

SGSO MILLING TOOLS

New Products 2025-2026



SGSO

KEEP ADVANCING WITH YOU



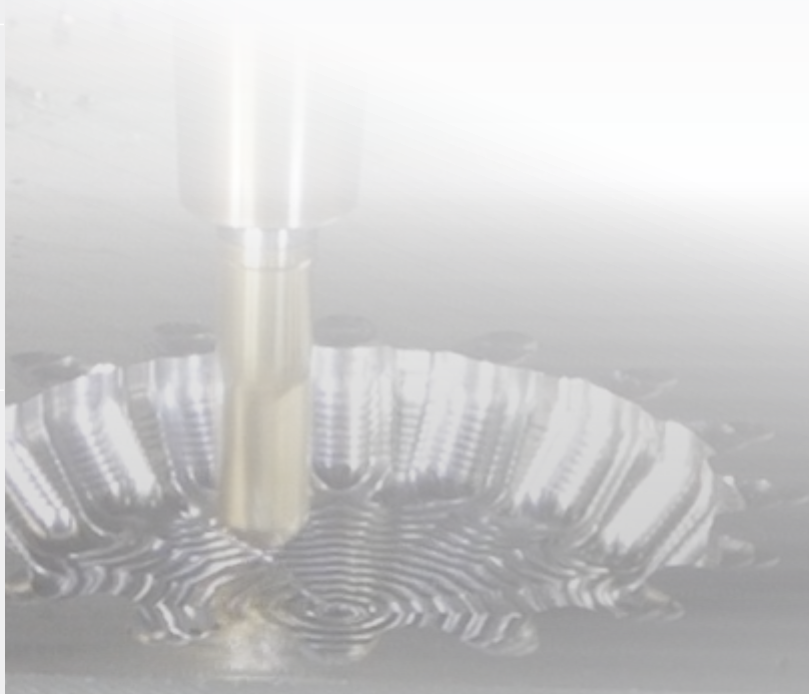
SGSO Technology Europe GmbH

HSX SERIES

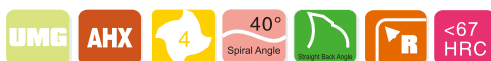
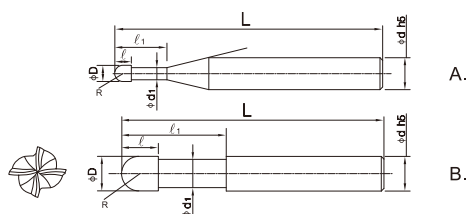
HSXBC-Highlights

- Possible for both side milling and profile milling.
- HSX coating leads to long tool life in hard milling.
- Excellent performance in 45-67 HRC materials.
- Unequal flutes design reduces the vibration.
- Stable milling in corner by optimized chip pockets.

45-67HRC



HSXBC 4-fluted High-hardness 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 ≤ 12	±0.005
6 < D ≤ 10	0 ~ -0.015	D > 12	±0.008
10 < D ≤ 18	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.	Type
	φD	CR	ℓ	ℓ ₁	φd ₁	γ/°	L	φd	
HSXBC4010 0450	1	0.5	1.8	3	0.95	15	50	4	A
HSXBC4010 0650	1	0.5	1.8	3	0.95	15	50	6	A
HSXBC4015 0450	1.5	0.75	2.7	4.5	1.42	15	50	4	A
HSXBC4015 0650	1.5	0.75	2.7	4.5	1.42	15	50	6	A
HSXBC4020 0450	2	1	4	6	1.9	15	50	4	A
HSXBC4020 0650	2	1	4	6	1.9	15	50	6	A
HSXBC4025 0650	2.5	1.25	4.5	7.5	2.4	15	50	6	A
HSXBC4030 0460	3	1.5	5.4	9	2.9	15	60	4	A
HSXBC4030 0660	3	1.5	5.4	9	2.9	15	60	6	A
HSXBC4040 0460	4	2	6.4	12	3.9	-	60	4	B
HSXBC4040 0660	4	2	6.4	12	3.9	15	60	6	A
HSXBC4050 0660	5	2.5	9	15	4.85	15	60	6	A
HSXBC4060 0660	6	3	10.8	18	5.85	-	60	6	B
HSXBC4080 0875	8	4	14.4	24	7.8	-	75	8	B
HSXBC4080 08100	8	4	14.4	24	7.8	-	100	8	B
HSXBC4100 1075	10	5	18	30	9.8	-	75	10	B
HSXBC4100 10100	10	5	18	30	9.8	-	100	10	B
HSXBC4120 12100	12	6	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							
		○	○	○	○	○	○						

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	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	45000	2730	1	0.02	40,000	2,275	1	0.02	34,394	1,750	1	0.02
HSXBC4010 0650	45000	2730	1	0.02	40,000	2,275	1	0.02	34,394	1,750	1	0.02
HSXBC4015 0450	30000	2400	1.5	0.04	26,750	2,000	1.5	0.03	23,000	1,590	1.5	0.02
HSXBC4015 0650	30000	2400	1.5	0.04	26,750	2,000	1.5	0.03	23,000	1,590	1.5	0.02
HSXBC4020 0450	22500	2400	2	0.05	20,000	2,000	2	0.04	17,200	1,590	2	0.03
HSXBC4020 0650	22500	2400	2	0.05	20,000	2,000	2	0.04	17,200	1,590	2	0.03
HSXBC4025 0650	18000	2280	2.5	0.06	16,050	1,900	2.5	0.05	13,800	1,490	2.5	0.04
HSXBC4030 0460	15000	2340	3	0.08	13,380	1,950	3	0.06	11,500	1,500	3	0.05
HSXBC4030 0660	15000	2340	3	0.08	13,380	1,950	3	0.06	11,500	1,500	3	0.05
HSXBC4040 0460	11250	2340	4	0.1	10,000	1,950	4	0.08	8,600	1,520	4	0.06
HSXBC4040 0660	11250	2340	4	0.1	10,000	1,950	4	0.08	8,600	1,520	4	0.06
HSXBC4040 0675	11250	2340	4	0.1	10,000	1,950	4	0.08	8,600	1,520	4	0.06
HSXBC4050 0660	9000	2400	5	0.12	8,050	2,000	5	0.1	6,800	1,550	5	0.08
HSXBC4050 0675	9000	2400	5	0.12	8,050	2,000	5	0.1	6,800	1,550	5	0.08
HSXBC4060 0660	7500	2400	6	0.15	6,687	2,000	6	0.12	5,750	1,540	6	0.09
HSXBC4060 0675	7500	2400	6	0.15	6,687	2,000	6	0.12	5,750	1,540	6	0.09
HSXBC4080 0860	5625	2500	8	0.2	5,015	2,080	8	0.16	4,300	1,600	8	0.12
HSXBC4080 0875	5625	2500	8	0.2	5,015	2,080	8	0.16	4,300	1,600	8	0.12
HSXBC4080 08100	5625	2500	8	0.2	5,015	2,080	8	0.16	4,300	1,600	8	0.12
HSXBC4100 1075	4500	2500	10	0.25	4,012	2,080	10	0.2	3,400	1,600	10	0.15
HSXBC4100 10100	4500	2500	10	0.25	4,012	2,080	10	0.2	3,400	1,600	10	0.15
HSXBC4120 12100	3750	2350	12	0.3	3,343	1,950	12	0.24	2,880	1,500	12	0.18

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

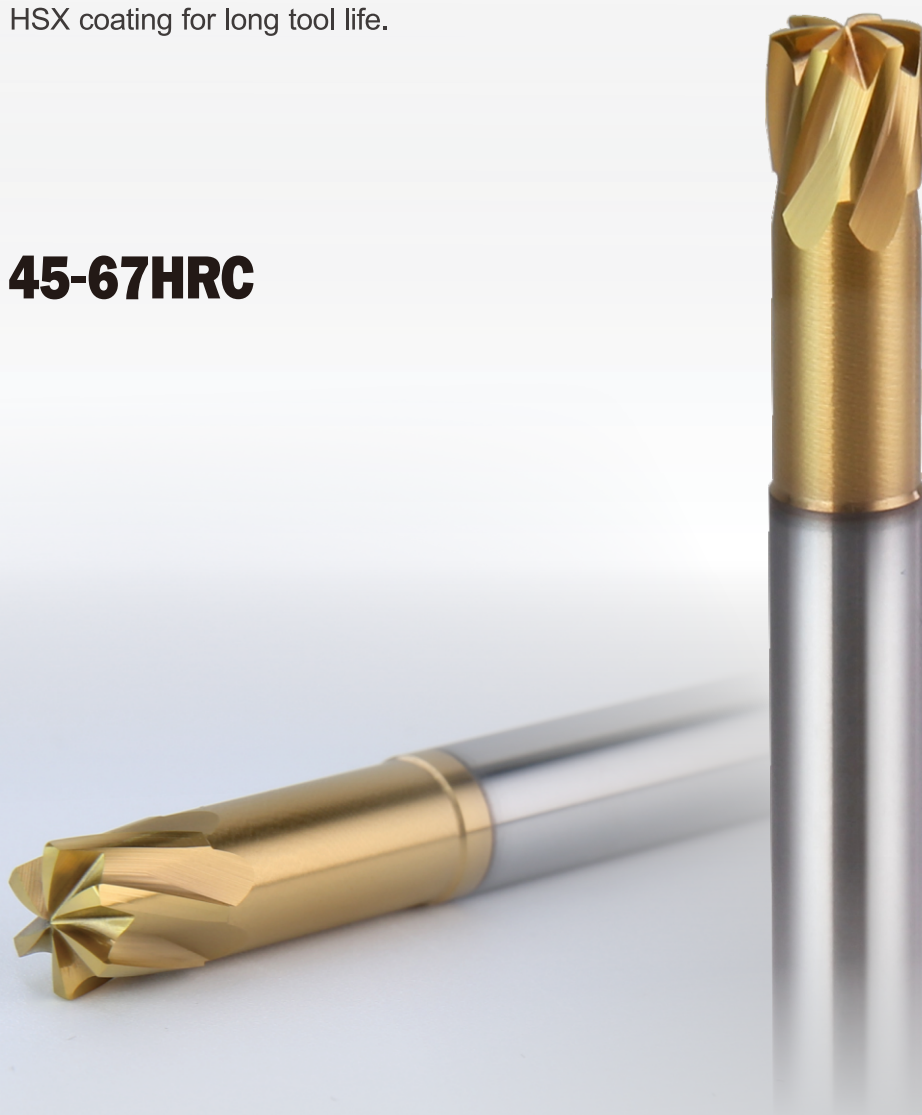
Workpiece	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
	Type No.	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm
HSXBC4010 0450	40000	1500	0.02	0.02	38500	1500	0.02	0.02	38216	1300	0.02	0.02
HSXBC4010 0650	40000	1500	0.02	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

HSX SERIES

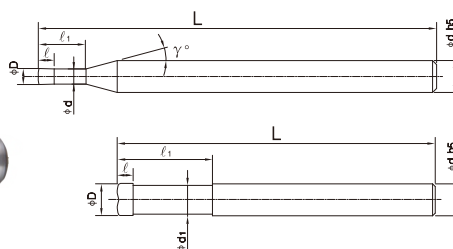
HSXHR-Highlights

- Axial cutting force minimizes vibration.
- Optimized high feed radius for lower cutting resistance.
- Multi-edge design for high efficiency.
- Suitable for 45–67 HRC materials.
- HSX coating for long tool life.

45-67HRC



HSXHR High Efficiency High Feed End Mill



A.

B.



∅ 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	Shank Dia.	Shape
	φD	R	ℓ	ℓ ₁	φd ₁	γ/°	L	φd	
HSXHR4010 0450	1	0.130	1	3	0.95	15	50	4	A
HSXHR4010 0650	1	0.130	1	3	0.95	15	50	6	A
HSXHR4020 0450	2	0.183	2	6	1.9	15	50	4	A
HSXHR4020 0650	2	0.183	2	6	1.9	15	50	6	A
HSXHR4030 0450	3	0.315	3	9	2.9	15	50	4	A
HSXHR4030 0660	3	0.315	3	9	2.9	15	60	6	A
HSXHR6040 0450	4	0.370	4	12	3.9	—	50	4	B
HSXHR6040 0660	4	0.370	4	12	3.9	15	60	6	A
HSXHR6050 0660	5	0.500	5	15	4.85	15	60	6	A
HSXHR6060 0660	6	0.530	6	18	5.85	—	60	6	B
HSXHR6080 0875	8	0.800	8	24	7.8	—	75	8	B
HSXHR6080 08100	8	0.800	8	24	7.8	—	100	8	B
HSXHR6100 1075	10	0.900	10	30	9.8	—	75	10	B
HSXHR6100 10100	10	0.900	10	30	9.8	—	100	10	B
HSXHR6120 12100	12	1.000	12	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

HSXHR High Efficiency High Feed End Mill 6 flutes Z constant Roughing

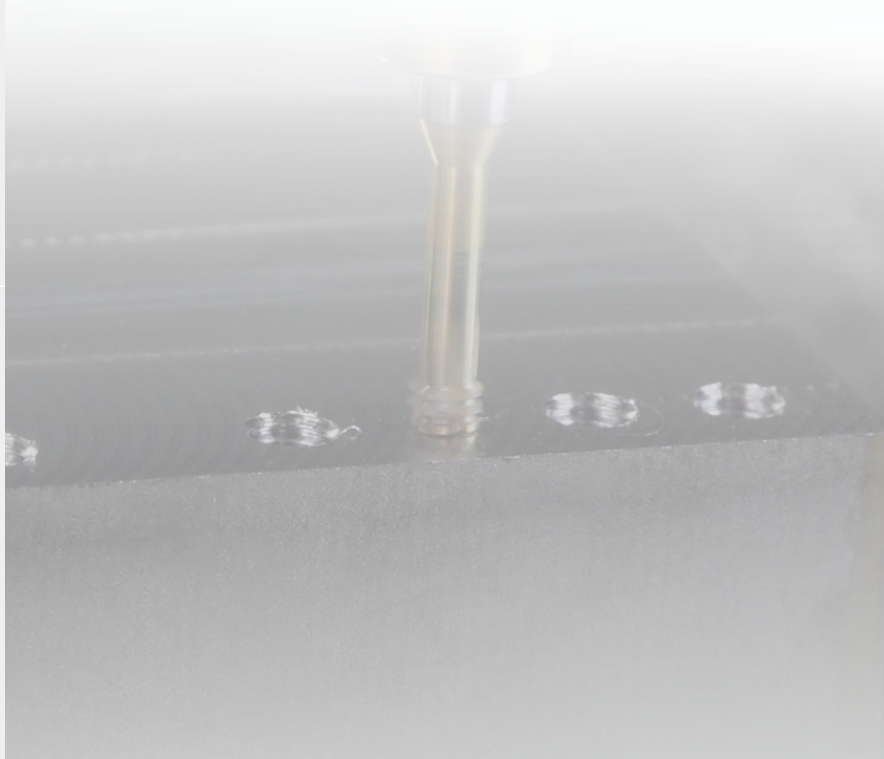
Workpiece Type No.	Hardened Steels (≤52HRC)				Hardened Steels (58-62HRC)				Hardened Steels (63-69HRC)			
	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm	n min ⁻¹	Vf mm/min	ap mm	ae mm
HSXHR4010R0.13 0450	25500	3800	0.04	0.53	19100	1800	0.02	0.53	15900	1070	0.012	0.5
HSXHR4010R0.13 0650	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

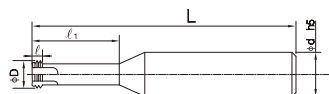
HSXDT Thread Mill – Highlights

- 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 67 HRC.

≤67HRC



HSXDT Thread Milling Cutter



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

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

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

HSXDT Thread Milling Cutter

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

HGX SERIES

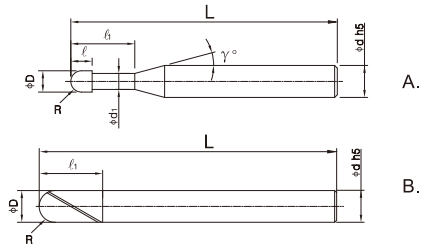
HGXB4 – Highlights

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

≤55HRC



HGXB 4-Flute Ball End Mill



φD	D Tol. [mm]	φD	R Tol. [mm]
D≤3	0~0.010	1<D≤12	±0.005
3<D≤6	0~0.012	D>12	±0.008
6<D≤10	0~0.015		
10<D≤18	0~0.018		

Unit : mm

Type No.	Radius	Length of Cut	Under Neck Length	Dia.	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	
	R	ℓ	ℓ ₁	φD	φd ₁	γ/°	L	φd	
HGXB4010 0450	0.5	0.8	2	1	0.95	12	50	4	A
HGXB4010 0650	0.5	0.8	2	1	0.95	12	50	6	A
HGXB4015 0450	0.75	1.2	4	1.5	1.42	11	50	4	A
HGXB4015 0650	0.75	1.2	4	1.5	1.42	11	50	6	A
HGXB4020 0450	1	2	4	2	1.9	11	50	4	A
HGXB4020 0650	1	2	4	2	1.9	11	50	6	A
HGXB4025 0450	1.25	2	5.0	2.5	2.4	11	50	4	A
HGXB4025 0650	1.25	2	7	2.5	2.4	11	50	6	A
HGXB4030 0450	1.5	2.4	6	3	2.9	11	50	4	A
HGXB4030 0660	1.5	2.4	8	3	2.9	11	60	6	A
HGXB4040 0450	2	3.2	6	4	—	—	50	4	B
HGXB4040 0660	2	3.2	10	4	3.9	11	60	6	A
HGXB4050 0660	2.5	4	12	5	4.85	11	60	6	A
HGXB4060 0660	3	9	—	6	—	—	60	6	B
HGXB4060 0675	3	9	—	6	—	—	75	6	B
HGXB4080 0875	4	12	—	8	—	—	75	8	B
HGXB4080 08100	4	12	—	8	—	—	100	8	B
HGXB4100 1075	5	15	—	10	—	—	75	10	B
HGXB4100 10100	5	15	—	10	—	—	100	10	B
HGXB4120 1275	6	18	—	12	—	—	75	12	B
HGXB4120 12100	6	18	—	12	—	—	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

HGX SERIES

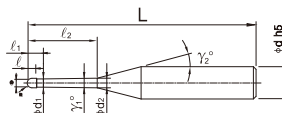
HGXPB2 – Highlights

- 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

$\leq 55\text{HRC}$



HGXPB 2-Flute Taper Neck Ball End Mill



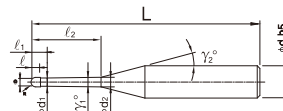
Ø D	D Tol. [mm]
D < 3	0 ~ -0.010
3 < D ≤ 6	0 ~ -0.012
6 < D ≤ 10	0 ~ -0.015
10 < D ≤ 18	0 ~ -0.018

Ø D	R Tol. [mm]
D < 1	±0.003
1 < D ≤ 12	±0.005
D > 12	±0.008

Unit : mm

Type No.	Radius	Under Neck Length	Length of Cut	Dia.	Taper Angle	Neck Taper Angle	Effective length	Tip Dia.	Shank Dia.	Overall Length	Shank Dia.
	R	l_1	l	ϕD	$\gamma_1 / ^\circ$	$\gamma_2 / ^\circ$	l_2	ϕd_1	ϕd_2	L	ϕd
HGXPB2006-2-T0.4 0450	0.3	0.6	0.36	0.6	0.4	12	2	0.56	0.58	50	4
HGXPB2006-4-T0.4 0450	0.3	0.6	0.36	0.6	0.4	12	4	0.56	0.607	50	4
HGXPB2006-6-T0.9 0450	0.3	0.6	0.36	0.6	0.9	12	6	0.56	0.73	50	4
HGXPB2008-4-T0.4 0450	0.4	0.7	0.4	0.8	0.4	12	4	0.76	0.806	50	4
HGXPB2008-6-T0.4 0450	0.4	0.7	0.4	0.8	0.4	12	6	0.76	0.834	50	4
HGXPB2010-6-T0.4 0450	0.5	0.8	0.6	1	0.4	12	6	0.95	1.023	50	4
HGXPB2010-6-T0.4 0650	0.5	0.8	0.6	1	0.4	12	6	0.95	1.023	50	6
HGXPB2010-8-T0.4 0450	0.5	0.8	0.6	1	0.4	12	8	0.95	1.051	50	4
HGXPB2010-8-T0.4 0660	0.5	0.8	0.6	1	0.4	12	8	0.95	1.051	60	6
HGXPB2010-10-T0.4 0450	0.5	0.8	0.6	1	0.4	12	10	0.95	1.078	50	4
HGXPB2010-10-T0.4 0660	0.5	0.8	0.6	1	0.4	12	10	0.95	1.078	60	6
HGXPB2010-15-T0.4 0450	0.5	0.8	0.6	1	0.4	12	15	0.95	1.148	50	4
HGXPB2010-15-T0.4 0660	0.5	0.8	0.6	1	0.4	12	15	0.95	1.148	60	6
HGXPB2010-6-T0.9 0450	0.5	0.8	0.6	1	0.9	12	6	0.95	1.113	50	4
HGXPB2010-6-T0.9 0650	0.5	0.8	0.6	1	0.9	12	6	0.95	1.113	50	6
HGXPB2010-10-T0.9 0450	0.5	0.8	0.6	1	0.9	12	10	0.95	1.239	50	4
HGXPB2010-10-T0.9 0660	0.5	0.8	0.6	1	0.9	12	10	0.95	1.239	60	6
HGXPB2010-15-T0.9 0450	0.5	0.8	0.6	1	0.9	12	15	0.95	1.396	50	4
HGXPB2010-15-T0.9 0660	0.5	0.8	0.6	1	0.9	12	15	0.95	1.396	60	6
HGXPB2010-20-T0.9 0460	0.5	0.8	0.6	1	0.9	12	20	0.95	1.553	60	4
HGXPB2010-20-T0.9 0675	0.5	0.8	0.6	1	0.9	12	20	0.95	1.553	75	6
HGXPB2015-8-T0.4 0660	0.75	1.35	0.9	1.5	0.4	12	8	1.42	1.513	50	6
HGXPB2015-10-T0.4 0660	0.75	1.35	0.9	1.5	0.4	12	10	1.42	1.541	50	6
HGXPB2015-12-T0.4 0660	0.75	1.35	0.9	1.5	0.4	12	12	1.42	1.569	60	6
HGXPB2015-15-T0.9 0660	0.75	1.35	0.9	1.5	0.9	12	15	1.42	1.848	60	6
HGXPB2015-20-T0.9 0675	0.75	1.35	0.9	1.5	0.9	12	20	1.42	2.006	75	6
HGXPB2020-8-T0.4 0650	1	1.7	1.2	2	0.4	12	8	1.9	1.988	50	6
HGXPB2020-12-T0.4 0660	1	1.7	1.2	2	0.4	12	12	1.9	2.044	60	6

HGXPB 2-Flute Taper Neck Ball End Mill



φD	D Tol. [mm]	φD	R Tol. [mm]
D<3	0~-0.010	D<1	±0.003
3<D≤6	0~-0.012	1<D≤12	±0.005
6<D≤10	0~-0.015	D>12	±0.008
10<D≤18	0~-0.018		

Unit : mm

Type No.	Radius	Under Neck Length	Length of Cut	Dia.	Taper Angle	Neck Taper Angle	Effective length	Tip Dia.	Shank Dia.	Overall Length	Shank Dia.
	R	ℓ ₁	ℓ	φD	γ ₁ /°	γ ₂ /°	ℓ ₂	φd ₁	φd ₂	L	φd
HGXPB2020-16-T0.4 0660	1	1.7	1.2	2	0.4	12	16	1.9	2.1	60	6
HGXPB2020-20-T0.4 0675	1	1.7	1.2	2	0.4	12	20	1.9	2.156	75	6
HGXPB2020-12-T0.9 0660	1	1.7	1.2	2	0.9	12	12	1.9	2.224	50	6
HGXPB2020-16-T0.9 0660	1	1.7	1.2	2	0.9	12	16	1.9	2.349	60	6
HGXPB2020-20-T0.9 0675	1	1.7	1.2	2	0.9	12	20	1.9	2.475	75	6
HGXPB2020-25-T0.9 0675	1	1.7	1.2	2	0.9	12	25	1.9	2.631	75	6
HGXPB2020-30-T0.9 0675	1	1.7	1.2	2	0.9	12	30	1.9	2.699	75	6
HGXPB2020-40-T0.9 06100	1	1.7	1.2	2	0.9	12	40	1.9	3.103	100	6
HGXPB2030-8-T0.4 0650	1.5	2.5	1.8	3	0.4	12	8	2.9	2.977	50	6
HGXPB2030-16-T0.4 0660	1.5	2.5	1.8	3	0.4	12	16	2.9	3.088	60	6
HGXPB2030-20-T0.4 0660	1.5	2.5	1.8	3	0.4	12	20	2.9	3.144	60	6
HGXPB2030-16-T0.9 0660	1.5	2.5	1.8	3	0.9	12	15	2.9	3.292	50	6
HGXPB2030-20-T0.9 0660	1.5	2.5	1.8	3	0.9	12	20	2.9	3.45	60	6
HGXPB2030-30-T0.9 0675	1.5	2.5	1.8	3	0.9	12	30	2.9	3.764	75	6
HGXPB2030-40-T0.9 06100	1.5	2.5	1.8	3	0.9	12	40	2.9	4.392	100	6
HGXPB2040-20-T0.9 0875	1.5	2.5	1.8	3	0.4	12	8	2.9	4.277	75	8
HGXPB2040-30-T0.9 08100	2	8	6	4	0.9	12	30	3.9	4.591	100	8
HGXPB2040-40-T0.9 08100	2	8	6	4	0.9	12	40	3.9	4.905	100	8
HGXPB2060-30-T0.9 08100	3	12	9	6	0.9	12	30	5.85	6.416	75	8
HGXPB2060-45-T0.9 08100	3	12	9	6	0.9	12	45	5.85	6.887	100	8

TABLE OF RECOMMENDED MILLING MATERIALS

○ Very suitable ○ Suitable

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

Cutting Parameter

HGXPB 2-FluteTaper 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}	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
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-FluteTaper 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



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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.