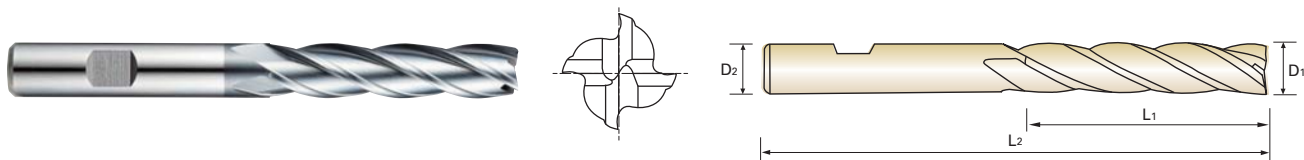


4 FLUTE LONG LENGTH (Center Cut)



P. 19

GYG02 SERIES

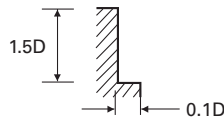
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GYG02020	2.0	6	10	54
GYG02030	3.0	6	12	56
GYG02040	4.0	6	19	63
GYG02050	5.0	6	24	68
GYG02060	6.0	6	24	68
GYG02070	7.0	8	30	80
GYG02080	8.0	8	38	88
GYG02090	9.0	10	38	88
GYG02100	10.0	10	45	95
GYG02120	12.0	12	53	110
GYG02140	14.0	12	53	110
GYG02160	16.0	16	63	123
GYG02180	18.0	16	63	123
GYG02200	20.0	20	75	141
GYG02220	22.0	20	75	141
GYG02250	25.0	25	90	166

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

GYF96, GYG02 SERIES
Only One Coated PM60, 4 FLUTE (Center Cut)

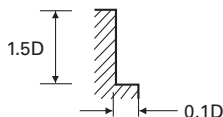
Material	P															
	Structural Steels Carbon Steels				Structural Steels Carbon Steels Cast Irons				Carbon Steels Alloy Steels Tool Steels				Prehardened Steels Alloy Steels Tool Steels			
Hardness					~ HRc20				HRc20 ~ HRc30				HRc30 ~ HRc35			
Strength	~ 500N/mm ²				500 ~ 800N/mm ²				800 ~ 1000N/mm ²				1000 ~ 1100N/mm ²			
Diameter	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz
2.0	11040	350	69	0.008	10080	290	63	0.007	7320	205	46	0.007	4920	150	31	0.008
3.0	7920	490	75	0.015	7200	420	68	0.015	5280	300	50	0.014	3240	215	31	0.017
4.0	6360	575	80	0.023	5640	480	71	0.021	4320	360	54	0.021	2760	240	35	0.022
5.0	5280	610	83	0.029	4800	505	75	0.026	3480	385	55	0.028	2400	265	38	0.028
6.0	4680	650	88	0.035	4320	540	81	0.031	3120	395	59	0.032	2160	275	41	0.032
8.0	3720	685	93	0.046	3120	575	78	0.046	2400	445	60	0.046	1680	290	42	0.043
10.0	2760	755	87	0.068	2520	635	79	0.063	1920	455	60	0.059	1200	320	38	0.067
12.0	2400	685	90	0.071	2160	575	81	0.067	1680	445	63	0.066	1070	290	40	0.068
14.0	2160	660	95	0.076	1920	550	84	0.072	1320	420	58	0.080	950	275	42	0.072
16.0	1920	610	97	0.079	1680	515	84	0.077	1200	410	60	0.085	820	265	41	0.081
18.0	1800	550	102	0.076	1500	480	85	0.080	1070	370	61	0.086	760	235	43	0.077
20.0	1500	530	94	0.088	1260	445	79	0.088	940	330	59	0.088	640	210	40	0.082
22.0	1260	490	87	0.097	1140	385	79	0.084	820	305	57	0.093	560	190	39	0.085
25.0	1200	445	94	0.093	1010	365	79	0.090	760	275	60	0.090	500	180	39	0.090



The FEED, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = mm/min.
Vc = m/min.
Fz = mm/tooth

Material	P				M			
	Alloy Steels Tool Steels				Stainless Steels			
Hardness	HRc35 ~ HRc40							
Strength	1100 ~ 1300N/mm ²							
Diameter	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz
2.0	3960	100	25	0.006	4360	110	27	0.006
3.0	2880	150	27	0.013	3170	165	30	0.013
4.0	2400	180	30	0.019	2640	200	33	0.019
5.0	2040	190	32	0.023	2240	210	35	0.023
6.0	1740	215	33	0.031	1910	235	36	0.031
8.0	1380	220	35	0.040	1520	240	38	0.039
10.0	1070	240	34	0.056	1180	265	37	0.056
12.0	860	220	32	0.064	950	240	36	0.063
14.0	760	205	33	0.067	840	225	37	0.067
16.0	660	200	33	0.076	730	220	37	0.075
18.0	600	180	34	0.075	660	200	37	0.076
20.0	530	170	33	0.080	580	185	36	0.080
22.0	480	155	33	0.081	530	170	37	0.080
25.0	430	150	34	0.087	470	165	37	0.088



RPM = rev./min.
FEED = mm/min.
Vc = m/min.
Fz = mm/tooth

- A. The ONLY ONE material is based on powder metallurgy that ensures **High Toughness** performance which is one of the advantages of Cobalt HSS.
- B. The ONLY ONE has **Exceptional Wear Resistance** which is another advantage of the micro-grain carbide tools.
- C. The ONLY ONE has **very strong toughness which can bring out better performances also on machines with unstable conditions such as vibration and irregular composition of work materials.**
- D. The ONLY ONE performs better without causing chipping than Normal coated carbide end mills under the same carbide cutting conditions.
- E. Excellent performance for Stainless Steels
Pre-hardened Steels, Carbon steels,
Alloy steels and Cast Iron.

Note Limited performance can occur under the rigid clamping, high speed machining and/or high hardness materials above HRc45.



YG PRODUCT PHILOSOPHY

- A. For whom did we develop 'ONLY ONE'?
 - For every CNC machining center & Conventional milling machine, **for users who pursue to Increase productivity.**
 - **'Only One' can replace all of both Coated Solid Carbide & HSS Co8 End Mills.**
- B. It can replace;
 - **Both Coated and uncoated Solid Carbide End Mills.**
 - **Better Tool Life & Cheaper Price than Coated Solid Carbide End Mills.**
 - All of **HSS Co8(M42) End Mills.**
- C. High Technologies applied;
 - YG-1's advanced "Y" coating technology applied, which is an AlCrN based coating
 - 4 flutes and roughers are with multiple helix (from Ø3mm to Ø25mm)

Parameters	HSS Co8	Only One (Coated PM60)	Coated Normal Carbide
Cutting Speed	(↓)	(↑)	(↑)
Toughness		(↑)	(↑)
Price	(↓)(↓) Low	(↓) Medium	(↑) High

- A. The ONLY ONE material is based on powder metallurgy that ensures **High Toughness** performance which is one of the advantages of Cobalt HSS.
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Note Limited performance can occur under the rigid clamping, high speed machining and/or high hardness materials above HRc45.

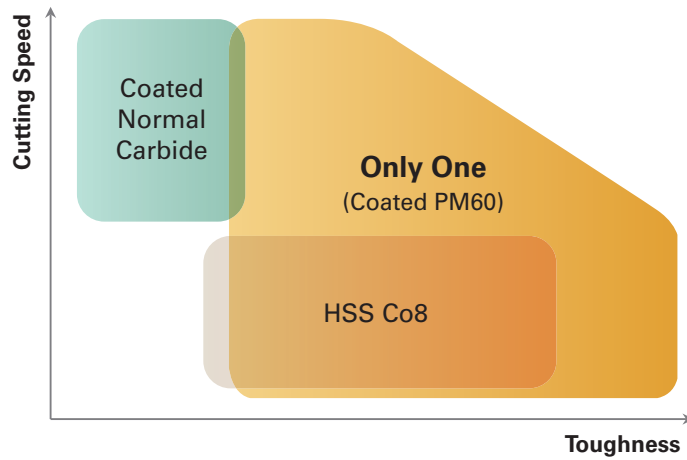


YG PRODUCT PHILOSOPHY

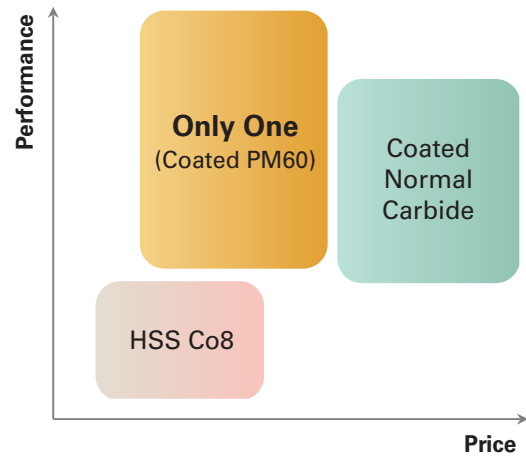
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Parameters	HSS Co8	Only One (Coated PM60)	Coated Normal Carbide
Cutting Speed	(↓)	(↑)	(↑)
Toughness		(↑)	(↑)
Price	(↓)(↓) Low	(↓) Medium	(↑) High

To protect chipping problems under the unstable machining conditions with vibration,




Higher Toughness than HSS Co8,
Cutting Speed (Vc) is as high as Coated Normal Carbide.



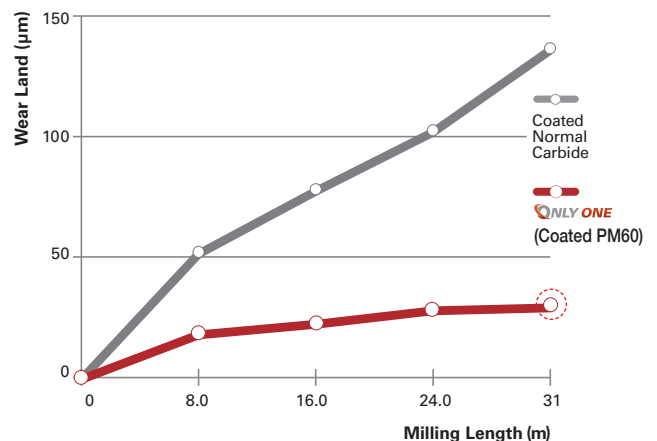
Better performance than HSS Co8,
Better price than Coated Normal Carbide.

YG CASE STUDY 1


• 4 Flute Square End Mill, S45C – Carbide Cutting Condition

Result	Only One Coated PM60 > Coated Normal Carbide	
Tool List	Only One Coated PM60	Coated Normal Carbide
Size	Ø10xØ10x22x72	Ø10xØ10x22x70
Work Material	- JIS : S45C - DIN : C45	- KS : SM45C - AISI : 1045
RPM	2750 rev/min.	
Feed	520 mm/rev.	
Milling Method	Down & Side Cutting 	
Milling Depth	Axial : 3 mm	Radial : 1 mm
Coolant	Wet Cut	
Machine	Machining Center	

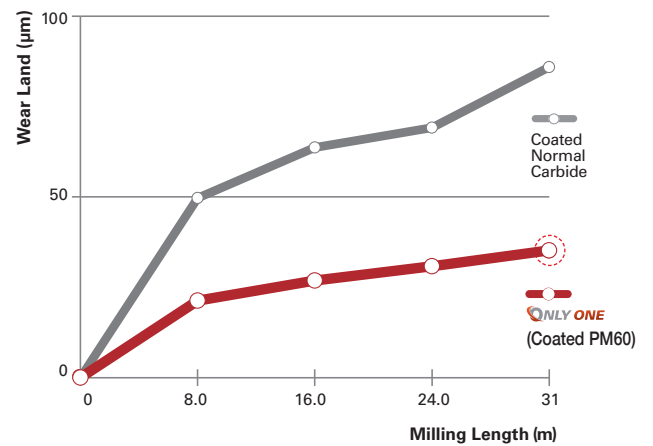
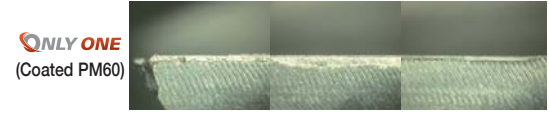
Cutting Edges Condition



• 4 Flute Square End Mill, S45C(HRc30) – Carbide Cutting Condition

Result	Only One Coated PM60 > Coated Normal Carbide	
Tool List	Only One Coated PM60	Coated Normal Carbide
Size	Ø10xØ10x22x72	Ø10xØ10x22x70
Work Material	- JIS : S45C - DIN : C45	- KS : SM45C - AISI : 1045
RPM	2750 rev/min.	
Feed	520 mm/rev.	
Milling Method	Down & Side Cutting 	
Milling Depth	Axial : 10 mm	Radial : 1 mm
Coolant	Wet Cut	
Machine	Machining Center	

Cutting Edges Condition



ICON GUIDE



Powder Metallurgy HSS



No. of Flute



Helix Angle



Tolerance of Ball Radius



Type of Shank













Type of Periphery



Cutting condition of tool see the page 000

◎:Excellent ○:Good

ITEM	MODEL	DESCRIPTION	SIZE		P			M	N		S	PAGE
					Carbon Steels	Alloy Steels	Hardened Steels	Stainless Steels	Copper	Aluminum	Titanium	
			Min.	Max.	~HB225	HB225~352	HRC30~40	HRC40~45				
GYF99		PM60, 2 FLUTE SHORT LENGTH (Center Cut)	D1.0	D25.0	◎	◎	○		◎	○	◎	6
GYG01		PM60, 3 FLUTE SHORT LENGTH (Center Cut)	D1.0	D25.0	◎	◎	○		◎	○	◎	7
GYF96		PM60, 4 FLUTE SHORT LENGTH (Center Cut)	D1.0	D25.0	◎	◎	○		◎	○	◎	8
GYG52		PM60, 4 FLUTE MULTIPLE HELIX SHORT LENGTH (Center Cut)	D3.0	D25.0	◎	◎	○		◎	○	◎	9
GYG02		PM60, 4 FLUTE LONG LENGTH (Center Cut)	D2.0	D25.0	◎	◎	○		◎	○	◎	10
GYF97		PM60, 2 FLUTE SHORT LENGTH BALL NOSE	R0.5	R12.5	◎	◎	○		◎	○	◎	11
GYF94		PM60, MULTI FLUTE SHORT LENGTH ROUGHING - FINE (Center Cut)	D6.0	D25.0	◎	◎	○		◎	○	◎	12
GYF98		PM60, MULTI FLUTE LONG LENGTH ROUGHING - FINE (Center Cut)	D6.0	D25.0	◎	◎	○		◎	○	◎	13
GYG03		PM60, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE (Center Cut)	D6.0	D25.0	◎	◎	○		◎	○	◎	14
GYF95		PM60, MULTI FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS ROUGHING - FINE (Center Cut)	D6.0	D25.0	◎	◎	○		◎	○	◎	15