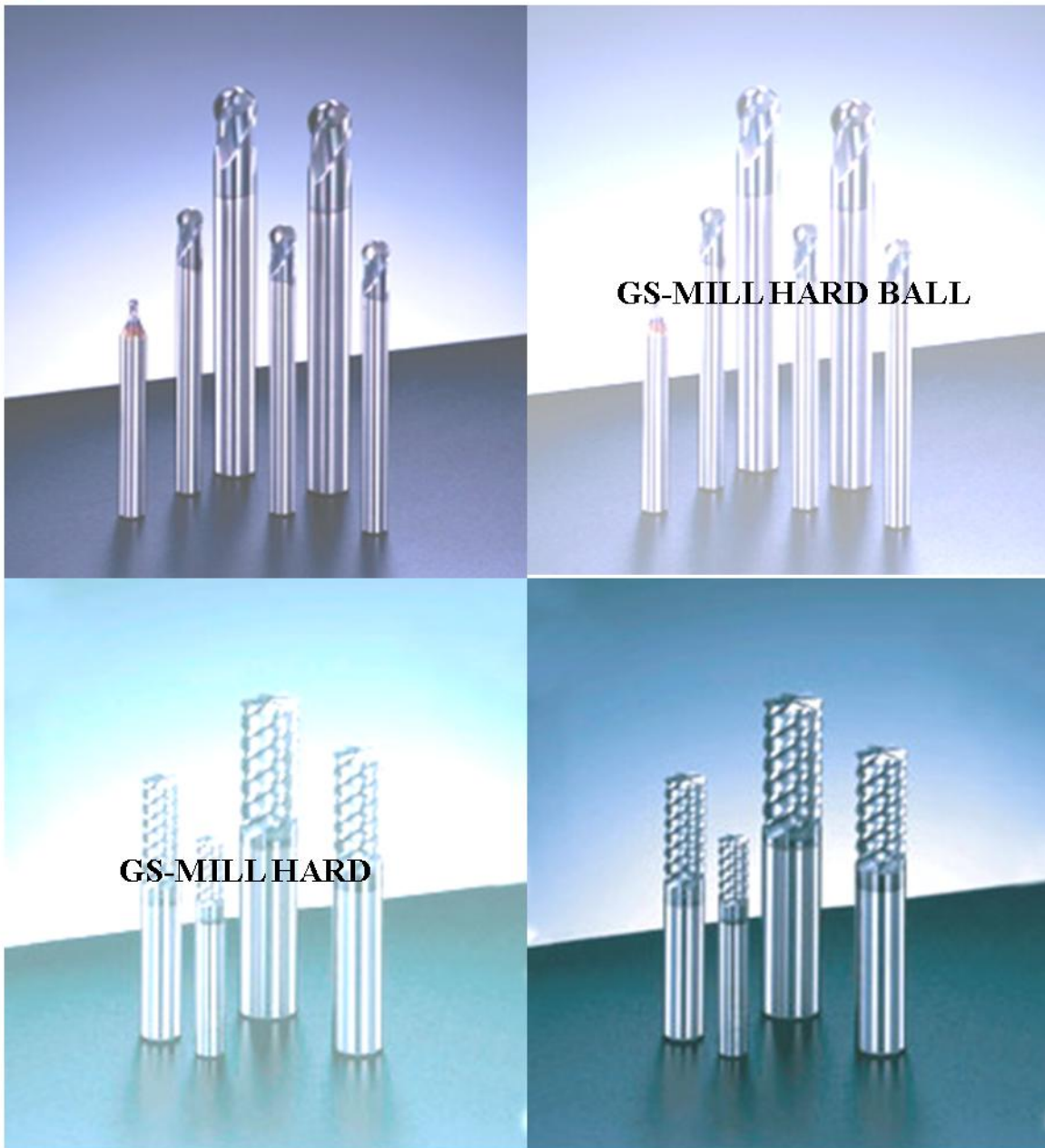


Coated Carbide End mill

GS MILL SERIES

High performance end mill with superior heat and wear resistance suitable for high-speed machining and machining of Hardened materials up to 70 Hrc

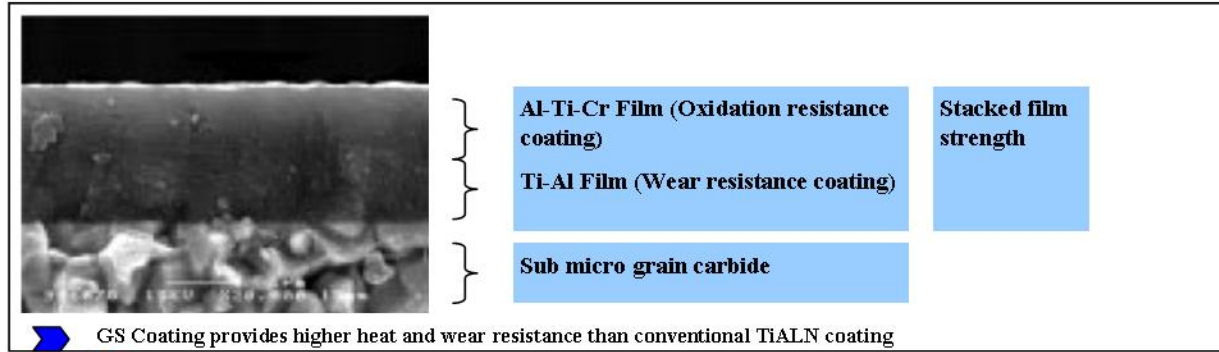
NEW



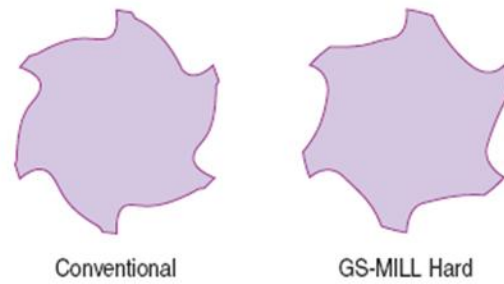
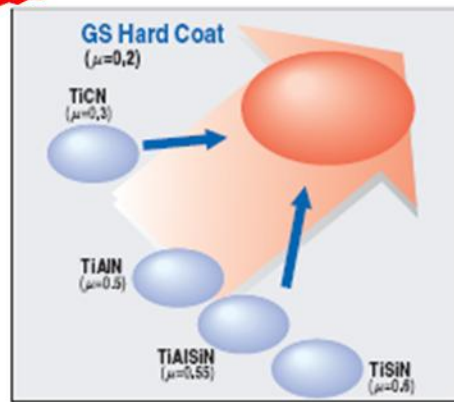
GS MILL SERIES

Features

- Made from Ultra micro grain carbide with New Composite Multi-layer GS Coating (Al-Ti-Cr based coating).
- GS Coating provides superior heat resistance and lubricity during milling operations. It's smooth surface provides efficient chip removal and less cutting resistance.
- Suitable for groove milling even with four flutes
- Improved cutting geometry provides higher chip resistance



NEW Coating



Improved Flute Geometry for High Speed Milling

Work Materials

-Hardened Steel from 45-70 Hrc such as Mold Steel, High Speed Steel, Alloy Steel etc.

Selection Chart ● : Great ○ : Good △ : OK

Side Milling			Grooving			Workpiece Material															
Rough	Semi-Finish	Finish	Rough	Semi-finish	Finish	Profile Milling	Rib Process	Structural Steel	Carbon Steel	Alloy Steel	Die Steel				Stainless Steel		Titanium Alloys	Nickel Alloys	Cast Iron	Aluminum, Copper Alloys	
											30 to 45 Hrc	45 to 55 Hrc	55 to 60 Hrc	60-65 Hrc	300 Series	400 Series					
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

List No. 9399 GS-MILL HARD



This end mill is most suitable for super-high-speed machining of hardened material by "GS Hard Coat".

EDP. NO	Dia. of End mill	Length of Cut	OAL	Shank Dia.	No. OF Flutes
1386186	1/4"	5/8"	2-1/2"	1/4"	6
1386192	3/8"	1"	3"	3/8"	8
1386208	1/2"	1-1/8"	3-1/2"	1/2"	8
1386214	5/8"	1-1/2"	4"	5/8"	10
1386220	3/4"	1-3/4"	4-1/4"	3/4"	10

List No. 9423 GS-MILL HARD BALL

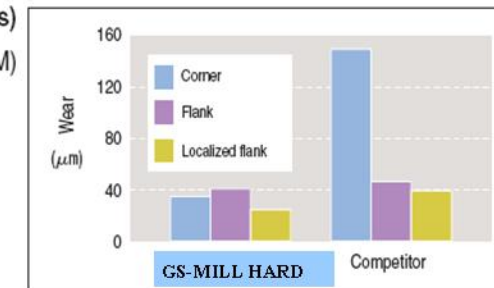
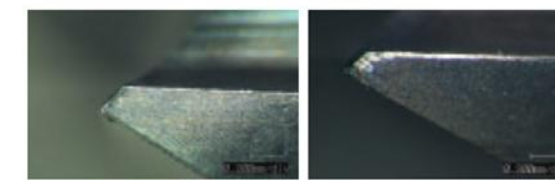


Suitable for high efficiency and high precision finishing of hardened die and mold.

EDP. NO	Dia. of End mill	Length of Cut	OAL	SHANK DIA	No. OF Flutes
1386237	1/32"	3/64"	3"	1/4"	2
1386243	1/16"	3/32"	3"	1/4"	2
1386250	1/8"	3/16"	3"	1/4"	2
1386266	3/16"	9/32"	3"	1/4"	2
1386272	1/4"	3/8"	3"	1/4"	2
1386289	5/16"	15/32"	3-3/16"	5/16"	2
1386295	3/8"	9/16"	3-3/16"	3/8"	2

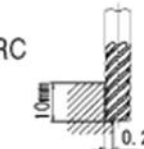
Performance

Ultra-high-speed side milling $\phi 10\text{mm}$ (0.394in)(six flutes)
Reduce wear to 1/3 in cutting speed of 800m/min (2625 SFM)



Milling condition

Tool : $\phi 10$ (0.394in)
Cutting Speed : 800m/min(2625 SFM)(25,000min⁻¹)
Feed : 10,500mm/min(413 IPM)
Work Material : H13(SKD61), 53HRC
Cutting Fluid : Air Blow
Milling Length : 75m(246FEET)

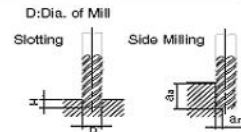


GS Mill Hard List No. 9399

Conventional Condition

Work Material	Carbon Steels, Alloy Steels ~35HRC		Pre-Hardened Steels, Mold Steels 35-45HRC		Hardened Steels, H13 45-55HRC		Hardened Steels, D2 55-60HRC		Hardened Steels, M2 60-65HRC		Hardened Steels, M35, PM 65-70HRC		
	400 - 460 SFM		350 - 420 SFM		280 - 320 SFM		220 - 250 SFM		200 - 220 SFM		140 - 160 SFM		
Milling Conditions	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	
1	20,000	21.3	20,000	15.4	15,600	10.2	12,300	6.3	11,100	5.5	7,800	3.7	
2	19,000	43.3	17,200	30.3	13,400	20.9	10,500	12.6	9,500	10.6	6,700	7.5	
3	15,000	84.6	13,400	60.6	10,400	41.3	8,200	25.6	7,400	21.3	5,200	15.0	
4	11,200	94.5	10,000	68.5	7,800	46.5	6,100	28.7	5,600	23.6	3,900	16.5	
5	9,000	106.3	8,000	76.0	6,200	51.2	4,900	31.9	4,400	26.4	3,100	18.5	
6	7,500	106.3	6,700	76.0	5,200	51.2	4,100	31.9	3,700	26.4	2,600	18.5	
8	5,600	106.3	5,000	76.0	3,900	51.2	3,050	31.9	2,800	26.4	1,950	18.5	
10	4,500	106.3	4,000	76.0	3,100	51.2	2,450	31.9	2,200	26.4	1,550	18.5	
12	3,750	106.3	3,350	76.0	2,600	51.2	2,050	31.9	1,850	26.4	1,300	18.5	
16	2,800	98.4	2,500	70.9	1,950	48.0	1,530	29.9	1,400	24.8	980	17.3	
20	2,250	82.7	2,000	60.6	1,550	41.3	1,230	25.6	1,100	21.3	780	15.0	
Depth of Cut	a _s					1~1.5D							
	a _r	0.1D				0.05D				0.02D			
	H	0.1D				0.05D				~0.05D Max.0.5mm			

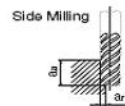
Adjust milling condition when unusual vibration or sound occurs.



High Speed Condition

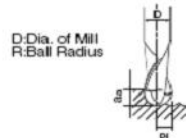
Work Material	Carbon Steels, Alloy Steels ~35HRC		Pre-Hardened Steels, Mold Steels 35-45HRC		Hardened Steels, H13 45-55HRC		Hardened Steels, D2 55-60HRC		Hardened Steels, M2 60-65HRC		
	800 - 1000 SFM		800 - 1000 SFM		800 - 1000 SFM		600 - 740 SFM		400 - 490 SFM		
Milling Conditions	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	
1	48,000	49.2	48,000	49.2	48,000	49.2	48,000	36.6	38,000	27.6	
2	48,000	112.2	48,000	112.2	48,000	112.2	36,000	63.0	24,000	39.4	
3	32,000	192.9	32,000	192.9	32,000	192.9	24,000	107.9	16,000	66.9	
4	24,000	204.7	24,000	204.7	24,000	204.7	18,000	114.2	12,000	70.9	
5	19,200	228.3	19,200	228.3	19,200	228.3	14,300	126.0	9,600	78.7	
6	16,000	228.3	16,000	228.3	16,000	228.3	12,000	126.0	8,000	78.7	
8	12,000	228.3	12,000	228.3	12,000	228.3	9,000	126.0	6,000	78.7	
10	9,600	228.3	9,600	228.3	9,600	228.3	7,200	126.0	4,800	78.7	
12	8,000	228.3	8,000	228.3	8,000	228.3	6,000	126.0	4,000	78.7	
16	6,000	212.6	6,000	212.6	6,000	212.6	4,500	118.1	3,000	74.8	
20	4,800	181.1	4,800	181.1	4,800	181.1	3,600	101.6	2,400	63.0	
Depth of Cut	a _s					1~1.5D					
	a _r	0.1D		0.05D		0.02D		0.01D			

- 1) When using low RPM machines, use the maximum RPM and adjust the feed rate.
- 2) Recommend dry machining when high speed milling.
- 3) Adjust milling condition when unusual vibration or sound occurs.



GS Mill Hard Ball List No. 9423

Work Material	Mold Steels, Pre-Hardened Steels (40 - 50 HRC)		Hardened Steels (50 - 55 HRC)		Hardened Steels (55 - 60 HRC)		Hardened Steels (60 - 65 HRC)		
	750 - 780 SFM		751 - 780 SFM		550 - 580 SFM		400 - 430 SFM		
Milling Conditions	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	RPM	Feed (IPM)	
R0.2	50,000	19.7	50,000	19.7	50,000	19.7	50,000	19.7	
R0.3	50,000	31.5	50,000	31.5	50,000	31.5	50,000	27.6	
R0.5	50,000	55.1	50,000	55.1	50,000	51.2	42,000	39.4	
R0.75	50,000	78.7	50,000	78.7	37,300	55.1	28,000	39.4	
R1	38,100	82.7	38,100	82.7	28,000	55.1	21,000	39.4	
R1.25	30,500	82.7	30,500	82.7	22,400	55.1	16,800	39.4	
R1.5	25,400	82.7	25,400	82.7	18,700	55.1	14,000	39.4	
R2	19,100	82.7	19,100	82.7	14,000	55.1	10,500	39.4	
R2.5	15,300	82.7	15,300	82.7	11,200	55.1	8,400	39.4	
R3	12,700	82.7	12,700	82.7	9,300	55.1	7,000	39.4	
R4	9,500	82.7	9,500	82.7	7,000	55.1	5,300	39.4	
R5	7,600	82.7	7,600	82.7	5,600	55.1	4,200	39.4	
R6	6,400	82.7	6,400	82.7	4,700	55.1	3,500	39.4	
Depth of Cut	a _s	0.08D				0.05D			
	Pf	0.25D				0.15D			



- 1) Recommended oil mist process.
- 2) When depth of the cut is reduced, it can increase feed rate more.
- 3) When using machine with low RPM, use maximum speed and adjust the feed rate relatively.
- 4) Adjust milling condition when unusual vibration or sound occurs.

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