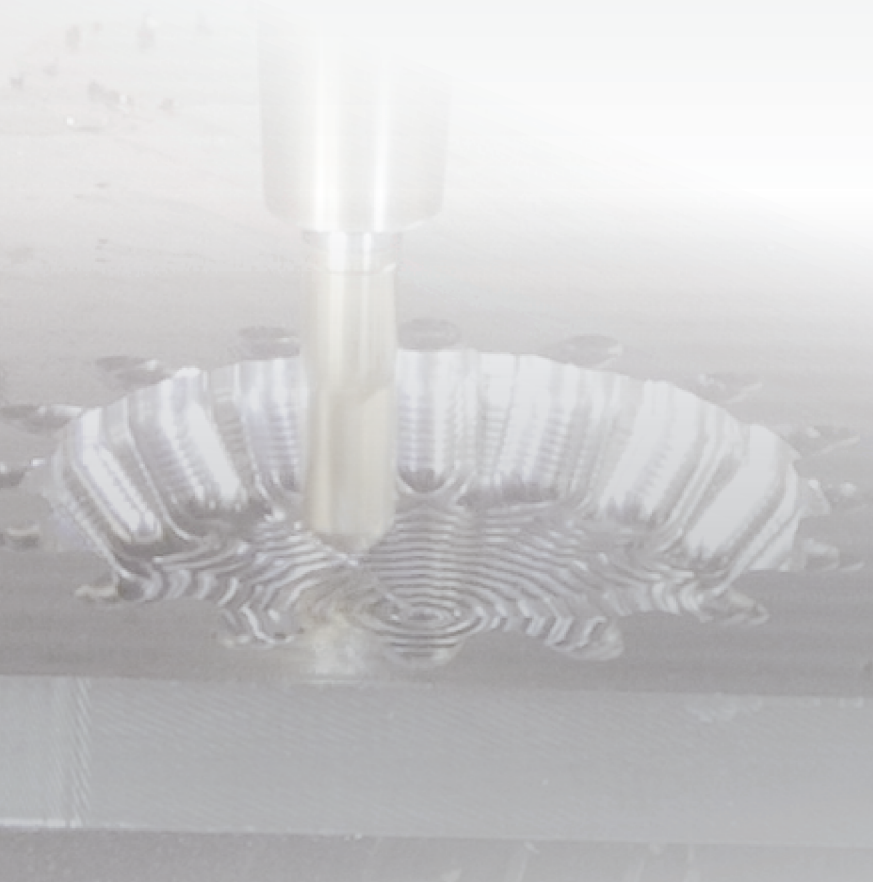
HSX SERIES

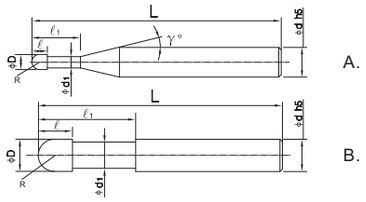
HSXBC-Highlights

- 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



UMG AHX 4 40° Spiral Angle Arc Back Angle ≤70 HRC

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]
1<D≤3	±0.005
4<D≤6	±0.007
8<D≤12	±0.01

Unit : mm

Type No.	Dia.	Radius	Length of Cut	Under Neck Length	Neck Dia.	Neck Taper Angle	Overall Length	Shank Dia.	Type
	ϕD	R	ℓ	ℓ1	ϕd1	γ/°	L	ϕd	
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	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	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

BALL NOSE END MILL
HSX SERIES

Cutting Parameter

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	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