YU-EV26 **AMERICAS**

BEST VALUE IN THE WORLD OF CUTTING TOOLS

EV MILLS

Economical High-Performance Solid Carbide End Mills

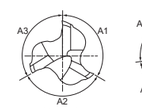
- Optimized Lengths for Mill / Turn Platforms and Live-Tool Lathes
- Precision-Ground Geometry for Multi-Material Performance

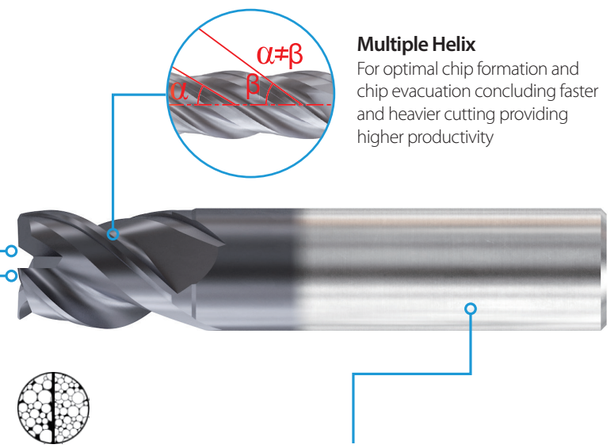
PRODUCT FEATURES & LINE UP

2 Flute	Ball Nose Square Corner Radius	Inch - Ball : Ø1/16 - Ø1/2 - Square & Corner Radius : Ø1/8 - Ø1/2 Metric - Ball : Ø2 - Ø16 - Square : Ø1 - Ø10	Ensures smooth chip evacuation and easy programming
3 Flute	Ball Nose Square Corner Radius	Inch : Ø1/8 – Ø1/2	Low cutting forces and corner radius diameters for key-way cutting
4 Flute	Ball Nose Square Corner Radius	Inch - Ball & Corner Radius : Ø1/8 - Ø1/2 - Square : Ø1/8 - Ø3/4 Metric : Ø2 - Ø20	Highest Metal Removal Rates and Tool life

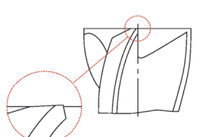
PRODUCT GEOMETRY

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

CASE STUDY

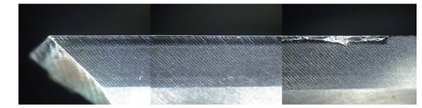
TEST I SLOTTING

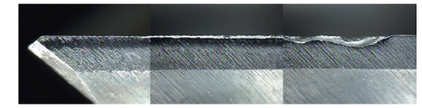
Ø10mm 3 Flute End Mill

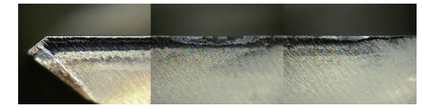
Cutting Condition

Tool	Ø10mm
Work Material	- DIN: C45 (1.0503) - JIS: S45C - AISI: 1045
RPM (rev./min.)	6,400 rev./min.
IPM (in/min.)	45 in/min.
Milling Depth	10mm(.3937") (1xD) (Axial Depth) 10mm(.3937") (1xD) (Radial Depth)
Coolant	Water Soluble
Machine	Machining Center

Wear after 70.2ft in cut

YG


Competitor 1


Competitor 2


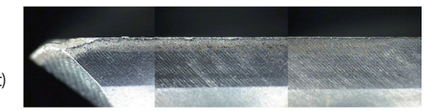
TEST II SIDE MILLING

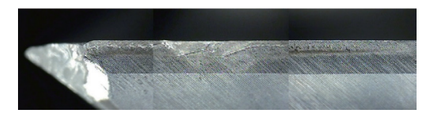
Ø10mm 3 Flute End Mill

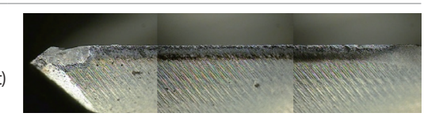
Cutting Condition

Tool	Ø10mm
Work Material	- DIN: X2CrNiMo17-12-2 (1.4404) - JIS: SUS316L - AISI: 316L
RPM (rev./min.)	3,500 rev./min.
IPM (in/min.)	25 in/min.
Milling Depth	10mm(.3937") (1xD) (Axial Depth) 5mm(.1968") (0.5xD) (Radial Depth)
Coolant	Water Soluble
Machine	Machining Center

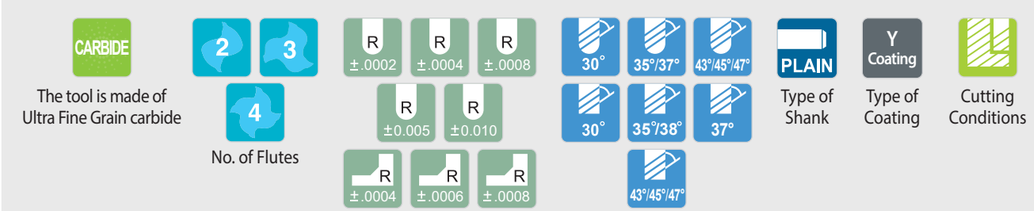
Wear after 27.6ft in cut

YG (After Cutting 27.6ft)


Competitor 1 (Broken At 10.5ft)


Competitor 2 (After Cutting 27.6ft)


GUIDE TO ICONS



SELECTION GUIDE

SOLID CARBIDE END MILLS
EV MILLS

Please visit globalyg1.com/mat for material search

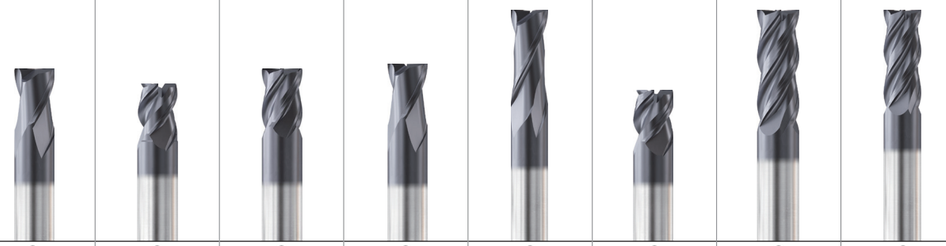
Recommended cutting conditions : p.21 - 34

◎ : Excellent ○ : Good

SERIES	GMK53	GMK31	GMK88	GMK90
FLUTE	2	2	3	4
HELIX ANGLE	30°	30°	43°/45°/47°	35°/37°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R1/32	R1.0	R1/16	R1/16
SIZE MAX	R1/4	R8.0	R1/4	R1/4
PAGE	6	7	8	9
	Y-Coating			

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
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	◎	◎			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			○	○	
	13		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					

GMK86	GMK89	GMK91	GMK85	GMK32	GMK87	GMK54	GMK33
2	3	4	2	2	3	4	4
30°	43°/45°/47°	35°/38°	30°	30°	43°/45°/47°	35°/38°	37°, 35°/38°
CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
D1/8	D1/8	D1/8	D1/8	D1.0	D1/8	D1/8	D2.0
D1/2	D1/2	D1/2	D1/2	D10.0	D1/2	D3/4	D20.0
10	12	14	16	17	18	19	20
Y-Coating							



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								41	

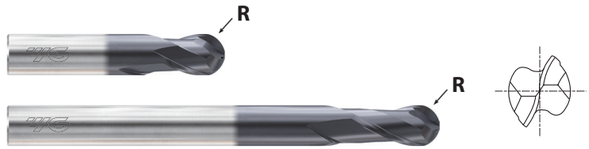
SOLID CARBIDE END MILLS

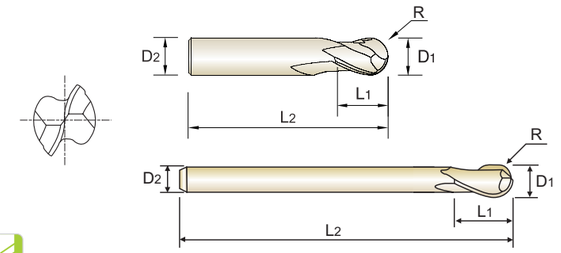
2 FLUTE BALL NOSE

SERIES

PLAIN SHANK **GMK53**

▶Ensures smooth chip evacuation and enhanced cutting performance at the ball tip





CARBIDE | 2 | 30° | R ±.0002 | R ±.0004 | PLAIN | Y Coating | p.21

R1/32~R1/8 R5/32~R1/4 Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK53004	R1/32	**1/16**	1/4	1/16	2-1/2
GMK53902	R1/16	**1/8**	1/4	3/16	1-1/2
GMK53901	R1/16	**1/8**	1/8	5/16	2-3/8
GMK53008	R1/16	**1/8**	1/4	5/16	2-3/4
GMK53010	R5/64	**5/32**	1/4	1/4	1-1/2
GMK53012	R3/32	**3/16**	3/16	3/8	3-1/8
GMK53903	R3/32	**3/16**	1/4	5/16	1-1/2
GMK53904	R1/8	**1/4**	1/4	3/8	1-1/2
GMK53016	R1/8	**1/4**	1/4	1/2	3-1/2
GMK53020	R5/32	**5/16**	3/8	7/16	2
GMK53905	R3/16	**3/8**	3/8	1/2	2
GMK53024	R3/16	**3/8**	3/8	3/4	4
GMK53028	R7/32	**7/16**	1/2	9/16	2-3/8
GMK53906	R1/4	**1/2**	1/2	5/8	2-3/8
GMK53032	R1/4	**1/2**	1/2	7/8	4-1/4

Size	Ball Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
Up to Ø1/4	±.0002	0 ~ -.0005	h5
Over Ø1/4	±.0004	0 ~ -.0006	

◎ : 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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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																				○					○	

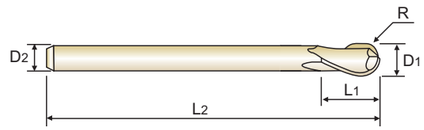
SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE

SERIES

PLAIN SHANK **GMK31**

▶Ensures smooth chip evacuation and enhanced cutting performance at the ball tip



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.22

R1.0~R3.0 R4.0~R8.0 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
GMK31020	R1.0	**2.0**	6	5	50
GMK31030	R1.5	**3.0**	6	6	60
GMK31040	R2.0	**4.0**	6	8	70
GMK31050	R2.5	**5.0**	6	10	80
GMK31060060	R3.0	**6.0**	6	9	60
GMK31060	R3.0	**6.0**	6	12	90
GMK31080060	R4.0	**8.0**	8	12	60
GMK31100	R5.0	**10.0**	10	18	100
GMK31120	R6.0	**12.0**	12	22	110
GMK31160	R8.0	**16.0**	16	30	150

Size	Ball Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø6	±0.005	0 ~ -0.012	h5
Over Ø6	±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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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																				○					○	

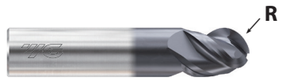
SOLID CARBIDE END MILLS

3 FLUTE BALL NOSE

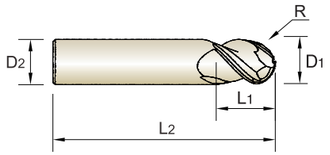
SERIES

PLAIN SHANK **GMK88**

- 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 Lathes with driven tooling



Unequal Index



CARBIDE | 3 | 43°/45°/47° | R ±.0008 | PLAIN | Y Coating | p.23

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK88008	R1/16	**1/8**	1/4	3/16	1-1/2
GMK88010	R5/64	**5/32**	1/4	1/4	1-1/2
GMK88012	R3/32	**3/16**	1/4	5/16	1-1/2
GMK88016	R1/8	**1/4**	1/4	3/8	1-1/2
GMK88020	R5/32	**5/16**	3/8	7/16	2
GMK88024	R3/16	**3/8**	3/8	1/2	2
GMK88028	R7/32	**7/16**	1/2	9/16	2-3/8
GMK88032	R1/4	**1/2**	1/2	5/8	2-3/8

Ball Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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													○	○	○	○	○	○	○							

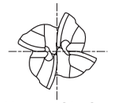
SOLID CARBIDE END MILLS

4 FLUTE BALL NOSE

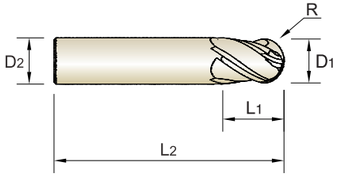
SERIES

PLAIN SHANK **GMK90**

- 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 Lathes with driven tooling



Unequal Index



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | Y Coating | p.24

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK90008	R1/16	**1/8**	1/4	3/16	1-1/2
GMK90010	R5/64	**5/32**	1/4	1/4	1-1/2
GMK90012	R3/32	**3/16**	1/4	5/16	1-1/2
GMK90016	R1/8	**1/4**	1/4	3/8	1-1/2
GMK90020	R5/32	**5/16**	3/8	7/16	2
GMK90024	R3/16	**3/8**	3/8	1/2	2
GMK90028	R7/32	**7/16**	1/2	9/16	2-3/8
GMK90032	R1/4	**1/2**	1/2	5/8	2-3/8

Ball Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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													○	○	○	○	○	○	○							

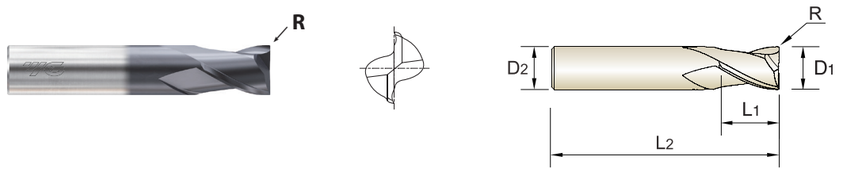
SOLID CARBIDE END MILLS

2 FLUTE CORNER RADIUS

SERIES

PLAIN SHANK **GMK86**

▶ Strengthens the cutting edge by incorporating bottom land touch for improved durability
▶ Short overhang for applications on Mill-Turn machines or Lathes with driven tooling



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.25

Ø1/8~Ø1/4 Ø5/16~Ø1/2 — Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK86008	R.005	**1/8**	1/4	3/16	1-1/2
GMK86901	R.010	**1/8**	1/4	3/16	1-1/2
GMK86909	R.015	**1/8**	1/4	3/16	1-1/2
GMK86917	R.020	**1/8**	1/4	3/16	1-1/2
GMK86925	R.030	**1/8**	1/4	3/16	1-1/2
GMK86010	R.005	**5/32**	1/4	1/4	1-1/2
GMK86902	R.010	**5/32**	1/4	1/4	1-1/2
GMK86910	R.015	**5/32**	1/4	1/4	1-1/2
GMK86918	R.020	**5/32**	1/4	1/4	1-1/2
GMK86926	R.030	**5/32**	1/4	1/4	1-1/2
GMK86012	R.005	**3/16**	1/4	5/16	1-1/2
GMK86903	R.010	**3/16**	1/4	5/16	1-1/2
GMK86911	R.015	**3/16**	1/4	5/16	1-1/2
GMK86919	R.020	**3/16**	1/4	5/16	1-1/2
GMK86927	R.030	**3/16**	1/4	5/16	1-1/2
GMK86016	R.005	**1/4**	1/4	3/8	1-1/2
GMK86904	R.010	**1/4**	1/4	3/8	1-1/2
GMK86912	R.015	**1/4**	1/4	3/8	1-1/2
GMK86920	R.020	**1/4**	1/4	3/8	1-1/2
GMK86928	R.030	**1/4**	1/4	3/8	1-1/2

▶ NEXT PAGE

Size	Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
Up to Ø1/4	±.0004	0 ~ -.0005	h5
Over Ø1/4	±.0006	0 ~ -.0006	

◎ : 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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○											○					○	

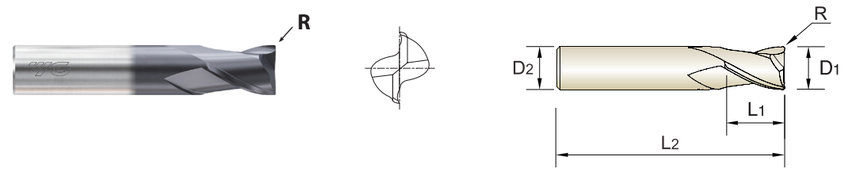
SOLID CARBIDE END MILLS

2 FLUTE CORNER RADIUS

SERIES

PLAIN SHANK GMK86

▶ Strengthens the cutting edge by incorporating bottom land touch for improved durability
▶ Short overhang for applications on Mill-Turn machines or Lathes with driven tooling



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.25

Ø1/8~Ø1/4 Ø5/16~Ø1/2 — Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK86020	R.005	**5/16**	3/8	7/16	2
GMK86905	R.010	**5/16**	3/8	7/16	2
GMK86913	R.015	**5/16**	3/8	7/16	2
GMK86921	R.020	**5/16**	3/8	7/16	2
GMK86929	R.030	**5/16**	3/8	7/16	2
GMK86024	R.005	**3/8**	3/8	1/2	2
GMK86906	R.010	**3/8**	3/8	1/2	2
GMK86914	R.015	**3/8**	3/8	1/2	2
GMK86922	R.020	**3/8**	3/8	1/2	2
GMK86930	R.030	**3/8**	3/8	1/2	2
GMK86028	R.005	**7/16**	1/2	9/16	2-3/8
GMK86907	R.010	**7/16**	1/2	9/16	2-3/8
GMK86915	R.015	**7/16**	1/2	9/16	2-3/8
GMK86923	R.020	**7/16**	1/2	9/16	2-3/8
GMK86931	R.030	**7/16**	1/2	9/16	2-3/8
GMK86032	R.005	**1/2**	1/2	5/8	2-3/8
GMK86908	R.010	**1/2**	1/2	5/8	2-3/8
GMK86916	R.015	**1/2**	1/2	5/8	2-3/8
GMK86924	R.020	**1/2**	1/2	5/8	2-3/8
GMK86932	R.030	**1/2**	1/2	5/8	2-3/8

Size	Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
Up to Ø1/4	±.0004	0 ~ -.0005	h5
Over Ø1/4	±.0006	0 ~ -.0006	

◎ : 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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○											○					○	

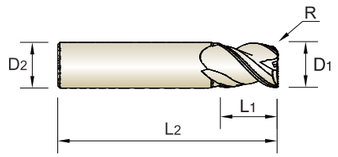
SOLID CARBIDE END MILLS

3 FLUTE CORNER RADIUS

SERIES
PLAIN SHANK **GMK89**

▶Smooth cutting action, unequal flute geometry and multiple helix eliminate vibrations
▶Short overhang for applications on Mill-Turn machines or Lathes with driven tooling

Unequal Index



CARBIDE | 3 | 43°/45°/47° | R ±.0008 | PLAIN | Y Coating | p.26-27

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK89008	R.005	**1/8**	1/4	3/16	1-1/2
GMK89901	R.010	**1/8**	1/4	3/16	1-1/2
GMK89909	R.015	**1/8**	1/4	3/16	1-1/2
GMK89917	R.020	**1/8**	1/4	3/16	1-1/2
GMK89925	R.030	**1/8**	1/4	3/16	1-1/2
GMK89010	R.005	**5/32**	1/4	1/4	1-1/2
GMK89902	R.010	**5/32**	1/4	1/4	1-1/2
GMK89910	R.015	**5/32**	1/4	1/4	1-1/2
GMK89918	R.020	**5/32**	1/4	1/4	1-1/2
GMK89926	R.030	**5/32**	1/4	1/4	1-1/2
GMK89012	R.005	**3/16**	1/4	5/16	1-1/2
GMK89903	R.010	**3/16**	1/4	5/16	1-1/2
GMK89911	R.015	**3/16**	1/4	5/16	1-1/2
GMK89919	R.020	**3/16**	1/4	5/16	1-1/2
GMK89927	R.030	**3/16**	1/4	5/16	1-1/2
GMK89016	R.005	**1/4**	1/4	3/8	1-1/2
GMK89904	R.010	**1/4**	1/4	3/8	1-1/2
GMK89912	R.015	**1/4**	1/4	3/8	1-1/2
GMK89920	R.020	**1/4**	1/4	3/8	1-1/2
GMK89928	R.030	**1/4**	1/4	3/8	1-1/2

▶ NEXT PAGE

Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		○	○	○	○	○	○	○	○	○	○

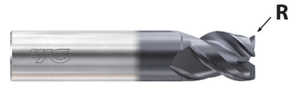
ISO	N										S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials				Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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

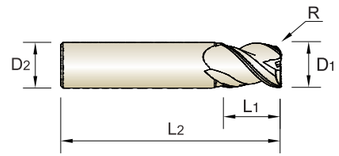
3 FLUTE CORNER RADIUS

SERIES
PLAIN SHANK **GMK89**

▶Smooth cutting action, unequal flute geometry and multiple helix eliminate vibrations
▶Short overhang for applications on Mill-Turn machines or Lathes with driven tooling



Unequal Index



CARBIDE | 3 | 43°/45°/47° | R ±.0008 | PLAIN | Y Coating | p.26-27

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK89020	R.005	**5/16**	3/8	7/16	2
GMK89905	R.010	**5/16**	3/8	7/16	2
GMK89913	R.015	**5/16**	3/8	7/16	2
GMK89921	R.020	**5/16**	3/8	7/16	2
GMK89929	R.030	**5/16**	3/8	7/16	2
GMK89024	R.005	**3/8**	3/8	1/2	2
GMK89906	R.010	**3/8**	3/8	1/2	2
GMK89914	R.015	**3/8**	3/8	1/2	2
GMK89922	R.020	**3/8**	3/8	1/2	2
GMK89930	R.030	**3/8**	3/8	1/2	2
GMK89028	R.005	**7/16**	1/2	9/16	2-3/8
GMK89907	R.010	**7/16**	1/2	9/16	2-3/8
GMK89915	R.015	**7/16**	1/2	9/16	2-3/8
GMK89923	R.020	**7/16**	1/2	9/16	2-3/8
GMK89931	R.030	**7/16**	1/2	9/16	2-3/8
GMK89032	R.005	**1/2**	1/2	5/8	2-3/8
GMK89908	R.010	**1/2**	1/2	5/8	2-3/8
GMK89916	R.015	**1/2**	1/2	5/8	2-3/8
GMK89924	R.020	**1/2**	1/2	5/8	2-3/8
GMK89932	R.030	**1/2**	1/2	5/8	2-3/8

Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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

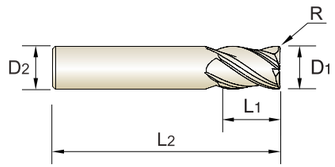
4 FLUTE CORNER RADIUS

SERIES

PLAIN SHANK **GMK91**

▶ Strengthens the cutting edge by incorporating bottom land touch for improved durability
▶ Short overhang for applications on Mill-Turn machines or Lathes with driven tooling

Unequal Index



CARBIDE | 4 | 35°/38° | R ±.0008 | PLAIN | Y Coating | p.28

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK91008	R.005	**1/8**	1/4	3/16	1-1/2
GMK91901	R.010	**1/8**	1/4	3/16	1-1/2
GMK91909	R.015	**1/8**	1/4	3/16	1-1/2
GMK91917	R.020	**1/8**	1/4	3/16	1-1/2
GMK91925	R.030	**1/8**	1/4	3/16	1-1/2
GMK91010	R.005	**5/32**	1/4	1/4	1-1/2
GMK91902	R.010	**5/32**	1/4	1/4	1-1/2
GMK91910	R.015	**5/32**	1/4	1/4	1-1/2
GMK91918	R.020	**5/32**	1/4	1/4	1-1/2
GMK91926	R.030	**5/32**	1/4	1/4	1-1/2
GMK91012	R.005	**3/16**	1/4	5/16	1-1/2
GMK91903	R.010	**3/16**	1/4	5/16	1-1/2
GMK91911	R.015	**3/16**	1/4	5/16	1-1/2
GMK91919	R.020	**3/16**	1/4	5/16	1-1/2
GMK91927	R.030	**3/16**	1/4	5/16	1-1/2
GMK91016	R.005	**1/4**	1/4	3/8	1-1/2
GMK91904	R.010	**1/4**	1/4	3/8	1-1/2
GMK91912	R.015	**1/4**	1/4	3/8	1-1/2
GMK91920	R.020	**1/4**	1/4	3/8	1-1/2
GMK91928	R.030	**1/4**	1/4	3/8	1-1/2

▶ NEXT PAGE

Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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

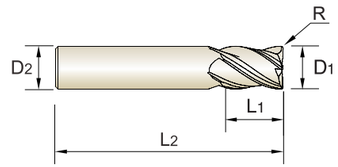
4 FLUTE CORNER RADIUS

SERIES

PLAIN SHANK **GMK91**

▶ Strengthens the cutting edge by incorporating bottom land touch for improved durability
▶ Short overhang for applications on Mill-Turn machines or Lathes with driven tooling

Unequal Index



CARBIDE | 4 | 35°/38° | R ±.0008 | PLAIN | Y Coating | p.28

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK91020	R.005	**5/16**	3/8	7/16	2
GMK91905	R.010	**5/16**	3/8	7/16	2
GMK91913	R.015	**5/16**	3/8	7/16	2
GMK91921	R.020	**5/16**	3/8	7/16	2
GMK91929	R.030	**5/16**	3/8	7/16	2
GMK91024	R.005	**3/8**	3/8	1/2	2
GMK91906	R.010	**3/8**	3/8	1/2	2
GMK91914	R.015	**3/8**	3/8	1/2	2
GMK91922	R.020	**3/8**	3/8	1/2	2
GMK91930	R.030	**3/8**	3/8	1/2	2
GMK91028	R.005	**7/16**	1/2	9/16	2-3/8
GMK91907	R.010	**7/16**	1/2	9/16	2-3/8
GMK91915	R.015	**7/16**	1/2	9/16	2-3/8
GMK91923	R.020	**7/16**	1/2	9/16	2-3/8
GMK91931	R.030	**7/16**	1/2	9/16	2-3/8
GMK91032	R.005	**1/2**	1/2	5/8	2-3/8
GMK91908	R.010	**1/2**	1/2	5/8	2-3/8
GMK91916	R.015	**1/2**	1/2	5/8	2-3/8
GMK91924	R.020	**1/2**	1/2	5/8	2-3/8
GMK91932	R.030	**1/2**	1/2	5/8	2-3/8

Corner Radius Tolerance	Mill Dia. Tolerance	Shank Dia. Tolerance
±.0008	0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○				○	○	○	○	○	○	○	○					○	

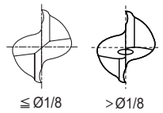
SOLID CARBIDE END MILLS

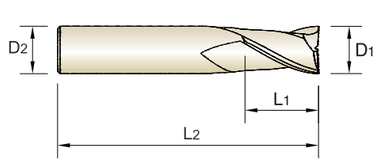
2 FLUTE SQUARE

SERIES

PLAIN SHANK **GMK85**

▶ Wide flutes allow for smooth chip evacuation with difficult to machine materials
▶ Short overhang for applications on Mill-Turn machines or Lathes with driven tooling



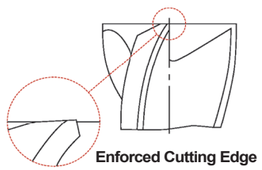


CARBIDE | 2 | 30° | PLAIN | Y Coating | p.29

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK85008	**1/8**	1/4	3/16	1-1/2
GMK85010	**5/32**	1/4	1/4	1-1/2
GMK85012	**3/16**	1/4	5/16	1-1/2
GMK85016	**1/4**	1/4	3/8	1-1/2
GMK85020	**5/16**	3/8	7/16	2
GMK85024	**3/8**	3/8	1/2	2
GMK85028	**7/16**	1/2	9/16	2-3/8
GMK85032	**1/2**	1/2	5/8	2-3/8

Size	Mill Dia. Tolerance	Shank Dia. Tolerance
Up to Ø1/4	0 ~ -.0005	h5
Over Ø1/4	0 ~ -.0006	



◎ : 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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○											○					○	

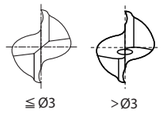
SOLID CARBIDE END MILLS

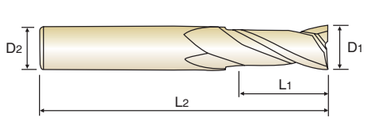
2 FLUTE SQUARE

SERIES

PLAIN SHANK **GMK32**

▶ Strengthens the cutting edge by incorporating bottom land touch for improved durability



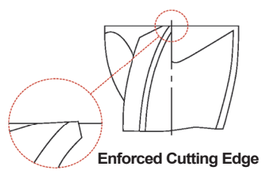


CARBIDE | 2 | 30° | PLAIN | Y Coating | p.30

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK320104S	**1.0**	4	2.5	50
GMK32010	**1.0**	6	2.5	50
GMK32020	**2.0**	6	6	50
GMK32035	**3.5**	6	10	50
GMK32040	**4.0**	6	10	50
GMK32050	**5.0**	6	15	60
GMK32060	**6.0**	6	15	60
GMK32070	**7.0**	8	20	60
GMK32080	**8.0**	8	20	70
GMK32090	**9.0**	10	22	70
GMK32100	**10.0**	10	25	75

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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○											○					○	

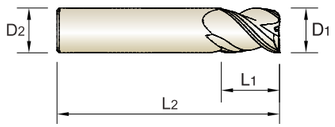
SOLID CARBIDE END MILLS

3 FLUTE SQUARE

SERIES
PLAIN SHANK **GMK87**

- 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 Lathes with driven tooling

Unequal Index

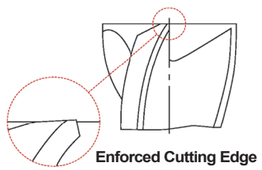


CARBIDE | 3 | 43°/45°/47° | PLAIN | Y Coating | p.31-32

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK87008	**1/8**	1/4	3/16	1-1/2
GMK87010	**5/32**	1/4	1/4	1-1/2
GMK87012	**3/16**	1/4	5/16	1-1/2
GMK87016	**1/4**	1/4	3/8	1-1/2
GMK87020	**5/16**	3/8	7/16	2
GMK87024	**3/8**	3/8	1/2	2
GMK87028	**7/16**	1/2	9/16	2-3/8
GMK87032	**1/2**	1/2	5/8	2-3/8

Mill Dia. Tolerance	Shank Dia. Tolerance
0 ~ -.0008	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											○	○	○	○	○	○	○							

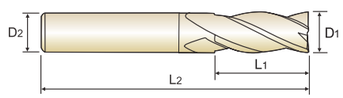
SOLID CARBIDE END MILLS

4 FLUTE SQUARE

SERIES
PLAIN SHANK **GMK54**

- Strengthens the cutting edge by incorporating bottom land touch for improved durability

Unequal Index

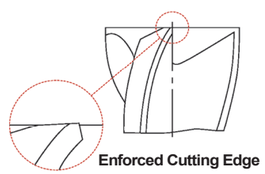


CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.33

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK54008	**1/8**	1/4	3/16	1-1/2
GMK54010	**5/32**	1/4	1/4	1-1/2
GMK54012	**3/16**	1/4	5/16	1-1/2
GMK54902	**1/4**	1/4	3/8	1-1/2
GMK54016	**1/4**	1/4	3/4	2-1/2
GMK54903	**5/16**	3/8	7/16	2
GMK54020	**5/16**	5/16	13/16	2-1/2
GMK54904	**3/8**	3/8	1/2	2
GMK54024	**3/8**	3/8	1	2-1/2
GMK54028	**7/16**	1/2	9/16	2-3/8
GMK54905	**1/2**	1/2	5/8	2-3/8
GMK54032	**1/2**	1/2	1	3
GMK54040	**5/8**	5/8	1-1/4	3-1/2
GMK54048	**3/4**	3/4	1-1/2	4
GMK54901	**3/4**	3/4	2-1/4	5

Mill Dia. Tolerance	Shank Dia. Tolerance
0 ~ -.0008	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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○				○	○	○	○	○	○	○	○					○	

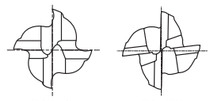
SOLID CARBIDE END MILLS

4 FLUTE SQUARE

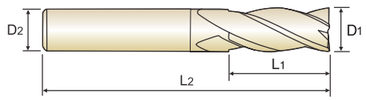
SERIES

PLAIN SHANK **GMK33**

▶Strengthens the cutting edge by incorporating bottom land touch for improved durability



Unequal Index



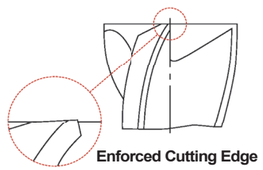
CARBIDE | 4 | 37° | 35°/38° | PLAIN | Y Coating | p.34

D1<Ø3 D1≥Ø3

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK33020	2.0	6	6	50
GMK33030	3.0	6	8	50
GMK33040	4.0	6	10	50
GMK33045	4.5	6	14	50
GMK33060	6.0	6	15	60
GMK33080	8.0	8	20	70
GMK33100	10.0	10	25	75
GMK33120	12.0	12	30	80
GMK33200	20.0	20	45	100

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



Enforced Cutting Edge

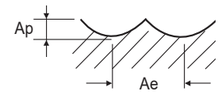
◎ : Excellent ○ : Good

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	29.1	29.2	29.3	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
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						○	○	○	○				○	○	○	○	○	○	○	○					○	

GMK53 SERIES

2 FLUTE BALL NOSE

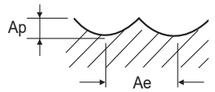


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/16	1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.2D	0.1D	SFM	235	390	420	460	510	575	635	670	700
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	14360	11920	10270	9370	7790	7030	6470	5850	5350
					IPM	12	25	29	32	40	49	58	64	67
	5		0.2D	0.1D	SFM	180	300	340	365	415	460	510	535	560
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	11000	9170	8310	7440	6340	5620	5200	4670	4280
					IPM	9	19	23	26	32	39	47	51	53
	6-7	Low alloy steel	0.2D	0.1D	SFM	235	390	420	460	510	575	635	670	700
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	14360	11920	10270	9370	7790	7030	6470	5850	5350
					IPM	12	25	29	32	40	49	58	64	67
	8-9		0.2D	0.1D	SFM	180	300	340	365	415	460	510	535	560
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	11000	9170	8310	7440	6340	5620	5200	4670	4280
					IPM	9	19	23	26	32	39	47	51	53
	10	High alloyed steel, and tool steel	0.2D	0.1D	SFM	235	390	420	460	510	575	635	670	700
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	14360	11920	10270	9370	7790	7030	6470	5850	5350
					IPM	12	25	29	32	40	49	58	64	67
	11.1		0.2D	0.1D	SFM	180	300	340	365	415	460	510	535	560
					IPT	.0004	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0062
					RPM	11000	9170	8310	7440	6340	5620	5200	4670	4280
					IPM	9	19	23	26	32	39	47	51	53
	11.2		0.1D	0.1D	SFM	80	140	170	185	190	200	205	210	210
					IPT	.0005	.0011	.0014	.0017	.0025	.0035	.0045	.0055	.0063
					RPM	4890	4280	4160	3770	2900	2440	2090	1830	1600
					IPM	4	9	12	13	15	17	19	20	20

GMK31 SERIES

2 FLUTE BALL NOSE

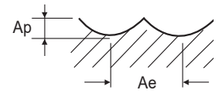


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	5	6	8	10	12	16
P	1-4	Non-alloy steel	0.2D	0.1D	SFM	285	390	420	460	510	575	635	700	765
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	13850	12630	10190	8910	8220	6960	6180	5650	4640
					IPM	28	26	28	31	39	49	58	67	66
	5		0.2D	0.1D	SFM	215	300	340	365	415	465	510	560	605
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	10350	9660	8200	7130	6680	5610	4930	4510	3660
					IPM	21	20	22	25	31	40	46	53	52
	6-7	Low alloy steel	0.2D	0.1D	SFM	285	390	420	460	510	575	635	700	765
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	13850	12630	10190	8910	8220	6960	6180	5650	4640
					IPM	28	26	28	31	39	49	58	67	66
	8-9		0.2D	0.1D	SFM	215	300	340	365	415	465	510	560	605
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	10350	9660	8200	7130	6680	5610	4930	4510	3660
					IPM	21	20	22	25	31	40	46	53	52
	10	High alloyed steel, and tool steel	0.2D	0.1D	SFM	285	390	420	460	510	575	635	700	765
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	13850	12630	10190	8910	8220	6960	6180	5650	4640
					IPM	28	26	28	31	39	49	58	67	66
	11.1		0.2D	0.1D	SFM	215	300	340	365	415	465	510	560	605
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	10350	9660	8200	7130	6680	5610	4930	4510	3660
					IPM	21	20	22	25	31	40	46	53	52
	11.2		0.1D	0.1D	SFM	90	140	165	185	190	195	205	210	215
					IPT	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071
					RPM	4460	4460	4060	3570	3080	2390	1970	1700	1310
					IPM	9	9	11	13	15	17	19	20	19

GMK88 SERIES

3 FLUTE BALL NOSE

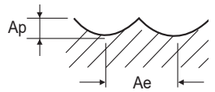


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.5D	0.8D	SFM	530	530	530	530	530	530	530	530
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	16200	12960	10800	8100	6480	5400	4630	4050
					IPM	49	43	39	39	47	42	38	34
	5		0.5D	0.8D	SFM	370	370	370	370	370	370	370	370
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	11310	9050	7540	5650	4520	3770	3230	2830
					IPM	34	30	27	27	33	29	26	24
	6-7	Low alloy steel	0.5D	0.8D	SFM	530	530	530	530	530	530	530	530
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	16200	12960	10800	8100	6480	5400	4630	4050
					IPM	49	43	39	39	47	42	38	34
	8-9		0.5D	0.8D	SFM	370	370	370	370	370	370	370	370
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	11310	9050	7540	5650	4520	3770	3230	2830
					IPM	34	30	27	27	33	29	26	24
	10 - 11.1	High alloyed steel, and tool steel	0.5D	0.8D	SFM	225	225	225	225	225	225	225	225
					IPT	.0007	.0007	.0008	.0011	.0017	.0018	.0019	.0020
					RPM	6880	5500	4580	3440	2750	2290	1960	1720
					IPM	14	12	11	11	14	12	11	10
M	12 - 13	Stainless steel	0.5D	0.8D	SFM	255	255	255	255	255	255	255	255
					IPT	.0006	.0006	.0010	.0012	.0016	.0018	.0019	.0020
					RPM	7790	6230	5200	3900	3120	2600	2230	1950
					IPM	14	11	16	14	15	14	13	12
	14.1		0.5D	0.8D	SFM	280	280	280	280	280	280	280	280
					IPT	.0008	.0008	.0010	.0016	.0018	.0020	.0021	.0022
					RPM	8560	6850	5700	4280	3420	2850	2440	2140
					IPM	21	16	17	21	18	17	15	14
	14.2		0.5D	0.8D	SFM	255	255	255	255	255	255	255	255
					IPT	.0006	.0006	.0010	.0012	.0016	.0018	.0019	.0020
					RPM	7790	6230	5200	3900	3120	2600	2230	1950
					IPM	14	11	16	14	15	14	13	12
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.8D	SFM	390	390	390	390	390	390	390	390
					IPT	.0012	.0013	.0015	.0020	.0029	.0032	.0033	.0034
					RPM	11920	9530	7950	5960	4770	3970	3410	2980
					IPM	43	37	36	36	41	38	34	30
S	31 - 35	Heat Resistant Super Alloys	0.2D	0.3D	SFM	70	70	70	70	70	70	70	70
					IPT	.0006	.0006	.0007	.0011	.0012	.0014	.0015	.0016
					RPM	2140	1710	1430	1070	860	710	610	530
					IPM	4	3	3	4	3	3	3	3
	36 - 37	Titanium Alloys	0.5D	0.3D	SFM	155	155	155	155	155	155	155	155
					IPT	.0007	.0007	.0009	.0015	.0016	.0018	.0019	.0020
					RPM	4740	3790	3160	2370	1890	1580	1350	1180
					IPM	10	8	9	11	9	9	8	7

GMK90 SERIES

4 FLUTE BALL NOSE

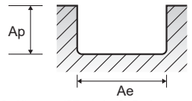


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.5D	0.8D	SFM	530	530	530	530	530	530	530	530
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	16200	12960	10800	8100	6480	5400	4630	4050
					IPM	65	57	52	52	62	56	50	45
	5		0.5D	0.8D	SFM	370	370	370	370	370	370	370	370
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	11310	9050	7540	5650	4520	3770	3230	2830
					IPM	45	40	36	36	43	39	35	32
	6-7	Low alloy steel	0.5D	0.8D	SFM	530	530	530	530	530	530	530	530
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	16200	12960	10800	8100	6480	5400	4630	4050
					IPM	65	57	52	52	62	56	50	45
	8-9		0.5D	0.8D	SFM	370	370	370	370	370	370	370	370
					IPT	.0010	.0011	.0012	.0016	.0024	.0026	.0027	.0028
					RPM	11310	9050	7540	5650	4520	3770	3230	2830
					IPM	45	40	36	36	43	39	35	32
	10 - 11.1	High alloyed steel, and tool steel	0.5D	0.8D	SFM	225	225	225	225	225	225	225	225
					IPT	.0007	.0007	.0008	.0011	.0017	.0018	.0019	.0020
					RPM	6880	5500	4580	3440	2750	2290	1960	1720
					IPM	19	15	15	15	19	16	15	14
M	12 - 13	Stainless steel	0.5D	0.8D	SFM	255	255	255	255	255	255	255	255
					IPT	.0006	.0006	.0010	.0012	.0016	.0018	.0019	.0020
					RPM	7790	6230	5200	3900	3120	2600	2230	1950
					IPM	19	15	21	19	20	19	17	16
	14.1		0.5D	0.8D	SFM	280	280	280	280	280	280	280	280
					IPT	.0008	.0008	.0010	.0016	.0018	.0020	.0021	.0022
					RPM	8560	6850	5700	4280	3420	2850	2440	2140
					IPM	27	22	23	27	25	23	20	19
	14.2		0.5D	0.8D	SFM	255	255	255	255	255	255	255	255
					IPT	.0006	.0006	.0010	.0012	.0016	.0018	.0019	.0020
					RPM	7790	6230	5200	3900	3120	2600	2230	1950
					IPM	19	15	21	19	20	19	17	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.8D	SFM	390	390	390	390	390	390	390	390
					IPT	.0012	.0013	.0015	.0020	.0029	.0032	.0033	.0034
					RPM	11920	9530	7950	5960	4770	3970	3410	2980
					IPM	57	50	48	48	55	51	45	41
S	31 - 35	Heat Resistant Super Alloys	0.2D	0.3D	SFM	70	70	70	70	70	70	70	70
					IPT	.0006	.0006	.0007	.0011	.0012	.0014	.0015	.0016
					RPM	2140	1710	1430	1070	860	710	610	530
					IPM	5	4	4	5	4	4	4	3
	36 - 37	Titanium Alloys	0.5D	0.3D	SFM	155	155	155	155	155	155	155	155
					IPT	.0007	.0007	.0009	.0015	.0016	.0018	.0019	.0020
					RPM	4740	3790	3160	2370	1890	1580	1350	1180
					IPM	13	11	11	14	12	11	10	9

GMK86 SERIES

2 FLUTE CORNER RADIUS - SLOTTING

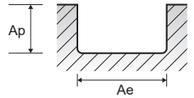


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	1.0D	0.2D	SFM	370	400	425	440	445	465	460	460
					IPT	.0004	.0006	.0009	.0012	.0018	.0020	.0020	.0020
					RPM	11310	9780	8660	6720	5440	4740	4020	3510
					IPM	9	12	16	16	20	19	16	14
	5		1.0D	0.05D	SFM	240	255	270	280	280	300	310	310
					IPT	.0003	.0005	.0007	.0010	.0013	.0015	.0016	.0016
					RPM	7330	6230	5500	4280	3420	3060	2710	2370
					IPM	4	6	8	9	9	9	9	8
	6-7	Low alloy steel	1.0D	0.2D	SFM	370	400	425	440	445	465	460	460
					IPT	.0004	.0006	.0009	.0012	.0018	.0020	.0020	.0020
					RPM	11310	9780	8660	6720	5440	4740	4020	3510
					IPM	9	12	16	16	20	19	16	14
	8-9		1.0D	0.05D	SFM	240	255	270	280	280	300	310	310
					IPT	.0003	.0005	.0007	.0010	.0013	.0015	.0016	.0016
					RPM	7330	6230	5500	4280	3420	3060	2710	2370
					IPM	4	6	8	9	9	9	9	8
	10	High alloyed steel, and tool steel	1.0D	0.2D	SFM	370	400	425	440	445	465	460	460
					IPT	.0004	.0006	.0009	.0012	.0018	.0020	.0020	.0020
					RPM	11310	9780	8660	6720	5440	4740	4020	3510
					IPM	9	12	16	16	20	19	16	14
	11.1 - 11.2		1.0D	0.05D	SFM	240	255	270	280	280	300	310	310
					IPT	.0003	.0005	.0007	.0010	.0013	.0015	.0016	.0016
					RPM	7330	6230	5500	4280	3420	3060	2710	2370
					IPM	4	6	8	9	9	9	9	8
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.05D	SFM	370	400	425	440	445	465	460	460
					IPT	.0004	.0006	.0009	.0012	.0018	.0020	.0020	.0020
					RPM	11310	9780	8660	6720	5440	4740	4020	3510
					IPM	9	12	16	16	20	19	16	14
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0006	.0007	.0010	.0013	.0017	.0022	.0024	.0026
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	15	15	17	16	18	19	17	16
	29.1	Non Metallic Materials	1.0D	0.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0006	.0007	.0010	.0013	.0017	.0022	.0024	.0026
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	15	15	17	16	18	19	17	16

GMK89 SERIES

3 FLUTE CORNER RADIUS - SLOTTING

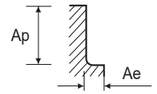


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	1.0D	0.8D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	5		1.0D	0.8D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	6-7	Low alloy steel	1.0D	0.8D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	8-9		1.0D	0.8D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	10 - 11.1	High alloyed steel, and tool steel	1.0D	0.8D	SFM	210	210	210	210	210	230	230	230
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013
					RPM	6420	5130	4280	3210	2570	2340	2010	1760
					IPM	2	3	4	4	5	8	7	7
M	12 - 13	Stainless steel	1.0D	0.8D	SFM	485	485	485	485	485	485	485	485
					IPT	.0002	.0002	.0004	.0004	.0005	.0009	.0013	.0016
					RPM	14820	11860	9880	7410	5930	4940	4230	3710
					IPM	9	7	12	9	9	13	16	18
	14.1		1.0D	0.8D	SFM	350	350	350	350	350	350	350	350
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	10700	8560	7130	5350	4280	3570	3060	2670
					IPM	6	8	11	11	14	19	18	18
	14.2		1.0D	0.8D	SFM	310	310	310	310	310	310	310	310
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	9470	7580	6320	4740	3790	3160	2710	2370
					IPM	6	7	9	10	13	17	16	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.8D	SFM	365	365	365	365	365	405	405	405
					IPT	.0002	.0004	.0006	.0008	.0013	.0018	.0020	.0022
					RPM	11150	8920	7440	5580	4460	4130	3540	3090
					IPM	7	11	13	13	17	22	21	20
S	31 - 35	Heat Resistant Super Alloys	1.0D	0.5D	SFM	85	85	85	85	85	85	85	85
					IPT	.0002	.0003	.0003	.0005	.0007	.0012	.0014	.0016
					RPM	2600	2080	1730	1300	1040	870	740	650
					IPM	2	2	2	2	2	3	3	3
	36 - 37	Titanium Alloys	1.0D	0.5D	SFM	190	190	190	190	190	190	190	190
					IPT	.0002	.0003	.0004	.0006	.0010	.0016	.0019	.0021
					RPM	5810	4650	3870	2900	2320	1940	1660	1450
					IPM	3	4	5	5	7	9	9	9

GMK89 SERIES

3 FLUTE CORNER RADIUS - SIDE CUTTING

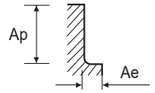


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.5D	1.0D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	5		0.5D	1.0D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	6-7	Low alloy steel	0.5D	1.0D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	8-9		0.5D	1.0D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	10 - 11.1	High alloyed steel, and tool steel	0.5D	1.0D	SFM	210	210	210	210	210	230	230	230
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013
					RPM	6420	5130	4280	3210	2570	2340	2010	1760
					IPM	2	3	4	4	5	8	7	7
M	12 - 13	Stainless steel	0.5D	1.0D	SFM	485	485	485	485	485	485	485	485
					IPT	.0002	.0002	.0004	.0004	.0005	.0009	.0013	.0016
					RPM	14820	11860	9880	7410	5930	4940	4230	3710
					IPM	9	7	12	9	9	13	16	18
	14.1		0.5D	1.0D	SFM	350	350	350	350	350	350	350	350
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	10700	8560	7130	5350	4280	3570	3060	2670
					IPM	6	8	11	11	14	19	18	18
	14.2		0.5D	1.0D	SFM	310	310	310	310	310	310	310	310
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	9470	7580	6320	4740	3790	3160	2710	2370
					IPM	6	7	9	10	13	17	16	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.0D	SFM	365	365	365	365	365	405	405	405
					IPT	.0002	.0004	.0006	.0008	.0013	.0018	.0020	.0022
					RPM	11150	8920	7440	5580	4460	4130	3540	3090
					IPM	7	11	13	13	17	22	21	20
S	31 - 35	Heat Resistant Super Alloys	0.25D	1.0D	SFM	85	85	85	85	85	85	85	85
					IPT	.0002	.0003	.0003	.0005	.0007	.0012	.0014	.0016
					RPM	2600	2080	1730	1300	1040	870	740	650
					IPM	2	2	2	2	2	3	3	3
	36 - 37	Titanium Alloys	0.35D	1.0D	SFM	190	190	190	190	190	190	190	190
					IPT	.0002	.0003	.0004	.0006	.0010	.0016	.0019	.0021
					RPM	5810	4650	3870	2900	2320	1940	1660	1450
					IPM	3	4	5	5	7	9	9	9

GMK91 SERIES

4 FLUTE CORNER RADIUS - SIDE CUTTING

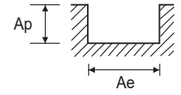


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	12220	9780	8150	6110	4890	4480	3840	3360
					IPM	10	12	13	15	22	27	26	26
	5		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	8560	6850	5700	4280	3420	3160	2710	2370
					IPM	7	8	9	10	15	19	18	18
	6-7	Low alloy steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	12220	9780	8150	6110	4890	4480	3840	3360
					IPM	10	12	13	15	22	27	26	26
	8-9		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	8560	6850	5700	4280	3420	3160	2710	2370
					IPM	7	8	9	10	15	19	18	18
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	12220	9780	8150	6110	4890	4480	3840	3360
					IPM	10	12	13	15	22	27	26	26
	11.1		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	8560	6850	5700	4280	3420	3160	2710	2370
					IPM	7	8	9	10	15	19	18	18
	11.2		0.3D	1.5D	SFM	165	165	165	165	165	185	185	185
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013
					RPM	5040	4030	3360	2520	2020	1890	1620	1410
					IPM	2	3	4	4	6	8	8	7
M	12 - 13	Stainless steel	0.3D	1.5D	SFM	425	425	425	425	425	425	425	425
					IPT	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0016
					RPM	12990	10390	8660	6490	5200	4330	3710	3250
					IPM	10	8	14	13	19	23	22	21
	14.1		0.3D	1.5D	SFM	300	300	300	300	300	300	300	300
					IPT	.0002	.0003	.0005	.0007	.0011	.0019	.0021	.0022
					RPM	9170	7330	6110	4580	3670	3060	2620	2290
					IPM	7	9	12	13	16	23	22	20
	14.2		0.3D	1.5D	SFM	270	270	270	270	270	270	270	270
					IPT	.0002	.0003	.0005	.0007	.0011	.0019	.0021	.0022
					RPM	8250	6600	5500	4130	3300	2750	2360	2060
					IPM	7	8	11	12	15	21	20	18
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	SFM	295	295	295	295	295	320	320	320
					IPT	.0002	.0004	.0006	.0008	.0013	.0019	.0021	.0023
					RPM	9020	7210	6010	4510	3610	3260	2790	2440
					IPM	7	12	14	14	19	25	23	22
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0010	.0011	.0014	.0019	.0025	.0032	.0035	.0038
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	51	47	47	48	53	54	51	48
	29.1	Non Metallic Materials	0.1D	1.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0010	.0011	.0014	.0019	.0025	.0032	.0035	.0038
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	51	47	47	48	53	54	51	48
S	31 - 35	Heat Resistant Super Alloys	0.2D	1.0D	SFM	80	80	80	80	80	80	80	80
					IPT	.0002	.0003	.0005	.0007	.0012	.0018	.0020	.0022
					RPM	2440	1960	1630	1220	980	810	700	610
					IPM	2	2	3	3	5	6	6	5
	36 - 37	Titanium Alloys	0.3D	1.0D	SFM	215	215	215	215	215	215	215	215
					IPT	.0002	.0003	.0004	.0006	.0010	.0017	.0019	.0020
					RPM	6570	5260	4380	3290	2630	2190	1880	1640
					IPM	5	6	7	8	11	15	14	13

GMK85 SERIES

2 FLUTE SQUARE - SLOTTING

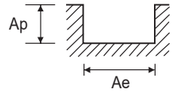


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	265	300	315	335	340	325	325	330
					IPT	.0005	.0008	.0010	.0012	.0018	.0020	.0020	.0020
					RPM	8100	7330	6420	5120	4160	3310	2840	2520
					IPM	8	12	13	12	15	13	11	10
	5		1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	165	185	185	200	200	200	200	200
					IPT	.0005	.0008	.0010	.0013	.0015	.0016	.0016	.0016
					RPM	5040	4520	3770	3060	2440	2040	1750	1530
					IPM	5	7	8	8	7	7	6	5
	6-7	Low alloy steel	1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	265	300	315	335	340	325	325	330
					IPT	.0005	.0008	.0010	.0012	.0018	.0020	.0020	.0020
					RPM	8100	7330	6420	5120	4160	3310	2840	2520
					IPM	8	12	13	12	15	13	11	10
	8-9		1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	165	185	185	200	200	200	200	200
					IPT	.0005	.0008	.0010	.0013	.0015	.0016	.0016	.0016
					RPM	5040	4520	3770	3060	2440	2040	1750	1530
					IPM	5	7	8	8	7	7	6	5
	10	High alloyed steel, and tool steel	1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	265	300	315	335	340	325	325	330
					IPT	.0005	.0008	.0010	.0012	.0018	.0020	.0020	.0020
					RPM	8100	7330	6420	5120	4160	3310	2840	2520
					IPM	8	12	13	12	15	13	11	10
	11.1 - 11.2		1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	165	185	185	200	200	200	200	200
					IPT	.0005	.0008	.0010	.0013	.0015	.0016	.0016	.0016
					RPM	5040	4520	3770	3060	2440	2040	1750	1530
					IPM	5	7	8	8	7	7	6	5
M	14.1	Stainless steel	1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	140	155	160	170	165	165	160	160
					IPT	.0005	.0008	.0010	.0013	.0016	.0018	.0018	.0018
					RPM	4280	3790	3260	2600	2020	1680	1400	1220
					IPM	4	6	7	7	6	6	5	4
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D=Ø1/8 : 0.2D D>Ø1/8 : 0.5D	SFM	265	300	315	335	340	325	325	330
					IPT	.0005	.0008	.0010	.0012	.0018	.0020	.0020	.0020
					RPM	8100	7330	6420	5120	4160	3310	2840	2520
					IPM	8	12	13	12	15	13	11	10
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0006	.0007	.0010	.0013	.0017	.0022	.0024	.0026
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	15	15	17	16	18	19	17	16
	29.1	Non Metallic Materials	1.0D	0.5D	SFM	415	435	415	415	435	415	415	415
					IPT	.0006	.0007	.0010	.0013	.0017	.0022	.0024	.0026
					RPM	12680	10630	8450	6340	5320	4230	3620	3170
					IPM	15	15	17	16	18	19	17	16

GMK32 SERIES

2 FLUTE SQUARE - SLOTTING

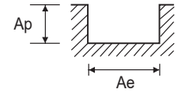


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1	2	3.5	4	5	6	7	8	9	10
P	1-4	Non-alloy steel	1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	215	235	265	300	315	335	340	340	325	325
					IPT	.0002	.0003	.0006	.0008	.0010	.0012	.0015	.0018	.0019	.0020
					RPM	21010	11300	7350	7320	6110	5410	4710	4100	3500	3150
					IPM	7	7	8	11	12	13	14	15	13	13
	5		1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	130	155	190	185	185	200	200	200	200	200
					IPT	.0002	.0005	.0007	.0008	.0010	.0013	.0014	.0015	.0015	.0016
					RPM	12730	7480	5270	4460	3630	3240	2770	2430	2160	1940
					IPM	4	7	7	7	7	8	8	7	7	6
	6-7	Low alloy steel	1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	215	235	265	300	315	335	340	340	325	325
					IPT	.0002	.0003	.0006	.0008	.0010	.0012	.0015	.0018	.0019	.0020
					RPM	21010	11300	7350	7320	6110	5410	4710	4100	3500	3150
					IPM	7	7	8	11	12	13	14	15	13	13
	8-9		1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	130	155	190	185	185	200	200	200	200	200
					IPT	.0002	.0005	.0007	.0008	.0010	.0013	.0014	.0015	.0015	.0016
					RPM	12730	7480	5270	4460	3630	3240	2770	2430	2160	1940
					IPM	4	7	7	7	7	8	8	7	7	6
	10	High alloyed steel, and tool steel	1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	215	235	265	300	315	335	340	340	325	325
					IPT	.0002	.0003	.0006	.0008	.0010	.0012	.0015	.0018	.0019	.0020
					RPM	21010	11300	7350	7320	6110	5410	4710	4100	3500	3150
					IPM	7	7	8	11	12	13	14	15	13	13
	11.1 - 11.2		1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	130	155	190	185	185	200	200	200	200	200
					IPT	.0002	.0005	.0007	.0008	.0010	.0013	.0014	.0015	.0015	.0016
					RPM	12730	7480	5270	4460	3630	3240	2770	2430	2160	1940
					IPM	4	7	7	7	7	8	8	7	7	6
M	14.1	Stainless steel	1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	110	130	140	155	160	170	170	165	165	165
					IPT	.0001	.0003	.0006	.0008	.0010	.0013	.0015	.0016	.0017	.0019
					RPM	10500	6210	3880	3820	3120	2760	2360	2030	1780	1620
					IPM	3	4	5	6	6	7	7	7	6	6
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D=1 : 0.15D 1<D≤3 : 0.2D D>3 : 0.5D	SFM	215	235	265	300	315	335	340	340	325	325
					IPT	.0002	.0003	.0006	.0008	.0010	.0012	.0015	.0018	.0019	.0020
					RPM	21010	11300	7350	7320	6110	5410	4710	4100	3500	3150
					IPM	7	7	8	11	12	13	14	15	13	13
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM	315	415	435	435	415	415	415	435	415	415
					IPT	.0002	.0004	.0007	.0007	.0010	.0013	.0015	.0017	.0019	.0022
					RPM	30560	20050	12060	10500	8020	6680	5750	5250	4470	4010
					IPM	9	16	16	16	16	17	17	18	17	17
	29.1	Non Metallic Materials	1.0D	0.5D	SFM	315	415	435	435	415	415	415	435	415	415
					IPT	.0002	.0004	.0007	.0007	.0010	.0013	.0015	.0017	.0019	.0022
					RPM	30560	20050	12060	10500	8020	6680	5750	5250	4470	4010
					IPM	9	16	16	16	16	17	17	18	17	17

GMK87 SERIES

3 FLUTE SQUARE - SLOTTING

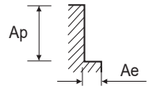


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	1.0D	0.8D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	5		1.0D	0.8D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	6-7	Low alloy steel	1.0D	0.8D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	8-9		1.0D	0.8D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	10 - 11.1	High alloyed steel, and tool steel	1.0D	0.8D	SFM	210	210	210	210	210	230	230	230
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013
					RPM	6420	5130	4280	3210	2570	2340	2010	1760
					IPM	2	3	4	4	5	8	7	7
M	12 - 13	Stainless steel	1.0D	0.8D	SFM	485	485	485	485	485	485	485	485
					IPT	.0002	.0002	.0004	.0004	.0005	.0009	.0013	.0016
					RPM	14820	11860	9880	7410	5930	4940	4230	3710
					IPM	9	7	12	9	9	13	16	18
	14.1		1.0D	0.8D	SFM	350	350	350	350	350	350	350	350
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	10700	8560	7130	5350	4280	3570	3060	2670
					IPM	6	8	11	11	14	19	18	18
	14.2		1.0D	0.8D	SFM	310	310	310	310	310	310	310	310
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	9470	7580	6320	4740	3790	3160	2710	2370
					IPM	6	7	9	10	13	17	16	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.8D	SFM	365	365	365	365	365	405	405	405
					IPT	.0002	.0004	.0006	.0008	.0013	.0018	.0020	.0022
					RPM	11150	8920	7440	5580	4460	4130	3540	3090
					IPM	7	11	13	13	17	22	21	20
S	31 - 35	Heat Resistant Super Alloys	1.0D	0.5D	SFM	85	85	85	85	85	85	85	85
					IPT	.0002	.0003	.0003	.0005	.0007	.0012	.0014	.0016
					RPM	2600	2080	1730	1300	1040	870	740	650
					IPM	2	2	2	2	2	3	3	3
	36 - 37	Titanium Alloys	1.0D	0.5D	SFM	190	190	190	190	190	190	190	190
					IPT	.0002	.0003	.0004	.0006	.0010	.0016	.0019	.0021
					RPM	5810	4650	3870	2900	2320	1940	1660	1450
					IPM	3	4	5	5	7	9	9	9

GMK87 SERIES

3 FLUTE SQUARE - SIDE CUTTING

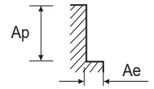


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
P	1-4	Non-alloy steel	0.5D	1.0D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	5		0.5D	1.0D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	6-7	Low alloy steel	0.5D	1.0D	SFM	500	500	500	500	500	550	550	550
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0018
					RPM	15280	12220	10190	7640	6110	5600	4800	4200
					IPM	9	11	12	14	20	25	24	23
	8-9		0.5D	1.0D	SFM	350	350	350	350	350	385	385	385
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019
					RPM	10700	8560	7130	5350	4280	3920	3360	2940
					IPM	6	8	9	10	14	18	17	17
	10 - 11.1	High alloyed steel, and tool steel	0.5D	1.0D	SFM	210	210	210	210	210	230	230	230
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013
					RPM	6420	5130	4280	3210	2570	2340	2010	1760
					IPM	2	3	4	4	5	8	7	7
M	12 - 13	Stainless steel	0.5D	1.0D	SFM	485	485	485	485	485	485	485	485
					IPT	.0002	.0002	.0004	.0004	.0005	.0009	.0013	.0016
					RPM	14820	11860	9880	7410	5930	4940	4230	3710
					IPM	9	7	12	9	9	13	16	18
	14.1		0.5D	1.0D	SFM	350	350	350	350	350	350	350	350
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	10700	8560	7130	5350	4280	3570	3060	2670
					IPM	6	8	11	11	14	19	18	18
	14.2		0.5D	1.0D	SFM	310	310	310	310	310	310	310	310
					IPT	.0002	.0003	.0005	.0007	.0011	.0018	.0020	.0022
					RPM	9470	7580	6320	4740	3790	3160	2710	2370
					IPM	6	7	9	10	13	17	16	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.0D	SFM	365	365	365	365	365	405	405	405
					IPT	.0002	.0004	.0006	.0008	.0013	.0018	.0020	.0022
					RPM	11150	8920	7440	5580	4460	4130	3540	3090
					IPM	7	11	13	13	17	22	21	20
S	31 - 35	Heat Resistant Super Alloys	0.25D	1.0D	SFM	85	85	85	85	85	85	85	85
					IPT	.0002	.0003	.0003	.0005	.0007	.0012	.0014	.0016
					RPM	2600	2080	1730	1300	1040	870	740	650
					IPM	2	2	2	2	2	3	3	3
	36 - 37	Titanium Alloys	0.35D	1.0D	SFM	190	190	190	190	190	190	190	190
					IPT	.0002	.0003	.0004	.0006	.0010	.0016	.0019	.0021
					RPM	5810	4650	3870	2900	2320	1940	1660	1450
					IPM	3	4	5	5	7	9	9	9

GMK54 SERIES

4 FLUTE SQUARE - SIDE CUTTING

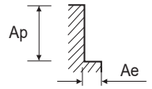


SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
P	1-4	Non-alloy steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	12220	9780	8150	6110	4890	4480	3840	3360	2690	2240
					IPM	10	12	13	15	22	27	26	26	23	23
	5		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	8560	6850	5700	4280	3420	3160	2710	2370	1900	1580
					IPM	7	8	9	10	15	19	18	18	16	16
	6-7	Low alloy steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	12220	9780	8150	6110	4890	4480	3840	3360	2690	2240
					IPM	10	12	13	15	22	27	26	26	23	23
	8-9		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	8560	6850	5700	4280	3420	3160	2710	2370	1900	1580
					IPM	7	8	9	10	15	19	18	18	16	16
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM	400	400	400	400	400	440	440	440	440	440
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	12220	9780	8150	6110	4890	4480	3840	3360	2690	2240
					IPM	10	12	13	15	22	27	26	26	23	23
	11.1		0.3D	1.5D	SFM	280	280	280	280	280	310	310	310	310	310
					IPT	.0002	.0003	.0004	.0006	.0011	.0015	.0017	.0019	.0021	.0026
					RPM	8560	6850	5700	4280	3420	3160	2710	2370	1900	1580
					IPM	7	8	9	10	15	19	18	18	16	16
	11.2		0.3D	1.5D	SFM	165	165	165	165	165	185	185	185	185	185
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0012	.0013	.0015	.0018
					RPM	5040	4030	3360	2520	2020	1890	1620	1410	1130	940
					IPM	2	3	4	4	6	8	8	7	7	7
M	12 - 13	Stainless steel	0.3D	1.5D	SFM	425	425	425	425	425	425	425	425	425	425
					IPT	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0016	.0018	.0022
					RPM	12990	10390	8660	6490	5200	4330	3710	3250	2600	2160
					IPM	10	8	14	13	19	23	22	21	19	19
	14.1		0.3D	1.5D	SFM	300	300	300	300	300	300	300	300	300	300
					IPT	.0002	.0003	.0005	.0007	.0011	.0019	.0021	.0022	.0025	.0030
					RPM	9170	7330	6110	4580	3670	3060	2620	2290	1830	1530
					IPM	7	9	12	13	16	23	22	20	18	18
	14.2		0.3D	1.5D	SFM	270	270	270	270	270	270	270	270	270	270
					IPT	.0002	.0003	.0005	.0007	.0011	.0019	.0021	.0022	.0024	.0030
					RPM	8250	6600	5500	4130	3300	2750	2360	2060	1650	1380
					IPM	7	8	11	12	15	21	20	18	16	17
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	SFM	295	295	295	295	295	320	320	320	320	320
					IPT	.0002	.0004	.0006	.0008	.0013	.0019	.0021	.0023	.0026	.0032
					RPM	9020	7210	6010	4510	3610	3260	2790	2440	1960	1630
					IPM	7	12	14	14	19	25	23	22	20	21
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM	415	435	415	415	435	415	415	415	415	415
					IPT	.0010	.0011	.0014	.0019	.0025	.0032	.0035	.0038	.0049	.0064
					RPM	12680	10630	8450	6340	5320	4230	3620	3170	2540	2110
					IPM	51	47	47	48	53	54	51	48	50	54
	29.1	Non Metallic Materials	0.1D	1.5D	SFM	415	435	415	415	435	415	415	415	415	415
					IPT	.0010	.0011	.0014	.0019	.0025	.0032	.0035	.0038	.0049	.0064
					RPM	12680	10630	8450	6340	5320	4230	3620	3170	2540	2110
					IPM	51	47	47	48	53	54	51	48	50	54
S	31 - 35	Heat Resistant Super Alloys	0.2D	1.0D	SFM	80	80	80	80	80	80	80	80	80	80
					IPT	.0002	.0003	.0005	.0007	.0012	.0018	.0020	.0022	.0025	.0030
					RPM	2440	1960	1630	1220	980	810	700	610	490	410
					IPM	2	2	3	3	5	6	6	5	5	5
	36 - 37	Titanium Alloys	0.3D	1.0D	SFM	215	215	215	215	215	215	215	215	215	215
					IPT	.0002	.0003	.0004	.0006	.0010	.0017	.0019	.0020	.0022	.0027
					RPM	6570	5260	4380	3290	2630	2190	1880	1640	1310	1100
					IPM	5	6	7	8	11	15	14	13	12	12

GMK33 SERIES

4 FLUTE SQUARE - SIDE CUTTING



SFM = Surface Feet per Minute
IPM = Inches Per Minute
RPM = Revolutions Per Minute
Ap : Inch (Axial Depth of Cut)
IPT = Inches Per Tooth
Ae : Inch (Radial Depth of Cut)

ISO	VDI 3323	Material Description	Ae	Ap	Para-meter	Diameter (Ø) 2	3	4	4.5	6	8	10	12	20
P	1-4	Non-alloy steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	400	400	400	400	400	400	440	440	440
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	19420	12950	9710	8630	6470	4850	4270	3550	2130
					IPM	9	10	12	14	16	21	26	26	22
	5		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	280	280	280	280	280	280	310	310	310
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	13690	9130	6840	6040	4560	3420	2990	2490	1500
					IPM	6	7	9	10	11	15	18	18	15
	6-7	Low alloy steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	400	400	400	400	400	400	440	440	440
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	19420	12950	9710	8630	6470	4850	4270	3550	2130
					IPM	9	10	12	14	16	21	26	26	22
	8-9		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	280	280	280	280	280	280	310	310	310
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	13690	9130	6840	6040	4560	3420	2990	2490	1500
					IPM	6	7	9	10	11	15	18	18	15
	10	High alloyed steel, and tool steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	400	400	400	400	400	400	440	440	440
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	19420	12950	9710	8630	6470	4850	4270	3550	2130
					IPM	9	10	12	14	16	21	26	26	22
	11.1		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	280	280	280	280	280	280	310	310	310
					IPT	.0001	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0026
					RPM	13690	9130	6840	6040	4560	3420	2990	2490	1500
					IPM	6	7	9	10	11	15	18	18	15
	11.2		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	165	165	165	165	165	165	185	185	185
					IPT	.0001	.0001	.0002	.0003	.0004	.0007	.0011	.0013	.0018
					RPM	8120	5410	4060	3560	2710	2030	1780	1490	890
					IPM	3	3	4	4	5	6	8	7	6
M	12 - 13	Stainless steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	425	425	425	425	425	425	425	425	425
					IPT	.0001	.0002	.0002	.0003	.0005	.0009	.0013	.0016	.0022
					RPM	20530	13690	10270	9160	6840	5130	4110	3420	2050
					IPM	8	9	10	11	14	18	22	22	18
	14.1		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	300	300	300	300	300	300	300	300	300
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0019	.0022	.0030
					RPM	14640	9760	7320	6470	4880	3660	2930	2440	1460
					IPM	7	8	9	10	14	16	22	22	18
	14.2		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	270	270	270	270	270	270	270	270	270
					IPT	.0001	.0002	.0003	.0004	.0007	.0011	.0019	.0022	.0030
					RPM	13210	8810	6610	5820	4400	3300	2640	2200	1320
					IPM	6	7	8	9	12	15	20	19	16
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	SFM	295	295	295	295	295	295	320	320	320
					IPT	.0002	.0002	.0004	.0005	.0008	.0013	.0019	.0023	.0032
					RPM	14320	9550	7160	6360	4780	3580	3120	2600	1560
					IPM	9	9	11	13	15	19	24	24	20
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM	415	415	435	415	415	435	415	415	415
					IPT	.0006	.0009	.0011	.0014	.0019	.0025	.0032	.0038	.0064
					RPM	20050	13370	10500	8950	6690	5250	4010	3340	2010
					IPM	51	51	48	50	51	52	51	51	51
	29.1	Non Metallic Materials	0.1D	1.5D	SFM	415	415	435	415	415	435	415	415	415
					IPT	.0006	.0009	.0011	.0014	.0019	.0025	.0032	.0038	.0064
					RPM	20050	13370	10500	8950	6690	5250	4010	3340	2010
					IPM	51	51	48	50	51	52	51	51	51
S	31 - 35	Heat Resistant Super Alloys	D<3 : 0.1D D≥3 : 0.2D	1.0D	SFM	80	80	80	80	80	80	80	80	80
					IPT	.0001	.0002	.0003	.0004	.0007	.0012	.0018	.0022	.0030
					RPM	3980	2650	1990	1730	1330	1000	800	660	400
					IPM	2	2	2	3	4	5	6	6	5
	36 - 37	Titanium Alloys	D<3 : 0.1D D≥3 : 0.3D	1.0D	SFM	215	215	215	215	215	215	215	215	215
					IPT	.0001	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0027
					RPM	10350	6900	5170	4640	3450	2590	2070	1720	1040
					IPM	3	4	6	7	9	10	14	14	11

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