	—	100	6
HSXR4080R0.1 0860	8	R0.1	16	—	60	8
HSXR4080R0.1 0875	8	R0.1	16	—	75	8
HSXR4080R0.1 08100	8	R0.1	16	—	100	8
HSXR4080R0.2 0860	8	R0.2	16	—	60	8
HSXR4080R0.2 0875	8	R0.2	16	—	75	8
HSXR4080R0.2 08100	8	R0.2	16	—	100	8
HSXR4080R0.3 0860	8	R0.3	16	—	60	8
HSXR4080R0.3 0875	8	R0.3	16	—	75	8
HSXR4080R0.3 08100	8	R0.3	16	—	100	8
HSXR4080R0.5 0860	8	R0.5	16	—	60	8
HSXR4080R0.5 0875	8	R0.5	16	—	75	8
HSXR4080R0.5 08100	8	R0.5	16	—	100	8
HSXR4080R0.5 08125	8	R0.5	20	—	125	8
HSXR4080R0.5 08150	8	R0.5	20	—	150	8
HSXR4080R1.0 0860	8	R1	16	—	60	8
HSXR4080R1.0 0875	8	R1	16	—	75	8
HSXR4080R1.0 08100	8	R1	16	—	100	8
HSXR4080R1.0 08125	8	R1	20	—	125	8
HSXR4080R1.0 08150	8	R1	20	—	150	8
HSXR4100R0.2 1075	10	R0.2	20	—	75	10
HSXR4100R0.2 10100	10	R0.2	20	—	100	10
HSXR4100R0.5 1075	10	R0.5	20	—	75	10
HSXR4100R0.5 10100	10	R0.5	20	—	100	10
HSXR4100R0.5 10125	10	R0.5	25	—	125	10
HSXR4100R0.5 10150	10	R0.5	25	—	150	10



HSXR 4-Flute Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HSXR4100R1.0 1075	10	R1	20	—	75	10
HSXR4100R1.0 10100	10	R1	20	—	100	10
HSXR4100R1.0 10125	10	R1	25	—	125	10
HSXR4100R1.0 10150	10	R1	25	—	150	10
HSXR4120R0.5 1275	12	R0.5	24	—	75	12
HSXR4120R0.5 12100	12	R0.5	24	—	100	12
HSXR4120R0.5 12125	12	R0.5	30	—	125	12
HSXR4120R0.5 12150	12	R0.5	30	—	150	12
HSXR4120R1.0 1275	12	R1	24	—	75	12
HSXR4120R1.0 12100	12	R1	24	—	100	12
HSXR4120R1.0 12125	12	R1	30	—	125	12
HSXR4120R1.0 12150	12	R1	30	—	150	12
HSXR4120R2.0 1275	12	R2	24	—	75	12
HSXR4120R2.0 12100	12	R2	24	—	100	12
HSXR4120R2.0 12125	12	R2	30	—	125	12
HSXR4120R2.0 12150	12	R2	30	—	150	12
HSXR4160R0.5 16100	16	R0.5	32	—	100	16
HSXR4160R1.0 16100	16	R1	32	—	100	16
HSXR4160R2.0 16100	16	R2	32	—	100	16
HSXR4160R0.5 16150	16	R0.5	40	—	150	16
HSXR4160R1.0 16150	16	R1	40	—	150	16
HSXR4160R2.0 16150	16	R2	40	—	150	16



Cutting Parameter

HSXR 4-Flute Corner Radius End Mill Face Milling Roughing

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXR4008R_	28000	1450	0.02	0.56	25000	1305	0.014	0.48	23000	420	0.012	0.4
HSXR4009R_	25000	1500	0.05	0.63	25000	1350	0.03	0.54	20000	450	0.02	0.45
HSXR4010R_	18000	1500	0.05	0.7	16000	1350	0.05	0.6	15000	500	0.03	0.5
HSXR4015R_	16155	1700	0.05	1.05	14360	1530	0.05	0.9	13500	600	0.03	0.75
HSXR4020R_	14301	2000	0.1	1.4	12712	1800	0.1	1.2	10000	800	0.05	1
HSXR4030R_	11056	2200	0.1	2.1	9828	1980	0.1	1.8	7200	800	0.05	1.5
HSXR4040R_	8712	2500	0.2	2.8	7744	2250	0.2	2.4	6000	1000	0.08	2
HSXR4060R_	6543	2800	0.2	4.2	5808	2520	0.2	3.6	4500	1200	0.08	3
HSXR4080R_	5445	3000	0.2	5.6	4840	2700	0.2	4.8	4000	1500	0.1	4
HSXR4100R_	4900	3600	0.2	7	4356	3200	0.2	6	3500	1800	0.1	5
HSXR4120R_	4356	3600	0.2	8.4	3872	3200	0.2	7.2	3200	2000	0.15	6

- For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times CR$.
- This item can be used for side milling and slotting applications.

HSXR 4-Flute Corner Radius End Mill Face Milling Finishing

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXR4020R_	12000	360	0.03	1	10000	300	0.03	1	8800	200	0.02	1
HSXR4030R_	9000	480	0.03	1.5	8000	400	0.03	1.5	7200	300	0.02	1.5
HSXR4040R_	7500	600	0.05	2	7000	500	0.05	2	6000	400	0.03	2
HSXR4060R_	6600	660	0.08	3.5	6000	600	0.05	3.5	4500	500	0.04	3.5
HSXR4080R_	5500	880	0.08	4.5	5000	800	0.05	4.5	4200	600	0.04	4.5
HSXR4100R_	4950	1100	0.08	6	4500	1000	0.06	6	2800	700	0.05	6
HSXR4120R_	4400	1320	0.08	8	4000	1200	0.06	8	2400	800	0.05	8

- For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times CR$.
- This item can be used for side milling and slotting applications.



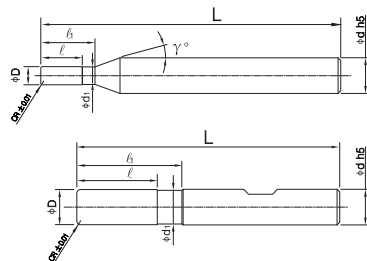
Cutting Parameter

HSXR 4-Flute Corner Radius End Mill Z-Level Milling

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXR4008R_	28000	1450	0.03	0.05	25000	1305	0.03	0.03	23000	420	0.03	0.02
HSXR4009R_	25000	1500	0.05	0.05	25000	1350	0.05	0.03	20000	450	0.05	0.02
HSXR4010R_	18000	1500	0.05	0.05	16000	1350	0.05	0.05	15000	500	0.05	0.02
HSXR4015R_	16155	1700	0.05	0.05	14360	1530	0.05	0.05	13500	600	0.05	0.02
HSXR4025R_	15200	1880	0.05	0.1	13500	1680	0.05	0.08	12000	700	0.05	0.02
HSXR4020R_	14301	2000	0.1	0.1	12712	1800	0.1	0.08	10000	800	0.1	0.03
HSXR4030R_	11056	2200	0.1	0.1	9828	1980	0.1	0.08	7200	800	0.1	0.03
HSXR4040R_	8712	2500	0.2	0.1	7744	2250	0.2	0.1	6000	1000	0.2	0.05
HSXR4060R_	6543	2800	0.2	0.2	5808	2520	0.2	0.1	4500	1200	0.2	0.05
HSXR4080R_	5445	3000	0.2	0.2	4840	2700	0.2	0.1	4000	1500	0.2	0.05
HSXR4100R_	4900	3600	0.2	0.2	4356	3200	0.2	0.1	3500	1800	0.2	0.05
HSXR4120R_	4356	3600	0.2	0.2	3872	3200	0.2	0.1	3200	2000	0.2	0.05

- For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times \text{CR}$.
- This item can be used for side milling and slotting applications.

HGHFE 4-Flute HPC Corner Radius 3D End Mill

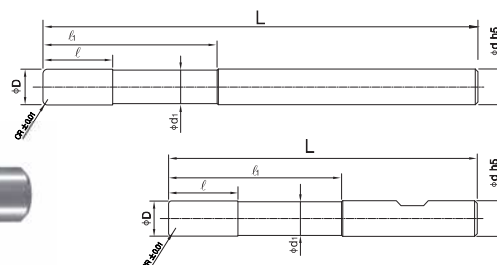


Ø D	D Tol. (mm)
1 < D < 6	0 ~ -0.015
6 < D < 20	0 ~ -0.02

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Shank
	φD	R	ℓ	ℓ ₁	φd ₁	γ/°	L	φd	
HGHFE4010R0.2-3 0650	1	R0.2	2.3	3	0.95	20	50	6	Cylinder Shank
HGHFE4020R0.2-6 0650	2	R0.2	4.6	6	1.9	20	50	6	Cylinder Shank
HGHFE4030R0.2-9 0650	3	R0.2	6.9	9	2.9	20	50	6	Cylinder Shank
HGHFE4040R0.2-12 0650	4	R0.2	9.2	12	3.8	20	50	6	Cylinder Shank
HGHFE4040R0.5-12 0650	4	R0.5	9.2	12	3.8	20	50	6	Cylinder Shank
HGHFE4050R0.5-15 0656-W	5	R0.5	11.5	15	4.7	20	56	6	Weldon Shank
HGHFE4060R0.5-18 0656-W	6	R0.5	13.8	18	5.6	—	56	6	Weldon Shank
HGHFE4060R1-18 0656-W	6	R1	13.8	18	5.6	—	56	6	Weldon Shank
HGHFE4080R0.5-24 0862-W	8	R0.5	18.4	24	7.6	—	62	8	Weldon Shank
HGHFE4080R1-24 0862-W	8	R1	18.4	24	7.6	—	62	8	Weldon Shank
HGHFE4080R2-24 0862-W	8	R2	18.4	24	7.6	—	62	8	Weldon Shank
HGHFE4100R0.5-30 1072-W	10	R0.5	23.0	30	9.5	—	72	10	Weldon Shank
HGHFE4100R1-30 1072-W	10	R1	23.0	30	9.5	—	72	10	Weldon Shank
HGHFE4100R2-30 1072-W	10	R2	23.0	30	9.5	—	72	10	Weldon Shank
HGHFE4120R0.5-36 1283-W	12	R0.5	27.6	36	11.5	—	83	12	Weldon Shank
HGHFE4120R1-36 1283-W	12	R1	27.6	36	11.5	—	83	12	Weldon Shank
HGHFE4120R2-36 1283-W	12	R2	27.6	36	11.5	—	83	12	Weldon Shank
HGHFE4160R1-48 1698-W	16	R1	36.8	48	15.5	—	98	16	Weldon Shank
HGHFE4200R1-60 20112-W	20	R1	46.0	60	19.5	—	112	20	Weldon Shank

HGHFE 4-Flute HPC Corner Radius 5D End Mill



ϕD	D Tol. [mm]
1 < D < 6	0 ~ -0.015
6 < D < 20	0 ~ -0.02

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Shank
	ϕD	R	l	l_1	ϕd_1	$\gamma / ^\circ$	L	ϕd	
HGHFE4010R0.2-5 0650	1	R0.2	1.8	5	0.95	20	50	6	Cylinder Shank
HGHFE4020R0.2-10 0650	2	R0.2	3.6	10	1.9	20	50	6	Cylinder Shank
HGHFE4030R0.2-15 0660	3	R0.2	5.4	15	2.9	20	60	6	Cylinder Shank
HGHFE4040R0.2-20 0660	4	R0.2	7.2	20	3.8	20	60	6	Cylinder Shank
HGHFE4040R0.5-20 0660	4	R0.5	7.2	20	3.8	20	60	6	Cylinder Shank
HGHFE4050R0.5-25 0675	5	R0.5	9	25	4.7	20	75	6	Cylinder Shank
HGHFE4060R0.5-30 0675	6	R0.5	10.8	30	5.6	-	75	6	Cylinder Shank
HGHFE4060R1-30 0675	6	R1	10.8	30	5.6	-	75	6	Cylinder Shank
HGHFE4080R0.5-40 08100	8	R0.5	14.4	40	7.6	-	100	8	Cylinder Shank
HGHFE4080R1-40 08100	8	R1	14.4	40	7.6	-	100	8	Cylinder Shank
HGHFE4100R0.5-50 10100	10	R0.5	18	50	9.5	-	100	10	Cylinder Shank
HGHFE4100R1-50 10100	10	R1	18	50	9.5	-	100	10	Cylinder Shank
HGHFE4100R2-50 10100	10	R2	18	50	9.5	-	100	10	Cylinder Shank
HGHFE4120R0.5-60 12107-W	12	R0.5	21.6	60	11.5	-	107	12	Weldon Shank
HGHFE4120R1-60 12107-W	12	R1	21.6	60	11.5	-	107	12	Weldon Shank
HGHFE4120R2-60 12107-W	12	R2	21.6	60	11.5	-	107	12	Weldon Shank
HGHFE4160R1-80 16130-W	16	R1	28.8	80	15.5	-	130	16	Weldon Shank
HGHFE4200R1-100 20152-W	20	R1	36	100	19.5	-	152	20	Weldon Shank



Cutting Parameter

HGHFE 4-Flute HPC Corner Radius End Mill Slot Milling

Workpiece	Pre-Hardened Steels (~30HRC)				Hardened Steels (30~40HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HGHFE4010	36000	300	1	1	31800	200	1	1
HGHFE4020	18000	400	2	2	15200	240	2	2
HGHFE4030	12000	500	3	3	10600	320	3	3
HGHFE4040	9000	600	4	4	7960	540	4	4
HGHFE4050	7200	700	5	5	6360	600	5	5
HGHFE4060	6000	800	6	6	5300	650	6	6
HGHFE4080	4450	1000	8	8	3980	800	8	8
HGHFE4100	3600	1200	10	10	3185	900	10	10
HGHFE4120	3000	1200	12	12	2750	1000	12	12
HGHFE4160	2250	1000	16	16	2050	800	16	16
HGHFE4200	1800	800	20	20	1640	600	20	20

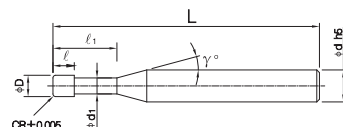
● For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times CR$.

HGHFE 4-Flute HPC Corner Radius End Mill Trochoidal Milling

Workpiece	Pre-Hardened Steels (~30HRC)				Hardened Steels (35~45HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HGHFE4010	40000	300	2	0.2	36000	270	1	0.18
HGHFE4020	20000	400	4	0.4	18000	360	2	0.36
HGHFE4030	13500	600	6	0.6	12150	540	3	0.54
HGHFE4040	10000	1000	8	0.8	9000	900	4	0.72
HGHFE4050	8000	1500	10	1	7200	1350	5	0.9
HGHFE4060	6500	2000	12	1.2	5850	1800	6	1.08
HGHFE4080	5000	2000	16	1.6	4500	1800	8	1.44
HGHFE4100	4000	2500	20	2	3600	2250	10	1.8
HGHFE4120	3350	3000	24	2.4	3015	2700	12	2.16
HGHFE4160	2500	2500	32	2	2250	2250	16	1.8
HGHFE4200	2000	2000	40	2	1800	1800	20	1.8

● For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times CR$.

HGXRP 4-Flute Short Corner Radius End Mill



ØD	D Tol. (mm)
D<3	0~-0.010
3<D≤6	0~-0.012
6<D≤10	0~-0.015
10<D≤12	0~-0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HGXRP4010R0.05 0450	1	R0.05	1	3	0.95	12	50	4
HGXRP4010R0.1 0450	1	R0.1	1	3	0.95	12	50	4
HGXRP4010R0.2 0450	1	R0.2	1	3	0.95	12	50	4
HGXRP4010R0.3 0450	1	R0.3	1	3	0.95	12	50	4
HGXRP4015R0.1 0450	1.5	R0.1	1.5	4.5	1.42	11	50	4
HGXRP4015R0.2 0450	1.5	R0.2	1.5	4.5	1.42	11	50	4
HGXRP4015R0.3 0450	1.5	R0.3	1.5	4.5	1.42	11	50	4
HGXRP4020R0.05 0450	2	R0.05	2	6	1.9	11	50	4
HGXRP4020R0.1 0450	2	R0.1	2	6	1.9	11	50	4
HGXRP4020R0.2 0450	2	R0.2	2	6	1.9	11	50	4
HGXRP4020R0.3 0450	2	R0.3	2	6	1.9	11	50	4
HGXRP4020R0.5 0450	2	R0.5	2	6	1.9	11	50	4
HGXRP4030R0.1 0450	3	R0.1	3	9	2.9	11	50	4
HGXRP4030R0.1 0660	3	R0.1	3	9	2.9	11	60	6
HGXRP4030R0.1 0675	3	R0.1	3	9	2.9	11	75	6
HGXRP4030R0.2 0450	3	R0.2	3	9	2.9	11	50	4
HGXRP4030R0.2 0650	3	R0.2	3	9	2.9	11	50	6
HGXRP4030R0.2 0660	3	R0.2	3	9	2.9	11	60	6
HGXRP4030R0.2 0675	3	R0.2	3	9	2.9	11	75	6
HGXRP4030R0.3 0450	3	R0.3	3	9	2.9	11	50	4
HGXRP4030R0.3 0660	3	R0.3	3	9	2.9	11	60	6
HGXRP4030R0.3 0675	3	R0.3	3	9	2.9	11	75	6
HGXRP4030R0.5 0450	3	R0.5	3	9	2.9	11	50	4
HGXRP4030R0.5 0650	3	R0.5	3	9	2.9	11	50	6
HGXRP4030R0.5 0660	3	R0.5	3	9	2.9	11	60	6
HGXRP4030R0.5 0675	3	R0.5	3	9	2.9	11	75	6

HGXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXRP4040R0.1 0450	4	R0.1	4	12	3.9	—	50	4
HGXRP4040R0.1 0660	4	R0.1	4	12	3.9	11	60	6
HGXRP4040R0.1 0675	4	R0.1	4	12	3.9	11	75	6
HGXRP4040R0.2 0450	4	R0.2	4	12	3.9	—	50	4
HGXRP4040R0.2 0650	4	R0.2	4	12	3.9	11	50	6
HGXRP4040R0.2 0660	4	R0.2	4	12	3.9	11	60	6
HGXRP4040R0.2 0675	4	R0.2	4	12	3.9	11	75	6
HGXRP4040R0.3 0450	4	R0.3	4	12	3.9	—	50	4
HGXRP4040R0.3 0660	4	R0.3	4	12	3.9	11	60	6
HGXRP4040R0.3 0675	4	R0.3	4	12	3.9	11	75	6
HGXRP4040R0.5 0450	4	R0.5	4	12	3.9	—	50	4
HGXRP4040R0.5 0660	4	R0.5	4	12	3.9	11	60	6
HGXRP4040R0.5 0675	4	R0.5	4	12	3.9	11	75	6
HGXRP4040R1.0 0450	4	R1	4	12	3.9	—	50	4
HGXRP4040R1.0 0660	4	R1	4	12	3.9	11	60	6
HGXRP4040R1.0 0675	4	R1	4	12	3.9	11	75	6
HGXRP4060R0.1 0650	6	R0.1	6	18	5.85	—	50	6
HGXRP4060R0.1 0660	6	R0.1	6	18	5.85	—	60	6
HGXRP4060R0.1 0675	6	R0.1	6	18	5.85	—	75	6
HGXRP4060R0.2 0650	6	R0.2	6	18	5.85	—	50	6
HGXRP4060R0.2 0660	6	R0.2	6	18	5.85	—	60	6
HGXRP4060R0.2 0675	6	R0.2	6	18	5.85	—	75	6
HGXRP4060R0.2 06100	6	R0.2	6	18	5.85	—	100	6
HGXRP4060R0.3 0650	6	R0.3	6	18	5.85	—	50	6
HGXRP4060R0.3 0660	6	R0.3	6	18	5.85	—	60	6
HGXRP4060R0.3 0675	6	R0.3	6	18	5.85	—	75	6
HGXRP4060R0.3 06100	6	R0.3	6	18	5.85	—	100	6
HGXRP4060R0.5 0650	6	R0.5	6	18	5.85	—	50	6
HGXRP4060R0.5 0660	6	R0.5	6	18	5.85	—	60	6
HGXRP4060R0.5 0675	6	R0.5	6	18	5.85	—	75	6
HGXRP4060R0.5 06100	6	R0.5	6	18	5.85	—	100	6
HGXRP4060R1.0 0650	6	R1	6	18	5.85	—	50	6



HGXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXRP4060R1.0 0660	6	R1	6	18	5.85	—	60	6
HGXRP4060R1.0 0675	6	R1	6	18	5.85	—	75	6
HGXRP4060R1.0 06100	6	R1	6	18	5.85	—	100	6
HGXRP4080R0.1 0860	8	R0.1	8	24	7.8	—	60	8
HGXRP4080R0.1 0875	8	R0.1	8	24	7.8	—	75	8
HGXRP4080R0.1 08100	8	R0.1	8	24	7.8	—	100	8
HGXRP4080R0.2 0860	8	R0.2	8	24	7.8	—	60	8
HGXRP4080R0.2 0875	8	R0.2	8	24	7.8	—	75	8
HGXRP4080R0.2 08100	8	R0.2	8	24	7.8	—	100	8
HGXRP4080R0.3 0860	8	R0.3	8	24	7.8	—	60	8
HGXRP4080R0.3 0875	8	R0.3	8	24	7.8	—	75	8
HGXRP4080R0.3 08100	8	R0.3	8	24	7.8	—	100	8
HGXRP4080R0.5 0860	8	R0.5	8	24	7.8	—	60	8
HGXRP4080R0.5 0875	8	R0.5	8	24	7.8	—	75	8
HGXRP4080R0.5 08100	8	R0.5	8	24	7.8	—	100	8
HGXRP4080R1.0 0860	8	R1	8	24	7.8	—	60	8
HGXRP4080R1.0 0875	8	R1	8	24	7.8	—	75	8
HGXRP4080R1.0 08100	8	R1	8	24	7.8	—	100	8
HGXRP4100R0.2 1075	10	R0.2	10	30	9.8	—	75	10
HGXRP4100R0.2 10100	10	R0.2	10	30	9.8	—	100	10
HGXRP4100R0.5 1075	10	R0.5	10	30	9.8	—	75	10
HGXRP4100R0.5 10100	10	R0.5	10	30	9.8	—	100	10
HGXRP4100R1.0 1075	10	R1	10	30	9.8	—	75	10
HGXRP4100R1.0 10100	10	R1	10	30	9.8	—	100	10
HGXRP4100R2.0 1075	10	R2	10	30	9.8	—	75	10
HGXRP4120R0.5 1275	12	R0.5	12	36	11.7	—	75	12
HGXRP4120R0.5 12100	12	R0.5	12	36	11.7	—	100	12

HGXRP 4-Flute Short Corner Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HGXRP4120R1.0 1275	12	R1	12	36	11.7	—	75	12
HGXRP4120R1.0 12100	12	R1	12	36	11.7	—	100	12
HGXRP4120R2.0 1275	12	R2	12	36	11.7	—	75	12
HGXRP4120R2.0 12100	12	R2	12	36	11.7	—	100	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
~40HRC		○	○	○				○	○		○	○	



Cutting Parameter

HGXP 4-Flute Short Corner Radius End Mill Face Milling

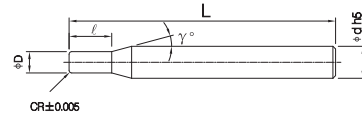
Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXP4010R_	20000	1800	0.05	0.5	18000	1620	0.05	0.4	16000	1440	0.05	0.32
HGXP4015R_	17950	2000	0.05	0.65	16155	1800	0.05	0.52	14360	1600	0.05	0.4
HGXP4020R_	15890	2200	0.1	1	14301	1980	0.1	0.8	12712	1760	0.1	0.64
HGXP4030R_	12285	2400	0.1	1.5	11056.5	2160	0.1	1.2	9828	1920	0.1	0.96
HGXP4040R_	9680	2800	0.2	2	8712	2520	0.2	1.6	7744	2240	0.2	1.08
HGXP4060R_	7260	3000	0.2	3	6534	2700	0.2	2.4	5808	2400	0.2	1.96
HGXP4080R_	6050	3500	0.2	4	5445	3150	0.2	3.2	4840	2800	0.2	2.52
HGXP4100R_	5445	3500	0.2	5	4900.5	3150	0.2	4	4356	2800	0.2	3.2
HGXP4120R_	4840	3600	0.2	6	4356	3240	0.2	4.8	3872	2880	0.2	3.84

HGXP 4-Flute Short Corner Radius End Mill Z-Level Milling

Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXP4010R_	20000	1800	0.05	0.03	18000	1620	0.05	0.03	16000	1440	0.05	0.02
HGXP4015R_	17950	2000	0.05	0.05	16155	1800	0.05	0.05	14360	1600	0.05	0.02
HGXP4020R_	15890	2200	0.1	0.05	14301	1980	0.1	0.05	12712	1760	0.1	0.03
HGXP4030R_	12285	2400	0.1	0.05	11056.5	2160	0.1	0.05	9828	1920	0.1	0.03
HGXP4040R_	9680	2800	0.2	0.05	8712	2520	0.2	0.05	7744	2240	0.2	0.05
HGXP4060R_	7260	3000	0.2	0.08	6534	2700	0.2	0.08	5808	2400	0.2	0.05
HGXP4080R_	6050	3500	0.2	0.08	5445	3150	0.2	0.08	4840	2800	0.2	0.05
HGXP4100R_	5445	3500	0.2	0.1	4900.5	3150	0.2	0.1	4356	2800	0.2	0.05
HGXP4120R_	4840	3600	0.2	0.1	4356	3240	0.2	0.1	3872	2880	0.2	0.05

- For Z-level and face milling, the recommended axial depth of cut (ap) is 0.3 × CR.
- This item can be used for side milling and slotting applications.

HGXR 2-Fute General Purpose Radius End Mill



Ø D	D Tol. (mm)
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012
6 < D < 10	0 ~ -0.015
10 < D < 12	0 ~ -0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	γ/°	L	φd
HGXR2002R0.05 0450	0.2	R0.05	0.4	12	50	4
HGXR2003R0.05 0450	0.3	R0.05	0.6	12	50	4
HGXR2004R0.05 0450	0.4	R0.05	0.8	12	50	4
HGXR2004R0.1 0450	0.4	R0.1	0.8	12	50	4
HGXR2005R0.05 0450	0.5	R0.05	1	12	50	4
HGXR2005R0.1 0450	0.5	R0.1	1	12	50	4
HGXR2006R0.05 0450	0.6	R0.05	1.2	12	50	4
HGXR2006R0.1 0450	0.6	R0.1	1.2	12	50	4
HGXR2007R0.05 0450	0.7	R0.05	1.4	12	50	4
HGXR2007R0.1 0450	0.7	R0.1	1.4	12	50	4
HGXR2008R0.05 0450	0.8	R0.05	1.6	12	50	4
HGXR2008R0.1 0450	0.8	R0.1	1.6	12	50	4
HGXR2009R0.1 0450	0.9	R0.1	1.8	12	50	4
HGXR2010R0.05 0450	1	R0.05	2	12	50	4
HGXR2010R0.1 0450	1	R0.1	2	12	50	4
HGXR2010R0.2 0450	1	R0.2	2	12	50	4
HGXR2010R0.3 0450	1	R0.3	2	12	50	4
HGXR2015R0.05 0450	1.5	R0.05	3	11	50	4
HGXR2015R0.1 0450	1.5	R0.1	3	11	50	4
HGXR2015R0.2 0450	1.5	R0.2	3	11	50	4
HGXR2015R0.3 0450	1.5	R0.3	3	11	50	4
HGXR2020R0.05 0450	2	R0.05	4	11	50	4
HGXR2020R0.1 0450	2	R0.1	4	11	50	4
HGXR2020R0.2 0450	2	R0.2	4	11	50	4
HGXR2020R0.3 0450	2	R0.3	4	11	50	4
HGXR2020R0.5 0450	2	R0.5	4	11	50	4



HGXR 2-Fute General Purpose Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HGXR2030R0.2 0450	3	R0.2	6	11	50	4
HGXR2030R0.2 0660	3	R0.2	6	11	60	6
HGXR2030R0.5 0450	3	R0.5	6	11	50	4
HGXR2030R0.5 0660	3	R0.5	6	11	60	6
HGXR2040R0.2 0450	4	R0.2	8	—	50	4
HGXR2040R0.2 0660	4	R0.2	8	11	60	6
HGXR2040R0.5 0450	4	R0.5	8	—	50	4
HGXR2040R0.5 0660	4	R0.5	8	11	60	6
HGXR2040R1.0 0450	4	R1	8	—	50	4
HGXR2040R1.0 0660	4	R1	8	11	60	6
HGXR2060R0.5 0650	6	R0.5	12	—	50	6
HGXR2060R0.5 0660	6	R0.5	12	—	60	6
HGXR2060R0.5 0675	6	R0.5	12	—	75	6
HGXR2060R0.5 06100	6	R0.5	12	—	100	6
HGXR2060R1.0 0650	6	R1	12	—	50	6
HGXR2060R1.0 0660	6	R1	12	—	60	6
HGXR2060R1.0 0675	6	R1	12	—	75	6
HGXR2060R1.0 06100	6	R1	12	—	100	6
HGXR2080R0.5 0860	8	R0.5	16	—	60	8
HGXR2080R0.5 0875	8	R0.5	16	—	75	8
HGXR2080R0.5 08100	8	R0.5	16	—	100	8
HGXR2080R1.0 0860	8	R1	16	—	60	8
HGXR2080R1.0 0875	8	R1	16	—	75	8
HGXR2080R1.0 08100	8	R1	16	—	100	8
HGXR2100R0.5 1075	10	R0.5	20	—	75	10
HGXR2100R0.5 10100	10	R0.5	20	—	100	10

HGXR 2-Fute General Purpose Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	l	$\gamma/^\circ$	L	ϕd
HGXR2100R1.0 1075	10	R1	20	—	75	10
HGXR2100R1.0 10100	10	R1	20	—	100	10
HGXR2120R0.5 1275	12	R0.5	24	—	75	12
HGXR2120R0.5 12100	12	R0.5	24	—	100	12
HGXR2120R1.0 1275	12	R1	24	—	75	12
HGXR2120R1.0 12100	12	R1	24	—	100	12
HGXR2120R2.0 1275	12	R2	24	—	75	12
HGXR2120R2.0 12100	12	R2	24	—	100	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS					STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS TOOL STEELS	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~35HRC	~350HB						
~40HRC	○	○	○			○	○	○	○		○	○	



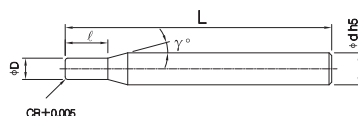
Cutting Parameter

HGXR 2-Flute General Purpose Radius End Mill Face Milling

Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXR2002R_	36000	360	0.006	0.12	30000	300	0.005	0.12	23000	200	0.003	0.1
HGXR2003R_	36000	350	0.008	0.18	30000	350	0.007	0.18	22000	300	0.003	0.15
HGXR2004R_	36000	500	0.012	0.28	30000	450	0.01	0.24	20000	400	0.005	0.2
HGXR2005R_	30000	600	0.016	0.14	25000	500	0.008	0.15	18500	400	0.006	0.1
HGXR2006R_	30000	600	0.016	0.2	25000	480	0.01	0.15	18000	384	0.007	0.1
HGXR2007R_	30000	840	0.016	0.25	25000	700	0.012	0.25	16800	560	0.01	0.15
HGXR2008R_	28000	1020	0.02	0.3	25000	850	0.014	0.25	15280	680	0.012	0.16
HGXR2009R_	25000	1200	0.05	0.3	25000	900	0.03	0.3	14000	800	0.02	0.2
HGXR2010R_	20000	1400	0.05	0.5	18000	1260	0.05	0.4	13600	1120	0.05	0.32
HGXR2015R_	17950	1500	0.05	0.65	16155	1350	0.05	0.52	13000	1200	0.05	0.4
HGXR2020R_	15890	1600	0.1	1	14301	1440	0.1	0.8	12712	1280	0.1	0.64
HGXR2030R_	12285	1800	0.1	1.5	11056	1620	0.1	1.2	9828	1440	0.1	0.96
HGXR2040R_	9680	2000	0.2	2	8712	1800	0.2	1.6	7744	1600	0.2	1.08
HGXR2060R_	7260	2500	0.2	3	6534	2250	0.2	2.4	5808	2000	0.2	1.96
HGXR2080R_	6050	2500	0.2	4	5445	2250	0.2	3.2	4840	2000	0.2	2.52
HGXR2100R_	5445	3000	0.2	5	4900	2700	0.2	4	4356	2400	0.2	3.2
HGXR2120R_	4840	3200	0.2	6	4356	2880	0.2	4.8	3872	2560	0.2	3.84

- For Z-level and face milling, the recommended axial depth of cut (ap) is $0.3 \times CR$.
- This item can be used for side milling and slotting applications.

HGXR 4-Flute General Purpose Radius End Mill



Ø D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012
6 < D ≤ 10	0 ~ -0.015
10 < D ≤ 18	0 ~ -0.018

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	CR	ℓ	γ/°	L	φd
HGXR4008R0.05 0450	0.8	R0.05	1.6	12	50	4
HGXR4008R0.1 0450	0.8	R0.1	1.6	12	50	4
HGXR4010R0.05 0450	1	R0.05	2	12	50	4
HGXR4010R0.1 0450	1	R0.1	2	12	50	4
HGXR4010R0.2 0450	1	R0.2	2	12	50	4
HGXR4010R0.3 0450	1	R0.3	2	12	50	4
HGXR4015R0.05 0450	1.5	R0.05	3	11	50	4
HGXR4015R0.1 0450	1.5	R0.1	3	11	50	4
HGXR4015R0.2 0450	1.5	R0.2	3	11	50	4
HGXR4015R0.3 0450	1.5	R0.3	3	11	50	4
HGXR4020R0.05 0450	2	R0.05	4	11	50	4
HGXR4020R0.1 0450	2	R0.1	4	11	50	4
HGXR4020R0.2 0450	2	R0.2	4	11	50	4
HGXR4020R0.3 0450	2	R0.3	4	11	50	4
HGXR4020R0.5 0450	2	R0.5	4	11	50	4
HGXR4025R0.1 0450	2.5	R0.1	5	11	50	4
HGXR4025R0.2 0450	2.5	R0.2	5	11	50	4
HGXR4025R0.3 0450	2.5	R0.3	5	11	50	4
HGXR4025R0.5 0450	2.5	R0.5	5	11	50	4
HGXR4030R0.1 0450	3	R0.1	6	11	50	4
HGXR4030R0.1 0660	3	R0.1	6	11	60	6
HGXR4030R0.1 0675	3	R0.1	6	11	75	6
HGXR4030R0.2 0450	3	R0.2	6	11	50	4
HGXR4030R0.2 0660	3	R0.2	6	11	60	6
HGXR4030R0.2 0675	3	R0.2	6	11	75	6
HGXR4030R0.3 0450	3	R0.3	6	11	50	4

HGXR 4-Flute General Purpose Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HGXR4030R0.3 0660	3	R0.3	6	11	60	6
HGXR4030R0.3 0675	3	R0.3	6	11	75	6
HGXR4030R0.5 0450	3	R0.5	6	11	50	4
HGXR4030R0.5 0660	3	R0.5	6	11	60	6
HGXR4030R0.5 0675	3	R0.5	6	11	75	6
HGXR4040R0.1 0450	4	R0.1	8	-	50	4
HGXR4040R0.1 0475	4	R0.1	8	-	75	4
HGXR4040R0.1 0660	4	R0.1	8	11	60	6
HGXR4040R0.1 0675	4	R0.1	8	11	75	6
HGXR4040R0.2 0450	4	R0.2	8	-	50	4
HGXR4040R0.2 0475	4	R0.2	8	-	75	4
HGXR4040R0.2 0650	4	R0.2	8	11	50	6
HGXR4040R0.2 0660	4	R0.2	8	11	60	6
HGXR4040R0.2 0675	4	R0.2	8	11	75	6
HGXR4040R0.3 0450	4	R0.3	8	-	50	4
HGXR4040R0.3 0475	4	R0.3	8	-	75	4
HGXR4040R0.3 0660	4	R0.3	8	11	60	6
HGXR4040R0.3 0675	4	R0.3	8	11	75	6
HGXR4040R0.5 0450	4	R0.5	8	-	50	4
HGXR4040R0.5 0475	4	R0.5	8	-	75	4
HGXR4040R0.5 0650	4	R0.5	8	11	50	6
HGXR4040R0.5 0660	4	R0.5	8	11	60	6
HGXR4040R0.5 0675	4	R0.5	8	11	75	6
HGXR4040R1.0 0450	4	R1	8	-	50	4
HGXR4040R1.0 0475	4	R1	8	-	75	4
HGXR4040R1.0 0660	4	R1	8	11	60	6
HGXR4040R1.0 0675	4	R1	8	11	75	6
HGXR4060R0.1 0650	6	R0.1	12	-	50	6
HGXR4060R0.1 0660	6	R0.1	12	-	60	6
HGXR4060R0.1 0675	6	R0.1	12	-	75	6
HGXR4060R0.1 06100	6	R0.1	12	-	100	6
HGXR4060R0.2 0650	6	R0.2	12	-	50	6

HGXR 4-Flute General Purpose Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	l	$\gamma/^\circ$	L	ϕd
HGXR4060R0.2 0660	6	R0.2	12	—	60	6
HGXR4060R0.2 0675	6	R0.2	12	—	75	6
HGXR4060R0.2 06100	6	R0.2	12	—	100	6
HGXR4060R0.3 0650	6	R0.3	12	—	50	6
HGXR4060R0.3 0660	6	R0.3	12	—	60	6
HGXR4060R0.3 0675	6	R0.3	12	—	75	6
HGXR4060R0.3 06100	6	R0.3	12	—	100	6
HGXR4060R0.5 0650	6	R0.5	12	—	50	6
HGXR4060R0.5 0660	6	R0.5	12	—	60	6
HGXR4060R0.5 0675	6	R0.5	12	—	75	6
HGXR4060R0.5 06100	6	R0.5	12	—	100	6
HGXR4060R1.0 0650	6	R1	12	—	50	6
HGXR4060R1.0 0660	6	R1	12	—	60	6
HGXR4060R1.0 0675	6	R1	12	—	75	6
HGXR4060R1.0 06100	6	R1	12	—	100	6
HGXR4080R0.1 0860	8	R0.1	16	—	60	8
HGXR4080R0.1 0875	8	R0.1	16	—	75	8
HGXR4080R0.1 08100	8	R0.1	16	—	100	8
HGXR4080R0.2 0860	8	R0.2	16	—	60	8
HGXR4080R0.2 0875	8	R0.2	16	—	75	8
HGXR4080R0.2 08100	8	R0.2	16	—	100	8
HGXR4080R0.3 0860	8	R0.3	16	—	60	8
HGXR4080R0.3 0875	8	R0.3	16	—	75	8
HGXR4080R0.3 08100	8	R0.3	16	—	100	8
HGXR4080R0.5 0860	8	R0.5	16	—	60	8
HGXR4080R0.5 0875	8	R0.5	16	—	75	8
HGXR4080R0.5 08100	8	R0.5	16	—	100	8
HGXR4080R1.0 0860	8	R1	16	—	60	8
HGXR4080R1.0 0875	8	R1	16	—	75	8
HGXR4080R1.0 08100	8	R1	16	—	100	8



HGXR 4-Flute General Purpose Radius End Mill

Unit : mm

Type No.	Dia.	Corner Radius	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	CR	ℓ	$\gamma/^\circ$	L	ϕd
HGXR4100R0.2 1075	10	R0.2	20	—	75	10
HGXR4100R0.2 10100	10	R0.2	20	—	100	10
HGXR4100R0.5 1075	10	R0.5	20	—	75	10
HGXR4100R0.5 10100	10	R0.5	20	—	100	10
HGXR4100R1.0 1075	10	R1	20	—	75	10
HGXR4100R1.0 10100	10	R1	20	—	100	10
HGXR4120R0.5 1275	12	R0.5	24	—	75	12
HGXR4120R0.5 12100	12	R0.5	24	—	100	12
HGXR4120R1.0 1275	12	R1	24	—	75	12
HGXR4120R1.0 12100	12	R1	24	—	100	12
HGXR4120R2.0 1275	12	R2	24	—	75	12
HGXR4120R2.0 12100	12	R2	24	—	100	12
HGXR4160R0.5 16100	16	R0.5	32	—	100	16
HGXR4160R1.0 16100	16	R1	32	—	100	16
HGXR4160R2.0 16100	16	R2	32	—	100	16

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CARBON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS TOOL STEELS	~40HRC	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB					
	○	○	○			○	○	○	○		○	○



Cutting Parameter

HGXR 4-Flute General Purpose Radius End Mill Face Milling

Workpiece	Carbon Steels、Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXR4008R_	28000	1500	0.02	0.3	25000	850	0.014	0.25	23000	680	0.012	0.16
HGXR4009R_	25000	1600	0.05	0.3	25000	900	0.03	0.3	20000	800	0.02	0.2
HGXR4010R_	20000	1800	0.05	0.5	18000	1620	0.05	0.4	16000	1440	0.05	0.32
HGXR4015R_	17950	2000	0.05	0.65	16155	1800	0.05	0.52	14360	1600	0.05	0.4
HGXR4020R_	15890	2200	0.1	1	14301	1980	0.1	0.8	12712	1760	0.1	0.64
HGXR4025R_	13500	2300	0.1	1.25	12080	2040	0.1	1	10080	1820	0.1	0.82
HGXR4030R_	12285	2400	0.1	1.5	11056	2160	0.1	1.2	9828	1920	0.1	0.96
HGXR4040R_	9680	2800	0.2	2	8712	2520	0.2	1.6	7744	2240	0.2	1.08
HGXR4060R_	7260	3000	0.2	3	6534	2700	0.2	2.4	5808	2400	0.2	1.96
HGXR4080R_	6050	3500	0.2	4	5445	3150	0.2	3.2	4840	2800	0.2	2.52
HGXR4100R_	5445	3500	0.2	5	4900	3150	0.2	4	4356	2800	0.2	3.2
HGXR4120R_	4840	3600	0.2	6	4356	3240	0.2	4.8	3872	2880	0.2	3.84



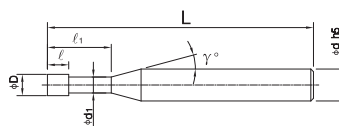
Cutting Parameter

HGXR 4-Flute General Purpose Radius End Mill Z-Level Milling

Workpiece	Carbon Steels、Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm
HGXR4008R_	28000	1500	0.02	0.02	25000	850	0.014	0.02	23000	680	0.012	0.015
HGXR4009R_	25000	1600	0.02	0.03	25000	900	0.03	0.03	20000	800	0.02	0.015
HGXR4010R_	20000	1800	0.05	0.03	18000	1620	0.05	0.03	16000	1440	0.05	0.02
HGXR4015R_	17950	2000	0.05	0.05	16155	1800	0.05	0.05	14360	1600	0.05	0.02
HGXR4020R_	15890	2200	0.1	0.05	14301	1980	0.1	0.05	12712	1760	0.1	0.03
HGXR4025R_	13520	2300	0.1	0.05	12080	2040	0.1	0.05	10080	1840	0.1	0.03
HGXR4030R_	12285	2400	0.1	0.05	11056	2160	0.1	0.05	9828	1920	0.1	0.03
HGXR4040R_	9680	2800	0.2	0.05	8712	2520	0.2	0.05	7744	2240	0.2	0.05
HGXR4060R_	7260	3000	0.2	0.08	6534	2700	0.2	0.08	5808	2400	0.2	0.05
HGXR4080R_	6050	3500	0.2	0.08	5445	3150	0.2	0.08	4840	2800	0.2	0.05
HGXR4100R_	5445	3500	0.2	0.1	4900	3150	0.2	0.1	4356	2800	0.2	0.05
HGXR4120R_	4840	3600	0.2	0.1	4356	3240	0.2	0.1	3872	2880	0.2	0.05

- For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times CR$.
- This item can be used for side milling and slotting applications.

HSXE2L 2-Flute Long Neck End Mill



Ø D	D Tol. [mm]
D ≤ 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	φD	ℓ	ℓ ₁	φd ₁	γ/°	L	φd
HSXE2001L0.3 0450	0.1	0.07	0.3	0.085	12	50	4
HSXE2001L0.5 0450	0.1	0.07	0.5	0.085	12	50	4
HSXE2001L0.75 0450	0.1	0.07	0.75	0.085	12	50	4
HSXE2001L1 0450	0.1	0.07	1	0.085	12	50	4
HSXE20015L0.3 0450	0.15	0.1	0.3	0.13	12	50	4
HSXE20015L0.5 0450	0.15	0.1	0.5	0.13	12	50	4
HSXE20015L0.75 0450	0.15	0.1	0.75	0.13	12	50	4
HSXE20015L1 0450	0.15	0.1	1	0.13	12	50	4
HSXE20015L1.5 0450	0.15	0.1	1.5	0.13	12	50	4
HSXE2002L0.5 0450	0.2	0.15	0.5	0.18	12	50	4
HSXE2002L1 0450	0.2	0.15	1	0.18	12	50	4
HSXE2002L1.5 0450	0.2	0.15	1.5	0.18	12	50	4
HSXE2002L2 0450	0.2	0.15	2	0.18	12	50	4
HSXE2002L2.5 0450	0.2	0.15	2.5	0.18	12	50	4
HSXE2002L3 0450	0.2	0.15	3	0.18	12	50	4
HSXE2003L1 0450	0.3	0.2	1	0.28	12	50	4
HSXE2003L1.5 0450	0.3	0.2	1.5	0.28	12	50	4
HSXE2003L2 0450	0.3	0.2	2	0.28	12	50	4
HSXE2003L2.5 0450	0.3	0.2	2.5	0.28	12	50	4
HSXE2003L3 0450	0.3	0.2	3	0.28	12	50	4
HSXE2003L3.5 0450	0.3	0.2	3.5	0.28	12	50	4
HSXE2003L4 0450	0.3	0.2	4	0.28	12	50	4
HSXE2004L1 0450	0.4	0.3	1	0.37	12	50	4
HSXE2004L1.5 0450	0.4	0.3	1.5	0.37	12	50	4
HSXE2004L2 0450	0.4	0.3	2	0.37	12	50	4
HSXE2004L2.5 0450	0.4	0.3	2.5	0.37	12	50	4
HSXE2004L3 0450	0.4	0.3	3	0.37	12	50	4
HSXE2004L3.5 0450	0.4	0.3	3.5	0.37	12	50	4



HSXE2L 2-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE2004L4 0450	0.4	0.3	4	0.37	12	50	4
HSXE2004L5 0450	0.4	0.3	5	0.37	12	50	4
HSXE2004L6 0450	0.4	0.3	6	0.37	12	50	4
HSXE2004L8 0450	0.4	0.3	8	0.37	12	50	4
HSXE2004L10 0450	0.4	0.3	10	0.37	12	50	4
HSXE2005L1 0450	0.5	0.35	1	0.46	12	50	4
HSXE2005L1.5 0450	0.5	0.35	1.5	0.46	12	50	4
HSXE2005L2 0450	0.5	0.35	2	0.46	12	50	4
HSXE2005L2.5 0450	0.5	0.35	2.5	0.46	12	50	4
HSXE2005L3 0450	0.5	0.35	3	0.46	12	50	4
HSXE2005L3.5 0450	0.5	0.35	3.5	0.46	12	50	4
HSXE2005L4 0450	0.5	0.35	4	0.46	12	50	4
HSXE2005L4.5 0450	0.5	0.35	4.5	0.46	12	50	4
HSXE2005L5 0450	0.5	0.35	5	0.46	12	50	4
HSXE2005L6 0450	0.5	0.35	6	0.46	12	50	4
HSXE2005L7 0450	0.5	0.35	7	0.46	12	50	4
HSXE2005L8 0450	0.5	0.35	8	0.46	12	50	4
HSXE2005L9 0450	0.5	0.35	9	0.46	12	50	4
HSXE2005L10 0450	0.5	0.35	10	0.46	12	50	4
HSXE2006L1.5 0450	0.6	0.45	1.5	0.56	12	50	4
HSXE2006L2 0450	0.6	0.45	2	0.56	12	50	4
HSXE2006L2.5 0450	0.6	0.45	2.5	0.56	12	50	4
HSXE2006L3 0450	0.6	0.45	3	0.56	12	50	4
HSXE2006L3.5 0450	0.6	0.45	3.5	0.56	12	50	4
HSXE2006L4 0450	0.6	0.45	4	0.56	12	50	4
HSXE2006L4.5 0450	0.6	0.45	4.5	0.56	12	50	4
HSXE2006L5 0450	0.6	0.45	5	0.56	12	50	4
HSXE2006L6 0450	0.6	0.45	6	0.56	12	50	4
HSXE2006L7 0450	0.6	0.45	7	0.56	12	50	4
HSXE2006L8 0450	0.6	0.45	8	0.56	12	50	4
HSXE2006L9 0450	0.6	0.45	9	0.56	12	50	4
HSXE2006L10 0450	0.6	0.45	10	0.56	12	50	4
HSXE2006L12 0450	0.6	0.45	12	0.56	12	50	4
HSXE2007L2 0450	0.7	0.5	2	0.66	12	50	4

HSXE2L 2-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE2007L4 0450	0.7	0.5	4	0.66	12	50	4
HSXE2007L6 0450	0.7	0.5	6	0.66	12	50	4
HSXE2007L8 0450	0.7	0.5	8	0.66	12	50	4
HSXE2007L10 0450	0.7	0.5	10	0.66	12	50	4
HSXE2008L2 0450	0.8	0.6	2	0.76	12	50	4
HSXE2008L3 0450	0.8	0.6	3	0.76	12	50	4
HSXE2008L4 0450	0.8	0.6	4	0.76	12	50	4
HSXE2008L5 0450	0.8	0.6	5	0.76	12	50	4
HSXE2008L6 0450	0.8	0.6	6	0.76	12	50	4
HSXE2008L7 0450	0.8	0.6	7	0.76	12	50	4
HSXE2008L8 0450	0.8	0.6	8	0.76	12	50	4
HSXE2008L10 0450	0.8	0.6	10	0.76	12	50	4
HSXE2008L12 0450	0.8	0.6	12	0.76	12	50	4
HSXE2008L16 0450	0.8	0.6	16	0.76	12	50	4
HSXE2009L6 0450	0.9	0.65	6	0.86	12	50	4
HSXE2009L8 0450	0.9	0.65	8	0.86	12	50	4
HSXE2009L10 0450	0.9	0.65	10	0.86	12	50	4
HSXE2010L3 0450	1	0.75	3	0.95	12	50	4
HSXE2010L4 0450	1	0.75	4	0.95	12	50	4
HSXE2010L5 0450	1	0.75	5	0.95	12	50	4
HSXE2010L6 0450	1	0.75	6	0.95	12	50	4
HSXE2010L7 0450	1	0.75	7	0.95	12	50	4
HSXE2010L8 0450	1	0.75	8	0.95	12	50	4
HSXE2010L9 0450	1	0.75	9	0.95	12	50	4
HSXE2010L10 0450	1	0.75	10	0.95	12	50	4
HSXE2010L12 0450	1	0.75	12	0.95	12	50	4
HSXE2010L14 0450	1	0.75	14	0.95	12	50	4
HSXE2010L16 0450	1	0.75	16	0.95	12	50	4
HSXE2010L18 0460	1	0.75	18	0.95	12	60	4
HSXE2010L20 0460	1	0.75	20	0.95	12	60	4
HSXE2010L22 0460	1	0.75	22	0.95	12	60	4
HSXE2012L6 0450	1.2	1	6	1.14	11	50	4
HSXE2012L8 0450	1.2	1	8	1.14	11	50	4
HSXE2012L10 0450	1.2	1	10	1.14	11	50	4



HSXE2L 2-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE2012L12 0450	1.2	1	12	1.14	11	50	4
HSXE2012L16 0450	1.2	1	16	1.14	11	50	4
HSXE2014L6 0450	1.4	1.1	6	1.34	11	50	4
HSXE2014L12 0450	1.4	1.1	12	1.34	11	50	4
HSXE2014L16 0450	1.4	1.1	16	1.34	11	50	4
HSXE2015L4 0450	1.5	1.2	4	1.42	11	50	4
HSXE2015L6 0450	1.5	1.2	6	1.42	11	50	4
HSXE2015L8 0450	1.5	1.2	8	1.42	11	50	4
HSXE2015L10 0450	1.5	1.2	10	1.42	11	50	4
HSXE2015L12 0450	1.5	1.2	12	1.42	11	50	4
HSXE2015L14 0450	1.5	1.2	14	1.42	11	50	4
HSXE2015L16 0450	1.5	1.2	16	1.42	11	50	4
HSXE2015L18 0460	1.5	1.2	18	1.42	11	60	4
HSXE2015L20 0460	1.5	1.2	20	1.42	11	60	4
HSXE2015L25 0460	1.5	1.2	25	1.42	11	60	4
HSXE2015L30 0475	1.5	1.2	30	1.42	11	75	4
HSXE2015L35 0475	1.5	1.2	35	1.42	11	75	4
HSXE2016L6 0450	1.6	1.3	6	1.52	11	50	4
HSXE2016L8 0450	1.6	1.3	8	1.52	11	50	4
HSXE2016L12 0450	1.6	1.3	12	1.52	11	50	4
HSXE2016L16 0450	1.6	1.3	16	1.52	11	50	4
HSXE2018L6 0450	1.8	1.4	6	1.72	11	50	4
HSXE2018L8 0450	1.8	1.4	8	1.72	11	50	4
HSXE2020L4 0450	2	1.6	4	1.9	11	50	4
HSXE2020L6 0450	2	1.6	6	1.9	11	50	4
HSXE2020L8 0450	2	1.6	8	1.9	11	50	4
HSXE2020L10 0450	2	1.6	10	1.9	11	50	4
HSXE2020L12 0450	2	1.6	12	1.9	11	50	4
HSXE2020L14 0450	2	1.6	14	1.9	11	50	4
HSXE2020L16 0450	2	1.6	16	1.9	11	50	4
HSXE2020L18 0460	2	1.6	18	1.9	11	60	4
HSXE2020L20 0460	2	1.6	20	1.9	11	60	4
HSXE2020L25 0460	2	1.6	25	1.9	11	60	4
HSXE2020L30 0475	2	1.6	30	1.9	11	75	4

HSXE2L 2-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE2020L35 0475	2	1.6	35	1.9	11	75	4
HSXE2020L40 0475	2	1.6	40	1.9	11	75	4
HSXE2025L8 0450	2.5	2	8	2.4	11	50	4
HSXE2025L10 0450	2.5	2	10	2.4	11	50	4
HSXE2025L12 0450	2.5	2	12	2.4	11	50	4
HSXE2025L16 0450	2.5	2	16	2.4	11	50	4
HSXE2025L20 0460	2.5	2	20	2.4	11	60	4
HSXE2025L25 0460	2.5	2	25	2.4	11	60	4
HSXE2025L30 0475	2.5	2	30	2.4	11	75	4
HSXE2025L35 0475	2.5	2	35	2.4	11	75	4
HSXE2025L40 0475	2.5	2	40	2.4	11	75	4
HSXE2030L8 0660	3	2.4	8	2.9	11	60	6
HSXE2030L10 0660	3	2.4	10	2.9	11	60	6
HSXE2030L12 0660	3	2.4	12	2.9	11	60	6
HSXE2030L16 0660	3	2.4	16	2.9	11	60	6
HSXE2030L20 0660	3	2.4	20	2.9	11	60	6
HSXE2030L25 0675	3	2.4	25	2.9	11	75	6
HSXE2030L30 0675	3	2.4	30	2.9	11	75	6
HSXE2030L35 0675	3	2.4	35	2.9	11	75	6
HSXE2030L40 06100	3	2.4	40	2.9	11	100	6
HSXE2030L50 06100	3	2.4	50	2.9	11	100	6
HSXE2040L12 0660	4	3.2	12	3.9	11	60	6
HSXE2040L16 0660	4	3.2	16	3.9	11	60	6
HSXE2040L20 0660	4	3.2	20	3.9	11	60	6
HSXE2040L25 0675	4	3.2	25	3.9	11	75	6
HSXE2040L30 0675	4	3.2	30	3.9	11	75	6
HSXE2040L35 0675	4	3.2	35	3.9	11	75	6
HSXE2040L40 06100	4	3.2	40	3.9	11	100	6
HSXE2040L50 06100	4	3.2	50	3.9	11	100	6
HSXE2050L20 0660	5	4	20	4.85	11	60	6
HSXE2050L25 0675	5	4	25	4.85	11	75	6
HSXE2050L30 0675	5	4	30	4.85	11	75	6
HSXE2050L40 06100	5	4	40	4.85	11	100	6
HSXE2050L50 06100	5	4	50	4.85	11	100	6



HSXE2L 2-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	l	l_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE2060L20 0660	6	4.8	20	5.85	-	60	6
HSXE2060L30 0675	6	4.8	30	5.85	-	75	6
HSXE2060L40 06100	6	4.8	40	5.85	-	100	6
HSXE2060L50 06100	6	4.8	50	5.85	-	100	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
		○	○	○	○	○	○	○			○	○	



Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.1	0.3	40000	150	0.006	0.06	40000	150	0.005	0.06	32000	120	0.003	0.05
	0.5	40000	100	0.006	0.06	40000	100	0.005	0.06	32000	80	0.003	0.05
	0.75	40000	80	0.004	0.06	40000	80	0.003	0.06	32000	70	0.002	0.05
	1	40000	60	0.002	0.06	40000	60	0.002	0.06	32000	50	0.001	0.05
0.15	0.3	40000	180	0.006	0.09	40000	180	0.005	0.09	32000	150	0.003	0.07
	0.5	40000	150	0.006	0.09	40000	150	0.005	0.09	32000	120	0.003	0.07
	0.75	40000	120	0.004	0.09	40000	120	0.003	0.09	32000	100	0.002	0.07
	1	40000	100	0.002	0.09	40000	100	0.002	0.09	32000	80	0.001	0.07
	1.5	40000	80	0.002	0.09	40000	80	0.002	0.09	32000	60	0.001	0.07
0.2	0.5	36000	240	0.006	0.12	30000	240	0.005	0.12	24000	200	0.003	0.1
	0.75	36000	200	0.006	0.12	30000	200	0.005	0.12	24000	180	0.003	0.1
	1	36000	180	0.006	0.12	30000	180	0.005	0.12	24000	150	0.003	0.1
	1.5	36000	120	0.004	0.12	30000	120	0.003	0.12	24000	100	0.002	0.1
	2	36000	80	0.004	0.12	30000	80	0.003	0.12	24000	50	0.002	0.1
	2.5	36000	60	0.002	0.12	30000	60	0.002	0.12	24000	50	0.001	0.1
	3	36000	40	0.002	0.12	30000	40	0.002	0.12	24000	40	0.001	0.1
0.3	1	36000	350	0.008	0.18	30000	350	0.007	0.18	24000	300	0.003	0.15
	1.5	36000	260	0.008	0.18	30000	260	0.007	0.18	24000	200	0.003	0.15
	2	36000	180	0.006	0.18	30000	180	0.005	0.18	24000	150	0.003	0.15
	2.5	36000	150	0.005	0.18	30000	150	0.004	0.18	24000	100	0.002	0.15
	3	36000	70	0.005	0.18	30000	70	0.004	0.18	24000	50	0.002	0.15
	3.5	30000	70	0.005	0.18	25000	70	0.004	0.18	20000	50	0.002	0.15
	4	28800	70	0.005	0.18	24000	70	0.004	0.18	19200	50	0.002	0.15
0.4	1	36000	495	0.012	0.28	30000	450	0.01	0.24	24000	400	0.005	0.2
	1.5	36000	440	0.012	0.28	30000	400	0.01	0.24	24000	360	0.005	0.2
	2	36000	400	0.012	0.28	30000	360	0.01	0.24	24000	320	0.005	0.2
	2.5	36000	370	0.01	0.28	30000	340	0.008	0.24	24000	280	0.005	0.2
	3	36000	350	0.01	0.28	30000	320	0.008	0.24	24000	260	0.004	0.2
	3.5	36000	300	0.008	0.28	30000	280	0.007	0.24	24000	220	0.004	0.2
	4	36000	275	0.008	0.28	30000	250	0.006	0.24	24000	200	0.003	0.2
	5	30000	275	0.006	0.28	25000	250	0.005	0.24	20000	180	0.003	0.2
	6	30000	220	0.005	0.28	25000	200	0.004	0.24	20000	150	0.002	0.2

Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
0.4	8	24000	165	0.003	0.28	20000	150	0.002	0.24	16000	120	0.001	0.2
	10	19200	110	0.003	0.28	16000	100	0.002	0.24	12800	80	0.001	0.2
	1	36000	605	0.025	0.36	30000	550	0.02	0.3	24000	500	0.01	0.25
	1.5	36000	570	0.025	0.36	30000	520	0.02	0.3	24000	450	0.01	0.25
	2	36000	550	0.025	0.36	30000	500	0.02	0.3	24000	420	0.01	0.25
	2.5	36000	530	0.020	0.36	30000	480	0.015	0.3	24000	400	0.008	0.25
	3	36000	460	0.020	0.36	30000	420	0.015	0.3	24000	350	0.007	0.25
	3.5	30000	440	0.015	0.36	25000	400	0.012	0.3	20000	320	0.006	0.25
	4	30000	420	0.012	0.36	25000	380	0.01	0.3	20000	280	0.005	0.25
	4.5	30000	385	0.01	0.36	25000	350	0.008	0.3	20000	230	0.004	0.25
0.5	5	30000	350	0.008	0.36	25000	320	0.007	0.3	20000	200	0.003	0.25
	6	30000	330	0.006	0.36	25000	300	0.005	0.3	20000	200	0.003	0.25
	7	24000	275	0.006	0.36	20000	250	0.005	0.3	16000	180	0.003	0.25
	8	24000	220	0.006	0.36	20000	200	0.005	0.3	16000	160	0.002	0.25
	9	24000	220	0.004	0.36	20000	200	0.003	0.3	16000	150	0.002	0.25
	10	19200	190	0.004	0.36	16000	170	0.003	0.3	12800	130	0.002	0.25
	1.5	36000	720	0.025	0.42	30000	650	0.02	0.35	24000	550	0.01	0.3
	2	36000	605	0.025	0.42	30000	550	0.02	0.35	24000	500	0.01	0.3
	2.5	36000	605	0.025	0.42	30000	550	0.02	0.35	24000	500	0.01	0.3
	3	36000	550	0.020	0.42	30000	500	0.015	0.35	24000	450	0.007	0.3
0.6	3.5	36000	550	0.020	0.42	30000	500	0.015	0.35	24000	450	0.007	0.3
	4	30000	495	0.012	0.42	25000	450	0.01	0.35	20000	400	0.005	0.3
	4.5	30000	495	0.012	0.42	25000	450	0.01	0.35	20000	400	0.005	0.3
	5	30000	440	0.010	0.42	25000	400	0.007	0.35	20000	350	0.003	0.3
	6	30000	385	0.006	0.42	25000	350	0.005	0.35	20000	300	0.002	0.3
	7	23760	340	0.003	0.24	19800	308	0.002	0.2	18000	280	0.002	0.2
	8	21120	300	0.003	0.24	17600	275	0.002	0.2	16000	250	0.002	0.2
	9	18480	260	0.003	0.18	15400	242	0.002	0.15	14000	220	0.002	0.15
	10	15840	240	0.003	0.18	13200	220	0.002	0.15	12000	200	0.002	0.15
	12	13200	180	0.003	0.12	11000	165	0.002	0.1	10000	150	0.002	0.1
0.7	2	36000	820	0.05	0.48	30000	750	0.04	0.4	24000	600	0.03	0.35
	4	30000	760	0.038	0.48	25000	690	0.03	0.4	20000	560	0.02	0.35



Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Undereck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.7	6	30000	600	0.025	0.48	25000	550	0.02	0.4	20000	410	0.015	0.35
	8	24000	470	0.015	0.48	20000	430	0.012	0.4	16000	330	0.01	0.35
	10	19200	330	0.01	0.48	16000	300	0.008	0.4	12800	200	0.005	0.35
0.8	2	30000	940	0.05	0.54	25000	850	0.04	0.45	20000	780	0.03	0.4
	3	30000	940	0.05	0.54	25000	850	0.04	0.45	20000	780	0.03	0.4
	4	30000	880	0.04	0.54	25000	800	0.03	0.45	20000	700	0.025	0.4
	5	30000	770	0.04	0.54	25000	700	0.03	0.45	20000	630	0.02	0.4
	6	24000	680	0.03	0.54	20000	620	0.025	0.45	16000	550	0.02	0.4
	7	21600	605	0.25	0.54	18000	550	0.2	0.45	14400	500	0.01	0.4
	8	19200	550	0.02	0.54	16000	500	0.015	0.45	12800	400	0.007	0.4
	10	19200	440	0.015	0.54	16000	400	0.012	0.45	12800	350	0.007	0.4
	12	19200	330	0.008	0.54	16000	300	0.007	0.45	12800	220	0.005	0.4
	16	18000	220	0.006	0.5	15000	200	0.005	0.40	12000	150	0.005	0.4
	2	30000	1320	0.08	0.6	25000	1200	0.07	0.5	20000	1000	0.06	0.45
	4	30000	1100	0.06	0.6	25000	1000	0.05	0.5	20000	900	0.04	0.45
0.9	6	24000	990	0.04	0.6	20000	900	0.03	0.5	16000	700	0.02	0.45
	8	21600	880	0.04	0.6	18000	800	0.03	0.5	14400	600	0.02	0.45
	10	19200	660	0.025	0.6	16000	600	0.02	0.5	12800	500	0.01	0.45
1	3	30000	1320	0.075	0.7	25000	1200	0.06	0.6	20000	1000	0.05	0.5
	4	30000	1100	0.06	0.7	25000	1000	0.05	0.6	20000	900	0.04	0.5
	5	24000	1100	0.05	0.7	20000	1000	0.04	0.6	16000	800	0.03	0.5
	6	24000	990	0.04	0.7	20000	900	0.03	0.6	16000	700	0.02	0.5
	7	24000	990	0.04	0.7	20000	900	0.03	0.6	16000	650	0.02	0.5
	8	21600	880	0.04	0.7	18000	800	0.03	0.6	14400	600	0.02	0.5
	9	21600	770	0.025	0.7	18000	700	0.02	0.6	14400	550	0.015	0.5
	10	19200	660	0.025	0.7	16000	600	0.02	0.6	12800	500	0.01	0.5
	12	19200	550	0.025	0.7	16000	500	0.02	0.6	12800	400	0.01	0.5
	14	19200	495	0.02	0.7	16000	450	0.015	0.6	12800	360	0.008	0.5
	16	16800	440	0.015	0.7	14000	400	0.012	0.6	11200	320	0.006	0.5
	18	16800	330	0.012	0.7	14000	300	0.01	0.6	11200	240	0.006	0.5
	20	14400	220	0.008	0.7	12000	200	0.007	0.6	9600	160	0.005	0.5
	22	14400	198	0.006	0.7	12000	180	0.005	0.6	9600	150	0.003	0.5

Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
1.2	6	24000	990	0.05	0.8	20000	900	0.04	0.7	16000	700	0.03	0.6
	8	21600	880	0.05	0.8	18000	800	0.04	0.7	14400	600	0.02	0.6
	10	19200	660	0.04	0.8	16000	600	0.03	0.7	12800	500	0.02	0.6
	12	16800	660	0.025	0.8	14000	600	0.02	0.7	11200	500	0.01	0.6
	16	14400	440	0.02	0.8	12000	400	0.018	0.7	9600	300	0.01	0.6
1.4	6	26400	1100	0.075	1	22000	1000	0.06	0.8	17600	800	0.04	0.7
	12	19200	770	0.04	1	16000	700	0.03	0.8	12800	500	0.01	0.7
	16	14400	440	0.02	0.8	12000	400	0.018	0.7	9600	300	0.01	0.6
1.5	4	27600	1320	0.08	1.1	23000	1200	0.07	0.9	18400	900	0.05	0.75
	6	27600	1100	0.075	1.1	23000	1000	0.06	0.9	18400	800	0.04	0.75
	8	24000	990	0.075	1.1	20000	900	0.06	0.9	16000	600	0.03	0.75
	10	24000	880	0.05	1.1	20000	800	0.04	0.9	16000	500	0.03	0.75
	12	19200	770	0.05	1.1	16000	700	0.04	0.9	12800	500	0.02	0.75
	14	16800	660	0.04	1.1	14000	600	0.03	0.9	11200	400	0.02	0.75
	16	14400	550	0.025	1.1	12000	500	0.02	0.9	9600	360	0.01	0.75
	18	12000	440	0.025	1.1	10000	400	0.02	0.9	8000	330	0.008	0.75
	20	10800	352	0.02	1.1	9000	320	0.015	0.9	7200	280	0.005	0.75
	25	9600	275	0.012	1.1	8000	250	0.01	0.9	6400	200	0.004	0.75
	30	8400	220	0.006	1.1	7000	200	0.005	0.9	5600	150	0.003	0.75
	35	7200	165	0.004	1.1	6000	150	0.003	0.9	4800	110	0.002	0.75
1.6	6	26400	1100	0.075	1.2	22000	1000	0.06	0.96	17600	850	0.04	0.8
	8	24000	990	0.075	1.2	20000	900	0.06	0.96	16000	750	0.03	0.8
	12	19200	770	0.05	1	16000	700	0.04	0.9	12800	500	0.02	0.75
	16	14400	550	0.025	1	12000	500	0.02	0.9	9600	360	0.01	0.75
1.8	6	24000	1100	0.08	1.2	20000	1000	0.07	1	16000	900	0.05	0.9
	8	21600	990	0.075	1.2	18000	900	0.06	1	14400	800	0.04	0.9
	10	19200	880	0.075	1.2	16000	800	0.06	1	12800	700	0.04	0.9
	12	16800	770	0.06	1.2	14000	700	0.05	1	11200	600	0.03	0.9
	14	16800	770	0.06	1.2	14000	700	0.05	1	11200	600	0.03	0.9
	16	14400	660	0.05	1.2	12000	600	0.04	1	9600	500	0.02	0.9
	18	12000	550	0.05	1.2	10000	500	0.04	1	8000	410	0.02	0.9
2	6	24000	1100	0.1	1.4	20000	1000	0.08	1.2	16000	900	0.06	1



Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
2	8	21600	990	0.08	1.4	18000	900	0.07	1.2	14400	800	0.05	1
	10	19200	880	0.075	1.4	16000	800	0.06	1.2	12800	700	0.05	1
	12	16800	770	0.06	1.4	14000	700	0.05	1.2	11200	600	0.04	1
	14	16800	770	0.05	1.4	14000	700	0.04	1.2	11200	600	0.03	1
	16	14400	660	0.05	1.4	12000	600	0.04	1.2	9600	500	0.03	1
	18	12000	550	0.04	1.4	10000	500	0.03	1.2	8000	410	0.02	1
	20	12000	440	0.04	1.4	10000	400	0.03	1.2	8000	380	0.02	1
	25	10800	385	0.025	1.4	9000	350	0.02	1.2	7200	330	0.015	1
	30	9600	330	0.02	1.4	8000	300	0.015	1.2	6400	280	0.01	1
	35	8400	275	0.015	1.4	7000	250	0.012	1.2	5600	230	0.008	1
	40	7200	220	0.01	1.4	6000	200	0.008	1.2	4800	180	0.005	1
	50	6000	132	0.006	1.4	5000	120	0.005	1.2	4000	100	0.004	1
2.5	8	19200	1100	0.1	1.8	16000	1000	0.08	1.5	12800	800	0.07	1.25
	10	19200	880	0.075	1.8	16000	800	0.06	1.5	12800	700	0.05	1.25
	12	16800	880	0.08	1.8	14000	800	0.07	1.5	11200	700	0.06	1.25
	16	14400	770	0.075	1.8	12000	700	0.06	1.5	9600	600	0.05	1.25
	20	12000	660	0.075	1.8	10000	600	0.06	1.5	8000	500	0.05	1.25
	25	10800	600	0.025	1.8	9000	500	0.02	1.5	7200	400	0.015	1.25
	30	9600	440	0.04	1.8	8000	400	0.03	1.5	6400	300	0.025	1.25
	35	8400	330	0.02	1.4	7000	300	0.015	1.2	5600	280	0.01	1.25
	40	7200	275	0.02	1.8	6000	250	0.015	1.5	4800	200	0.012	1.25
	50	6000	165	0.012	1.8	5000	150	0.01	1.5	4000	120	0.008	1.25
3	10	18000	880	0.15	2	15000	800	0.12	1.8	12000	700	0.09	1.5
	12	16800	990	0.125	2	14000	900	0.1	1.8	11200	800	0.08	1.5
	16	14400	880	0.1	2	12000	800	0.08	1.8	9600	700	0.07	1.5
	20	12000	880	0.1	2	10000	800	0.08	1.8	8000	700	0.07	1.5
	25	10800	770	0.08	2	9000	700	0.07	1.8	7200	600	0.06	1.5
	30	9600	770	0.06	2	8000	700	0.05	1.8	6400	600	0.03	1.5
	35	8400	330	0.02	1.8	7000	300	0.015	1.5	5600	280	0.02	1.25
	40	7200	275	0.02	1.4	6000	250	0.015	1.2	4800	200	0.012	1

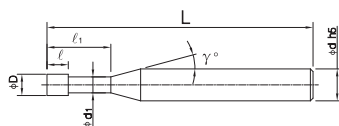


Cutting Parameter

HSXE2L 2-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
4	12	14400	990	0.125	2.4	12000	900	0.1	2.0	9600	720	0.1	1.5
	16	12000	880	0.1	2.4	10000	800	0.08	2.0	8000	640	0.09	1.5
	20	10800	880	0.1	2.4	9000	800	0.08	2.0	7200	640	0.08	1.5
	25	9600	770	0.08	2.4	8000	700	0.07	2.0	6400	560	0.07	1.5
	30	8400	770	0.06	2.4	7000	700	0.05	2.0	5600	560	0.07	1.5
	35	7200	330	0.02	2.4	6000	300	0.015	2.0	4800	240	0.06	1.5
	40	6000	275	0.02	1.8	5000	250	0.015	1.5	4000	200	0.03	1.5
	45	4800	220	0.012	1.8	4000	200	0.01	1.5	3200	160	0.02	1.25
	50	3600	165	0.012	1.8	3000	150	0.01	1.5	2400	120	0.012	1

HSXE4L 4-Flute Long Neck End Mill



$\varnothing D$	D Tol. [mm]
$D \leq 3$	0 ~ -0.010
$3 < D \leq 6$	0 ~ -0.012

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	$\varnothing D$	ℓ	ℓ_1	$\varnothing d_1$	$\gamma / ^\circ$	L	$\varnothing d$
HSXE4008L2 0450	0.8	0.6	2	0.76	12	50	4
HSXE4008L3 0450	0.8	0.6	3	0.76	12	50	4
HSXE4008L4 0450	0.8	0.6	4	0.76	12	50	4
HSXE4008L5 0450	0.8	0.6	5	0.76	12	50	4
HSXE4008L6 0450	0.8	0.6	6	0.76	12	50	4
HSXE4008L7 0450	0.8	0.6	7	0.76	12	50	4
HSXE4008L8 0450	0.8	0.6	8	0.76	12	50	4
HSXE4008L10 0450	0.8	0.6	10	0.76	12	50	4
HSXE4008L12 0450	0.8	0.6	12	0.76	12	50	4
HSXE4008L16 0450	0.8	0.6	16	0.76	12	50	4
HSXE4010L3 0450	1	0.75	3	0.95	12	50	4
HSXE4010L4 0450	1	0.75	4	0.95	12	50	4
HSXE4010L5 0450	1	0.75	5	0.95	12	50	4
HSXE4010L6 0450	1	0.75	6	0.95	12	50	4
HSXE4010L7 0450	1	0.75	7	0.95	12	50	4
HSXE4010L8 0450	1	0.75	8	0.95	12	50	4
HSXE4010L9 0450	1	0.75	9	0.95	12	50	4
HSXE4010L10 0450	1	0.75	10	0.95	12	50	4
HSXE4010L12 0450	1	0.75	12	0.95	12	50	4
HSXE4010L14 0450	1	0.75	14	0.95	12	50	4
HSXE4010L16 0450	1	0.75	16	0.95	12	50	4
HSXE4010L18 0460	1	0.75	18	0.95	12	60	4
HSXE4010L20 0460	1	0.75	20	0.95	12	60	4
HSXE4010L22 0460	1	0.75	22	0.95	12	60	4
HSXE4012L6 0450	1.2	1	6	1.14	11	50	4
HSXE4012L8 0450	1.2	1	8	1.14	11	50	4



HSXE4L 4-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE4012L10 0450	1.2	1	10	1.14	11	50	4
HSXE4012L12 0450	1.2	1	12	1.14	11	50	4
HSXE4014L6 0450	1.4	1.1	6	1.34	11	50	4
HSXE4014L12 0450	1.4	1.1	12	1.34	11	50	4
HSXE4014L16 0450	1.4	1.1	16	1.34	11	50	4
HSXE4015L4 0450	1.5	1.2	4	1.42	11	50	4
HSXE4015L6 0450	1.5	1.2	6	1.42	11	50	4
HSXE4015L8 0450	1.5	1.2	8	1.42	11	50	4
HSXE4015L10 0450	1.5	1.2	10	1.42	11	50	4
HSXE4015L12 0450	1.5	1.2	12	1.42	11	50	4
HSXE4015L14 0450	1.5	1.2	14	1.42	11	50	4
HSXE4015L16 0450	1.5	1.2	16	1.42	11	50	4
HSXE4015L18 0460	1.5	1.2	18	1.42	11	60	4
HSXE4015L20 0460	1.5	1.2	20	1.42	11	60	4
HSXE4015L25 0460	1.5	1.2	25	1.42	11	60	4
HSXE4016L8 0450	1.6	1.3	8	1.52	11	50	4
HSXE4016L12 0450	1.6	1.3	12	1.52	11	50	4
HSXE4016L16 0450	1.6	1.3	16	1.52	11	50	4
HSXE4020L6 0450	2	1.6	6	1.9	11	50	4
HSXE4020L8 0450	2	1.6	8	1.9	11	50	4
HSXE4020L10 0450	2	1.6	10	1.9	11	50	4
HSXE4020L12 0450	2	1.6	12	1.9	11	50	4
HSXE4020L14 0450	2	1.6	14	1.9	11	50	4
HSXE4020L16 0450	2	1.6	16	1.9	11	50	4
HSXE4020L18 0460	2	1.6	18	1.9	11	60	4
HSXE4020L20 0460	2	1.6	20	1.9	11	60	4
HSXE4020L25 0460	2	1.6	25	1.9	11	60	4
HSXE4020L30 0475	2	1.6	30	1.9	11	75	4
HSXE4020L35 0475	2	1.6	35	1.9	11	75	4
HSXE4025L8 0450	2.5	2	8	2.4	11	50	4
HSXE4025L10 0450	2.5	2	10	2.4	11	50	4
HSXE4025L12 0450	2.5	2	12	2.4	11	50	4
HSXE4025L16 0450	2.5	2	16	2.4	11	50	4
HSXE4025L20 0460	2.5	2	20	2.4	11	60	4

HSXE4L 4-Flute Long Neck End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXE4025L25 0460	2.5	2	25	2.4	11	60	4
HSXE4025L30 0475	2.5	2	30	2.4	11	75	4
HSXE4025L35 0475	2.5	2	35	2.4	11	75	4
HSXE4030L10 0450	3	2.4	10	2.9	11	50	4
HSXE4030L10 0660	3	2.4	10	2.9	11	60	6
HSXE4030L12 0450	3	2.4	12	2.9	11	50	4
HSXE4030L12 0660	3	2.4	12	2.9	11	60	6
HSXE4030L16 0450	3	2.4	16	2.9	11	50	4
HSXE4030L16 0660	3	2.4	16	2.9	11	60	6
HSXE4030L20 0660	3	2.4	20	2.9	11	60	6
HSXE4030L25 0675	3	2.4	25	2.9	11	75	6
HSXE4030L30 0675	3	2.4	30	2.9	11	75	6
HSXE4030L35 0675	3	2.4	35	2.9	11	75	6
HSXE4030L40 06100	3	2.4	40	2.9	11	100	6
HSXE4040L12 0660	4	3.2	12	3.9	11	60	6
HSXE4040L16 0660	4	3.2	16	3.9	11	60	6
HSXE4040L20 0660	4	3.2	20	3.9	11	60	6
HSXE4040L25 0675	4	3.2	25	3.9	11	75	6
HSXE4040L30 0675	4	3.2	30	3.9	11	75	6
HSXE4040L35 0675	4	3.2	35	3.9	11	75	6
HSXE4040L40 06100	4	3.2	40	3.9	11	100	6
HSXE4040L50 06100	4	3.2	50	3.9	11	100	6

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB							
○	○	○	○	○	○	○	○				○	○	

Cutting Parameter

HSXE4L 4-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
0.8	2	30000	1870	0.05	0.54	25000	1700	0.04	0.45	20000	1560	0.03	0.4
	3	30000	1870	0.05	0.54	25000	1700	0.04	0.45	20000	1560	0.03	0.4
	4	30000	1760	0.04	0.54	25000	1600	0.03	0.45	20000	1468	0.025	0.4
	5	30000	1540	0.04	0.54	25000	1400	0.03	0.45	20000	1285	0.02	0.4
	6	24000	1360	0.04	0.54	20000	1240	0.025	0.45	16000	1138	0.02	0.4
	7	21600	1200	0.25	0.54	18000	1100	0.2	0.45	14400	1009	0.01	0.4
	8	19200	1100	0.018	0.54	16000	1000	0.015	0.45	12800	920	0.007	0.4
	10	19200	880	0.015	0.54	16000	800	0.012	0.45	12800	730	0.007	0.4
	12	19200	660	0.008	0.54	16000	600	0.007	0.45	12800	550	0.005	0.4
	16	18000	880	0.006	0.48	15000	800	0.005	0.40	12000	730	0.005	0.4
1	3	30000	2650	0.075	0.72	25000	2400	0.06	0.6	20000	2200	0.05	0.5
	4	30000	2200	0.06	0.72	25000	2000	0.05	0.6	20000	1800	0.04	0.5
	5	24000	2200	0.05	0.72	20000	2000	0.04	0.6	16000	1800	0.03	0.5
	6	24000	2000	0.04	0.72	20000	1800	0.03	0.6	16000	1650	0.02	0.5
	7	24000	2000	0.04	0.72	20000	1800	0.03	0.6	16000	1650	0.02	0.5
	8	21600	1750	0.04	0.72	18000	1600	0.03	0.6	14400	1450	0.02	0.5
	9	21600	1540	0.025	0.72	18000	1400	0.02	0.6	14400	1300	0.015	0.5
	10	19200	1320	0.025	0.72	16000	1200	0.02	0.6	12800	1100	0.01	0.5
	12	19200	1100	0.025	0.72	16000	1000	0.02	0.6	12800	920	0.01	0.5
	14	19200	990	0.02	0.72	16000	900	0.015	0.6	12800	820	0.008	0.5
	16	16800	880	0.015	0.72	14000	800	0.012	0.6	11200	730	0.006	0.5
	18	16800	660	0.012	0.72	14000	600	0.01	0.6	11200	550	0.006	0.5
1.2	20	14400	440	0.008	0.72	12000	400	0.007	0.6	9600	370	0.005	0.5
	22	14400	396	0.006	0.72	12000	360	0.005	0.6	9600	330	0.003	0.5
	6	24000	2000	0.05	0.84	20000	1800	0.04	0.7	16000	1400	0.03	0.6
	8	21600	1760	0.05	0.84	18000	1600	0.04	0.7	14400	1200	0.02	0.6
1.4	10	19200	1300	0.04	0.84	16000	1200	0.03	0.7	12800	1000	0.02	0.6
	12	16800	1300	0.025	0.84	14000	1200	0.02	0.7	11200	1000	0.01	0.6
	6	26400	2200	0.075	0.96	22000	2000	0.06	0.8	17600	1600	0.04	0.7
	12	19200	1540	0.04	0.96	16000	1400	0.03	0.8	12800	1000	0.01	0.7
1.5	16	14400	880	0.02	0.84	12000	800	0.018	0.7	9600	600	0.01	0.6
	4	27600	2640	0.08	1.08	23000	2400	0.07	0.9	18400	1800	0.05	0.75



Cutting Parameter

HSXE4L 4-Flute Long Neck End Mill Face Milling

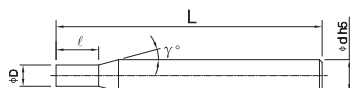
Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Undereck mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
1.5	6	27600	2200	0.075	1.08	23000	2000	0.06	0.9	18400	1600	0.04	0.75
	8	24000	1980	0.075	1.08	20000	1800	0.06	0.9	16000	1200	0.03	0.75
	10	24000	1760	0.05	1.08	20000	1600	0.04	0.9	16000	1000	0.03	0.75
	12	19200	1540	0.05	1.08	16000	1400	0.04	0.9	12800	1000	0.02	0.75
	14	16800	1320	0.04	1.08	14000	1200	0.03	0.9	11200	800	0.02	0.75
	16	14400	1100	0.025	1.08	12000	1000	0.02	0.9	9600	720	0.015	0.75
	18	12000	880	0.025	1.08	10000	800	0.02	0.9	8000	660	0.015	0.75
	20	10800	700	0.018	1.08	9000	640	0.014	0.9	7200	560	0.01	0.75
	25	9600	550	0.012	1.08	8000	500	0.01	0.9	6400	400	0.008	0.75
1.6	8	24000	1980	0.075	1.15	20000	1800	0.06	0.96	16000	1500	0.03	0.8
	12	19200	1540	0.05	1.1	16000	1400	0.04	0.9	12800	1000	0.02	0.75
	16	14400	1100	0.025	1.1	12000	1000	0.02	0.9	9600	720	0.01	0.75
1.8	6	24000	2200	0.08	1.2	20000	2000	0.07	1	16000	1800	0.05	0.9
	8	21600	1980	0.075	1.2	18000	1800	0.06	1	14400	1600	0.04	0.9
	10	19200	1760	0.075	1.2	16000	1600	0.06	1	12800	1400	0.04	0.9
	12	16800	1540	0.06	1.2	14000	1400	0.05	1	11200	1200	0.03	0.9
	14	16800	1540	0.06	1.2	14000	1400	0.05	1	11200	1200	0.03	0.9
	16	14400	1320	0.05	1.2	12000	1200	0.04	1	9600	1000	0.02	0.9
	18	12000	1100	0.05	1.2	10000	1000	0.04	1	8000	820	0.02	0.9
2	6	24000	2200	0.1	1.4	20000	2000	0.08	1.2	16000	1800	0.06	1
	8	21600	1980	0.08	1.4	18000	1800	0.07	1.2	14400	1650	0.05	1
	10	19200	1760	0.075	1.4	16000	1600	0.06	1.2	12800	1500	0.05	1
	12	16800	1540	0.06	1.4	14000	1400	0.05	1.2	11200	1300	0.04	1
	14	16800	1540	0.05	1.4	14000	1400	0.04	1.2	11200	1300	0.03	1
	16	14400	1300	0.05	1.4	12000	1200	0.04	1.2	9600	1100	0.03	1
	18	12000	1100	0.04	1.4	10000	1000	0.03	1.2	8000	920	0.02	1
	20	12000	880	0.04	1.4	10000	800	0.03	1.2	8000	730	0.02	1
	25	10800	770	0.025	1.4	9000	700	0.02	1.2	7200	640	0.015	1
	30	9600	660	0.018	1.4	8000	600	0.015	1.2	6400	550	0.01	1
	35	8400	550	0.015	1.4	7000	500	0.012	1.2	5600	460	0.008	1
2.5	8	19200	2200	0.1	1.8	16000	2000	0.08	1.5	12800	1830	0.07	1.25
	10	18000	2000	0.1	1.8	15000	1800	0.08	1.5	11800	1550	0.07	1.25

Cutting Parameter

HSXE4L 4-Flute Long Neck End Mill Face Milling

Workpiece		Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Diameter mm	Underneck mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
2.5	12	16800	1760	0.08	1.8	14000	1600	0.07	1.5	11200	1450	0.06	1.25
	16	14400	1540	0.075	1.8	12000	1400	0.06	1.5	9600	1280	0.05	1.25
	20	12000	1300	0.075	1.8	10000	1200	0.06	1.5	8000	1100	0.05	1.25
	25	10800	990	0.025	1.8	9000	900	0.02	1.5	7200	830	0.015	1.25
	30	9600	880	0.04	1.8	8000	800	0.03	1.5	6400	734	0.025	1.25
	35	8400	660	0.018	1.44	7000	600	0.015	1.2	5600	550	0.01	1
3	10	19200	2200	0.18	2.16	16000	2000	0.15	1.8	12800	1800	0.1	1.5
	12	16800	2000	0.12	2.16	14000	1800	0.1	1.8	11200	1650	0.08	1.5
	16	14400	1500	0.1	2.16	12000	1400	0.08	1.8	9600	1280	0.07	1.5
	20	12000	1300	0.1	2.16	10000	1200	0.08	1.8	8000	1100	0.07	1.5
	25	10800	1100	0.08	2.16	9000	1000	0.07	1.8	7200	920	0.06	1.5
	30	9600	880	0.06	2.16	8000	800	0.05	1.8	6400	730	0.03	1.5
	35	8400	660	0.018	1.44	7000	600	0.015	1.2	5600	550	0.02	1.2
4	40	7200	600	0.018	1.2	6000	550	0.015	1.0	4800	500	0.012	1
	12	12000	2000	0.2	2.5	9500	2000	0.15	2	8000	1600	0.08	1.6
	16	10000	2000	0.15	2.5	8000	1800	0.1	2	7000	1400	0.06	1.6
	20	8500	1800	0.12	2.5	7000	1600	0.08	2	6500	1200	0.05	1.6
	25	8000	1600	0.1	2.5	6000	1400	0.07	2	5200	1200	0.04	1.6
	30	6800	1400	0.08	2.5	4800	1000	0.05	2	4200	850	0.03	1.6
	35	5500	1000	0.07	2.5	4200	880	0.04	2	3800	720	0.02	1.6
	40	4000	860	0.05	2.5	3600	720	0.03	2	3000	600	0.01	1.6
	45	3600	600	0.04	2.5	3200	500	0.03	2	2850	400	0.01	1.6
5	50	3200	380	0.02	2.5	3000	300	0.03	2	2600	220	0.01	1.6
	16	10000	2000	0.2	3	7000	1800	0.12	2.5	5500	1600	0.08	2
	25	8000	1600	0.15	3	5800	1400	0.07	2.5	4200	1200	0.05	2
	35	6000	1200	0.1	3	4200	900	0.05	2.5	3500	800	0.03	2
	50	3500	750	0.07	3	2800	620	0.03	2.5	2500	500	0.02	2

HSXEF 4-Flute Power End Mill



φD	D Tol. [mm]
D<3	0~-0.010
3<D<6	0~-0.012
6<D<10	0~-0.015
10<D<18	0~-0.018
D>18	0~-0.020

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	ℓ	γ/°	L	φd
HSXEF4010 0450	1	3	12	50	4
HSXEF4010 0650	1	3	12	50	6
HSXEF4012 0450	1.2	3.5	11	50	4
HSXEF4014 0450	1.4	4	11	50	4
HSXEF4015 0450	1.5	4	11	50	4
HSXEF4015 0650	1.5	4	11	50	6
HSXEF4016 0450	1.6	5	11	50	4
HSXEF4020 0450	2	6	11	50	4
HSXEF4020 0650	2	6	11	50	6
HSXEF4025 0450	2.5	8	11	50	4
HSXEF4025 0650	2.5	8	11	50	6
HSXEF4030 0450	3	8	11	50	4
HSXEF4030 0650	3	8	11	50	6
HSXEF4030 0675	3	12	11	75	6
HSXEF4040 0450	4	11	—	50	4
HSXEF4040 0475	4	15	—	75	4
HSXEF4040 0650	4	11	11	50	6
HSXEF4040 0675	4	15	11	75	6
HSXEF4050 0650	5	13	11	50	6
HSXEF4050 0675	5	18	11	75	6
HSXEF4060 0650	6	16	—	50	6
HSXEF4060 0660	6	16	—	60	6
HSXEF4060 0675	6	20	—	75	6
HSXEF4060 06100	6	20	—	100	6
HSXEF4080 0860	8	20	—	60	8
HSXEF4080 0875	8	20	—	75	8
HSXEF4080 08100	8	25	—	100	8
HSXEF4080 08125	8	28	—	125	8



HSXEF 4-Flute Power End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	ℓ	γ/°	L	φd
HSXEF4100 1075	10	25	-	75	10
HSXEF4100 10100	10	30	-	100	10
HSXEF4100 10125	10	35	-	125	10
HSXEF4120 1275	12	30	-	75	12
HSXEF4120 12100	12	35	-	100	12
HSXEF4120 12125	12	42	-	125	12
HSXEF4160 16100	16	45	-	100	16
HSXEF4160 16150	16	50	-	150	16
HSXEF4200 20100	20	45	-	100	20
HSXEF4200 20150	20	55	-	150	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
ALLOY STEELS	PREHARDENED STEELS	TOOL STEELS				DUCTILE CAST IRON						
~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○	○	○	○	○	○	○	○			○	○	

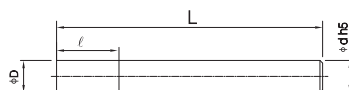


Cutting Parameter

HSXEF 4-Flute Power End Mill Side Milling

Workpiece	Pre-Hardened Steels (30-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HSXEF4010	15000	600	2	0.05	12000	480	2	0.03	10500	200	1	0.02
HSXEF4012	13500	660	2.4	0.05	10800	528	2.4	0.03	9450	200	1.2	0.02
HSXEF4015	12000	720	3	0.05	9600	576	3	0.03	8400	250	1.5	0.02
HSXEF4016	11800	750	3.2	0.05	9440	600	3.2	0.03	8260	250	1.6	0.02
HSXEF4020	10000	800	4	0.05	8000	640	4	0.03	7000	300	2	0.03
HSXEF4025	8500	850	5	0.05	6800	680	5	0.03	5950	350	2.5	0.03
HSXEF4030	7500	900	6	0.05	6000	720	6	0.03	5250	400	3	0.03
HSXEF4040	6800	1000	8	0.1	5440	800	8	0.03	4760	440	4	0.03
HSXEF4050	6000	1200	10	0.1	4800	960	10	0.05	4200	500	5	0.05
HSXEF4060	5000	1500	12	0.1	4000	1200	12	0.05	3500	550	6	0.05
HSXEF4080	4200	2000	16	0.1	3360	1600	16	0.05	2940	600	8	0.05
HSXEF4100	4000	2500	20	0.1	3200	2000	20	0.05	2800	600	10	0.06
HSXEF4120	3800	3000	24	0.1	3040	2400	24	0.1	2660	500	12	0.1
HSXEF4140	3500	2600	28	0.1	2800	2080	28	0.1	2450	500	14	0.1
HSXEF4160	3200	2500	32	0.1	2560	2000	32	0.1	2240	500	16	0.1
HSXEF4200	3000	2000	40	0.1	2400	1600	40	0.1	2100	500	20	0.1

HSXHE 4/6 Flute Hard Milling End Mill



φD	D Tol. (mm)
1<D≤5	0~-0.012
6<D≤8	0~-0.015
8<D≤12	0~-0.018
12<D≤20	0~-0.02

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Flute No.	Overall Length	Shank Dia.
	φD	l	γ/°		L	φd
HSXHE4010 0650	1	3	20	4	50	6
HSXHE4015 0650	1.5	4	20	4	50	6
HSXHE4020 0650	2	6	20	4	50	6
HSXHE4025 0650	2.5	8	20	4	50	6
HSXHE4030 0650	3	8	20	4	50	6
HSXHE4040 0660	4	11	20	4	50	6
HSXHE4050 0660	5	13	20	4	60	6
HSXHE6060 0660	6	16	-	6	60	6
HSXHE6080 0875	8	20	-	6	75	8
HSXHE6100 1075	10	25	-	6	75	10
HSXHE6120 12100	12	35	-	6	100	12
HSXHE6160 16100	16	40	-	6	100	16
HSXHE6200 20100	20	45	-	6	100	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○	○	○	○	○	○			○	○	



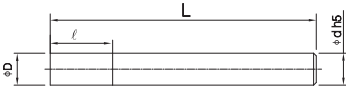
Cutting Parameter

HSXHE 4/6-Flute Hard Milling End Mill Side Milling

Workpiece	Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)				Hardened Steels (65-70HRC)			
Type No.	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm
HSXHE4010 0650	15000	600	2	0.05	12000	480	2	0.03	10500	200	1	0.01
HSXHE4015 0650	12000	720	3	0.05	9600	576	3	0.03	8400	220	1.5	0.01
HSXHE4020 0650	10000	800	4	0.05	8000	640	4	0.03	7000	240	2	0.02
HSXHE4025 0650	8500	850	5	0.05	6800	680	5	0.03	5950	240	2.5	0.02
HSXHE4030 0650	7500	900	6	0.05	6000	720	6	0.03	5250	240	3	0.03
HSXHE4040 0660	6800	1000	8	0.1	5440	800	8	0.03	4760	280	4	0.03
HSXHE4050 0660	6000	1200	10	0.1	4800	960	10	0.05	4200	300	5	0.03

Workpiece	Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)				Hardened Steels (65-70HRC)			
Type No.	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm	Spindle Speed min ¹	Feed mm/min	Ap mm	Ae mm
HSXHE6060 0660	4000	870	15	0.1	3200	700	15	0.05	2100	360	15	0.03
HSXHE6080 0875	3500	900	18	0.1	2800	700	18	0.05	1600	360	18	0.03
HSXHE6100 1075	2800	850	25	0.1	2240	680	25	0.05	1500	340	25	0.03
HSXHE6120 12100	2500	800	30	0.1	2000	650	30	0.05	1200	325	30	0.03
HSXHE6160 16100	2200	750	35	0.1	1760	650	35	0.05	1000	325	35	0.03
HSXHE6200 20100	2000	700	40	0.1	1600	600	40	0.05	800	300	40	0.03

HSXEG 6-Flute Hard Milling End Mill



Ø D	D Tol. (mm)
6<D≤10	0~-0.015
10<D≤18	0~-0.018
D>18	0~-0.020

Unit : mm

Type No.	Dia.	Length of Cut	Overall Length	Shank Dia.
	φD	ℓ	L	φd
HSXEG6060 0660	6	18	60	6
HSXEG6060 0675	6	24	75	6
HSXEG6080 0860	8	20	60	8
HSXEG6080 0875	8	32	75	8
HSXEG6100 1075	10	30	75	10
HSXEG6100 10100	10	40	100	10
HSXEG6120 1275	12	32	75	12
HSXEG6120 12100	12	45	100	12
HSXEG6160 16100	16	40	100	16
HSXEG6160 16150	16	64	150	16
HSXEG6200 20100	20	45	100	20
HSXEG6200 20150	20	75	150	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~45HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○	○	○	○	○	○			○	○	



Cutting Parameter

HSXEG 6-Flute Hard Milling End Mill Side Milling

Workpiece	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXEG6060	4500	2420	15	0.2	4000	870	15	0.1	3200	700	15	0.05
HSXEG6080	4000	2400	18	0.2	3500	900	18	0.1	2800	700	18	0.05
HSXEG6100	3500	2300	25	0.2	2800	850	25	0.1	2240	680	25	0.05
HSXEG6120	3000	2000	30	0.2	2500	800	30	0.1	2000	650	30	0.05
HSXEG6160	2400	2000	35	0.2	2200	750	35	0.1	1760	650	35	0.05
HSXEG6200	2200	1800	40	0.2	2000	700	40	0.1	1600	600	40	0.05

HGHFE SERIES

Suitable for dynamic trochoidal roughing and slotting

- Use of carbide rods specially designed for roughing increases mill's resistance in high efficiency machining.
- Unequal teeth space and variable spiral design reduce the cutting vibration, making the cutting process more smoother.
- Use of the U-shaped gash provides enough space for chip pocket, which in return increases the ability of chip removal during the side high efficiency roughing and grooving.
- Adopting 42 degree helix angle to reduce cutting resistance and make cutting more efficient.
- The AlCr/TiSi-based wear-resistant coating ensures the tool performance in general steel and stainless steel machining.

$\leq 45\text{HRC}$



Unequal teeth space and variable spiral design reduce the cutting vibration and enables high-speed cutting.

U-shaped gash design for smoother chip removal.

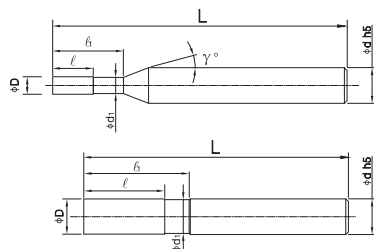
Adoption of carbide rods with high rupture strength increases mills' shock resistance.

Adopting 42 degree helix angle with low cutting resistance.

Stable process even in heavy-duty applications.



HGHFE 4-Flute HPC 3D End Mill



φD	D Tol. [mm]
1 < D ≤ 6	0 ~ -0.015
6 < D ≤ 20	0 ~ -0.02

Unit : mm

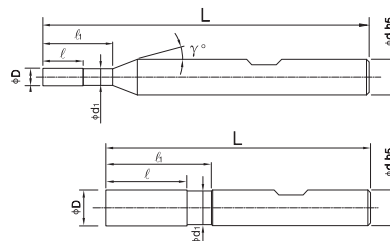
Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Shank
	φD	ℓ	ℓ₁	φd₁	γ/°	L	φd	
HGHFE4010-3 0650	1	2.3	3	0.95	20	50	6	Cylinder Shank
HGHFE4020-6 0650	2	4.6	6	1.9	20	50	6	Cylinder Shank
HGHFE4030-9 0650	3	6.9	9	2.9	20	50	6	Cylinder Shank
HGHFE4040-12 0650	4	9.2	12	3.8	20	50	6	Cylinder Shank
HGHFE4050-15 0660	5	11.5	15	4.7	20	60	6	Cylinder Shank
HGHFE4060-18 0660	6	13.8	18	5.6	—	60	6	Cylinder Shank
HGHFE4080-24 0860	8	18.4	24	7.6	—	60	8	Cylinder Shank
HGHFE4100-30 1075	10	23.0	30	9.5	—	75	10	Cylinder Shank
HGHFE4120-36 1275	12	27.6	36	11.5	—	75	12	Cylinder Shank
HGHFE4120-36 12100	12	27.6	36	11.5	—	100	12	Cylinder Shank
HGHFE4160-48 16100	16	36.8	48	15.5	—	100	16	Cylinder Shank
HGHFE4200-60 20120	20	46.0	60	19.5	—	120	20	Cylinder Shank

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable
 ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
~40HRC	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB							
○	○	○			○	○	○	○	○		○	○	

HGHFE 4-Flute HPC 3D End Mill Weldon Shank



Ø D	D Tol. [mm]
1 < D ≤ 6	0 ~ -0.015
6 < D ≤ 20	0 ~ -0.02

Unit : mm

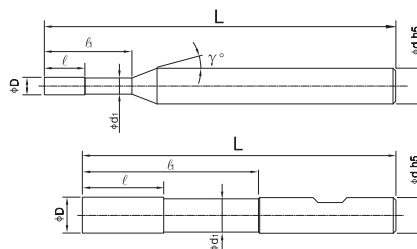
Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Shank
	φD	ℓ	ℓ ₁	φd ₁	γ/°	L	φd	
HGHFE4010-3 0656-W	1	2.3	3	0.95	20	56	6	Weldon Shank
HGHFE4020-6 0656-W	2	4.6	6	1.9	20	56	6	Weldon Shank
HGHFE4030-9 0656-W	3	6.9	9	2.9	20	56	6	Weldon Shank
HGHFE4040-12 0656-W	4	9.2	12	3.8	20	56	6	Weldon Shank
HGHFE4050-15 0656-W	5	11.5	15	4.7	20	56	6	Weldon Shank
HGHFE4060-18 0656-W	6	13.8	18	5.6	—	56	6	Weldon Shank
HGHFE4080-24 0862-W	8	18.4	24	7.6	—	62	8	Weldon Shank
HGHFE4100-30 1072-W	10	23.0	30	9.5	—	72	10	Weldon Shank
HGHFE4120-36 1283-W	12	27.6	36	11.5	—	83	12	Weldon Shank
HGHFE4160-48 1698-W	16	36.8	48	15.5	—	98	16	Weldon Shank
HGHFE4200-60 20112-W	20	46.0	60	19.5	—	112	20	Weldon Shank

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○			○	○	○	○		○	○	

HGHFE 4-Flute HPC 5D End Mill



ϕD	D Tol. [mm]
$1 < D \leq 6$	0 ~ -0.015
$6 < D \leq 20$	0 ~ -0.02

Unit : mm

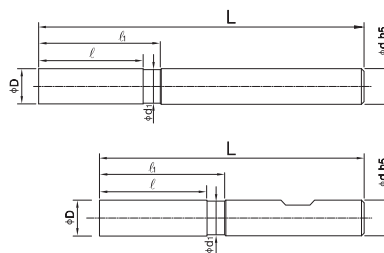
Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Shank
	ϕD	l	l_1	ϕd_1	$\gamma / ^\circ$	L	ϕd	
HGHFE4010-5 0650	1	1.8	5	0.95	20	50	6	Cylinder Shank
HGHFE4020-10 0650	2	3.6	10	1.9	20	50	6	Cylinder Shank
HGHFE4030-15 0660	3	5.4	15	2.9	20	60	6	Cylinder Shank
HGHFE4040-20 0660	4	7.2	20	3.8	20	60	6	Cylinder Shank
HGHFE4050-25 0675	5	9.0	25	4.7	20	75	6	Cylinder Shank
HGHFE4060-30 0675	6	10.8	30	5.6	—	75	6	Cylinder Shank
HGHFE4080-40 08100	8	14.4	40	7.6	—	100	8	Cylinder Shank
HGHFE4100-50 10100	10	18.0	50	9.5	—	100	10	Cylinder Shank
HGHFE4120-60 12107-VV	12	21.6	60	11.5	—	107	12	Weldon Shank
HGHFE4160-80 16130-VV	16	28.8	80	15.5	—	130	16	Weldon Shank
HGHFE4200-100 20152-VV	20	36.0	100	19.5	—	152	20	Weldon Shank

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable
 ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
~40HRC	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB							
○	○	○			○	○	○	○	○		○	○	

HGHFE 5-Flute HPC 3.5D End Mill Weldon Shank



$\varnothing D$	D Tol. [mm]
$1 < D \leq 6$	$0 \sim -0.015$
$6 < D \leq 20$	$0 \sim -0.02$

Unit : mm

Type No.	Dia.	Length of Cut	Under Neck Length	Neck Dia.	Overall Length	Shank Dia.	Shank
	$\varnothing D$	l	l_1	$\varnothing d_1$	L	$\varnothing d$	
HGHFE5060-21 0660	6	18	21	5.6	60	6	Cylinder Shank
HGHFE5080-28 0875	8	24	28	7.6	75	8	Cylinder Shank
HGHFE5100-35 1075	10	30	35	9.5	75	10	Cylinder Shank
HGHFE5120-42 1289-W	12	36	42	11.5	89	12	Weldon Shank
HGHFE5160-56 16106-W	16	48	56	15.5	106	16	Weldon Shank
HGHFE5200-70 20122-W	20	60	70	19.5	122	20	Weldon Shank

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB							
○	○	○			○	○	○	○	○		○	○	



Cutting Parameter

HGHFE HPC End Mill Slot Milling

Workpiece	Pre-Hardened Steels (~30HRC)				Hardened Steels (30~40HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HGHFE4010	36000	300	1	1	31800	200	1	1
HGHFE4020	18000	400	2	2	15200	240	2	2
HGHFE4030	12000	500	3	3	10600	320	3	3
HGHFE4040	9000	600	4	4	7960	540	4	4
HGHFE4050	7200	700	5	5	6360	600	5	5
HGHFE4060	6000	800	6	6	5300	650	6	6
HGHFE4080	4450	1000	8	8	3980	800	8	8
HGHFE4100	3600	1200	10	10	3185	900	10	10
HGHFE4120	3000	1200	12	12	2750	1000	12	12
HGHFE4160	2250	1000	16	16	2050	800	16	16
HGHFE4200	1800	800	20	20	1640	600	20	20

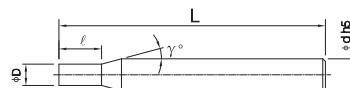
- For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times CR$.

HGHFE HPC End Mill Trochoidal Milling

Workpiece	Pre-Hardened Steels (~30HRC)				Hardened Steels (35~45HRC)			
Type No.	n min^{-1}	V_f mm/min	a_p mm	a_e mm	n min^{-1}	V_f mm/min	a_p mm	a_e mm
HGHFE4010	40000	300	2	0.2	36000	270	1	0.18
HGHFE4020	20000	400	4	0.4	18000	360	2	0.36
HGHFE4030	13500	600	6	0.6	12150	540	3	0.54
HGHFE4040	10000	1000	8	0.8	9000	900	4	0.72
HGHFE4050	8000	1500	10	1	7200	1350	5	0.9
HGHFE4060	6500	2000	12	1.2	5850	1800	6	1.08
HGHFE4080	5000	2000	16	1.6	4500	1800	8	1.44
HGHFE4100	4000	2500	20	2	3600	2250	10	1.8
HGHFE4120	3350	3000	24	2.4	3015	2700	12	2.16
HGHFE4160	2500	2500	32	2	2250	2250	16	1.8
HGHFE4200	2000	2000	40	2	1800	1800	20	1.8

- For Z-level and face milling, the recommended axial depth of cut (a_p) is $0.3 \times CR$.

HGXEF 4-Flute Power End Mill



φD	D Tol. [mm]
D<3	0~-0.010
3<D≤6	0~-0.012
6<D<10	0~-0.015
10<D<18	0~-0.018
D>18	0~-0.020

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	ℓ	γ/°	L	φd
HGXEF4010 0450	1	3	12	50	4
HGXEF4010 0650	1	3	12	50	6
HGXEF4012 0450	1.2	3.5	11	50	4
HGXEF4014 0450	1.4	4	11	50	4
HGXEF4015 0450	1.5	4	11	50	4
HGXEF4015 0650	1.5	4	11	50	6
HGXEF4016 0450	1.6	5	11	50	4
HGXEF4020 0450	2	6	11	50	4
HGXEF4020 0650	2	6	11	50	6
HGXEF4025 0450	2.5	8	11	50	4
HGXEF4025 0650	2.5	8	11	50	6
HGXEF4030 0450	3	8	11	50	4
HGXEF4030 0650	3	8	11	50	6
HGXEF4030 0660	3	8	11	60	6
HGXEF4030 0675	3	12	11	75	6
HGXEF4040 0450	4	11	—	50	4
HGXEF4040 0475	4	15	—	75	4
HGXEF4040 0650	4	11	11	50	6
HGXEF4040 0660	4	11	11	60	6
HGXEF4040 0675	4	15	11	75	6
HGXEF4050 0650	5	13	11	50	6
HGXEF4050 0660	5	13	11	60	6
HGXEF4050 0675	5	18	11	75	6
HGXEF4060 0650	6	16	—	50	6
HGXEF4060 0660	6	16	—	60	6
HGXEF4060 0675	6	20	—	75	6



HGXEF 4-Flute Power End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	$\gamma/^\circ$	L	ϕd
HGXEF4060 06100	6	20	—	100	6
HGXEF4080 0860	8	20	—	60	8
HGXEF4080 0875	8	20	—	75	8
HGXEF4080 08100	8	25	—	100	8
HGXEF4100 1075	10	25	—	75	10
HGXEF4100 10100	10	30	—	100	10
HGXEF4100 10125	10	35	—	125	10
HGXEF4120 1275	12	30	—	75	12
HGXEF4120 12100	12	35	—	100	12
HGXEF4120 12125	12	42	—	125	12
HGXEF4160 16100	16	45	—	100	16
HGXEF4160 16150	16	50	—	150	16
HGXEF4200 20100	20	45	—	100	20
HGXEF4200 20150	20	55	—	150	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
~40HRC	~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB							
○	○	○			○	○	○	○	○		○	○	

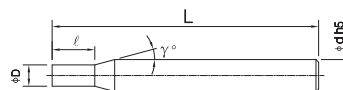


Cutting Parameter

HGXEF 4-Flute Power End Mill Side Milling

Workpiece	Carbon Steels、Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXEF4010 0450	18150	320	2	0.1	16500	320	2	0.05	15000	250	1.5	0.05
HGXEF4012 0450	18150	320	2.4	0.1	16500	320	2.4	0.05	15000	250	1.8	0.05
HGXEF4014 0450	15000	350	2.8	0.1	14000	340	2.8	0.1	13500	280	2.1	0.05
HGXEF4015 0450	14520	360	3	0.1	13200	360	3	0.1	12000	300	2.25	0.05
HGXEF4016 0450	14000	380	3.2	0.1	12500	400	3.2	0.1	11800	320	2.4	0.05
HGXEF4020 0450	12100	400	4	0.15	11000	400	4	0.1	11000	350	3	0.05
HGXEF4025 0450	10285	440	5	0.15	9350	440	5	0.1	8500	400	3.75	0.05
HGXEF4030 0450	9075	480	6	0.15	8250	480	6	0.1	7500	450	4.5	0.05
HGXEF4040 0450	7018	600	8	0.15	6380	600	8	0.1	5800	550	6	0.08
HGXEF4050 0650	6050	700	10	0.2	5500	700	10	0.1	5000	580	7.5	0.1
HGXEF4060 0660	5445	1000	12	0.2	4950	1000	12	0.1	4500	600	9	0.1
HGXEF4080 0875	4598	1500	16	0.3	4180	1500	16	0.2	3800	600	12	0.1
HGXEF4100 1075	4235	2000	20	0.3	3850	2000	20	0.2	3500	550	15	0.1
HGXEF4120 1275	3388	2500	24	0.3	3080	2500	24	0.2	2800	500	18	0.1
HGXEF4140 1475	3025	2000	28	0.3	2750	2000	28	0.2	2500	500	21	0.1
HGXEF4160 16100	2662	2000	32	0.3	2420	2000	32	0.2	2200	450	24	0.1
HGXEF4200 20100	2420	2000	40	0.3	2200	2000	40	0.2	2000	400	30	0.1

HGXE 2-Flute General Purpose End Mill



φD	D Tol. (mm)
D<3	0~-0.010
3<D≤6	0~-0.012
6<D≤10	0~-0.015
10<D≤18	0~-0.018
D>18	0~-0.020

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	l	γ/°	L	φd
HGXE2001 0450	0.1	0.2	12	50	4
HGXE20015 0450	0.15	0.3	12	50	4
HGXE2002 0450	0.2	0.4	12	50	4
HGXE2003 0450	0.3	0.6	12	50	4
HGXE2004 0450	0.4	1.2	12	50	4
HGXE2005 0450	0.5	1.5	12	50	4
HGXE2006 0450	0.6	1.8	12	50	4
HGXE2007 0450	0.7	2.1	12	50	4
HGXE2008 0450	0.8	2.4	12	50	4
HGXE2010 0450	1	3	12	50	4
HGXE2010 0650	1	3	12	50	6
HGXE2012 0450	1.2	3.5	11	50	4
HGXE2014 0450	1.4	4	11	50	4
HGXE2015 0450	1.5	4	11	50	4
HGXE2015 0650	1.5	4	11	50	6
HGXE2016 0450	1.6	5	11	50	4
HGXE2020 0450	2	6	11	50	4
HGXE2020 0650	2	6	11	50	6
HGXE2025 0450	2.5	8	11	50	4
HGXE2025 0650	2.5	8	11	50	6
HGXE2030 0450	3	8	11	50	4
HGXE2030 0650	3	8	11	50	6
HGXE2030 0675	3	12	11	75	6
HGXE2040 0450	4	11	—	50	4
HGXE2040 0650	4	11	11	50	6
HGXE2040 0675	4	15	11	75	6
HGXE2050 0650	5	13	11	50	6
HGXE2050 0675	5	18	11	75	6

HGXE 2-Flute General Purpose End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	ℓ	$\gamma / ^\circ$	L	ϕd
HGXE2060 0650	6	16	—	50	6
HGXE2060 0660	6	16	—	60	6
HGXE2060 0675	6	20	—	75	6
HGXE2080 0860	8	20	—	60	8
HGXE2080 0875	8	20	—	75	8
HGXE2080 08100	8	25	—	100	8
HGXE2100 1075	10	25	—	75	10
HGXE2100 10100	10	30	—	100	10
HGXE2120 1275	12	30	—	75	12
HGXE2120 12100	12	35	—	100	12
HGXE2160 16100	16	45	—	100	16
HGXE2200 20100	20	45	—	100	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○			○	○	○	○		○	○	



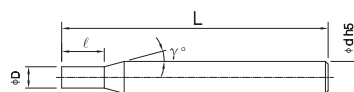
Cutting Parameter

HGXE 2-Flute General Purpose End Mill Face Milling

Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXE2001 0450	48000	150	0.006	0.06	40000	150	0.005	0.06	32000	120	0.003	0.05
HGXE20015 0450	48000	150	0.006	0.09	40000	180	0.005	0.09	32000	80	0.003	0.05
HGXE2002 0450	36000	240	0.006	0.12	30000	240	0.005	0.12	24000	200	0.003	0.1
HGXE2003 0450	36000	300	0.01	0.2	30000	300	0.01	0.2	24000	300	0.01	0.2
HGXE2004 0450	33880	325	0.03	0.28	30800	300	0.03	0.28	28000	300	0.03	0.28
HGXE2005 0450	30250	363	0.03	0.3	27500	330	0.03	0.3	25000	300	0.03	0.3
HGXE2006 0450	26620	425	0.04	0.42	24200	385	0.04	0.42	22000	350	0.04	0.42
HGXE2007 0450	25000	450	0.04	0.49	23200	420	0.04	0.49	21000	380	0.04	0.49
HGXE2008 0450	24200	484	0.04	0.56	22000	440	0.04	0.56	20000	400	0.04	0.56
HGXE2010 0450	21780	605	0.05	0.7	19800	550	0.05	0.7	18000	500	0.05	0.7
HGXE2012 0450	21080	650	0.05	0.84	11900	550	0.05	0.84	17000	500	0.05	0.84
HGXE2014 0450	19580	695	0.05	0.91	17500	600	0.05	0.91	16000	550	0.05	0.91
HGXE2015 0450	18150	726	0.05	1.05	16500	660	0.05	1.05	15000	600	0.05	1.05
HGXE2016 0450	16620	800	0.05	1.12	14500	750	0.05	1.12	13500	650	0.05	1.12
HGXE2020 0450	15125	900	0.1	1.5	13750	825	0.1	1.5	12500	750	0.05	1.5
HGXE2025 0450	12100	1210	0.1	1.75	11000	1100	0.1	1.75	10000	1000	0.05	1.75
HGXE2030 0450	9680	1210	0.1	2.1	8800	1100	0.1	2.1	8000	1000	0.05	2.1
HGXE2040 0450	7865	1210	0.1	2.8	7150	1100	0.1	2.8	6500	1100	0.05	2.8
HGXE2050 0650	7260	1210	0.1	3.5	6600	1100	0.1	3.5	6000	1000	0.1	3.5
HGXE2060 0650	6050	726	0.1	4.2	5500	660	0.1	4.2	5000	600	0.1	4.2
HGXE2080 0860	5445	726	0.2	5.6	4950	660	0.1	5.6	4500	600	0.1	5.6
HGXE2100 1075	4840	605	0.2	7	4400	550	0.2	7	4000	500	0.1	7
HGXE2120 1275	4235	605	0.2	8.4	3850	550	0.2	8.4	3500	500	0.1	8.4
HGXE2140 1475	3630	605	0.2	9.6	3300	550	0.2	9.6	3000	500	0.1	9.6
HGXE2160 16100	3388	605	0.2	11.2	3080	550	0.2	11.2	2800	500	0.1	11.2
HGXE2200 20100	3025	605	0.2	14	2750	550	0.2	14	2500	500	0.1	14

- This item can be used for side milling and slotting applicaitons

HGXE 4-Flute General Purpose End Mill



Ø D	D Tol. (mm)
D<3	0~-0.010
3<D≤6	0~-0.012
6<D≤10	0~-0.015
10<D≤18	0~-0.018
D>18	0~-0.020

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	φD	ℓ	γ/°	L	φd
HGXE4008 0450	0.8	2.4	12	50	4
HGXE4010 0450	1	3	12	50	4
HGXE4010 0650	1	3	12	50	6
HGXE4012 0450	1.2	3.5	11	50	4
HGXE4014 0450	1.4	4	11	50	4
HGXE4015 0450	1.5	4	11	50	4
HGXE4015 0650	1.5	4	11	50	6
HGXE4016 0450	1.6	5	11	50	4
HGXE4020 0450	2	6	11	50	4
HGXE4020 0650	2	6	11	50	6
HGXE4025 0450	2.5	8	11	50	4
HGXE4025 0650	2.5	8	11	50	6
HGXE4030 0450	3	8	11	50	4
HGXE4030 0650	3	8	11	50	6
HGXE4030 0675	3	12	11	75	6
HGXE4040 0450	4	11	—	50	4
HGXE4040 0475	4	15	—	75	4
HGXE4040 0650	4	11	11	50	6
HGXE4040 0675	4	15	11	75	6
HGXE4050 0650	5	13	11	50	6
HGXE4050 0675	5	18	11	75	6
HGXE4060 0650	6	16	—	50	6
HGXE4060 0660	6	16	—	60	6
HGXE4060 0675	6	20	—	75	6

HGXE 4-Flute General Purpose End Mill

Unit : mm

Type No.	Dia.	Length of Cut	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD	l	$\gamma/^\circ$	L	ϕd
HGXE4060 06100	6	20	—	100	6
HGXE4080 0860	8	20	—	60	8
HGXE4080 0875	8	20	—	75	8
HGXE4080 08100	8	25	—	100	8
HGXE4100 1075	10	25	—	75	10
HGXE4100 10100	10	30	—	100	10
HGXE4120 1275	12	30	—	75	12
HGXE4120 12100	12	35	—	100	12
HGXE4160 16100	16	45	—	100	16
HGXE4160 16125	16	50	—	125	16
HGXE4200 20100	20	45	—	100	20
HGXE4200 20125	20	55	—	125	20

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC		~50HRC	~55HRC	~60HRC	~65HRC	~35HRC	~350HB						
○		○	○			○	○	○	○		○	○	



Cutting Parameter

HGXE 4-Flute General Purpose End Mill Face Milling

Workpiece	Carbon Steels, Alloy Steels (≤35HRC)				Pre-Hardened Steels (35~45HRC)				Hardened Steels (45-55HRC)			
Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HGXE4008 0450	22000	1200	0.03	0.56	21600	1160	0.03	0.56	19800	720	0.03	0.56
HGXE4010 0450	21780	1400	0.05	0.7	19800	1240	0.05	0.7	18000	800	0.05	0.7
HGXE4012 0450	20000	1500	0.05	0.8	18000	1280	0.05	0.8	17000	850	0.05	0.8
HGXE4014 0450	18800	1680	0.05	1	17200	1320	0.05	1	16000	900	0.05	1
HGXE4015 0450	18150	1680	0.05	1.05	16500	1488	0.05	1.05	15000	960	0.05	1.05
HGXE4016 0450	18150	1680	0.05	1.1	16500	1488	0.05	1.1	15000	960	0.05	1.1
HGXE4020 0450	15125	2100	0.1	1.5	13750	1860	0.1	1.5	12500	1200	0.05	1.5
HGXE4025 0450	12100	2800	0.1	1.75	11000	2480	0.1	1.75	1100	1600	0.05	1.75
HGXE4030 0450	9680	2800	0.1	2.1	8800	2480	0.1	2.1	8000	1600	0.05	2.1
HGXE4040 0450	7865	2800	0.1	2.8	7150	2480	0.1	2.8	6500	1600	0.05	2.8
HGXE4050 0650	7260	2100	0.1	3.5	6600	1860	0.1	3.5	6000	1200	0.1	3.5
HGXE4060 0650	6050	1680	0.1	4.2	5500	1488	0.1	4.2	5000	960	0.1	4.2
HGXE4080 0860	5445	1680	0.2	5.6	4950	1488	0.2	5.6	4500	960	0.1	5.6
HGXE4100 1075	4840	1400	0.2	7	4400	1240	0.2	7	4000	800	0.1	7
HGXE4120 1275	4235	1400	0.2	8.4	3850	1240	0.2	8.4	3500	800	0.1	8.4
HGXE4140 1475	3630	1400	0.2	9.6	3300	1240	0.2	9.6	3000	800	0.1	9.6
HGXE4160 16100	3388	1400	0.2	11.2	3080	1240	0.2	11.2	2800	800	0.1	11.2
HGXE4200 20100	3025	1400	0.2	14	2750	1240	0.2	14	2500	800	0.1	14

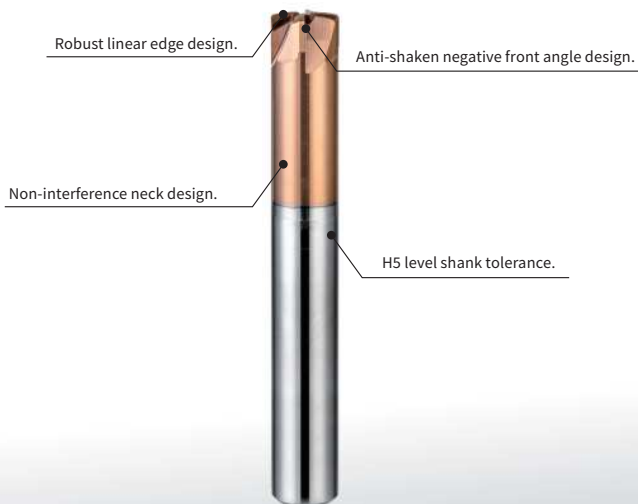
- This item can be used for side milling and slotting applicaitons

HSHFR SERIES

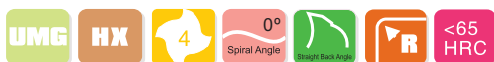
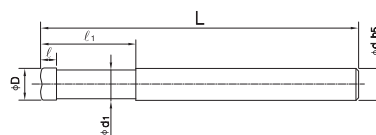
High Efficiency Roughing Endmills.

- Robust linear cutting edge.
- TiSiN multilayer coatings with Chrome concentration > 13%.
- Wide range of shank diameters for different machining purposes.
- Specially designed for hardened materials (1.2379, 1.2083, 1.2343).

≤ 65HRC



HSHFR 4-Flute High Feed End Mill



ϕD	D Tol. [mm]
$6 < D \leq 12$	$0 \sim -0.02$

Unit : mm

Type No.	Dia.	CAM-R	Length of Cut	Under Neck Length	Neck Dia.	Overall Length	Shank Dia.
	ϕD	R	ℓ	ℓ_1	ϕd_1	L	ϕd
HSHFR4060R0.55 0660	6	R0.55	3	18	5.8	60	6
HSHFR4080R0.75 0875	8	R0.75	4	24	7.8	75	8
HSHFR4100R0.95 1075	10	R0.95	5	30	9.6	75	10
HSHFR4120R1.15 1275	12	R1.15	6	36	11.6	75	12

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS, HARDENED STEELS				STAINLESS STEELS	CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
PREHARDENED STEELS	TOOL STEELS						DUCTILE CAST IRON						
~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	~35HRC		~350HB						
○	○	○	○	○	○								



Cutting Parameter

HSHFR 4-Flute High Feed End Mill Z-Level Milling Roughing

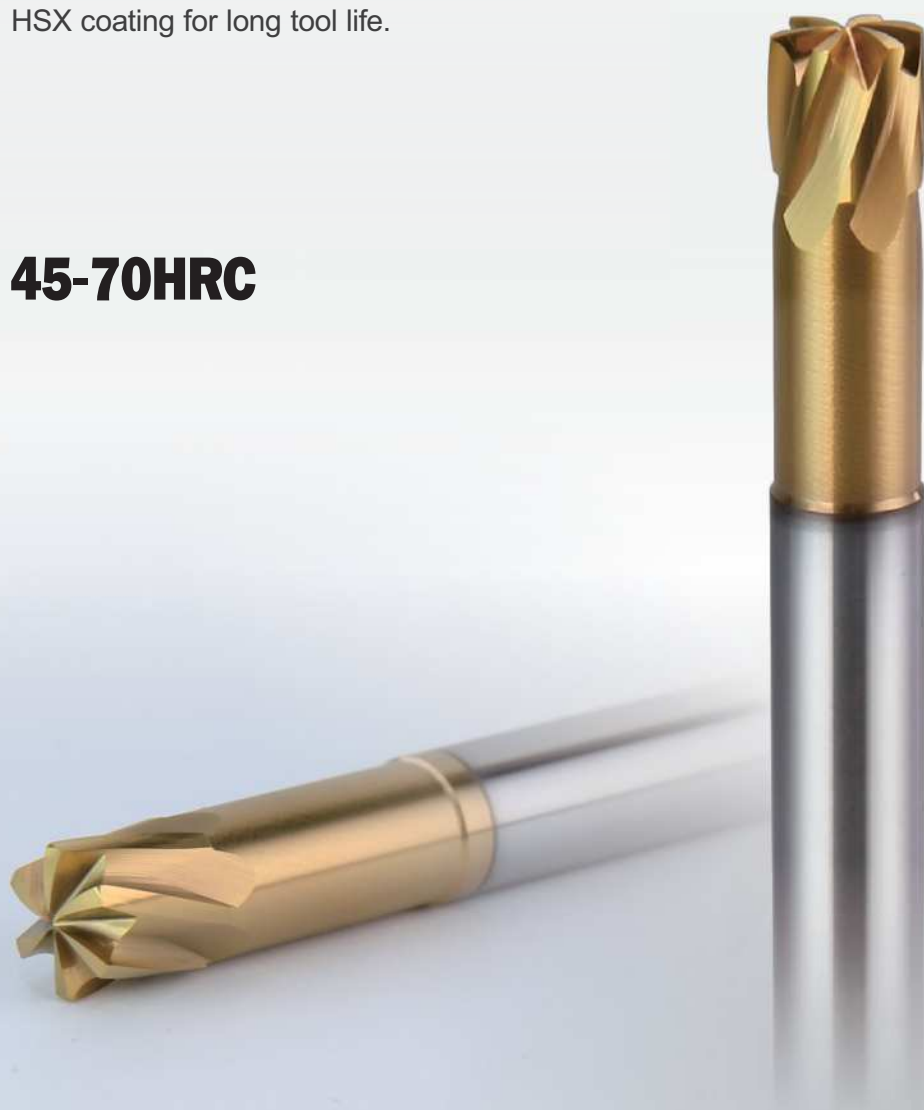
Workpiece Type No.	Pre-Hardened Steels (35-45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm
HSHFR4060R0.55 0660	6000	4000	0.2	3	6000	4000	0.2	2.5	4200	2500	0.1	2
HSHFR4080R0.75 0875	4500	5000	0.3	4	4500	5000	0.3	3	4000	3000	0.1	2.5
HSHFR4100R0.95 1075	4000	4500	0.35	5	4000	4500	0.35	4	3600	3000	0.1	3
HSHFR4120R1.0 1275	4000	4000	0.42	6	4000	4000	0.42	5	3200	3000	0.1	4

HSX SERIES

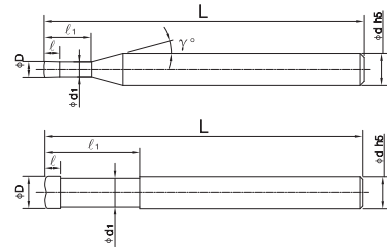
HSXHR-Highlights

- Axial cutting force minimizes vibration.
- Optimized high feed radius for lower cutting resistance.
- Multi-edge design for high efficiency.
- Suitable for 45–70HRC materials.
- HSX coating for long tool life.

45-70HRC



HSXHR 4/6-flute High Feed End Mill



A.

B.



Ø D	D Tol. [mm]
D < 12	0 ~ -0.02

Unit : mm

Type No.	Dia.	CAM-R	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Flute No.	Shank Dia.	Shape
	φD	R	ℓ	ℓ ₁	φd ₁	γ/°	L		φd	
HSXHR4010 0450	1	R0.130	1	3	0.95	15	50	4	4	A
HSXHR4010 0650	1	R0.130	1	3	0.95	15	50	4	6	A
HSXHR4020 0450	2	R0.183	2	6	1.9	15	50	4	4	A
HSXHR4020 0650	2	R0.183	2	6	1.9	15	50	4	6	A
HSXHR4030 0450	3	R0.315	3	9	2.9	15	50	4	4	A
HSXHR4030 0660	3	R0.315	3	9	2.9	15	60	4	6	A
HSXHR6040 0450	4	R0.370	4	12	3.9	—	50	6	4	B
HSXHR6040 0660	4	R0.370	4	12	3.9	15	60	6	6	A
HSXHR6050 0660	5	R0.500	5	15	4.85	15	60	6	6	A
HSXHR6060 0660	6	R0.530	6	18	5.85	—	60	6	6	B
HSXHR6080 0875	8	R0.800	8	24	7.8	—	75	6	8	B
HSXHR6080 08100	8	R0.800	8	24	7.8	—	100	6	8	B
HSXHR6100 1075	10	R0.900	10	30	9.8	—	75	6	10	B
HSXHR6100 10100	10	R0.900	10	30	9.8	—	100	6	10	B
HSXHR6120 12100	12	R1.000	12	36	11.7	—	100	6	12	B

Diameter D	CAM (R)	Leftover	Diameter D	CAM (R)	Leftover	• Please set up CAM R as radius. • If you need DXF or STP files, please contact with us.
1	0.13	0.023	6	0.53	0.168	
2	0.183	0.06	8	0.8	0.229	
3	0.315	0.083	10	0.9	0.305	
4	0.37	0.12	12	1	0.383	
5	0.5	0.138				

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PREHARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
		○	○	○	○	○	○						



Cutting Parameter

HSXHR 4/6-Flute High Feed End Mill Z constant Roughing

Workpiece	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
Type No.	n min ⁻¹	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	V _f mm/min	a _p mm	a _e mm	n min ⁻¹	V _f mm/min	a _p mm	a _e mm
HSXHR4010R0.13 0450	25500	3800	0.04	0.53	19100	1800	0.02	0.53	15900	1070	0.012	0.5
HSXHR4010R0.13 0650	25500	3800	0.04	0.53	19100	1800	0.02	0.53	15900	1070	0.012	0.5
HSXHR4020R0.183 0450	12700	3800	0.08	1.11	9600	2000	0.04	1.11	8000	1080	0.02	1
HSXHR4020R0.183 0650	12700	3800	0.08	1.11	9600	2000	0.04	1.11	8000	1080	0.02	1
HSXHR4030R0.315 0450	8500	4000	0.12	1.62	6400	2400	0.06	1.62	5300	1120	0.03	1.5
HSXHR4030R0.315 0660	8500	4000	0.12	1.62	6400	2400	0.06	1.62	5300	1120	0.03	1.5
HSXHR6040R0.37 0450	6400	5850	0.16	2.18	4800	2700	0.08	2.18	4000	1710	0.05	2
HSXHR6040R0.37 0650	6400	5850	0.16	2.18	4800	2700	0.08	2.18	4000	1710	0.05	2
HSXHR6050R0.5 0660	5100	6000	0.2	2.73	3800	2750	0.1	2.73	4000	1710	0.05	2
HSXHR6060R0.53 0650	4200	5870	0.24	3.27	3200	2800	0.1	3.27	2700	1770	0.08	3
HSXHR6060R0.53 0660	4200	5870	0.24	3.27	3200	2800	0.1	3.27	2700	1770	0.08	3
HSXHR6080R0.8 0860	3200	6150	0.28	4.36	2400	3000	0.15	4.36	2000	1800	0.1	4
HSXHR6080R0.8 0875	4200	5870	0.24	3.27	2400	2900	0.15	3.27	2000	1800	0.1	4
HSXHR6080R0.8 08100	4200	5870	0.24	3.27	2400	2800	0.15	3.27	2000	1800	0.1	4
HSXHR6100R0.9 1075	2500	6000	0.3	5.46	1900	3150	0.2	5.46	1600	1800	0.15	5
HSXHR6100R0.9 10100	2500	6000	0.3	5.46	1900	3000	0.2	5.46	1600	1800	0.15	5
HSXHR6120R1 1275	2100	5750	0.35	6.57	1600	3000	0.25	6.57	1300	1670	0.18	6
HSXHR6120R1 12100	2100	5750	0.35	6.57	1600	3000	0.25	6.57	1300	1670	0.18	6

HSXDT SERIES

HSXDT Thread Mill – Highlights

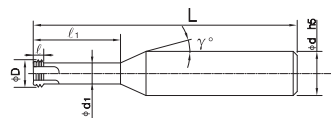
- Long tool life with excellent wear resistance.
- Stable performance from optimized flute design.
- Sharper and strong edges for minimal burrs and cleaner threads.
- Left-hand cutting — use with counterclockwise rotation.
- Capable of machining materials up to 70HRC.

<70HRC





HSXDT Thread Milling Cutter-2.5D Underneck



Type No.	Dia.	Regular Thread		Pitch	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.
	ϕD		Z	P	ℓ	ℓ_1	ϕd_1	$\gamma/^\circ$	L	ϕd
HSXDT-0.4-5 0650	1.4	M2	4	0.4	1.2	5	0.90	20	50	6
HSXDT-0.45-6.25 0650	1.8	M2.5	4	0.45	1.35	6.25	1.25	20	50	6
HSXDT-0.5-7.5 0650	2.4	M3	4	0.5	1.5	7.5	1.80	20	50	6
HSXDT-0.7-10 0650	3.1	M4	4	0.7	2.1	10	2.25	20	50	6
HSXDT-0.8-12.5 0650	3.8	M5	4	0.8	2.4	12.5	2.80	20	50	6
HSXDT-1.0-15 0650	4.6	M6	4	1	3	15	3.35	20	50	6
HSXDT-1.25-20 1075	6.2	M8	4	1.25	3.75	20	4.65	20	75	10
HSXDT-0.75-20 1075	6.2	*	4	0.75	2.25	20	5.15	20	75	10
HSXDT-1.5-25 1075	7.5	M10	4	1.5	4.50	25	5.60	20	75	10
HSXDT-1.0-25 1075	7.5	*	4	1	3	25	6.10	20	75	10
HSXDT-1.75-30 1075	9.0	M12	4	1.75	5.25	30	6.80	20	75	10
HSXDT-2-40 12100	11.5	M16	4	2	6	40	8.85	20	100	12
HSXDT-2.5-50 16125	15	M20	4	2.5	7.5	50	11.70	20	125	16

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

CARBON STEELS	ALLOY STEELS	PRE-HARDENED STEELS	HARDENED STEELS				CAST IRON DUCTILE CAST IRON	COPPER ALLOYS	ALUMINUM ALLOY	GRAPHITE	TITANIUM ALLOY	HEAT RESISTANT ALLOYS	PLASTIC
			~55HRC	~60HRC	~65HRC	~70HRC							
○	○	○	○	○	○	○	○	○	○	○	○	○	○



Cutting Parameter

HSXDT Thread Milling Cutter

WorkPiece		Tool steels (25-35HRC)			Hardened Steels (≤45HRC)		
Type No.	DCmm	n min ⁻¹	F mm/min	fz mm/t	n min ⁻¹	F mm/min	fz mm/t
HSXDT-M2-0.4-5 0650	1.4	16800	121	0.0018	14280	114	0.002
HSXDT-M2.5-0.45-6.25 0650	1.8	12500	95	0.019	10625	106	0.0025
HSXDT-M3-0.5-7.5 0650	2.4	9500	87	0.0023	8075	80	0.0025
HSXDT-M4-0.7-10 0650	3.1	7500	120	0.004	6375	76	0.003
HSXDT-M5-0.75-20 1075	3.8	6500	130	0.005	5525	88	0.004
HSXDT-M6-1.0-25 1075	4.6	5000	120	0.006	4250	85	0.005
HSXDT-M8-1.25-20 1075	6.2	3600	109	0.007	3060	85	0.007
HSXDT-M10-1.5-25 1075	7.5	3000	120	0.01	2550	92	0.009
HSXDT-M12-1.75-30 1075	9	2700	119	0.011	2295	92	0.01
HSXDT-M16-2-40 12100	11.5	2200	123	0.014	1870	112	0.015
HSXDT-M20-2.5-50 16125	15	1600	109	0.017	1360	87	0.016

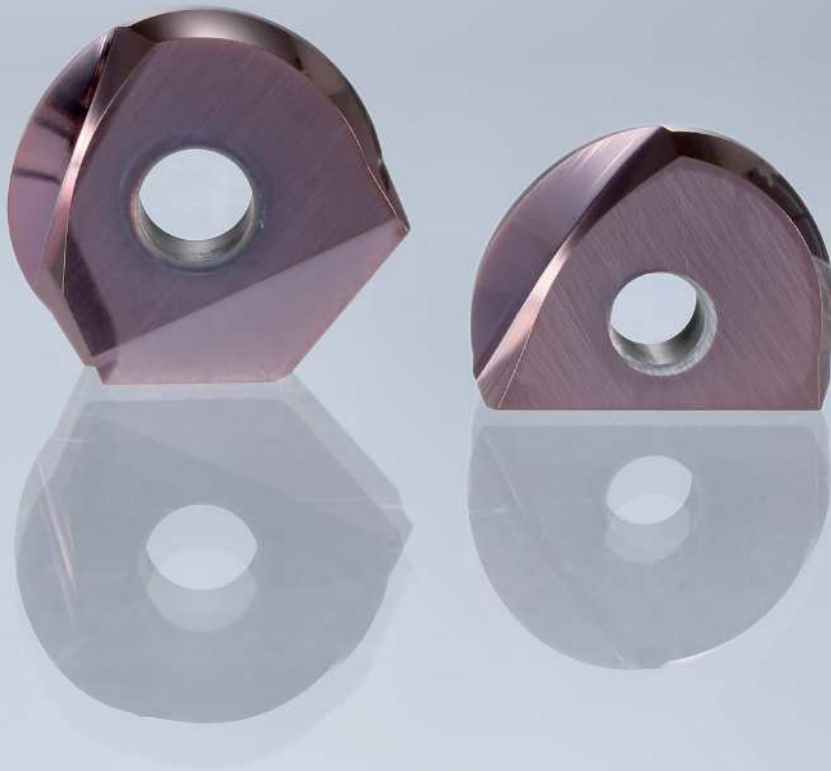
WorkPiece		Hardened Steels (≤52HRC)			Hardened Steels (58~62HRC)		
Type No.	DCmm	n min ⁻¹	F mm/min	fz mm/t	n min ⁻¹	F mm/min	fz mm/t
HSXDT-M2-0.4-5 0650	1.4	12500	100	0.002	10000	69	0.0017
HSXDT-M2.5-0.45-6.25 0650	1.8	9700	77	0.002	7760	68	0.0022
HSXDT-M3-0.5-7.5 0650	2.4	7300	58	0.002	5840	70	0.003
HSXDT-M4-0.7-10 0650	3.1	5600	67	0.003	4480	71	0.004
HSXDT-M5-0.75-20 1075	3.8	4600	74	0.004	3680	74	0.005
HSXDT-M6-1.0-25 1075	4.6	3800	76	0.005	3040	61	0.005
HSXDT-M8-1.25-20 1075	6.2	2800	67	0.006	2240	63	0.007
HSXDT-M10-1.5-25 1075	7.5	2300	83	0.009	1840	66	0.009
HSXDT-M12-1.75-30 1075	9	1900	84	0.011	1520	67	0.011
HSXDT-M16-2-40 12100	11.5	1500	90	0.015	1200	67	0.014
HSXDT-M20-2.5-50 16125	15	1200	77	0.016	960	69	0.018

VSB&MSB Insert

INTERCHANGABLE BALL HEAD MILLING CUTTER

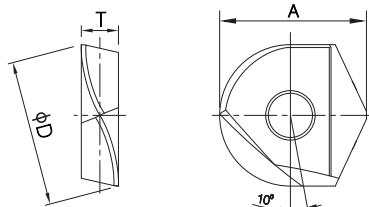
The Speciality of Insert Series

- Ultra-Fined Micro-Particle Substrate, High Hardness and Excellent Wear Resistance .
- Insert Clamping R Accuracy $\pm 0.01\text{mm}$.
- S-Shaped Spiral Design, Low Cutting Vibration, High Quality Workpiece Surface .
- AHX Nano Multi-Layer Coating up to 70HRC .





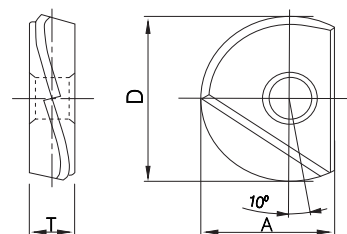
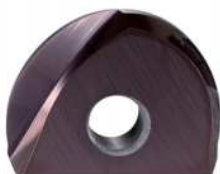
VSB Finishing Ball Nose Insert



Unit : mm

Type No.	D	R	A	T
VSB160-BS-R 9105-B	16	8	16.6	4.2
VSB200-BS-R 9105-B	20	10	20.2	5.2
VSB250-BS-R 9105-B	25	12.5	24.3	6.2
VSB300-BS-R 9105-B	30	15	29.2	7.2

MSB Finishing Ball Nose Insert



Unit : mm

Type No.	D	R	A	T
MSB120-S-R 9105-B	12	6	10	3
MSB160-S-R 9105-B	16	8	12	4
MSB200-S-R 9105-B	20	10	15	5
MSB250-S-R 9105-B	25	12.5	18.5	6
MSB300-S-R 9105-B	30	15	22.5	7

Cutting Parameter

VSB Finishing Ball Nose Insert

Workpiece	Pre-Hardened Steels (<45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm
VSB160-BS-R 9105-B	6000-10000	6000-10000	0.05-0.1	0.2	5500-6000	2500-3000	0.05-0.1	0.2	5500-6000	2500-3000	0.05-0.1	0.2
VSB200-BS-R 9105-B	6000-10000	6000-10000	0.05-0.12	0.25	5500-6000	3000-3600	0.05-0.12	0.25	5500-6000	3000-3600	0.05-0.12	0.25
VSB250-BS-R 9105-B	6000-8000	6000-8000	0.05-0.12	0.25	5000-5500	3000-4500	0.05-0.12	0.25	5000-5500	3000-4500	0.05-0.12	0.25
VSB300-BS-R 9105-B	5000-8000	5000-8000	0.05-0.2	0.3	4500-5000	3000-6000	0.05-0.2	0.3	4500-5000	3000-6000	0.05-0.2	0.3

MSB Finishing Ball Nose Insert

Workpiece	Pre-Hardened Steels (<45HRC)				Hardened Steels (45-55HRC)				Hardened Steels (55-65HRC)			
Type No.	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm	n min ⁻¹	V_f mm/min	a_p mm	a_e mm
MSB120-S-R 9105-B	8000-10000	2500-5000	0.05-0.1	0.2	6000-6500	2500-3000	0.05-0.1	0.2	6000-6500	2500-3000	0.05-0.1	0.2
MSB160-S-R 9105-B	6000-10000	6000-10000	0.05-0.1	0.2	5500-6000	2500-3000	0.05-0.1	0.2	5500-6000	2500-3000	0.05-0.1	0.2
MSB200-S-R 9105-B	6000-10000	6000-10000	0.05-0.12	0.25	5500-6000	3000-3600	0.05-0.12	0.25	5500-6000	3000-3600	0.05-0.12	0.25
MSB250-S-R 9105-B	6000-8000	6000-8000	0.05-0.12	0.25	5000-5500	3000-4500	0.05-0.12	0.25	5000-5500	3000-4500	0.05-0.12	0.25
MSB300-S-R 9105-B	5000-8000	5000-8000	0.05-0.2	0.3	4500-5000	3000-6000	0.05-0.2	0.3	4500-5000	3000-6000	0.05-0.2	0.3

① $V_c(\text{m/min})$ Cutting Speed

$$V_c = \frac{\pi \times D \times n}{1000}$$

$\pi = 3.14$ (the Circular Constant)
 $D = \text{Outside Diameter}$
 $n = \text{Rotation}$

② $n(\text{r.p.m})$ Rotation

$$n = \frac{1000 \times V_c}{\pi \times D}$$

$V_c = \text{Cutting Speed}$
 $\pi = 3.14$ (the Circular Constant)
 $D = \text{Outside Diameter}$

③ $V_f(\text{mm/min})$ Feed Rate

$$V_f = f_z \times Z \times n$$

$n = \text{Rotation}$
 $Z = \text{Number of flutes}$
 $f_z = \text{Feed per tooth}$

④ $f_z(\text{mm/Z})$ Feed Per Tooth

$$f_z = \frac{V_f}{n \times Z}$$

$V_f = \text{Feed Rate}$
 $n = \text{Rotation}$
 $Z = \text{Number of flutes}$

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Safety Notice

- Please do not touch the cutting edge with your hands.
- Please use within the recommended range and replace the tool in advance.
- Sometimes there may be high-temperature cutting flying out and elongated cutting discharged. Please use protective equipment such as safety covers and goggles.
- When using non water soluble cutting fluid, fire prevention measures must be taken.
- When using a rotating tool, it is necessary to conduct a trial run to confirm whether there is any oscillation, vibration, or abnormal sound.