YE-EV25 EUROPE

YG EV MILLS

Economical High Performance Solid Carbide End Mills

- Chatter free design for High-Speed Milling
- Short plain and from Flat adapted shank to save material
- Short 1xD Length-of-Cut to cover most applications and to maintain stability

EV MILLS

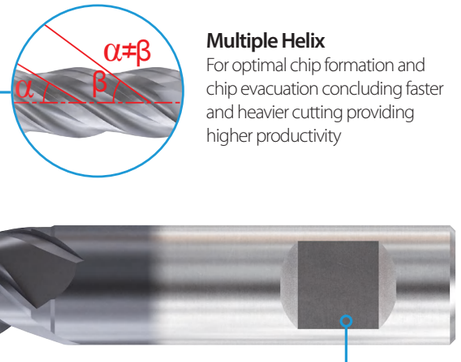
- Extremely stable due to short design addressing also the growing market of mill-turn machines
- Environmentally friendly design minimizes raw material and grinding costs
- Soft cut to support mill-turn machines as well driven units in lathe tooling
- Radius transition created between floor and wall (according DIN) with undersize end mills increases durability of machined shafts
- Instead of regrinding use a new EV MILL with 100% performance

PRODUCT FEATURES & LINE UP

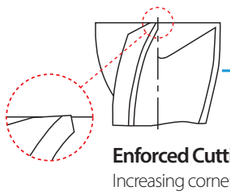
	2 Flute	Ball Nose	Ø 2mm – Ø 12mm	Ensures smooth chip evacuation and easy programming
		Square		
	3 Flute	Ball Nose	Ø 1.8mm – Ø 11.7mm	Low cutting forces and undersize corner radius diameters for key-way cutting
		Square		
		Corner Radius		
	4 Flute	Ball Nose	Ø 2mm – Ø 12mm	Highest Metal Removal Rates and Tool life
		Square		

PRODUCT GEOMETRY

Unequal Index
Unique geometry applied to reduce vibration and also to achieve excellent chip evacuation for better surface finish



Multiple Helix
For optimal chip formation and chip evacuation concluding faster and heavier cutting providing higher productivity



Enforced Cutting Edge
Increasing corner stability at square end mills to enable higher tool life

Ultra Fine Grain Carbide
Premium carbide substrate achieving exceptional wear resistance

Adapted Flat and Straight Shank
Common clamping adaptors are applicable, only hydraulic chucks require use of a sleeve to avoid vibrations

CASE STUDY

TEST I Slotting

Ø10mm 3 Flute End Mill

Cutting Condition

Tool	Ø10mm
Work Material	- DIN: C45 (1.0503) - JIS: S45C - AISI: 1045
RPM (rev./min.)	6,400 rev./min.
Feed (mm/min.)	1,150 mm/min.
Milling Depth (mm)	10.0mm (1xD) (Axial Depth) 10.0mm (1xD) (Radial Depth)
Coolant	Water Soluble
Machine	Machining Center

Wear after 21.4m in cut

YG 

Competitor 1 

Competitor 2 

TEST II SIDE MILLING

Ø10mm 3 Flute End Mill

Cutting Condition

Tool	Ø10mm
Work Material	- DIN: X2CrNiMo17-12-2 (1.4404) - JIS: SUS316L - AISI: 316L
RPM (rev./min.)	3,500 rev./min.
Feed (mm/min.)	630 mm/min.
Milling Depth (mm)	10.0mm (1xD) (Axial Depth) 5.0mm (0.5xD) (Radial Depth)
Coolant	Water Soluble
Machine	Machining Center

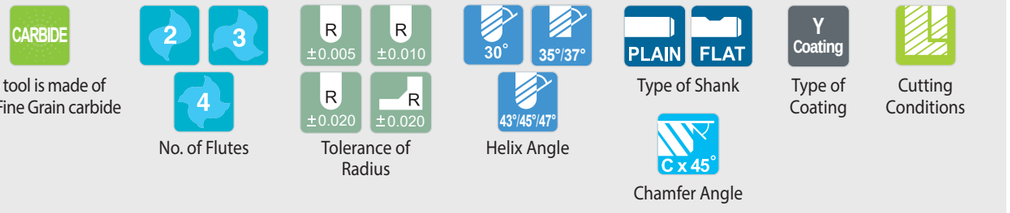
Wear after 8.4m in cut

YG (After Cutting 8.4m) 

Competitor 1 (Broken At 3.2m) 

Competitor 2 (After Cutting 8.4m) 

GUIDE TO ICONS



SELECTION GUIDE

SOLID CARBIDE END MILL
EV MILLS

Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p.13-24

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GMK57	GMK62
		SERIES					GMK57	GMK62
		FLUTE					2	3
		HELIX ANGLE					30°	43°/45°/47° (MULTIPLE HELIX)
		CUTTING EDGE SHAPE					BALL NOSE	BALL NOSE
		SIZE MIN					R1.0	R1.0
		SIZE MAX					R6.0	R6.0
		PAGE					6	7
							Y-Coating	Y-Coating
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & tempered	300	32	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & tempered	275	29	◎	◎
	8			Quenched & tempered	300	32	◎	◎
	9			Quenched & tempered	350	38	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎
	11.1			Quenched & Tempered	325	35	◎	◎
	11.2			Quenched & Tempered	409	44	◎	
	12		Ferritic / Martensitic	Annealed	200	15		○
M	13	Stainless steel	Martensitic	Quenched & Tempered	240	23		○
	14.1			Austenitic	180	10		○
	14.2			PH Stainless steel	180	10		○
K	15	Grey cast iron	Pearlitic / ferritic		180	10		○
	16		Pearlitic (Martensitic)		260	26		○
	17	Nodular cast iron	Ferritic		160	3		○
	18		Pearlitic		250	25		○
	19	Malleable cast iron	Ferritic		130			○
	20		Pearlitic		230	21		○
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29.1	Non Metallic Materials	Duroplastic					
	29.2		GRAPHITE					
	29.3		CFRP, GFRP					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		○
	32			Cured	280	30		○
	33		Ni or Co Based	Annealed	250	25		○
	34			Cured	350	38		○
	35			Cast	320	34		○
	36	Titanium Alloys	Pure Titanium		400 Rm			○
	37		Alpha + Beta Alloys	Hardened	1050 Rm			○
H	38.1	Hardened steel		Hardened	421-469	45-49		
	38.2			Hardened	481-560	50-55		
	39.1			Hardened	577-654	56-60		
	39.2			Hardened	670-739	61-65		
	39.3			Hardened		66-70		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

GMK65	GMK60 GMK61	GMK55 GMK56	GMK58 GMK59	GMK63 GMK64	ISO
4	3	2	3	4	
35°/37° (MULTIPLE HELIX)	43°/45°/47° (MULTIPLE HELIX)	30°	43°/45°/47° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	
BALL NOSE	CORNER RADIUS	SQUARE	SQUARE	SQUARE	
R1.0	D1.8	D2.0	D2.0	D2.0	
R6.0	D11.7	D12.0	D12.0	D12.0	
8	9	10	11	12	
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	
◎	◎	◎	◎	◎	1
◎	◎	◎	◎	◎	2
◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	4
◎	◎	◎	◎	◎	5
◎	◎	◎	◎	◎	6
◎	◎	◎	◎	◎	7
◎	◎	◎	◎	◎	8
◎	◎	◎	◎	◎	9
◎	◎	◎	◎	◎	10
◎	◎	◎	◎	◎	11.1
		◎			11.2
○	○		○	○	12
○	○		○	○	13
○	○	○	○	○	14.1
○	○		○	○	14.2
○	○		○	○	15
○	○		○	○	16
○	○		○	○	17
○	○		○	○	18
○	○		○	○	19
○	○		○	○	20
					21
					22
					23
					24
					25
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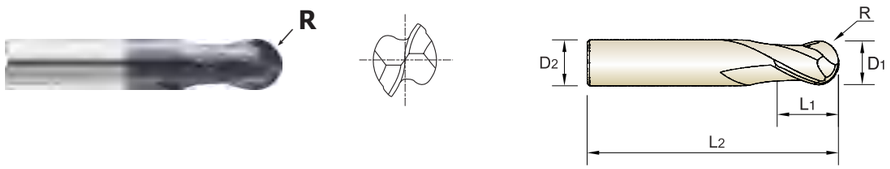
					27
					28
					29.1
					29.2
					29.3
					30
○	○		○	○	31
○	○		○	○	32
○	○		○	○	33
○	○		○	○	34
○	○		○	○	35
○	○		○	○	36
○	○		○	○	37
					38.1
					38.2
					39.1
					39.2
					39.3
					40
					41

SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE

SERIES
PLAIN SHANK **GMK57**

▶ For precision finishing applications providing higher accuracy than 3&4 Flute Ball Nose tools
▶ Wide flutes allow for smooth chip evacuation
▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.13

R1~R3 R4~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK57020	R1.0	**2.0**	6	4.5	38
GMK57030	R1.5	**3.0**	6	5.5	38
GMK57040	R2.0	**4.0**	6	7.5	43
GMK57050	R2.5	**5.0**	6	9	43
GMK57060	R3.0	**6.0**	6	9	43
GMK57080	R4.0	**8.0**	8	12	50
GMK57100	R5.0	**10.0**	10	14	55
GMK57120	R6.0	**12.0**	12	16.5	60

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0~-0.012	h5
over R3	±0.010	0~-0.015	

◎ : Excellent ○ : Good

ISO	P																						M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel											Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20										
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21										
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230										
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎																				

ISO	N										S							H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																								

SOLID CARBIDE END MILLS

3 FLUTE BALL NOSE

SERIES
PLAIN SHANK **GMK62**

▶ For roughing and semi-finishing applications having one edge to center
▶ Smooth cutting action, unequal flute geometry and multiple helix eliminate vibrations
▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes

CARBIDE | 3 | 43°/45°/47° | R ±0.020 | PLAIN | Y Coating | p.14

D=Ø2, 45° HELIX

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK62020	R1.0	**2.0**	6	4.5	38
GMK62030	R1.5	**3.0**	6	5.5	38
GMK62040	R2.0	**4.0**	6	7.5	38
GMK62050	R2.5	**5.0**	6	9	38
GMK62060	R3.0	**6.0**	6	9	38
GMK62080	R4.0	**8.0**	8	12	43
GMK62100	R5.0	**10.0**	10	14	50
GMK62120	R6.0	**12.0**	12	16.5	55

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.020	0~-0.020	h5

◎ : Excellent ○ : Good

ISO	P																						M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel											Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20										
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21										
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230										
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○										

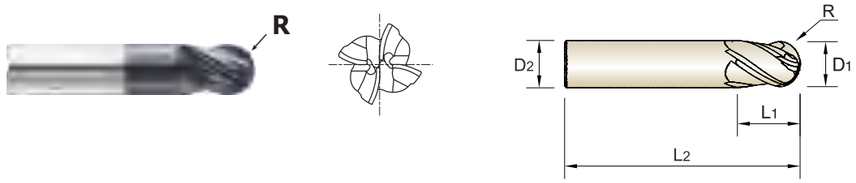
ISO	N										S							H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended											○	○	○	○	○	○	○							

SOLID CARBIDE END MILLS

4 FLUTE BALL NOSE

SERIES
PLAIN SHANK **GMK65**

- ▶ For roughing and finishing applications having two edges to center
- ▶ Unequal flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance in Steels under HRc40 and other materials
- ▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes



CARBIDE | 4 | 35°/37° | R ±0.020 | PLAIN | Y Coating | p.16

D=Ø2, 37° HELIX

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK65020	R1.0	**2.0**	6	4.5	38
GMK65030	R1.5	**3.0**	6	5.5	38
GMK65040	R2.0	**4.0**	6	7.5	38
GMK65050	R2.5	**5.0**	6	9	38
GMK65060	R3.0	**6.0**	6	9	38
GMK65080	R4.0	**8.0**	8	12	43
GMK65100	R5.0	**10.0**	10	14	50
GMK65120	R6.0	**12.0**	12	16.5	55

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.020	0~-0.020	h5

◎ : Excellent ○ : Good

ISO	P																						M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel													Stainless steel				Grey cast iron			Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20										
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21										
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230										
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○										

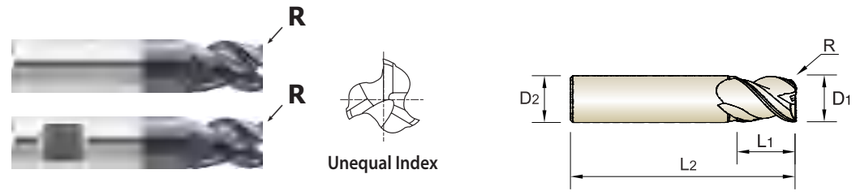
ISO	N										S							H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel						Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended											○	○	○	○	○	○	○							

SOLID CARBIDE END MILLS

3 FLUTE CORNER RADIUS for KEYWAY MILLING

SERIES
PLAIN SHANK **GMK60**
FLAT SHANK **GMK61**

- ▶ Special undersize design for key-way slots to comply with DIN 6885 while ramping, slotting and finishing with one tool
- ▶ Smooth cutting action, unequal flute geometry and multiple helix eliminate vibrations
- ▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes



CARBIDE | 3 | 43°/45°/47° | R ±0.020 | PLAIN | FLAT | Y Coating | p.18

D<Ø3, 45° HELIX

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMK60018	**GMK61018**	R0.12	**1.8**	6	4.5	38
GMK60028	**GMK61028**	R0.12	**2.8**	6	5.5	38
GMK60038	**GMK61038**	R0.2	**3.8**	6	7.5	38
GMK60048	**GMK61048**	R0.2	**4.8**	6	9	38
GMK600575	**GMK610575**	R0.2	**5.75**	6	9	38
GMK600775	**GMK610775**	R0.2	**7.75**	8	12	43
GMK60097	**GMK61097**	R0.33	**9.7**	10	14	50
GMK60117	**GMK61117**	R0.33	**11.7**	12	16.5	55

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.020	0~-0.020	h5

◎ : Excellent ○ : Good

ISO	P																						M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel													Stainless steel				Grey cast iron			Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20										
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21										
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230										
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○										

ISO	N										S							H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel						Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended											○	○	○	○	○	○	○							

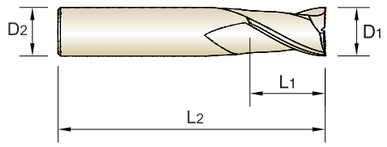
SERIES

PLAIN SHANK **GMK55**

FLAT SHANK **GMK56**

SOLID CARBIDE END MILLS
2 FLUTE SQUARE

▶ Wide flutes allow for smooth chip evacuation with difficult to machine materials
▶ Short overhang and lower cutting forces for applications on Mill-Turn machines or with Driven Tooling at Lathes



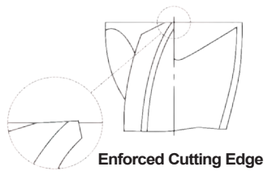
CARBIDE | 2 | 30° | PLAIN | FLAT | Y Coating | p.20

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D_1	D_2	L_1	L_2
GMK55020	**GMK56020**	**2.0**	6	4.5	38
GMK55030	**GMK56030**	**3.0**	6	5.5	38
GMK55040	**GMK56040**	**4.0**	6	7.5	43
GMK55050	**GMK56050**	**5.0**	6	9	43
GMK55060	**GMK56060**	**6.0**	6	9	43
GMK55080	**GMK56080**	**8.0**	8	12	50
GMK55100	**GMK56100**	**10.0**	10	14	55
GMK55120	**GMK56120**	**12.0**	12	16.5	60

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~-0.012	h5
over Ø6	0~-0.015	



◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			○							

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																								

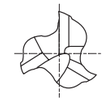
SERIES

PLAIN SHANK **GMK58**

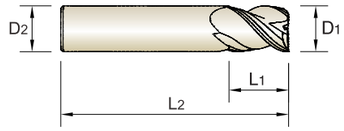
FLAT SHANK **GMK59**

SOLID CARBIDE END MILLS
3 FLUTE SQUARE

▶ For roughing and finishing applications having one edge to center
▶ Unequal flute geometry and multiple helix eliminate vibrations
▶ Excellent performance in Steels under HRc40 and other materials
▶ Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes



Unequal Index



CARBIDE | 3 | 43°/45°/47° | PLAIN | FLAT | Y Coating | p.21

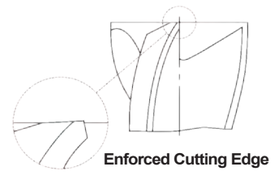
D=Ø2, 45° HELIX

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D_1	D_2	L_1	L_2
GMK58020	**GMK59020**	**2.0**	6	4.5	38
GMK58030	**GMK59030**	**3.0**	6	5.5	38
GMK58040	**GMK59040**	**4.0**	6	7.5	38
GMK58050	**GMK59050**	**5.0**	6	9	38
GMK58060	**GMK59060**	**6.0**	6	9	38
GMK58080	**GMK59080**	**8.0**	8	12	43
GMK58100	**GMK59100**	**10.0**	10	14	50
GMK58120	**GMK59120**	**12.0**	12	16.5	55

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.020	h5



◎ : Excellent ○ : Good

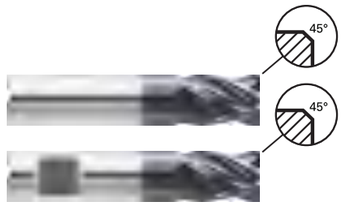
ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	14.2	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○

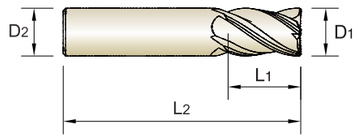
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended											○	○	○	○	○	○	○							

SERIES
PLAIN SHANK **GMK63**
FLAT SHANK **GMK64**

SOLID CARBIDE END MILLS
4 FLUTE SQUARE

- For roughing and finishing applications having two edges to center
- Unequal flute geometry and multiple helix eliminate vibrations
- Excellent performance in Steels under HRc40 and other materials
- Short overhang for applications on Mill-Turn machines or with Driven Tooling at Lathes





CARBIDE | 4 | 35°/37° | PLAIN | FLAT | C x 45° | Y Coating | p.23

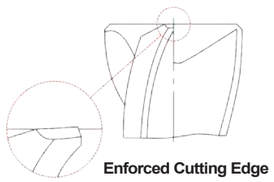
D=Ø2, 37° HELIX

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer Size
PLAIN	FLAT	D_1	D_2	L_1	L_2	
GMK63020	**GMK64020**	**2.0**	6	4.5	38	0.1
GMK63030	**GMK64030**	**3.0**	6	5.5	38	0.1
GMK63040	**GMK64040**	**4.0**	6	7.5	38	0.15
GMK63050	**GMK64050**	**5.0**	6	9	38	0.15
GMK63060	**GMK64060**	**6.0**	6	9	38	0.2
GMK63080	**GMK64080**	**8.0**	8	12	43	0.2
GMK63100	**GMK64100**	**10.0**	10	14	50	0.3
GMK63120	**GMK64120**	**12.0**	12	16.5	55	0.35

▶ Note: Use of hydraulic chucks requires reducer sleeves to ensure stable clamping

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.020	h5

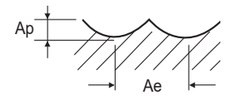


Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P													M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	14.2	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			○	○	○	○	○	○	○	○	○	○

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys			Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended											○	○	○	○	○	○	○							



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

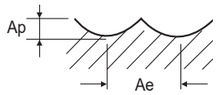
GMK57 SERIES

2 FLUTE BALL NOSE

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	2		0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	3		0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	4		0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	5		0.2D	0.1D	Vc	65	91	103	112	126	141	155	170
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	10350	9660	8200	7130	6680	5610	4930	4510
					FEED	540	500	570	640	800	1010	1180	1350
	6		0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	7	Low alloy steel	0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	8		0.2D	0.1D	Vc	65	91	103	112	126	141	155	170
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	10350	9660	8200	7130	6680	5610	4930	4510
					FEED	540	500	570	640	800	1010	1180	1350
	9		0.2D	0.1D	Vc	65	91	103	112	126	141	155	170
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	10350	9660	8200	7130	6680	5610	4930	4510
					FEED	540	500	570	640	800	1010	1180	1350
	10		0.2D	0.1D	Vc	87	119	128	140	155	175	194	213
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	13850	12630	10190	8910	8220	6960	6180	5650
					FEED	720	660	710	800	990	1250	1480	1700
	11.1	High alloyed steel, and tool steel	0.1D	0.1D	Vc	65	91	103	112	126	141	155	170
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	10350	9660	8200	7130	6680	5610	4930	4510
					FEED	540	500	570	640	800	1010	1180	1350
	11.2		0.1D	0.1D	Vc	28	42	51	56	58	60	62	64
					fz	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150
					RPM	4460	4460	4060	3570	3080	2390	1970	1700
					FEED	230	230	280	320	370	430	470	510

GMK62 SERIES

3 FLUTE BALL NOSE



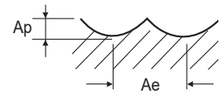
Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	2		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	3		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	4		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	5		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1187	899	728	647	719	809	701	629
	6	Low alloy steel	0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	7		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	1702	1289	1044	928	1031	1160	1006	902
	8		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1187	899	728	647	719	809	701	629
	9		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1187	899	728	647	719	809	701	629
	10	High alloyed steel, and tool steel	0.5D	0.8D	Vc	68	68	68	68	68	68	68	68
					fz	0.014	0.017	0.019	0.021	0.028	0.042	0.045	0.049
					RPM	10823	7215	5411	4329	3608	2706	2165	1804
					FEED	455	368	308	273	303	341	292	265
	11.1		0.5D	0.8D	Vc	68	68	68	68	68	68	68	68
					fz	0.014	0.017	0.019	0.021	0.028	0.042	0.045	0.049
					RPM	10823	7215	5411	4329	3608	2706	2165	1804
					FEED	455	368	308	273	303	341	292	265
M	12	Stainless steel	0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.013	0.015	0.015	0.025	0.03	0.04	0.045	0.05
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	478	368	276	368	368	368	331	306
	13		0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.013	0.015	0.015	0.025	0.03	0.04	0.045	0.05
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	478	368	276	368	368	368	331	306
	14.1		0.5D	0.8D	Vc	85	85	85	85	85	85	85	85
					fz	0.015	0.02	0.02	0.025	0.041	0.045	0.05	0.055
					RPM	13528	9019	6764	5411	4509	3382	2706	2255
					FEED	609	541	406	406	555	457	406	372
	14.2		0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.015	0.02	0.02	0.025	0.041	0.045	0.05	0.055
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	551	490	368	368	502	414	368	337

▶ NEXT PAGE

GMK62 SERIES

3 FLUTE BALL NOSE



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

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
K	15	Grey cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
	16		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
	17	Nodular cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
	18		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
	19	Malleable cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
	20		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	1591	1174	938	841	947	1051	920	824
S	31	Heat Resistant Super Alloys	0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.01	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	100	94	70	68	94	78	70	63
	32		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.01	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	100	94	70	68	94	78	70	63
	33		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.01	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	100	94	70	68	94	78	70	63
	34		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.01	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	100	94	70	68	94	78	70	63
	35		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.01	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	100	94	70	68	94	78	70	63
	36	Titanium Alloys	0.5D	0.3D	Vc	47	47	47	47	47	47	47	47
					fz	0.014	0.018	0.018	0.022	0.037	0.040	0.045	0.049
					RPM	7480	4987	3740	2992	2493	1870	1496	1247
					FEED	314	269	202	197	277	224	202	183
	37		0.5D	0.3D	Vc	47	47	47	47	47	47	47	47
					fz	0.014	0.018	0.018	0.022	0.037	0.040	0.045	0.049
					RPM	7480	4987	3740	2992	2493	1870	1496	1247
					FEED	314	269	202	197	277	224	202	183

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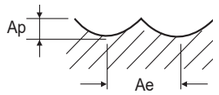
4 FLUTE BALL NOSE



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

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	2		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	3		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	4		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	5		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1583	1199	971	863	959	1079	935	839
	6	Low alloy steel	0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	7		0.5D	0.8D	Vc	162	162	162	162	162	162	162	162
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	25783	17189	12892	10313	8594	6446	5157	4297
					FEED	2269	1719	1392	1238	1375	1547	1341	1203
	8		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1583	1199	971	863	959	1079	935	839
	9		0.5D	0.8D	Vc	113	113	113	113	113	113	113	113
					fz	0.022	0.025	0.027	0.030	0.040	0.060	0.065	0.070
					RPM	17985	11990	8992	7194	5995	4496	3597	2997
					FEED	1583	1199	971	863	959	1079	935	839
	10	High alloyed steel, and tool steel	0.5D	0.8D	Vc	68	68	68	68	68	68	68	68
					fz	0.014	0.017	0.019	0.021	0.028	0.042	0.045	0.049
					RPM	10823	7215	5411	4329	3608	2706	2165	1804
					FEED	606	491	411	364	404	455	390	354
	11.1		0.5D	0.8D	Vc	68	68	68	68	68	68	68	68
					fz	0.014	0.017	0.019	0.021	0.028	0.042	0.045	0.049
					RPM	10823	7215	5411	4329	3608	2706	2165	1804
					FEED	606	491	411	364	404	455	390	354
M	12	Stainless steel	0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.013	0.015	0.015	0.025	0.03	0.04	0.045	0.05
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	637	490	368	490	490	490	441	408
	13		0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.013	0.015	0.015	0.025	0.03	0.04	0.045	0.05
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	637	490	368	490	490	490	441	408
	14.1		0.5D	0.8D	Vc	85	85	85	85	85	85	85	85
					fz	0.015	0.02	0.02	0.025	0.041	0.045	0.05	0.055
					RPM	13528	9019	6764	5411	4509	3382	2706	2255
					FEED	812	722	541	541	740	609	541	496
	14.2		0.5D	0.8D	Vc	77	77	77	77	77	77	77	77
					fz	0.015	0.02	0.02	0.025	0.041	0.045	0.05	0.055
					RPM	12255	8170	6127	4902	4085	3064	2451	2042
					FEED	735	654	490	490	670	551	490	449

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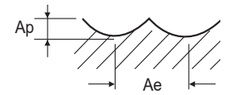
GMK65 SERIES

4 FLUTE BALL NOSE

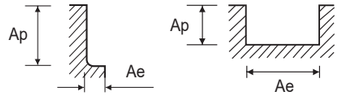


Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
K	15	Grey cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
	16		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
	17	Nodular cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
	18		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
	19	Malleable cast iron	0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
	20		0.5D	0.8D	Vc	119	119	119	119	119	119	119	119
					fz	0.028	0.031	0.033	0.037	0.05	0.074	0.081	0.087
					RPM	18939	12626	9470	7576	6313	4735	3788	3157
					FEED	2121	1566	1250	1121	1263	1402	1227	1098
S	31	Heat Resistant Super Alloys	0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.010	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	134	125	94	91	125	104	94	85
	32		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.010	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	134	125	94	91	125	104	94	85
	33		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.010	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	134	125	94	91	125	104	94	85
	34		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.010	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	134	125	94	91	125	104	94	85
	35		0.2D	0.3D	Vc	21	21	21	21	21	21	21	21
					fz	0.010	0.014	0.014	0.017	0.028	0.031	0.035	0.038
					RPM	3342	2228	1671	1337	1114	836	668	557
					FEED	134	125	94	91	125	104	94	85
	36	Titanium Alloys	0.5D	0.3D	Vc	47	47	47	47	47	47	47	47
					fz	0.014	0.018	0.018	0.022	0.037	0.040	0.045	0.049
					RPM	7480	4987	3740	2992	2493	1870	1496	1247
					FEED	419	359	269	263	369	299	269	244
	37		0.5D	0.3D	Vc	47	47	47	47	47	47	47	47
					fz	0.014	0.018	0.018	0.022	0.037	0.040	0.045	0.049
					RPM	7480	4987	3740	2992	2493	1870	1496	1247
					FEED	419	359	269	263	369	299	269	244

GMK60, GMK61 SERIES

3 FLUTE CORNER RADIUS - SIDE CUTTING & SLOTTING



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

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Parameter	Diameter (Ø) 1.8	2.8	3.8	4.8	5.75	7.75	9.7	11.7
P	1	Non-alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	2		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	3		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	4		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	5		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	6	Low alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	7		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	26880	17280	12732	10080	8414	6243	5513	4571
							FEED	242	259	306	333	404	506	628	645
	8		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	9		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	18922	12164	8963	7096	5923	4395	3839	3183
							FEED	170	182	215	234	284	356	438	449
	10	High alloyed steel, and tool steel	0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	11318	7276	5361	4244	3543	2629	2297	1904
							FEED	34	65	96	102	117	150	186	183
	11.1		0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	11318	7276	5361	4244	3543	2629	2297	1904
							FEED	34	65	96	102	117	150	186	183
M	12	Stainless steel	0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	26172	16825	12397	9815	8193	6079	4857	4026
							FEED	157	202	223	265	320	401	495	471
	13		0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	26172	16825	12397	9815	8193	6079	4857	4026
							FEED	157	202	223	265	320	401	495	471
	14.1		0.5D	1.0D	1.0D	0.8D	Vc	106	106	106	106	106	106	106	106
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	18745	12050	8879	7029	5868	4354	3478	2884
							FEED	169	181	213	274	317	366	501	476
	14.2		0.5D	1.0D	1.0D	0.8D	Vc	95	95	95	95	95	95	95	95
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	16800	10800	7958	6300	5259	3902	3117	2585
							FEED	151	162	191	246	284	328	449	427

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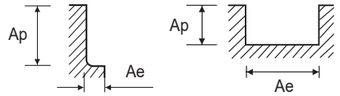
GMK60, GMK61 SERIES

3 FLUTE CORNER RADIUS - SIDE CUTTING & SLOTTING

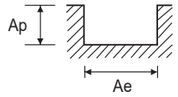


Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Parameter	Diameter (Ø) 1.8	2.8	3.8	4.8	5.75	7.75	9.7	11.7
K	15	Grey cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	16		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	17	Nodular cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	18		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	19	Malleable cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
	20		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	19806	12732	9382	7427	6200	4600	4036	3346
							FEED	238	229	281	312	372	469	581	582
S	31	Heat Resistant Super Alloys	0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	32		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	33		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	34		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	35		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4598	2956	2178	1724	1439	1068	853	707
							FEED	41	44	46	41	52	61	84	81
	36	Titanium Alloys	0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	10257	6594	4858	3846	3211	2382	1903	1578
							FEED	62	79	102	127	154	179	240	237
	37		0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	10257	6594	4858	3846	3211	2382	1903	1578
							FEED	62	79	102	127	154	179	240	237

GMK55, GMK56 SERIES

2 FLUTE SQUARE - SLOTTING

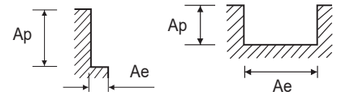


Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Slotting Ae	Slotting Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	2		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	3		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	4		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	5		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	47	50	56	57	61	61	61	61
					fz	0.008	0.013	0.019	0.025	0.033	0.040	0.040	0.039
					RPM	7480	5310	4460	3630	3240	2430	1940	1620
					FEED	120	140	170	180	210	190	160	130
	6		1.0D	up to Ø3: 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	7	Low alloy steel	1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	8		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	47	50	56	57	61	61	61	61
					fz	0.008	0.013	0.019	0.025	0.033	0.040	0.040	0.039
					RPM	7480	5310	4460	3630	3240	2430	1940	1620
					FEED	120	140	170	180	210	190	160	130
	9		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	47	50	56	57	61	61	61	61
					fz	0.008	0.013	0.019	0.025	0.033	0.040	0.040	0.039
					RPM	7480	5310	4460	3630	3240	2430	1940	1620
					FEED	120	140	170	180	210	190	160	130
	10	High alloyed steel, and tool steel	1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	71	81	92	96	102	103	99	100
					fz	0.008	0.012	0.020	0.025	0.031	0.045	0.051	0.051
					RPM	11300	8590	7320	6110	5410	4100	3150	2650
					FEED	180	210	290	310	340	370	320	270
	11.1		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	47	50	56	57	61	61	61	61
					fz	0.008	0.013	0.019	0.025	0.033	0.040	0.040	0.039
					RPM	7480	5310	4460	3630	3240	2430	1940	1620
					FEED	120	140	170	180	210	190	160	130
	11.2		1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	47	50	56	57	61	61	61	61
					fz	0.008	0.013	0.019	0.025	0.033	0.040	0.040	0.039
					RPM	7480	5310	4460	3630	3240	2430	1940	1620
					FEED	120	140	170	180	210	190	160	130
M	14.1	Stainless steel	1.0D	up to Ø3 : 0.2D over Ø3 : 0.5D	Vc	39	43	48	49	52	51	51	49
					fz	0.007	0.013	0.019	0.025	0.032	0.043	0.048	0.048
					RPM	6210	4560	3820	3120	2760	2030	1620	1300
					FEED	90	120	150	160	180	170	160	120

GMK58, GMK59 SERIES

3 FLUTE SQUARE - SIDE CUTTING & SLOTTING



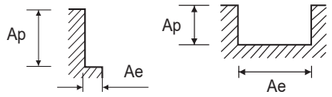
Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	2		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	3		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	4		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	5		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	153	170	204	225	272	345	425	438
	6		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	7	Low alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	218	242	290	319	387	490	610	628
	8		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	153	170	204	225	272	345	425	438
	9		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	153	170	204	225	272	345	425	438
	10	High alloyed steel, and tool steel	0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	10186	6791	5093	4074	3395	2546	2228	1857
							FEED	31	61	92	98	112	145	180	178
	11.1		0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	10186	6791	5093	4074	3395	2546	2228	1857
							FEED	31	61	92	98	112	145	180	178
M	12	Stainless steel	0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	23555	15703	11777	9422	7852	5889	4711	3926
							FEED	141	188	212	254	306	389	481	459
	13		0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	23555	15703	11777	9422	7852	5889	4711	3926
							FEED	141	188	212	254	306	389	481	459
	14.1		0.5D	1.0D	1.0D	0.8D	Vc	106	106	106	106	106	106	106	106
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	16870	11247	8435	6748	5623	4218	3374	2812
							FEED	152	169	202	263	304	354	486	464
	14.2		0.5D	1.0D	1.0D	0.8D	Vc	95	95	95	95	95	95	95	95
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	15120	10080	7560	6048	5040	3780	3024	2520
							FEED	136	151	181	236	272	318	435	416

▶ NEXT PAGE

GMK58, GMK59 SERIES

3 FLUTE SQUARE - SIDE CUTTING & SLOTTING



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

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12
K	15	Grey cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
	16		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
	17	Nodular cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
	18		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
	19	Malleable cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
	20		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	214	214	267	299	357	455	564	568
S	31	Heat Resistant Super Alloys	0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	37	41	43	40	50	59	82	79
	32		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	37	41	43	40	50	59	82	79
	33		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	37	41	43	40	50	59	82	79
	34		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	37	41	43	40	50	59	82	79
	35		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	37	41	43	40	50	59	82	79
	36	Titanium Alloys	0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	9231	6154	4615	3692	3077	2308	1846	1538
							FEED	55	74	97	122	148	173	233	231
	37		0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	9231	6154	4615	3692	3077	2308	1846	1538
							FEED	55	74	97	122	148	173	233	231

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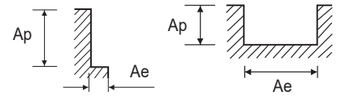
4 FLUTE SQUARE - SIDE CUTTING & SLOTTING



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

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12
P	1	Non-alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	2		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	3		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	4		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	5		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	204	227	272	300	363	460	566	583
	6	Low alloy steel	0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	7		0.5D	1.0D	1.0D	0.8D	Vc	152	152	152	152	152	152	168	168
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	24192	16128	12096	9677	8064	6048	5348	4456
							FEED	290	323	387	426	516	653	813	838
	8		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	204	227	272	300	363	460	566	583
	9		0.5D	1.0D	1.0D	0.8D	Vc	107	107	107	107	107	107	117	117
							fz	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047
							RPM	17030	11353	8515	6812	5677	4257	3724	3104
							FEED	204	227	272	300	363	460	566	583
	10	High alloyed steel, and tool steel	0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	10186	6791	5093	4074	3395	2546	2228	1857
							FEED	41	81	122	130	149	194	241	238
	11.1		0.5D	1.0D	1.0D	0.8D	Vc	64	64	64	64	64	64	70	70
							fz	0.001	0.003	0.006	0.008	0.011	0.019	0.027	0.032
							RPM	10186	6791	5093	4074	3395	2546	2228	1857
							FEED	41	81	122	130	149	194	241	238
M	12	Stainless steel	0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	23555	15703	11777	9422	7852	5889	4711	3926
							FEED	188	251	283	339	408	518	641	612
	13		0.5D	1.0D	1.0D	0.8D	Vc	148	148	148	148	148	148	148	148
							fz	0.002	0.004	0.006	0.009	0.013	0.022	0.034	0.039
							RPM	23555	15703	11777	9422	7852	5889	4711	3926
							FEED	188	251	283	339	408	518	641	612
	14.1		0.5D	1.0D	1.0D	0.8D	Vc	106	106	106	106	106	106	106	106
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	16870	11247	8435	6748	5623	4218	3374	2812
							FEED	202	225	270	351	405	472	648	619
	14.2		0.5D	1.0D	1.0D	0.8D	Vc	95	95	95	95	95	95	95	95
							fz	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055
							RPM	15120	10080	7560	6048	5040	3780	3024	2520
							FEED	181	202	242	314	363	423	581	554

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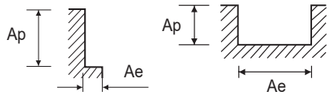
4 FLUTE SQUARE - SIDE CUTTING & SLOTTING



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

ISO	VDI 3323	Material Description	Side Ae	Side Ap	Slotting Ae	Slotting Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12
K	15	Grey cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
	16		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
	17	Nodular cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
	18		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
	19	Malleable cast iron	0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
	20		0.5D	1.0D	1.0D	0.8D	Vc	112	112	112	112	112	112	123	123
							fz	0.004	0.006	0.01	0.014	0.02	0.034	0.048	0.058
							RPM	17825	11884	8913	7130	5942	4456	3915	3263
							FEED	285	285	357	399	475	606	752	757
S	31	Heat Resistant Super Alloys	0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	50	55	58	53	66	79	109	105
	32		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	50	55	58	53	66	79	109	105
	33		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	50	55	58	53	66	79	109	105
	34		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	50	55	58	53	66	79	109	105
	35		0.25D	1D	1D	0.5D	Vc	26	26	26	26	26	26	26	26
							fz	0.003	0.005	0.007	0.008	0.012	0.019	0.033	0.038
							RPM	4138	2759	2069	1655	1379	1035	828	690
							FEED	50	55	58	53	66	79	109	105
	36	Titanium Alloys	0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	9231	6154	4615	3692	3077	2308	1846	1538
							FEED	74	98	129	162	197	231	310	308
	37		0.35D	1D	1D	0.5D	Vc	58	58	58	58	58	58	58	58
							fz	0.002	0.004	0.007	0.011	0.016	0.025	0.042	0.050
							RPM	9231	6154	4615	3692	3077	2308	1846	1538
							FEED	74	98	129	162	197	231	310	308

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