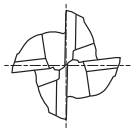
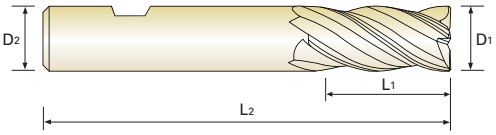
4 FLUTE MULTIPLE HELIX SHORT LENGTH (Center Cut)





PM 60 | 4 | M-Helix | FLAT

P. 20

GYG52 SERIES

Unit : mm

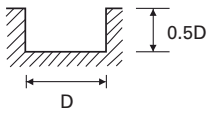
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GYG52030	3.0	6	8	52
GYG52040	4.0	6	11	55
GYG52050	5.0	6	13	57
GYG52060	6.0	6	13	57
GYG52070	7.0	8	16	66
GYG52080	8.0	8	19	69
GYG52090	9.0	10	19	69
GYG52100	10.0	10	22	72
GYG52120	12.0	12	26	83
GYG52140	14.0	12	26	83
GYG52160	16.0	16	32	92
GYG52180	18.0	16	32	92
GYG52200	20.0	20	38	104
GYG52220	22.0	20	38	104
GYG52250	25.0	25	45	121

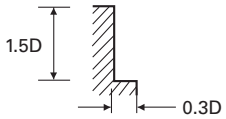
Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

GYG52 SERIES

Only One Coated PM60, 4 FLUTE MULTIPLE HELIX SHORT (Center Cut)

Material	P												M			
	Structural Steels Carbon Steels Cast Irons				Carbon Steels Alloy Steels Tool Steels				Prehardened Steels Alloy Steels Tool Steels				Stainless Steels 300 Series			
Hardness	~ HRc20				HRc20 ~ HRc30				HRc30 ~ HRc35							
Strength	~ 800N/㎟				800 ~ 1000N/㎟				1000 ~ 1300N/㎟							
Diameter	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz	RPM	FEED	Vc	Fz
3.0	7410	155	70	0.005	6740	140	64	0.005	4720	95	44	0.005	5090	100	48	0.005
4.0	5560	180	70	0.008	5050	165	63	0.008	3540	115	44	0.008	3800	125	48	0.008
5.0	4440	205	70	0.012	4040	185	63	0.011	2830	130	44	0.011	3060	155	48	0.013
6.0	3710	240	70	0.016	3370	220	64	0.016	2360	155	44	0.016	2550	180	48	0.018
8.0	2780	310	70	0.028	2530	280	64	0.028	1770	195	44	0.028	1910	220	48	0.029
10.0	2450	380	77	0.039	2230	345	70	0.039	1560	240	49	0.038	1530	295	48	0.048
12.0	2050	385	77	0.047	1860	350	70	0.047	1300	245	49	0.047	1270	285	48	0.056
14.0	1750	340	77	0.049	1590	310	70	0.049	1110	220	49	0.050	1090	260	48	0.060
16.0	1530	325	77	0.053	1390	295	70	0.053	980	205	49	0.052	960	240	48	0.063
18.0	1360	320	77	0.059	1240	295	70	0.059	870	205	49	0.059	850	240	48	0.071
20.0	1220	320	77	0.065	1110	290	70	0.065	780	205	49	0.066	760	235	48	0.077
25.0	980	245	77	0.063	890	225	70	0.063	620	160	49	0.065	610	190	48	0.078





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

PRODUCT INTRODUCTION

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.

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

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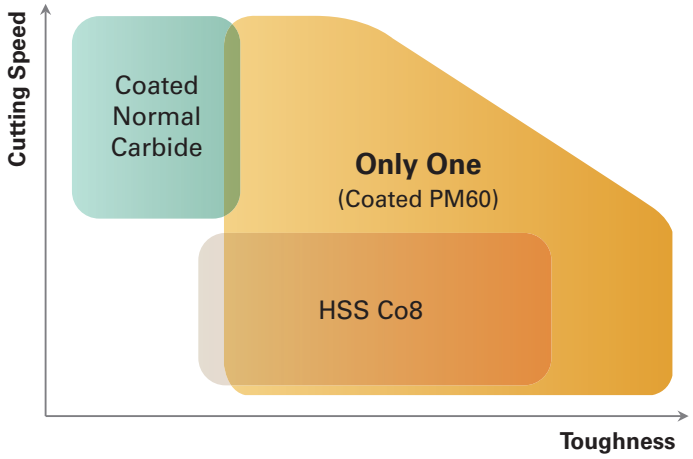
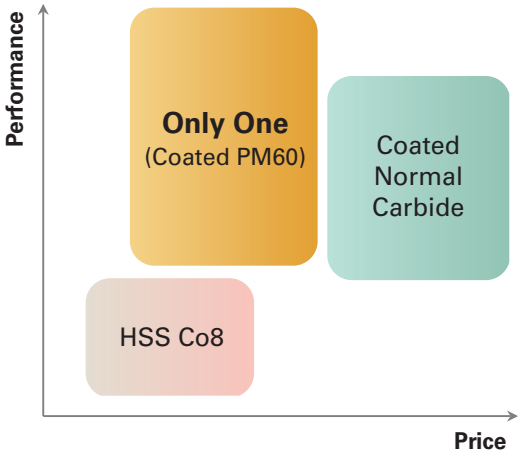
POSITIONING MAP

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.

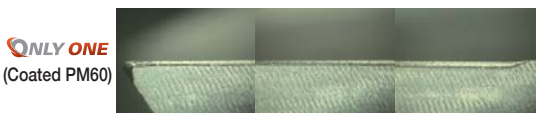
Better performance than HSS Co8,
Better price than Coated Normal Carbide.

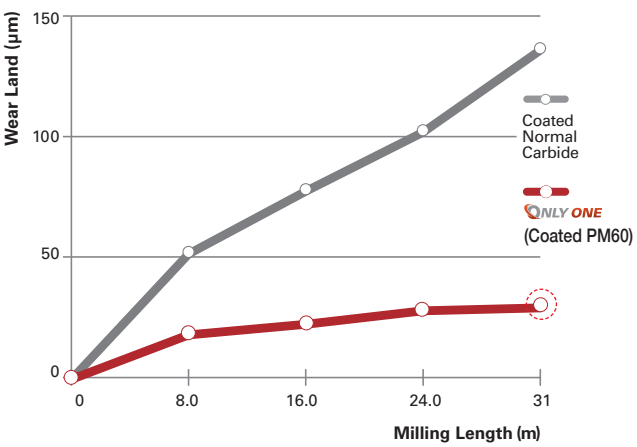
CASE STUDY 1

- **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



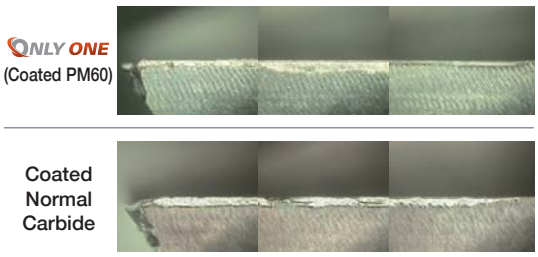


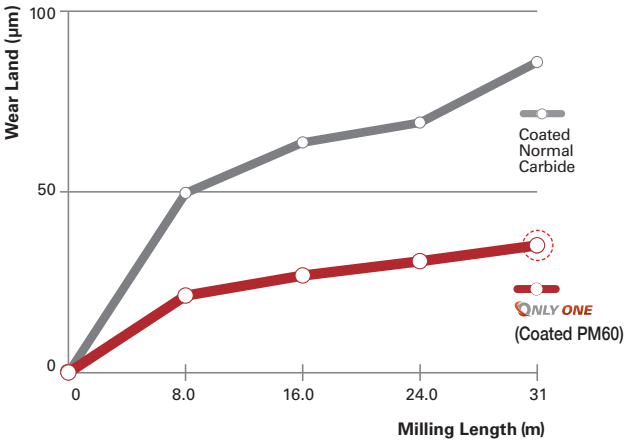
CASE STUDY 2

- **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

PM 60	Powder Metallurgy HSS
2 3 4	No. of Flute
M-Helix 30°	Helix Angle
R ±0.02	Tolerance of Ball Radius
FLAT	Type of Shank
FINE COARSE	Type of Periphery
	Cutting condition of tool see the page 000

◎:Excellent ○:Good

ITEM	MODEL	DESCRIPTION	SIZE		P				M	N			S	PAGE
			Min.	Max.	Carbon Steels ~HB225	Alloy Steels HB225~352	Prehardened Steels HRc30~40	Hardened Steels HRc40~45	Stainless Steels	Copper	Cast Iron	Aluminum	Titanium	
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	MULTIPLE HELIX 	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	MULTIPLE HELIX 	PM60, MULTI FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS ROUGHING - FINE (Center Cut)	D6.0	D25.0	◎	◎	○		◎	○	◎			15