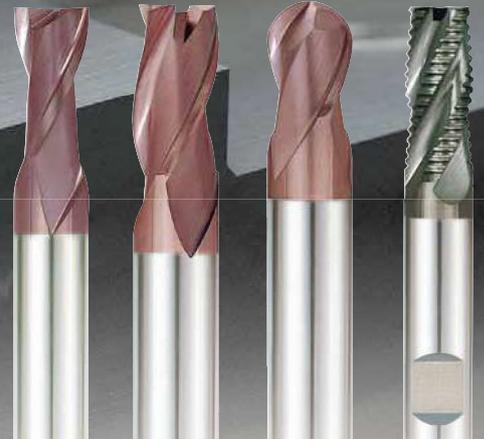




Leading Through Innovation



SOLID CARBIDE

K-2 END MILLS

K-2 VHM - Fräser

- General Purpose / Conventional or High Speed Milling / Wet & Dry Cutting
- Für allgemeinen Einsatz / Konventionelles oder Hochgeschwindigkeitsfräsen

SELECTION GUIDE



SOLID CARBIDE
K-2
END MILLS

General Purpose
Conventional or High Speed Milling
Wet & Dry Cutting



◎ : Excellent ○ : Good

Recommended cutting conditions : P 597

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	SHORT LENGTH TiAlN based	SHORT LENGTH TiAlN based	SHORT LENGTH TiAlN based	LONG LENGTH TiAlN based	
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			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	○	○	○	○	
	13		Martensitic Quenched & Tempered	240	23	○	○	○	○	
	14	Austenitic	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	100		○	○	○	○	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		○	○	○	○	
	24		≤ 12% Si, Curable	90		○	○	○	○	
	25		> 12% Si, Not Curable	130		○	○	○	○	
	26		Cutting Alloys, PB>1%	110		○	○	○	○	
	27	Copper and Copper Alloys (Bronze / Brass)	CuZn, CuSnZn (Brass)	90		○	○	○	○	
	28		CuSn, lead-free copper and electrolytic copper	100		○	○	○	○	
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic			○	○	○	○	
	30		Rubber, Wood, etc.			○	○	○	○	
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	○	○	○	○	
	32		Fe Based Cured	280	30	○	○	○	○	
	33		Fe Based Annealed	250	25	○	○	○	○	
	34	Ni or Co Based	Cured	350	38	○	○	○	○	
	35		Cast	320	34	○	○	○	○	
	36	Titanium Alloys	Pure Titanium	400 Rm		○	○	○	○	
37	Alpha + Beta Alloys		Hardened 1050 Rm		○	○	○	○		
H	38	Hardened steel	Hardened	550	55					
	39		Hardened	630	60					
	40	Chilled Cast Iron	Cast	400	42	○	○	○	○	
	41		Hardened Cast Iron	Hardened	550	55				

G9454	G9455	G9B81	G9634	G9B82	G9B83	G9B84	G9B85	G9424	G9G44	G9A68
2	2	2	4	2	2	4	4	2	2	2
30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE
R1.5	R1.5	R0.2	R1.0	D2.0	D3.0	D2.0	D3.0	D1.0	D3.0	D1.0
R10.0	R10.0	R2.0	R10.0	D12.0	D12.0	D12.0	D12.0	D20.0	D20.0	D20.0
552	553	554	556	557	559	560	562	563	564	565
LONG REACH	EXTRA LONG LENGTH	RB PROCESSING	SHORT LENGTH	SHORT LENGTH	LONG REACH	SHORT LENGTH	LONG REACH	SHORT LENGTH	SHORT LENGTH WITH CHAMFER	SHORT LENGTH
TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based

SELECTION GUIDE



SOLID CARBIDE
K-2
END MILLS

General Purpose with Coating
Conventional or High Speed Milling, Wet or Dry Cutting



◎ : Excellent ○ : Good

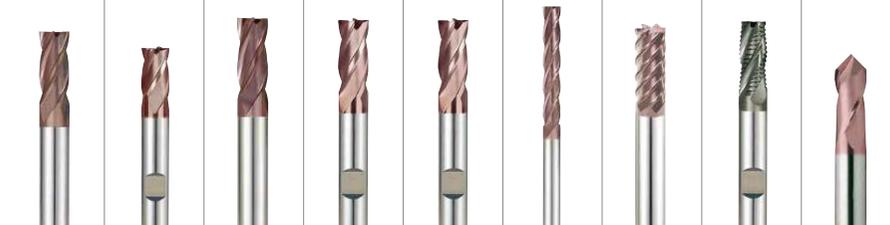
Recommended cutting conditions : P 597

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			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	
	13		Martensitic Quenched & Tempered	240	23	
K	14	Grey cast iron	Austenitic	180	10	
	15		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	100		
	23		≤ 12% Si, Not Curable	75		
	24	Aluminum-cast, alloyed	≤ 12% Si, Curable	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	Non Metallic Materials	CuSn, lead-free copper and electrolytic copper	100		
	29		Duroplastic, Fiber Reinforced Plastic			
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based Annealed	200	15	
	32		Cured	280	30	
	33		Annealed	250	25	
	34	Titanium Alloys	Ni or Co Based Cured	350	38	
	35		Cast	320	34	
	36		Pure Titanium	400 Rm		
37	Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel	Hardened	550	55	
	39		Hardened	630	60	
	40	Hardened Cast Iron	Cast	400	42	
	41		Hardened	550	55	

SERIES	G9G49	G9432	G9G50
FLUTE	3	4	4
HELIX ANGLE	45°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE
SIZE MIN	D3.0	D1.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0
PAGE	585	586	587
	LONG LENGTH with CHAMFER	SHORT LENGTH	SHORT LENGTH with CHAMFER
	TiAlN based	TiAlN based	TiAlN based



SERIES	G9A69	G9448	G9540	G9449	G9G51	G9453	G9F45 G9F46	G9A42	G9400
FLUTE	4	4	4	4	4	4	4&6	Multi Flute	2
HELIX ANGLE	30°	≈ 30°	≈ 30°	≈ 30°	≈ 30°	30°	45°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	DRILL MILL
SIZE MIN	D1.0	D2.0	D3.5	D2.0	D3.0	D3.0	D3.0	D6.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0	D25.0	D20.0
PAGE	588	589	590	591	592	593	594	595	596
	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH with CHAMFER	EXTRA LONG LENGTH	SHORT LENGTH LONG LENGTH	LONG LENGTH	-
	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	TiAlN based	X-Coating	TiAlN based



HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TiAlN-Coated END MILLS

JET-POWER END MILLS

V7 PLUS END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS

CRX S END MILLS

K-2 END MILLS

ONLY ONE COATED PM60 END MILLS

TANK-POWER END MILLS

GENERAL HSS END MILLS

MILLING CUTTERS

TECHNICAL DATA



PLAIN SHANK **G9624** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS**
- ▶ **Fraise carbure, 2 dents, hémisphérique, courte**
- ▶ **2 TAGLIENTI, SEMISFERICA, SERIE CORTA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9624020	R1.0	2.0	6	4	48
G9624025	R1.25	2.5	6	4	48
G9624030	R1.5	3.0	6	4	48
G9624040	R2.0	4.0	6	6	50
G9624901	R2.0	4.0	4	12	40
G9624050	R2.5	5.0	6	7	51
G9624902	R2.5	5.0	5	14	50
G9624060	R3.0	6.0	6	7	51
G9624080	R4.0	8.0	8	9	59
G9624100	R5.0	10.0	10	10	60
G9624120	R6.0	12.0	12	14	71
G9624140	R7.0	14.0	14	14	71
G9624160	R8.0	16.0	16	16	76
G9624180	R9.0	18.0	18	18	76
G9624200	R10.0	20.0	20	20	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S					T							
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550	550	630	400	550	
HB	60	100	75	90	130	110	90	100													
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



PLAIN SHANK **G9A70** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS**
- ▶ **Fraise carbure, 2 dents, hémisphérique, courte**
- ▶ **2 TAGLIENTI, SEMISFERICA, SERIE CORTA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9A70010	R0.5	1.0	3	3	39
G9A70015	R0.75	1.5	3	5	39
G9A70020	R1.0	2.0	3	7	39
G9A70025	R1.25	2.5	3	8	39
G9A70030	R1.5	3.0	3	9	39
G9A70040	R2.0	4.0	4	14	51
G9A70050	R2.5	5.0	5	16	51
G9A70060	R3.0	6.0	6	19	64
G9A70080	R4.0	8.0	8	21	64
G9A70100	R5.0	10.0	10	22	70
G9A70110	R5.5	11.0	11	25	70
G9A70120	R6.0	12.0	12	25	76
G9A70160	R8.0	16.0	16	32	89
G9A70200	R10.0	20.0	20	38	102

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S					T							
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550	550	630	400	550	
HB	60	100	75	90	130	110	90	100													
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



FLAT SHANK **G9437** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

- VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS
- (I) Fraise carbure, 2 dents, hémisphérique, courte
- (II) 2 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9437020	R1.0	2.0	6	3	50
G9437030	R1.5	3.0	6	4	50
G9437040	R2.0	4.0	6	5	54
G9437050	R2.5	5.0	6	6	54
G9437060	R3.0	6.0	6	7	54
G9437080	R4.0	8.0	8	9	58
G9437100	R5.0	10.0	10	11	66
G9437120	R6.0	12.0	12	12	73
G9437140	R7.0	14.0	14	14	75
G9437180	R9.0	18.0	18	18	84
G9437200	R10.0	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



FLAT SHANK **G9438** SERIES

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- VOLLHARTMETALL, 2 SCHNEIDEN LANG STIRNRADIUS
- (I) Fraise carbure, 2 dents, hémisphérique, longue
- (II) 2 TAGLIENTI, SEMISFERICA, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9438020	R1.0	2.0	3	6	38
G9438030	R1.5	3.0	6	7	57
G9438040	R2.0	4.0	6	8	57
G9438050	R2.5	5.0	6	10	57
G9438060	R3.0	6.0	6	10	57
G9438080	R4.0	8.0	8	16	63
G9438100	R5.0	10.0	10	19	72
G9438120	R6.0	12.0	12	22	83
G9438140	R7.0	14.0	14	22	83
G9438160	R8.0	16.0	16	26	92
G9438180	R9.0	18.0	18	26	92
G9438200	R10.0	20.0	20	32	104

● with plain shank

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9454** SERIES

CARBIDE, 2 FLUTE LONG REACH BALL NOSE

- VOLLHARTMETALL, 2 SCHNEIDEN GROÖE REICHWEITE STIRNRADIUS
- () Fraise carbure, 2 dents, hémisphérique longue portée
- () 2 TAGLIENTI, SEMISFERICA, GAMBO LUNGO

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9454030	R1.5	3.0	3	5	75
G9454040	R2.0	4.0	4	8	75
G9454050	R2.5	5.0	5	9	75
G9454060	R3.0	6.0	6	10	100
G9454080	R4.0	8.0	8	12	100
G9454100	R5.0	10.0	10	14	100
G9454120	R6.0	12.0	12	16	100
G9454140	R7.0	14.0	14	18	100
G9454160	R8.0	16.0	16	22	150
G9454200	R10.0	20.0	20	26	150

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



PLAIN SHANK **G9455** SERIES

CARBIDE, 2 FLUTE EXTRA LONG LENGTH BALL NOSE

- VOLLHARTMETALL, 2 SCHNEIDEN EXTRA LANG STIRNRADIUS
- () Fraise carbure, 2 dents, hémisphérique, extra-longue
- () 2 TAGLIENTI, SEMISFERICA, SERIE EXTRA LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9455903	R1.5	3.0	3	20	60
G9455030	R1.5	3.0	3	30	75
G9455904	R2.0	4.0	4	20	60
G9455040	R2.0	4.0	4	30	75
G9455905	R2.5	5.0	5	25	75
G9455050	R2.5	5.0	5	40	100
G9455906	R3.0	6.0	6	30	75
G9455060	R3.0	6.0	6	50	150
G9455908	R4.0	8.0	8	30	75
G9455080	R4.0	8.0	8	50	150
G9455910	R5.0	10.0	10	40	100
G9455100	R5.0	10.0	10	60	150
G9455912	R6.0	12.0	12	45	100
G9455914	R7.0	14.0	14	45	100
G9455916	R8.0	16.0	16	45	100
G9455918	R9.0	18.0	18	45	100
G9455920	R10.0	20.0	20	45	100
G9438200	R10.0	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



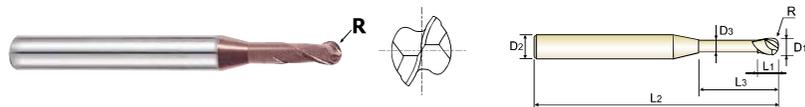
PLAIN SHANK **G9B81** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
- (1) Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
- (2) 2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.02)	D1	D2	L1	L3	D3	D3
G9B81004	R0.2	0.4	4	0.7	2	50	0.37
G9B81005	R0.25	0.5	4	0.75	2	50	0.45
G9B81901	R0.25	0.5	4	0.75	4	50	0.45
G9B81902	R0.25	0.5	4	0.75	6	50	0.45
G9B81006	R0.3	0.6	4	0.9	2	50	0.55
G9B81903	R0.3	0.6	4	0.9	4	50	0.55
G9B81904	R0.3	0.6	4	0.9	6	50	0.55
G9B81008	R0.4	0.8	4	1.2	4	50	0.75
G9B81905	R0.4	0.8	4	1.2	6	50	0.75
G9B81906	R0.4	0.8	4	1.2	8	50	0.75
G9B81010	R0.5	1.0	4	1.5	6	50	0.95
G9B81907	R0.5	1.0	4	1.5	8	50	0.95
G9B81908	R0.5	1.0	4	1.5	10	50	0.95
G9B81909	R0.5	1.0	4	1.5	12	50	0.95
G9B81012	R0.6	1.2	4	1.8	8	50	1.15
G9B81910	R0.6	1.2	4	1.8	12	50	1.15
G9B81014	R0.7	1.4	4	2.1	16	50	1.35
G9B81015	R0.75	1.5	4	2.3	6	50	1.45
G9B81911	R0.75	1.5	4	2.3	8	50	1.45
G9B81912	R0.75	1.5	4	2.3	10	50	1.45
G9B81913	R0.75	1.5	4	2.3	12	50	1.45
G9B81914	R0.75	1.5	4	2.3	16	50	1.45
G9B81915	R0.75	1.5	4	2.3	20	50	1.45
G9B81016	R0.8	1.6	4	2.4	8	50	1.55

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



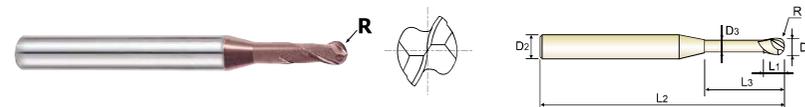
PLAIN SHANK **G9B81** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
- (1) Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
- (2) 2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.02)	D1	D2	L1	L3	D3	D3
G9B81916	R0.8	1.6	4	2.4	12	50	1.55
G9B81917	R0.8	1.6	4	2.4	16	50	1.55
G9B81918	R0.8	1.6	4	2.4	20	50	1.55
G9B81020	R1.0	2.0	4	3	8	50	1.95
G9B81919	R1.0	2.0	4	3	10	50	1.95
G9B81920	R1.0	2.0	4	3	12	50	1.95
G9B81921	R1.0	2.0	4	3	14	50	1.95
G9B81922	R1.0	2.0	4	3	16	50	1.95
G9B81923	R1.0	2.0	4	3	20	50	1.95
G9B81030	R1.5	3.0	6	4.5	10	50	2.85
G9B81924	R1.5	3.0	6	4.5	12	50	2.85
G9B81925	R1.5	3.0	6	4.5	16	60	2.85
G9B81926	R1.5	3.0	6	4.5	20	60	2.85
G9B81927	R1.5	3.0	6	4.5	25	75	2.85
G9B81040	R2.0	4.0	6	6	12	50	3.85
G9B81928	R2.0	4.0	6	6	16	60	3.85
G9B81929	R2.0	4.0	6	6	20	75	3.85
G9B81930	R2.0	4.0	6	6	25	75	3.85
G9B81931	R2.0	4.0	6	6	30	75	3.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9634** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH BALL NOSE

- VOLLHARTMETALL, 4 SCHNEIDEN KURZ STIRNRADIUS
- (I) Fraise carbure, 4 dents, hémisphérique, courte
- (II) 4 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.02)				
G9634020	R1.0	2.0	6	4	48
G9634030	R1.5	3.0	6	4	48
G9634040	R2.0	4.0	6	6	50
G9634050	R2.5	5.0	6	7	51
G9634060	R3.0	6.0	6	7	51
G9634080	R4.0	8.0	8	9	59
G9634100	R5.0	10.0	10	10	60
G9634120	R6.0	12.0	12	14	71
G9634140	R7.0	14.0	14	14	71
G9634160	R8.0	16.0	16	16	76
G9634180	R9.0	18.0	18	18	76
G9634200	R10.0	20.0	20	20	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S					T							
	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	39	40	41
HRc	15	30	25	38	34	35	36	37	55	60	42	55	400 Rm	1050 Rm	550	630	400	550			
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



PLAIN SHANK **G9B82** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH CORNER RADIUS

- VOLLHARTMETALL, 2 SCHNEIDEN KURZ ECKENRADIUS
- (I) Fraise carbure, 2 dents, torique, courte
- (II) 2 TAGLIENTI, SERIE CORTA, TORICA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B82020	R0.2	2.0	4	4	50
G9B82901	R0.3	2.0	4	4	50
G9B82902	R0.5	2.0	4	4	50
G9B82025	R0.2	2.5	4	5	50
G9B82903	R0.3	2.5	4	5	50
G9B82904	R0.5	2.5	4	5	50
G9B82030	R0.2	3.0	4	6	50
G9B82905	R0.3	3.0	4	6	50
G9B82906	R0.5	3.0	4	6	50
G9B82907	R1.0	3.0	4	6	50
G9B82040	R0.2	4.0	4	8	50
G9B82908	R0.3	4.0	4	8	50
G9B82909	R0.5	4.0	4	8	50
G9B82910	R1.0	4.0	4	8	50
G9B82050	R0.2	5.0	6	10	50
G9B82911	R0.3	5.0	6	10	50
G9B82912	R0.5	5.0	6	10	50
G9B82913	R1.0	5.0	6	10	50
G9B82060	R0.2	6.0	6	12	50
G9B82914	R0.3	6.0	6	12	50
G9B82915	R0.5	6.0	6	12	50
G9B82916	R1.0	6.0	6	12	50

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S					T							
	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	39	40	41
HRc	15	30	25	38	34	35	36	37	55	60	42	55	400 Rm	1050 Rm	550	630	400	550			
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



PLAIN SHANK **G9B82** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH CORNER RADIUS

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN KURZ ECKENRADIUS**
- ▶ **Fraise carbure, 2 dents, torique, courte**
- ▶ **2 TAGLIENTI, SERIE CORTA, TORICA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B82080	R0.5	8.0	8	16	60
G9B82917	R1.0	8.0	8	16	60
G9B82918	R1.5	8.0	8	16	60
G9B82919	R2.0	8.0	8	16	60
G9B82920	R2.5	8.0	8	16	60
G9B82100	R0.5	10.0	10	20	75
G9B82921	R1.0	10.0	10	20	75
G9B82922	R1.5	10.0	10	20	75
G9B82923	R2.0	10.0	10	20	75
G9B82924	R2.5	10.0	10	20	75
G9B82120	R0.5	12.0	12	24	75
G9B82925	R1.0	12.0	12	24	75
G9B82926	R1.5	12.0	12	24	75
G9B82927	R2.0	12.0	12	24	75
G9B82928	R2.5	12.0	12	24	75

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34						15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9B83** SERIES

CARBIDE, 2 FLUTE LONG REACH CORNER RADIUS

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN GROÖE REICHWEITE ECKENRADIUS**
- ▶ **Fraise carbure, 2 dents, torique longue portée**
- ▶ **2 TAGLIENTI, SERIE LUNGA, TORICA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B83030	R0.5	3.0	4	6	75
G9B83901	R1.0	3.0	4	6	75
G9B83040	R0.5	4.0	4	8	75
G9B83902	R1.0	4.0	4	8	75
G9B83050	R0.5	5.0	6	10	75
G9B83903	R1.0	5.0	6	10	75
G9B83060	R0.5	6.0	6	12	75
G9B83904	R1.0	6.0	6	12	75
G9B83080	R0.5	8.0	8	16	100
G9B83905	R1.0	8.0	8	16	100
G9B83906	R1.5	8.0	8	16	100
G9B83907	R2.0	8.0	8	16	100
G9B83908	R2.5	8.0	8	16	100
G9B83100	R0.5	10.0	10	20	100
G9B83909	R1.0	10.0	10	20	100
G9B83910	R1.5	10.0	10	20	100
G9B83911	R2.0	10.0	10	20	100
G9B83912	R2.5	10.0	10	20	100
G9B83120	R0.5	12.0	12	24	100
G9B83913	R1.0	12.0	12	24	100
G9B83914	R1.5	12.0	12	24	100
G9B83915	R2.0	12.0	12	24	100
G9B83916	R2.5	12.0	12	24	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34						15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9B84** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- VOLLHARTMETALL, 4 SCHNEIDEN KURZ ECKENRADIUS
- () Fraise carbure, 4 dents, torique, courte
- () 4 TAGLIENTI, SERIE CORTA, TORICA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B84020	R0.2	2.0	4	4	50
G9B84901	R0.3	2.0	4	4	50
G9B84902	R0.5	2.0	4	4	50
G9B84025	R0.2	2.5	4	5	50
G9B84903	R0.3	2.5	4	5	50
G9B84904	R0.5	2.5	4	5	50
G9B84030	R0.2	3.0	4	6	50
G9B84905	R0.3	3.0	4	6	50
G9B84906	R0.5	3.0	4	6	50
G9B84907	R1.0	3.0	4	6	50
G9B84040	R0.2	4.0	4	8	50
G9B84908	R0.3	4.0	4	8	50
G9B84909	R0.5	4.0	4	8	50
G9B84910	R1.0	4.0	4	8	50
G9B84050	R0.2	5.0	6	10	50
G9B84911	R0.3	5.0	6	10	50
G9B84912	R0.5	5.0	6	10	50
G9B84913	R1.0	5.0	6	10	50
G9B84060	R0.2	6.0	6	12	50
G9B84914	R0.3	6.0	6	12	50
G9B84915	R0.5	6.0	6	12	50
G9B84916	R1.0	6.0	6	12	50
G9B84080	R0.5	8.0	8	16	60
G9B84917	R1.0	8.0	8	16	60

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					I										
	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	39	40	41
HRc	15	30	25	38	34						15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9B84** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- VOLLHARTMETALL, 4 SCHNEIDEN KURZ ECKENRADIUS
- () Fraise carbure, 4 dents, torique, courte
- () 4 TAGLIENTI, SERIE CORTA, TORICA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B84918	R1.5	8.0	8	16	60
G9B84919	R2.0	8.0	8	16	60
G9B84920	R2.5	8.0	8	16	60
G9B84100	R0.5	10.0	10	20	75
G9B84921	R1.0	10.0	10	20	75
G9B84922	R1.5	10.0	10	20	75
G9B84923	R2.0	10.0	10	20	75
G9B84924	R2.5	10.0	10	20	75
G9B84120	R0.5	12.0	12	24	75
G9B84925	R1.0	12.0	12	24	75
G9B84926	R1.5	12.0	12	24	75
G9B84927	R2.0	12.0	12	24	75
G9B84928	R2.5	12.0	12	24	75

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					I										
	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	39	40	41
HRc	15	30	25	38	34						15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9B85** SERIES

CARBIDE, 4 FLUTE LONG REACH CORNER RADIUS

- ▶ **VOLLHARTMETALL, 4 SCHNEIDEN GROÖE REICHWEITE ECKENRADIUS**
- ▶ **Fraise carbure, 4 dents, torique longue portée**
- ▶ **4 TAGLIENTI, SERIE LUNGA, TORICA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R				
G9B85030	R0.5	3.0	4	6	75
G9B85901	R1.0	3.0	4	6	75
G9B85040	R0.5	4.0	4	8	75
G9B85902	R1.0	4.0	4	8	75
G9B85050	R0.5	5.0	6	10	75
G9B85903	R1.0	5.0	6	10	75
G9B85060	R0.5	6.0	6	12	75
G9B85904	R1.0	6.0	6	12	75
G9B85080	R0.5	8.0	8	16	100
G9B85905	R1.0	8.0	8	16	100
G9B85906	R1.5	8.0	8	16	100
G9B85907	R2.0	8.0	8	16	100
G9B85908	R2.5	8.0	8	16	100
G9B85100	R0.5	10.0	10	20	100
G9B85909	R1.0	10.0	10	20	100
G9B85910	R1.5	10.0	10	20	100
G9B85911	R2.0	10.0	10	20	100
G9B85912	R2.5	10.0	10	20	100
G9B85120	R0.5	12.0	12	24	100
G9B85913	R1.0	12.0	12	24	100
G9B85914	R1.5	12.0	12	24	100
G9B85915	R2.0	12.0	12	24	100
G9B85916	R2.5	12.0	12	24	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9424** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN KURZ**
- ▶ **Fraise carbure, 2 dents, courte**
- ▶ **2 TAGLIENTI, CORTA**

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9424010	1.0	4	3	40
G9424015	1.5	4	4.5	40
G9424020	2.0	2	8	32
G9424025	2.5	2.5	8	32
G9424030	3.0	3	12	32
G9424035	3.5	3.5	12	32
G9424040	4.0	4	12	40
G9424045	4.5	4.5	14	50
G9424050	5.0	5	14	50
G9424055	5.5	5.5	16	50
G9424060	6.0	6	16	50
G9424070	7.0	7	20	60
G9424080	8.0	8	20	60
G9424090	9.0	9	20	60
G9424100	10.0	10	22	70
G9424120	12.0	12	22	70
G9424140	14.0	14	25	75
G9424160	16.0	16	25	75
G9424200	20.0	20	32	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9G44** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH WITH CHAMFER

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
 (1) Fraise carbure, 2 dents, courte
 (1) 2 TAGLIENTI, CORTA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

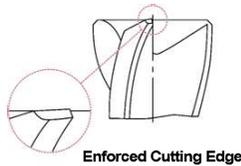
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G44030	3.0	3	12	32	0.10
G9G44040	4.0	4	12	40	0.10
G9G44050	5.0	5	14	50	0.10
G9G44060	6.0	6	16	50	0.10
G9G44080	8.0	8	20	60	0.13
G9G44100	10.0	10	22	70	0.13
G9G44120	12.0	12	22	70	0.18
G9G44140	14.0	14	25	75	0.18
G9G44160	16.0	16	25	75	0.18
G9G44200	20.0	20	32	100	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



◎ : Excellent ○ : Good

ISO	P										M					K							
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel					Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	21	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	130	130
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9A68** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
 (1) Fraise carbure, 2 dents, courte
 (1) 2 TAGLIENTI, CORTA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9A68010	1.0	3	3	39
G9A68015	1.5	3	5	39
G9A68020	2.0	3	7	39
G9A68025	2.5	3	7	39
G9A68030	3.0	3	9	39
G9A68040	4.0	4	14	51
G9A68050	5.0	5	16	51
G9A68060	6.0	6	19	64
G9A68080	8.0	8	21	64
G9A68100	10.0	10	22	70
G9A68120	12.0	12	25	76
G9A68160	16.0	16	32	89
G9A68200	20.0	20	38	102

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M					K							
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel					Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	21
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	21	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	130	130
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

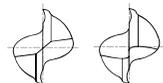


FLAT SHANK **G9444** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
 (1) Fraise carbure, 2 dents, courte
 (2) 2 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



under $\varnothing 3\text{mm}$ from $\varnothing 3\text{mm}$



P.603

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9444020	2.0	6	3	50
G9444030	3.0	6	4	50
G9444035	3.5	6	4	50
G9444040	4.0	6	5	54
G9444045	4.5	6	5	54
G9444050	5.0	6	6	54
G9444060	6.0	6	7	54
G9444070	7.0	8	8	58
G9444080	8.0	8	9	58
G9444090	9.0	10	10	66
G9444100	10.0	10	11	66
G9444120	12.0	12	12	73
G9444140	14.0	14	14	75
G9444160	16.0	16	16	82
G9444180	18.0	18	18	84
G9444200	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9527** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
 (1) Fraise carbure, 2 dents, longue
 (2) 2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



P.603

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9527035	3.5	3.5	7	50
G9527040	4.0	4	8	50
G9527045	4.5	4.5	8	50
G9527050	5.0	5	10	50
G9527055	5.5	5.5	10	57
G9527060	6.0	6	10	57
G9527065	6.5	6.5	13	60
G9527070	7.0	7	13	60
G9527075	7.5	7.5	16	63
G9527080	8.0	8	16	63
G9527085	8.5	8.5	16	67
G9527090	9.0	9	16	67
G9527095	9.5	9.5	19	72
G9527100	10.0	10	19	72
G9527110	11.0	11	22	83
G9527120	12.0	12	22	83
G9527130	13.0	13	22	83
G9527140	14.0	14	22	83
G9527150	15.0	15	26	92
G9527160	16.0	16	26	92
G9527180	18.0	18	26	92
G9527200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

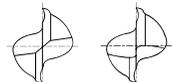


FLAT SHANK **G9445** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
 (1) Fraise carbure, 2 dents, longue
 (1) 2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



up to $\varnothing 2\text{mm}$ over $\varnothing 2\text{mm}$



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9445901	2.0	3	6	38
G9445028	2.8	6	7	57
G9445030	3.0	6	7	57
G9445035	3.5	6	7	57
G9445038	3.8	6	8	57
G9445040	4.0	6	8	57
G9445045	4.5	6	8	57
G9445048	4.8	6	10	57
G9445050	5.0	6	10	57
G9445957	5.8	6	10	57
G9445060	6.0	6	10	57
G9445967	6.8	8	13	63
G9445070	7.0	8	13	63
G9445977	7.8	8	16	63
G9445080	8.0	8	16	63
G9445087	8.7	10	16	72
G9445090	9.0	10	16	72
G9445097	9.7	10	19	72
G9445100	10.0	10	19	72
G9445117	11.7	12	22	83
G9445120	12.0	12	22	83
G9445137	13.7	14	22	83
G9445140	14.0	14	22	83

● with plain shank

► NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

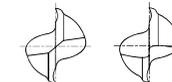


FLAT SHANK **G9445** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
 (1) Fraise carbure, 2 dents, longue
 (1) 2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



up to $\varnothing 2\text{mm}$ over $\varnothing 2\text{mm}$



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9445157	15.7	16	26	92
G9445160	16.0	16	26	92
G9445177	17.7	18	26	92
G9445180	18.0	18	26	92
G9445197	19.7	20	32	104
G9445200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○



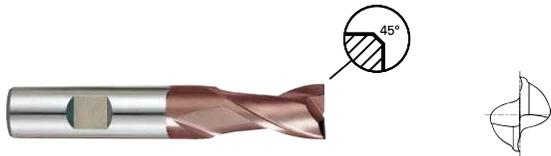
FLAT SHANK **G9G45** SERIES

CARBIDE, 2 FLUTE LONG LENGTH WITH CHAMFER

VOLLHARTMETALL, 2 SCHNEIDEN LANG
 (1) Fraise carbure, 2 dents, longue
 (2) 2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

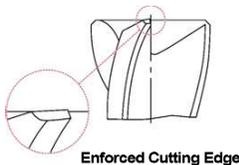
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G45030	3.0	6	7	57	0.10
G9G45040	4.0	6	8	57	0.10
G9G45050	5.0	6	10	57	0.10
G9G45060	6.0	6	10	57	0.10
G9G45080	8.0	8	16	63	0.13
G9G45100	10.0	10	19	72	0.13
G9G45120	12.0	12	22	83	0.18
G9G45140	14.0	14	22	83	0.18
G9G45160	16.0	16	26	92	0.18
G9G45200	20.0	20	32	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S				T								
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9452** SERIES

CARBIDE, 2 FLUTE EXTRA LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN EXTRA LANG
 (1) Fraise carbure, 2 dents, extra-longue
 (2) 2 TAGLIENTI, SERIE EXTRA-LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9452903	3.0	3	20	60
G9452030	3.0	3	30	75
G9452904	4.0	4	20	60
G9452040	4.0	4	30	75
G9452905	5.0	5	25	75
G9452050	5.0	5	40	100
G9452906	6.0	6	30	75
G9452060	6.0	6	50	150
G9452908	8.0	8	30	75
G9452080	8.0	8	50	150
G9452910	10.0	10	40	100
G9452100	10.0	10	60	150
G9452912	12.0	12	45	100
G9452120	12.0	12	75	150
G9452914	14.0	14	45	100
G9452140	14.0	14	65	150
G9452916	16.0	16	45	100
G9452160	16.0	16	65	150
G9452918	18.0	18	45	100
G9452180	18.0	18	65	150
G9452920	20.0	20	45	100
G9452200	20.0	20	65	150

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N								S				T								
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9B80** SERIES

CARBIDE, 2 FLUTE RIB PROCESSING

- VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
- (1) Fraise carbure, 2 dents pour usinage de rainure
- (2) 2 TAGLIENTI, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	D3	D3
G9B80004	0.4	4	0.7	2	50	0.37
G9B80901	0.4	4	0.7	4	50	0.37
G9B80005	0.5	4	0.75	2	50	0.45
G9B80902	0.5	4	0.75	4	50	0.45
G9B80903	0.5	4	0.75	6	50	0.45
G9B80006	0.6	4	0.9	2	50	0.55
G9B80904	0.6	4	0.9	4	50	0.55
G9B80905	0.6	4	0.9	6	50	0.55
G9B80007	0.7	4	1.1	4	50	0.65
G9B80906	0.7	4	1.1	6	50	0.65
G9B80008	0.8	4	1.2	4	50	0.75
G9B80907	0.8	4	1.2	6	50	0.75
G9B80908	0.8	4	1.2	8	50	0.75
G9B80009	0.9	4	1.4	6	50	0.85
G9B80909	0.9	4	1.4	8	50	0.85
G9B80910	0.9	4	1.4	10	50	0.85
G9B80010	1.0	4	1.5	6	50	0.95
G9B80911	1.0	4	1.5	8	50	0.95
G9B80912	1.0	4	1.5	10	50	0.95
G9B80913	1.0	4	1.5	12	50	0.95
G9B80012	1.2	4	1.8	6	50	1.15
G9B80914	1.2	4	1.8	8	50	1.15
G9B80915	1.2	4	1.8	10	50	1.15
G9B80916	1.2	4	1.8	12	50	1.15

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

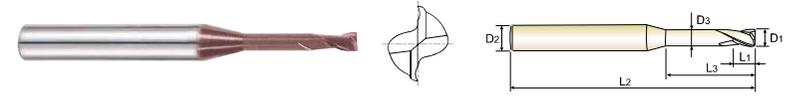


PLAIN SHANK **G9B80** SERIES

CARBIDE, 2 FLUTE RIB PROCESSING

- VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
- (1) Fraise carbure, 2 dents pour usinage de rainure
- (2) 2 TAGLIENTI, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
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- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	D3	D3
G9B80015	1.5	4	2.3	6	50	1.45
G9B80917	1.5	4	2.3	8	50	1.45
G9B80918	1.5	4	2.3	10	50	1.45
G9B80919	1.5	4	2.3	12	50	1.45
G9B80920	1.5	4	2.3	14	50	1.45
G9B80921	1.5	4	2.3	16	50	1.45
G9B80922	1.5	4	2.3	18	50	1.45
G9B80923	1.5	4	2.3	20	50	1.45
G9B80020	2.0	4	3	6	50	1.95
G9B80924	2.0	4	3	8	50	1.95
G9B80925	2.0	4	3	10	50	1.95
G9B80926	2.0	4	3	12	50	1.95
G9B80927	2.0	4	3	14	50	1.95
G9B80928	2.0	4	3	16	50	1.95
G9B80929	2.0	4	3	18	50	1.95
G9B80930	2.0	4	3	20	50	1.95
G9B80025	2.5	4	3.7	8	50	2.40
G9B80931	2.5	4	3.7	12	50	2.40
G9B80932	2.5	4	3.7	16	50	2.40
G9B80933	2.5	4	3.7	20	50	2.40

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P								M				K							
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



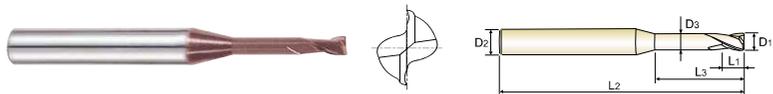
PLAIN SHANK **G9B80** SERIES

CARBIDE, 2 FLUTE RIB PROCESSING

- VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
- (1) Fraise carbure, 2 dents pour usinage de rainure
- (2) 2 TAGLIENTI, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	D3	D3
G9B80030	3.0	6	4.5	8	50	2.85
G9B80934	3.0	6	4.5	12	50	2.85
G9B80935	3.0	6	4.5	16	60	2.85
G9B80936	3.0	6	4.5	20	60	2.85
G9B80937	3.0	6	4.5	25	75	2.85
G9B80040	4.0	6	6	12	50	3.85
G9B80938	4.0	6	6	16	60	3.85
G9B80939	4.0	6	6	20	75	3.85
G9B80940	4.0	6	6	25	75	3.85
G9B80941	4.0	6	6	30	75	3.85
G9B80942	4.0	6	6	35	75	3.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N				S				T													
	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								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55								
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



FLAT SHANK **G9410** SERIES
PLAIN SHANK **G9553** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH THROW AWAY

- VOLLHARTMETALL, 3 SCHNEIDEN KURZ EINWEGFRÄSER
- (1) Fraise carbure, 3 dents, à jeter, courte
- (2) 3 TAGLIENTI, SERIE EXTRA CORTA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsern.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9553005	0.5	3	1.5	38
G9553006	0.6	3	1.5	38
G9553008	0.8	3	2	38
G9553010	1.0	3	2	38
G9553012	1.2	3	2	38
G9553015	1.5	3	2	38
G9553018	1.8	3	2	38
-	G9410020	2.0	6	35
-	G9410025	2.5	6	36
-	G9410030	3.0	6	36
-	G9410035	3.5	6	37
-	G9410040	4.0	6	38
-	G9410045	4.5	6	38
-	G9410050	5.0	6	39
-	G9410055	5.5	6	39
-	G9410957	5.8	6	39
-	G9410060	6.0	6	39
-	G9410967	6.8	8	42
-	G9410070	7.0	8	42
-	G9410977	7.8	8	42
-	G9410080	8.0	8	43
-	G9410087	8.7	10	48
-	G9410090	9.0	10	48
-	G9410097	9.7	10	48

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel and tool steel		Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N				S				T													
	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								
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55								
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



FLAT SHANK **G9410** SERIES
PLAIN SHANK **G9553** SERIES

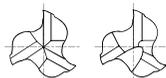
CARBIDE, 3 FLUTE SHORT LENGTH THROW AWAY

VOLLHARTMETALL, 3 SCHNEIDEN KURZ EINWEGFRÄSER

- 1) Fraise carbure, 3 dents, à jeter, courte
- 2) 3 TAGLIENTI, SERIE EXTRA CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaffräsern.



under $\varnothing 2\text{mm}$ from $\varnothing 2\text{mm}$



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	
					PLAIN
-	G9410100	10.0	10	13	50
-	G9410120	12.0	12	15	55
-	G9410140	14.0	14	15	58
-	G9410160	16.0	16	18	62
-	G9410180	18.0	18	20	70
-	G9410200	20.0	20	22	75

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M					K				
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N				S						T											
	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	39	40	41	
HRc	60	100	75	90	130	110	90	100	15	30	25	38	34	15	30	25	38	34	55	60	42	55
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550			
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



FLAT SHANK **G9G46** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH THROW AWAY WITH CHAMFER

VOLLHARTMETALL, 3 SCHNEIDEN KURZ EINWEGFRÄSER

- 1) Fraise carbure, 3 dents, à jeter, courte
- 2) 3 TAGLIENTI, SERIE EXTRA CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaffräsern.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G46030	3.0	6	5	36	0.1
G9G46040	4.0	6	7	38	0.1
G9G46050	5.0	6	8	39	0.1
G9G46060	6.0	6	8	39	0.1
G9G46080	8.0	8	11	43	0.13
G9G46100	10.0	10	13	50	0.13
G9G46120	12.0	12	15	55	0.18
G9G46140	14.0	14	15	58	0.18
G9G46160	16.0	16	18	62	0.18
G9G46200	20.0	20	22	75	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M					K				
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N				S						T											
	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	39	40	41	
HRc	60	100	75	90	130	110	90	100	15	30	25	38	34	15	30	25	38	34	55	60	42	55
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550			
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



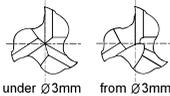
PLAIN SHANK **G9425** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
 (1) Fraise carbure, 3 dents, courte
 (2) 3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsem.



P.606-607

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9425010	1.0	4	3	40
G9425015	1.5	4	4.5	40
G9425020	2.0	2	8	32
G9425025	2.5	3	8	32
G9425030	3.0	3	12	32
G9425035	3.5	4	12	32
G9425040	4.0	4	12	40
G9425045	4.5	5	14	50
G9425050	5.0	5	14	50
G9425055	5.5	6	16	50
G9425060	6.0	6	16	50
G9425070	7.0	7	20	60
G9425080	8.0	8	20	60
G9425090	9.0	9	20	60
G9425100	10.0	10	22	70
G9425120	12.0	12	22	70
G9425140	14.0	14	25	75
G9425160	16.0	16	25	75
G9425200	20.0	20	32	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		



PLAIN SHANK **G9G47** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH WITH CHAMFER

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
 (1) Fraise carbure, 3 dents, courte
 (2) 3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsem.

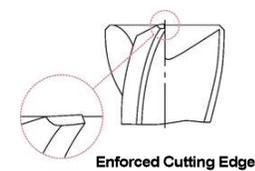


P.606-607

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G47030	3.0	3	12	32	0.1
G9G47040	4.0	4	12	40	0.1
G9G47050	5.0	5	14	50	0.1
G9G47060	6.0	6	16	50	0.1
G9G47080	8.0	8	20	60	0.13
G9G47100	10.0	10	22	70	0.13
G9G47120	12.0	12	22	70	0.18
G9G47140	14.0	14	25	75	0.18
G9G47160	16.0	16	25	75	0.18
G9G47200	20.0	20	32	100	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		



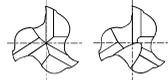
FLAT SHANK **G9439** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
 (1) Fraise carbure, 3 dents, courte
 (1) 3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsem.



up to Ø2mm over Ø2mm

CARBIDE DIN 6527 3 30° DIN 6535HB P.606-607

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9439020	2.0	6	3	50
G9439030	3.0	6	4	50
G9439035	3.5	6	4	50
G9439040	4.0	6	5	54
G9439045	4.5	6	5	54
G9439050	5.0	6	6	54
G9439060	6.0	6	7	54
G9439070	7.0	8	8	58
G9439080	8.0	8	9	58
G9439090	9.0	10	10	66
G9439100	10.0	10	11	66
G9439120	12.0	12	12	73
G9439140	14.0	14	14	75
G9439160	16.0	16	16	82
G9439180	18.0	18	18	84
G9439200	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M			K						
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	42	55			
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9528** SERIES

CARBIDE, 3 FLUTE LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN LANG
 (1) Fraise carbure, 3 dents, longue
 (1) 3 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsem.



CARBIDE DIN 6528 3 30° DIN 6535HA P.606-607

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9528035	3.5	3.5	7	50
G9528040	4.0	4	8	50
G9528045	4.5	4.5	8	50
G9528050	5.0	5	10	50
G9528055	5.5	5.5	10	57
G9528060	6.0	6	10	57
G9528065	6.5	6.5	13	60
G9528070	7.0	7	13	60
G9528075	7.5	7.5	16	63
G9528080	8.0	8	16	63
G9528085	8.5	8.5	16	67
G9528090	9.0	9	16	67
G9528095	9.5	9.5	19	72
G9528100	10.0	10	19	72
G9528110	11.0	11	22	83
G9528120	12.0	12	22	83
G9528130	13.0	13	22	83
G9528140	14.0	14	22	83
G9528150	15.0	15	26	92
G9528160	16.0	16	26	92
G9528180	18.0	18	26	92
G9528200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M			K						
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	55	60	42	55	55	60	42	55			
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



FLAT SHANK **G9433** SERIES

CARBIDE, 3 FLUTE LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN LANG
 (1) Fraise carbure, 3 dents, longue
 (1) 3 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsern.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9433030	3.0	6	7	57
G9433040	4.0	6	8	57
G9433050	5.0	6	10	57
G9433060	6.0	6	10	57
G9433080	8.0	8	16	63
G9433090	9.0	10	16	72
G9433100	10.0	10	19	72
G9433120	12.0	12	22	83
G9433140	14.0	14	22	83
G9433160	16.0	16	26	92
G9433180	18.0	18	26	92
G9433200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



FLAT SHANK **G9G48** SERIES

CARBIDE, 3 FLUTE LONG LENGTH WITH CHAMFER

VOLLHARTMETALL, 3 SCHNEIDEN LANG
 (1) Fraise carbure, 3 dents, longue
 (1) 3 TAGLIENTI, SERIE LUNGA

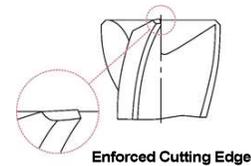
- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schafffräsern.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G48030	3.0	6	7	57	0.10
G9G48040	4.0	6	8	57	0.10
G9G48050	5.0	6	10	57	0.10
G9G48060	6.0	6	10	57	0.10
G9G48080	8.0	8	16	63	0.13
G9G48100	10.0	10	19	72	0.13
G9G48120	12.0	12	22	83	0.18
G9G48140	14.0	14	22	83	0.18
G9G48160	16.0	16	26	92	0.18
G9G48200	20.0	20	32	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



FLAT SHANK **G9447** SERIES

CARBIDE, 3 FLUTE 45° HELIX, LONG LENGTH

● VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG
 () Fraise carbure, 3 dents, hélice 45°, longue
 () 3 TAGLIENTI, ELICA 45°, SERIE LUNGA

▶ Suitable for dry milling applications at high temperatures.
 ▶ Excellent high-performance end mills.

▶ Für die Trockenbearbeitung.
 ▶ Hervorragendes Preis - Leistungsverhältnis.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9447030	3.0	6	7	57
G9447035	3.5	6	7	57
G9447040	4.0	6	8	57
G9447045	4.5	6	8	57
G9447050	5.0	6	10	57
G9447060	6.0	6	10	57
G9447070	7.0	8	13	63
G9447080	8.0	8	16	63
G9447090	9.0	10	16	72
G9447100	10.0	10	19	72
G9447120	12.0	12	22	83
G9447140	14.0	14	22	83
G9447160	16.0	16	26	92
G9447180	18.0	18	26	92
G9447200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550					
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



FLAT SHANK **G9G49** SERIES

CARBIDE, 3 FLUTE 45° HELIX, LONG LENGTH WITH CHAMFER

● VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG
 () Fraise carbure, 3 dents, hélice 45°, longue
 () 3 TAGLIENTI, ELICA 45°, SERIE LUNGA

▶ Suitable for dry milling applications at high temperatures.
 ▶ Excellent high-performance end mills.

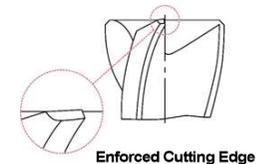
▶ Für die Trockenbearbeitung.
 ▶ Hervorragendes Preis - Leistungsverhältnis.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G49030	3.0	6	7	57	0.10
G9G49040	4.0	6	8	57	0.10
G9G49050	5.0	6	10	57	0.10
G9G49060	6.0	6	10	57	0.10
G9G49080	8.0	8	16	63	0.13
G9G49100	10.0	10	19	72	0.13
G9G49120	12.0	12	22	83	0.18
G9G49140	14.0	14	22	83	0.18
G9G49160	16.0	16	26	92	0.18
G9G49200	20.0	20	32	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550					
HB	60	100	75	90	130	110	90	100	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550		
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	



PLAIN SHANK **G9432** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
 () Fraise carbure, 4 dents, courte
 () 4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9432010	1.0	4	3	40
G9432015	1.5	4	4.5	40
G9432020	2.0	2	8	32
G9432025	2.5	2.5	8	32
G9432030	3.0	3	12	32
G9432035	3.5	3.5	12	32
G9432040	4.0	4	12	40
G9432045	4.5	4.5	14	50
G9432050	5.0	5	14	50
G9432055	5.5	5.5	16	50
G9432060	6.0	6	16	50
G9432070	7.0	7	20	60
G9432080	8.0	8	20	60
G9432090	9.0	9	20	60
G9432100	10.0	10	22	70
G9432120	12.0	12	22	70
G9432140	14.0	14	25	75
G9432160	16.0	16	25	75
G9432200	20.0	20	32	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K						
	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	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9G50** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH WITH CHAMFER

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
 () Fraise carbure, 4 dents, courte
 () 4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

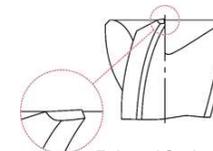
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G50030	3.0	3	12	32	0.10
G9G50040	4.0	4	12	40	0.10
G9G50050	5.0	5	14	50	0.10
G9G50060	6.0	6	16	50	0.10
G9G50080	8.0	8	20	60	0.13
G9G50100	10.0	10	22	70	0.13
G9G50120	12.0	12	22	70	0.18
G9G50140	14.0	14	25	75	0.18
G9G50160	16.0	16	25	75	0.18
G9G50200	20.0	20	32	100	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K						
	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	12	13	14	15	16	17	18	19	20	
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



PLAIN SHANK **G9A69** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
 () Fraise carbure, 4 dents, courte
 () 4 TAGLIENTI, CORTA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9A69010	1.0	3	3	39
G9A69015	1.5	3	5	39
G9A69020	2.0	3	7	39
G9A69025	2.5	3	7	39
G9A69030	3.0	3	10	39
G9A69040	4.0	4	14	51
G9A69050	5.0	5	16	51
G9A69060	6.0	6	19	64
G9A69080	8.0	8	21	64
G9A69100	10.0	10	22	70
G9A69120	12.0	12	25	76
G9A69160	16.0	16	32	89
G9A69200	20.0	20	38	102

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



FLAT SHANK **G9448** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
 () Fraise carbure, 4 dents, courte
 () 4 TAGLIENTI, SERIE CORTA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 4 flute allows for better work piece finishes.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9448020	2.0	6	4	50
G9448025	2.5	6	4	50
G9448030	3.0	6	5	50
G9448035	3.5	6	6	50
G9448040	4.0	6	8	54
G9448045	4.5	6	8	54
G9448050	5.0	6	9	54
G9448060	6.0	6	10	54
G9448070	7.0	8	11	58
G9448080	8.0	8	12	58
G9448090	9.0	10	13	66
G9448100	10.0	10	14	66
G9448120	12.0	12	16	73
G9448140	14.0	14	18	75
G9448160	16.0	16	22	82
G9448180	18.0	18	24	84
G9448200	20.0	20	26	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N					S					T										
	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	39	40	41
HRc	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	400 Rm	1050 Rm	550	630	400	550
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9540** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
 () Fraise carbure, 4 dents, longue
 (|) 4 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



P.608

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9540035	3.5	3.5	10	50
G9540040	4.0	4	11	50
G9540045	4.5	4.5	11	50
G9540050	5.0	5	13	50
G9540055	5.5	5.5	13	57
G9540060	6.0	6	13	57
G9540065	6.5	6.5	16	60
G9540070	7.0	7	16	60
G9540075	7.5	7.5	19	63
G9540080	8.0	8	19	63
G9540085	8.5	8.5	19	67
G9540090	9.0	9	19	67
G9540095	9.5	9.5	22	72
G9540100	10.0	10	22	72
G9540110	11.0	11	26	83
G9540120	12.0	12	26	83
G9540130	13.0	13	26	83
G9540140	14.0	14	26	83
G9540150	15.0	15	32	92
G9540160	16.0	16	32	92
G9540180	18.0	18	32	92
G9540200	20.0	20	38	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel			Low alloy steel			High alloyed steel and tool steel				Stainless steel		Grey cast iron	nodular cast iron	Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



FLAT SHANK **G9449** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
 () Fraise carbure, 4 dents, longue
 (|) 4 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



P.608

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9449901	2.0	3	7	38
G9449030	3.0	6	8	57
G9449035	3.5	6	10	57
G9449040	4.0	6	11	57
G9449045	4.5	6	11	57
G9449050	5.0	6	13	57
G9449060	6.0	6	13	57
G9449070	7.0	6	16	63
G9449080	8.0	8	19	63
G9449090	9.0	10	19	72
G9449100	10.0	10	22	72
G9449120	12.0	12	26	83
G9449140	14.0	14	26	83
G9449160	16.0	16	32	92
G9449180	18.0	18	32	92
G9449200	20.0	20	38	104

● with plain shank

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel			Low alloy steel			High alloyed steel and tool steel				Stainless steel		Grey cast iron	nodular cast iron	Malleable cast iron					
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323																				
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N					S					T										
	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							
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS

CRX S END MILLS

K-2 END MILLS

ONLY ONE COATED PM60 END MILLS

TANK-POWER END MILLS

GENERAL HSS END MILLS

MILLING CUTTERS

TECHNICAL DATA



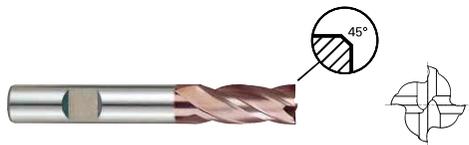
FLAT SHANK **G9G51** SERIES

CARBIDE, 4 FLUTE LONG LENGTH WITH CHAMFER

VOLLHARTMETALL, 4 SCHNEIDEN LANG
 () Fraise carbure, 4 dents, longue
 () 4 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

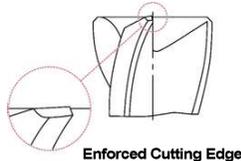
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G51030	3.0	6	8	57	0.10
G9G51040	4.0	6	11	57	0.10
G9G51050	5.0	6	13	57	0.10
G9G51060	6.0	6	13	57	0.10
G9G51080	8.0	8	19	63	0.13
G9G51100	10.0	10	22	72	0.13
G9G51120	12.0	12	26	83	0.18
G9G51140	14.0	14	26	83	0.18
G9G51160	16.0	16	32	92	0.18
G9G51200	20.0	20	38	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M					K				
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9453** SERIES

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN EXTRA LANG
 () Fraise carbure, 4 dents, extra-longue
 () 4 TAGLIENTI, SERIE EXTRA LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9453903	3.0	3	20	60
G9453030	3.0	3	30	75
G9453904	4.0	4	20	60
G9453040	4.0	4	30	75
G9453905	5.0	5	25	75
G9453050	5.0	5	40	100
G9453906	6.0	6	30	75
G9453060	6.0	6	50	150
G9453908	8.0	8	30	75
G9453080	8.0	8	50	150
G9453910	10.0	10	40	100
G9453100	10.0	10	60	150
G9453912	12.0	12	45	100
G9453120	12.0	12	75	150
G9453914	14.0	14	45	100
G9453916	16.0	16	45	100
G9453160	16.0	16	65	150
G9453918	18.0	18	45	100
G9453920	20.0	20	45	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5

◎ : Excellent ○ : Good

ISO	P										M					K				
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

HSS

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER PRO END MILLS

TitaNox-POWER END MILLS

JET-POWER END MILLS

V7 PLUS END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS

CRX S END MILLS

K-2 END MILLS

ONLY ONE COATED PM60 END MILLS

TANK-POWER END MILLS

GENERAL HSS END MILLS

MILLING CUTTERS

TECHNICAL DATA



PLAIN SHANK **G9F45** SERIES

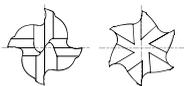
PLAIN SHANK **G9F46** SERIES

CARBIDE, 4&6 FLUTE 45° HELIX SHORT / LONG LENGTH

- VOLLHARTMETALL, 4&6 SCHNEIDEN 45° RECHTSSPIRALE KURZ / LANG
- () Fraise carbure, 4&6 dents, hélice 45°, courte / longue
- () 4&6 TAGLIANTI, ELICA 45°, SERIE CORTA / LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.

- Für die Trockenbearbeitung geeignet.
- Exzellente Hochleistungs Mühlen.



SHORT

Unit : mm

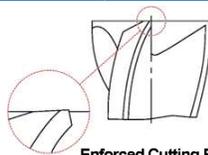
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
G9F45040	4.0	4	11	50	4
G9F45050	5.0	6	13	50	6
G9F45060	6.0	6	16	50	6
G9F45080	8.0	8	19	60	6
G9F45100	10.0	10	22	75	6
G9F45120	12.0	12	26	75	6
G9F45140	14.0	14	30	90	6
G9F45160	16.0	16	32	100	6
G9F45180	18.0	18	38	100	6
G9F45000	20.0	20	38	100	6

LONG

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
G9F46160	16.0	16	65	150	6
G9F46200	20.0	20	75	150	6

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P								M				K							
	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



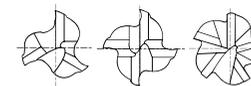
FLAT SHANK **G9A42** SERIES

CARBIDE, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

- VOLLHARTMETALL, MEHRSCHEIDEN LANG SCHRUPPFRÄSER - GROB
- () Fraise carbure, multi-dents, ébauche, pas grossier, longue
- () 3 - 4 - 5 TAGLIANTI, PER SGROSSATURA, SERIE LUNGA - Bombato grosso

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Fast chip ejection.

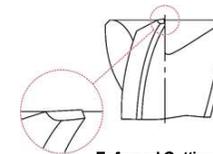
- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Guter Spanauswurf.



EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
G9A42080	8.0	8	16	63	3.00	0.60
G9A42100	10.0	10	22	72	4.00	0.60
G9A42120	12.0	12	26	83	4.00	0.74
G9A42140	14.0	14	26	83	4.00	0.94
G9A42160	16.0	16	32	92	4.00	0.94
G9A42180	18.0	18	32	92	4.00	0.94
G9A42200	20.0	20	38	104	4.00	0.94
G9A42250	25.0	25	45	121	5.00	0.94

Tolerances according to DIN 7160 & 7161

	Tolerance range in µm				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 -40	0 -48	0 -58	0 -70	0 -84
h5	0 -4	0 -5	0 -6	0 -8	0 -9



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P								M				K							
	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron			
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25	19	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



PLAIN SHANK **G9400** SERIES

CARBIDE, 2 FLUTE DRILL MILLS

VOLLHARTMETALL, 2 SCHNEIDEN BOHRNUTEN FRÄSER
Fraise foret carbure, 2 dents, multi-fonctions
2 TAGLIENTI, FRESA IN MD A 90°

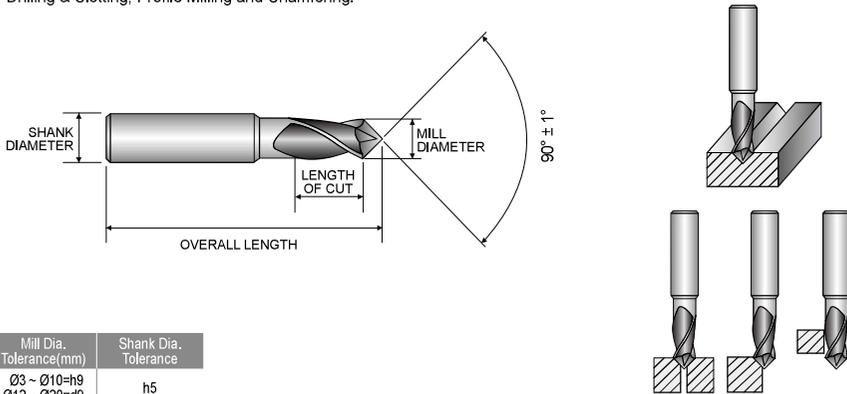


EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9400030	3.0	4	6	50
G9400040	4.0	5	8	50
G9400050	5.0	6	10	50
G9400060	6.0	8	12	60
G9400080	8.0	10	16	70
G9400100	10.0	12	18	70
G9400120	12.0	12	20	70
G9400140	14.0	14	24	80
G9400160	16.0	16	26	80
G9400200	20.0	20	32	100

Unit : mm

▶TiN, TiCN and TiAlN Coatings are available on your request.

- Performs many drilling and milling operations that are not presently done with the standard end mill.
- Among the many vertical milling machine operations, applications for the Drill Mill are: Drilling, Slotting, NC Milling, Drilling & Slotting, Profile Milling and Chamfering.



◎ : Excellent ○ : Good

ISO	P										M				K					
	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	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	32	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N		S				T														
	Aluminum-wrought alloy	Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys	Titanium Alloys													
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



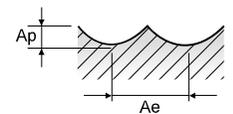
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9624, G9A70, G9437, G9438, G9454, G9455 SERIES **2 FLUTE BALL NOSE**

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

ISO	VDI 3323	Material Description	Ae	Parameter	Mill Diameter (Ø)											
					2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	1-4	Non-alloy steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225
				fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201
				RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581
				FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	55	80	90	95	110	125	135	150	160	160	170	175
	5	Non-alloy steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225
				fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201
				RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581
				FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	55	80	90	95	110	125	135	150	160	160	170	175
6-7	Low alloy steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225	
			fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201	
			RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581	
			FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			Ap	55	80	90	95	110	125	135	150	160	160	170	175	
8-9	Low alloy steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225	
			fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201	
			RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581	
			FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			Ap	55	80	90	95	110	125	135	150	160	160	170	175	
10	High alloyed steel, and tool steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225	
			fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201	
			RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581	
			FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			Ap	55	80	90	95	110	125	135	150	160	160	170	175	
11.1 - 11.2	High alloyed steel, and tool steel	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225	
			fz	0.026	0.025	0.035	0.045	0.06	0.089	0.122	0.15	0.165	0.18	0.188	0.201	
			RPM	12732	11141	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581	
			FEED	662	557	613	716	859	1098	1320	1512	1501	1468	1430	1440	
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			Ap	55	80	90	95	110	125	135	150	160	160	170	175	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	Vc	65	65	65	65	65	65	65	65	65	65	65	65
				fz	0.01	0.016	0.028	0.04	0.053	0.092	0.112	0.131	0.164	0.177	0.209	0.2
				RPM	10345	6897	5173	4138	3448	2586	2069	1724	1364	1293	1061	1035
				FEED	207	221	290	331	366	476	463	452	447	458	444	414
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	195	195	195	190	195	200	195	195	190	195	190	185
N	21~22	Aluminum-wrought alloy	0.7D	Vc	0.006	0.01	0.013	0.019	0.023	0.034	0.044	0.061	0.073	0.07	0.079	0.092
				fz	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944
				RPM	372	414	403	460	476	541	546	631	631	543	531	542
				FEED	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	195	195	195	190	195	200	195	195	190	195	190	185
				Ap	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944
H	38.1	Hardened steel	0.2D	Vc	25	35	45	50	50	55	55	55	60	60	60	
				fz	0.016	0.016	0.021	0.024	0.03	0.046	0.054	0.07	0.081	0.091	0.1	0.111
				RPM	3979	3714	3581	3183	2653	1989	1751	1459	1251	1194	1061	955
				FEED	127	119	150	153	159	183	189	204	203	217	212	212
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	55	80	90	95	110	125	135	150	160	160	170	175
H	40	Chilled Cast Iron	0.2D	Vc	80	105	110	125	135	155	170	190	200	205	215	225
				fz	0.023	0.023	0.031	0.04	0.06	0.08	0.1	0.12	0.128	0.141	0.148	0.158
				RPM	8754	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785
				FEED	403	390	444	484	700	796	859	955	931	898	890	880
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				Ap	55	80	90	95	110	125	135	150	160	160	170	175

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





RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

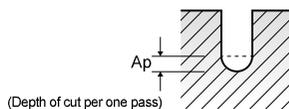
G9B81 SERIES 2 FLUTE BALL NOSE

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

ISO	VDI 3323	Material Description	Parameter	Mill Diameter (Ø)				
				0.4	0.5	0.6	0.8	1.0
P	1-4	Non-alloy steel	Vc	33~43	41~53	50~64	66~85	77~97
			fz	0.003-0.006	0.003-0.006	0.004-0.008	0.004-0.008	0.004-0.010
			RPM	26350-34000	26350-34000	26350-34000	26350-34000	24650-31000
			FEED	150-415	150-415	190-535	190-535	210-595
			Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090
			Vc	24-30	30-38	36-46	48-61	55-69
	5	Non-alloy steel	fz	0.002-0.005	0.002-0.005	0.002-0.006	0.002-0.006	0.003-0.007
			RPM	19100-24200	19100-24200	19100-24200	19100-24200	17400-22100
			FEED	75-230	75-230	95-300	95-300	105-330
			Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090
			Vc	33-43	41-53	50-64	66-85	77-97
			fz	0.003-0.006	0.003-0.006	0.004-0.008	0.004-0.008	0.004-0.010
6-7	Low alloy steel	RPM	26350-34000	26350-34000	26350-34000	26350-34000	24650-31000	
		FEED	150-415	150-415	190-535	190-535	210-595	
		Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090	
		Vc	24-30	30-38	36-46	48-61	55-69	
		fz	0.002-0.005	0.002-0.005	0.002-0.006	0.002-0.006	0.003-0.007	
		RPM	19100-24200	19100-24200	19100-24200	19100-24200	17400-22100	
8-9	Low alloy steel	FEED	75-230	75-230	95-300	95-300	105-330	
		Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090	
		Vc	33-43	41-53	50-64	66-85	77-97	
		fz	0.003-0.006	0.003-0.006	0.004-0.008	0.004-0.008	0.004-0.010	
		RPM	26350-34000	26350-34000	26350-34000	26350-34000	24650-31000	
		FEED	150-415	150-415	190-535	190-535	210-595	
10	High alloyed steel, and tool steel	Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090	
		Vc	24-30	30-38	36-46	48-61	55-69	
		fz	0.002-0.005	0.002-0.005	0.002-0.006	0.002-0.006	0.003-0.007	
		RPM	19100-24200	19100-24200	19100-24200	19100-24200	17400-22100	
		FEED	75-230	75-230	95-300	95-300	105-330	
		Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090	
11.1 - 11.2	High alloyed steel, and tool steel	Vc	24-30	30-38	36-46	48-61	55-69	
		fz	0.002-0.005	0.002-0.005	0.002-0.006	0.002-0.006	0.003-0.007	
11.1 - 11.2	High alloyed steel, and tool steel	RPM	19100-24200	19100-24200	19100-24200	19100-24200	17400-22100	
		FEED	75-230	75-230	95-300	95-300	105-330	
11.1 - 11.2	High alloyed steel, and tool steel	Ap	0.018-0.036	0.023-0.045	0.027-0.054	0.036-0.072	0.045-0.090	

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

▶ NEXT PAGE



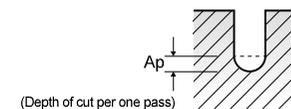
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9B81 SERIES 2 FLUTE BALL NOSE

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

VDI 3323	Parameter	Mill Diameter (Ø)								
		1.2	1.4	1.5	1.6	1.8	2.0	3.0	4.0	
1-4	Vc	77-98	79-97	75-97	78-101	82-103	82-101	85-104	90-117	
	fz	0.005-0.013	0.006-0.015	0.007-0.016	0.007-0.017	0.007-0.018	0.008-0.021	0.012-0.030	0.015-0.036	
	RPM	20500-26000	18000-22000	16000-20500	15500-20000	14500-18200	13000-16000	9000-11000	7200-9350	
	FEED	210-665	210-665	210-665	210-665	210-665	210-665	210-665	210-665	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
	Vc	55-69	56-67	54-70	56-70	58-72	59-72	57-108	63-83	
5	fz	0.004-0.009	0.004-0.011	0.005-0.011	0.005-0.012	0.005-0.013	0.006-0.014	0.009-0.014	0.011-0.025	
	RPM	14500-18300	12800-15300	11500-14900	11200-14000	10200-12800	9400-11500	6000-11500	5000-6600	
	FEED	105-330	105-330	105-330	105-330	105-330	105-330	105-330	105-330	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
	Vc	77-98	79-97	75-97	78-101	82-103	82-101	85-104	90-117	
	fz	0.005-0.013	0.006-0.015	0.007-0.016	0.007-0.017	0.007-0.018	0.008-0.021	0.012-0.030	0.015-0.036	
6-7	RPM	20500-26000	18000-22000	16000-20500	15500-20000	14500-18200	13000-16000	9000-11000	7200-9350	
	FEED	210-665	210-665	210-665	210-665	210-665	210-665	210-665	210-665	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
	Vc	55-69	56-67	54-70	56-70	58-72	59-72	57-108	63-83	
	fz	0.004-0.009	0.004-0.011	0.005-0.011	0.005-0.012	0.005-0.013	0.006-0.014	0.009-0.014	0.011-0.025	
	RPM	14500-18300	12800-15300	11500-14900	11200-14000	10200-12800	9400-11500	6000-11500	5000-6600	
8-9	FEED	105-330	105-330	105-330	105-330	105-330	105-330	105-330	105-330	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
	Vc	77-98	79-97	75-97	78-101	82-103	82-101	85-104	90-117	
	fz	0.005-0.013	0.006-0.015	0.007-0.016	0.007-0.017	0.007-0.018	0.008-0.021	0.012-0.030	0.015-0.036	
	RPM	20500-26000	18000-22000	16000-20500	15500-20000	14500-18200	13000-16000	9000-11000	7200-9350	
	FEED	210-665	210-665	210-665	210-665	210-665	210-665	210-665	210-665	
10	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
	Vc	55-69	56-67	54-70	56-70	58-72	59-72	57-108	63-83	
	fz	0.004-0.009	0.004-0.011	0.005-0.011	0.005-0.012	0.005-0.013	0.006-0.014	0.009-0.014	0.011-0.025	
	RPM	14500-18300	12800-15300	11500-14900	11200-14000	10200-12800	9400-11500	6000-11500	5000-6600	
	FEED	105-330	105-330	105-330	105-330	105-330	105-330	105-330	105-330	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	0.180-0.360	
11.1	High alloyed steel, and tool steel	Vc	55-69	56-67	54-70	56-70	58-72	59-72	57-108	
		fz	0.004-0.009	0.004-0.011	0.005-0.011	0.005-0.012	0.005-0.013	0.006-0.014	0.009-0.014	0.011-0.025
11.2	High alloyed steel, and tool steel	RPM	14500-18300	12800-15300	11500-14900	11200-14000	10200-12800	9400-11500	6000-11500	
		FEED	105-330	105-330	105-330	105-330	105-330	105-330	105-330	105-330
11.1 - 11.2	High alloyed steel, and tool steel	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.135-0.270	

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



YG K-2 END MILLS

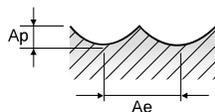
**RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER**

G9634 SERIES 4 FLUTE BALL NOSE

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

ISO	VDI 3323	Material Description	Ae	Parameter	Mill Diameter (Ø)												
					2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	
P	1-4	Non-alloy steel	0.2D	VC	85	110	110	125	135	155	170	190	200	205	215	225	
				fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15	
				RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581	
				FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149	
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
	5	Non-alloy steel	0.2D	VC	65	80	90	95	110	125	135	150	160	160	170	175	
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119	
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785	
				FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326	
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
6-7	Low alloy steel	0.2D	VC	85	110	110	125	135	155	170	190	200	205	215	225		
			fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15		
			RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581		
			FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
8-9	Low alloy steel	0.2D	VC	65	80	90	95	110	125	135	150	160	160	170	175		
			fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119		
			RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785		
			FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
10	High alloyed steel, and tool steel	0.2D	VC	85	110	110	125	135	155	170	190	200	205	215	225		
			fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15		
			RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581		
			FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
11.1 - 11.2	High alloyed steel, and tool steel	0.2D	VC	65	80	90	95	110	125	135	150	160	160	170	175		
			fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119		
			RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785		
			FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
			Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	VC	65	65	65	65	65	65	65	65	60	65	60	65	
				fz	0.008	0.012	0.021	0.03	0.04	0.068	0.083	0.097	0.125	0.135	0.159	0.15	
				RPM	10345	6897	5173	4138	3448	2586	2069	1724	1364	1293	1061	1035	
				FEED	331	331	434	497	552	703	687	669	682	698	675	621	
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
N	21~22	Aluminum-wrought alloy	0.7D	VC	195	195	195	190	195	200	195	195	190	195	185		
				fz	0.005	0.007	0.01	0.015	0.017	0.026	0.033	0.046	0.055	0.053	0.06	0.069	
				RPM	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944	
	23~25	Aluminum-cast, alloyed	0.7D	VC	195	195	195	190	195	200	195	195	190	195	185		
				fz	0.005	0.007	0.01	0.015	0.017	0.026	0.033	0.046	0.055	0.053	0.06	0.069	
				RPM	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944	
H	38.1	Hardened steel	0.2D	VC	25	35	45	50	55	55	55	55	55	60	60		
				fz	0.008	0.012	0.016	0.019	0.022	0.034	0.041	0.053	0.062	0.073	0.076	0.084	
				RPM	3979	3714	3581	3183	2653	2188	1751	1459	1251	1094	1061	955	
	40	Chilled Cast Iron	0.2D	VC	65	80	90	95	110	125	135	150	160	160	170	175	
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119	
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785	

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



YG K-2 END MILLS

**RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER**

G9B82, G9B83 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)									
						2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0		
P	1-4	Non-alloy steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	50	55	65	70	70	70	70	70	70	
					fz	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065		
					RPM	7958	5836	5173	4456	3714	2785	2228	1857		
					FEED	159	175	259	276	290	318	285	241		
					VC	30	35	40	40	45	45	40	45		
					fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048		
	5	Non-alloy steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	30	35	40	40	45	45	40	45		
					fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048		
					RPM	4775	3714	3183	2546	2387	1790	1273	1194		
					FEED	95	119	159	158	196	179	127	115		
					VC	50	55	65	70	70	70	70	70		
					fz	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065		
6-7	Low alloy steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	50	55	65	70	70	70	70	70			
				fz	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065			
				RPM	7958	5836	5173	4456	3714	2785	2228	1857			
				FEED	159	175	259	276	290	318	285	241			
				VC	30	35	40	40	45	45	40	45			
				fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048			
8-9	Low alloy steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	30	35	40	40	45	45	40	45			
				fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048			
				RPM	4775	3714	3183	2546	2387	1790	1273	1194			
				FEED	95	119	159	158	196	179	127	115			
				VC	50	55	65	70	70	70	70	70			
				fz	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065			
10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	50	55	65	70	70	70	70	70			
				fz	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065			
				RPM	7958	5836	5173	4456	3714	2785	2228	1857			
				FEED	159	175	259	276	290	318	285	241			
				VC	30	35	40	40	45	45	40	45			
				fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048			
11.1 - 11.2	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	30	35	40	40	45	45	40	45			
				fz	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048			
				RPM	4775	3714	3183	2546	2387	1790	1273	1194			
				FEED	95	119	159	158	196	179	127	115			
				VC	25	30	35	35	35	35	35	35			
				fz	0.009	0.016	0.025	0.031	0.04	0.053	0.059	0.058			
M	14.1	Stainless steel	1.0D	0.5D (Up to Ø3:0.2D)	VC	3979	3183	2785	2228	1857	1393	1114	928		
					fz	72	102	139	138	149	148	131	108		
					RPM	72	102	139	138	149	148	131	108		
					FEED	72	102	139	138	149	148	131	108		
					VC	60	55	60	55	55	55	60	55		
					fz	0.012	0.018	0.024	0.03	0.043	0.063	0.077	0.102		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	VC	9549	5836	4775	3501	2918	2188	1910	1459		
					fz	229	210	229	210	251	276	294	298		
					RPM	229	210	229	210	251	276	294	298		
					FEED</										



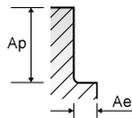
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9B84, G9B85 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)											
						1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0		
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90		
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.047	0.047		
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387		
	FEED				140	233	229	267	484	519	554	616	509	449			
	Vc				30	35	40	45	50	50	55	55	55	55			
	fz				0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
	RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459						
	FEED	76	119	153	172	302	306	362	333	266	216						
	5	Low alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90		
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.047	0.047		
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387		
					FEED	140	233	229	267	484	519	554	616	509	449		
Vc					30	35	40	45	50	50	55	55	55	55			
fz					0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459							
FEED	76	119	153	172	302	306	362	333	266	216							
6-7	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90			
				fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.047	0.047			
				RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387			
				FEED	140	233	229	267	484	519	554	616	509	449			
				Vc	30	35	40	45	50	50	55	55	55	55			
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459							
FEED	76	119	153	172	302	306	362	333	266	216							
8-9	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90			
				fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.047	0.047			
				RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387			
				FEED	140	233	229	267	484	519	554	616	509	449			
				Vc	30	35	40	45	50	50	55	55	55	55			
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459							
FEED	76	119	153	172	302	306	362	333	266	216							
10	Stainless steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90			
				fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.047	0.047			
				RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387			
				FEED	140	233	229	267	484	519	554	616	509	449			
				Vc	30	35	40	45	50	50	55	55	55	55			
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459							
FEED	76	119	153	172	302	306	362	333	266	216							
11.1 - 11.2	Stainless steel	0.1D	1.0D	Vc	25	35	35	45	45	45	45	45	45	45			
				fz	0.002	0.004	0.006	0.009	0.018	0.024	0.029	0.042	0.044	0.045			
				RPM	7958	7427	5570	3714	3183	2546	2387	1790	1432	1194			
				FEED	64	119	134	134	229	244	277	301	252	215			
				Vc	60	55	60	55	60	55	55	60	55	55			
				fz	0.008	0.013	0.017	0.026	0.035	0.044	0.065	0.093	0.116	0.155			
RPM	19099	11671	9549	5836	4775	3501	2918	2188	1910	1459							
FEED	611	607	649	607	668	616	759	814	886	905							
M	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	140				
				fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095			
				RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714			
				FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411			
				Vc	140	130	140	145	140	145	145	145	140				
				fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095			
RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714							
FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411							
N	Aluminum-wrought alloy	0.1D	1.5D	Vc	80	95	105	105	110	105	110	105	105				
				fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096			
				RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785			
				FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070			
				Vc	80	95	105	105	110	105	110	105	105				
				fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096			
RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785							
FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070							
H	Chilled Cast Iron	0.1D	1.0D	Vc	30	35	40	45	50	55	55	55	55				
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
				RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459			
				FEED	76	119	153	172	302	306	362	333	266	216			
				Vc	30	35	40	45	50	50	55	55	55	55			
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037			
RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459							
FEED	76	119	153	172	302	306	362	333	266	216							

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



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9424, G9G44, G9A68, G9444, G9527, G9445, G9G45, G9452 SERIES

2 FLUTE - SLOTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)												
						1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	0.5D (Up to Ø3.0-2.0)	Vc	45	45	50	55	65	70	70	70	70	75	75	70	
					fz	0.004	0.008	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063
					RPM	14324	9549	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114
	FEED				115	153	159	175	259	276	290	318	285	241	215	185	140	
	Vc				25	25	30	35	40	40	45	45	40	45	45	45	45	
	fz				0.004	0.008	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048	0.048	0.05	0.05	
	RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716				
	FEED	64	85	95	119	159	158	196	179	127	115	98	99	72				
	5	Low alloy steel	0.1D	0.5D (Up to Ø3.0-2.0)	Vc	45	45	50	55	65	70	70	70	70	75	75	70	
					fz	0.004	0.008	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063
					RPM	14324	9549	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114
					FEED	115	153	159	175	259	276	290	318	285	241	215	185	140
Vc					25	25	30	35	40	40	45	45	40	45	45	45	45	
fz					0.004	0.008	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048	0.048	0.05	0.05	
RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716					
FEED	64	85	95	119	159	158	196	179	127	115	98	99	72					
6-7	High alloyed steel, and tool steel	0.1D	0.5D (Up to Ø3.0-2.0)	Vc	45	45	50	55	65	70	70	70	70	75	75	70		
				fz	0.004	0.008	0.01	0.015	0.025	0.031	0.039	0.057	0.064	0.065	0.063	0.062	0.063	
				RPM	14324	9549	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114	
				FEED	115	153	159	175	259	276	290	318	285	241	215	185	140	
				Vc	25	25	30	35	40	40	45	45	40	45	45	45	45	
				fz	0.004	0.008	0.01	0.016	0.025	0.031	0.041	0.05	0.05	0.048	0.048	0.05	0.05	
RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716					
FEED	64	85	95	119	159	158	196	179	127	115	98	99	72					
8-9	High alloyed steel, and tool steel	0.1D	0.5D (Up to Ø3.0-2.0)	Vc	45	45	50	55	65	70	70	70	70	75	75	70		
				fz	0.004	0.008	0.01	0.015	0.025	0.031	0.039	0.057						



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

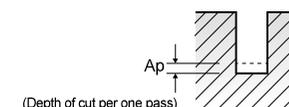
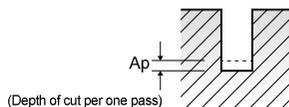
G9B80 SERIES 2 FLUTE - SLOTTING

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

ISO	VDI 3323	Material Description	Parameter	Mill Diameter (Ø)							
				0.4	0.5	0.6	0.7	0.8	0.9	1.0	
P	1-4	Non-alloy steel	Vc	33-43	42-53	50-64	58-75	58-75	61-76	60-75	
			fz	0.003-0.005	0.003-0.005	0.004-0.007	0.004-0.007	0.005-0.009	0.006-0.011	0.006-0.014	
			RPM	26500-34000	26500-34000	26500-34000	26500-34000	23000-30000	21500-27000	19000-24000	
			FEED	170-370	170-370	210-485	210-485	240-535	240-610	240-690	
			Ap	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090	
			Vc	24-30	30-38	36-45	42-53	41-53	42-54	42-53	
	5	Non-alloy steel	Vc	0.002-0.006	0.002-0.006	0.003-0.008	0.003-0.008	0.003-0.010	0.005-0.012	0.006-0.015	
			fz	19000-24000	19000-24000	19000-24000	19000-24000	16500-21000	15000-19000	13500-17000	
			RPM	72-290	72-290	95-365	95-365	100-410	135-460	160-510	
			FEED	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090	
			Ap	Vc	33-43	42-53	50-64	58-75	58-75	61-76	60-75
			fz	0.003-0.005	0.003-0.005	0.004-0.007	0.004-0.007	0.005-0.009	0.006-0.011	0.006-0.014	
6-7	Low alloy steel	RPM	26500-34000	26500-34000	26500-34000	26500-34000	23000-30000	21500-27000	19000-24000		
		FEED	170-370	170-370	210-485	210-485	240-535	240-610	240-690		
		Ap	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090		
		Vc	24-30	30-38	36-45	42-53	41-53	42-54	42-53		
		fz	0.002-0.006	0.002-0.006	0.003-0.008	0.003-0.008	0.003-0.010	0.005-0.012	0.006-0.015		
		RPM	19000-24000	19000-24000	19000-24000	19000-24000	16500-21000	15000-19000	13500-17000		
8-9	Low alloy steel	FEED	72-290	72-290	95-365	95-365	100-410	135-460	160-510		
		Ap	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090		
		Vc	33-43	42-53	50-64	58-75	58-75	61-76	60-75		
		fz	0.003-0.005	0.003-0.005	0.004-0.007	0.004-0.007	0.005-0.009	0.006-0.011	0.006-0.014		
		RPM	26500-34000	26500-34000	26500-34000	26500-34000	23000-30000	21500-27000	19000-24000		
		FEED	170-370	170-370	210-485	210-485	240-535	240-610	240-690		
10	High alloyed steel, and tool steel	Ap	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090		
		Vc	24-30	30-38	36-45	42-53	41-53	42-54	42-53		
		fz	0.002-0.006	0.002-0.006	0.003-0.008	0.003-0.008	0.003-0.010	0.005-0.012	0.006-0.015		
		RPM	19000-24000	19000-24000	19000-24000	19000-24000	16500-21000	15000-19000	13500-17000		
		FEED	72-290	72-290	95-365	95-365	100-410	135-460	160-510		
		Ap	0.007-0.018	0.009-0.022	0.011-0.026	0.012-0.031	0.014-0.035	0.030-0.060	0.045-0.090		
11.1 - 11.2	High alloyed steel, and tool steel	Vc	24-30	30-38	36-45	42-53	41-53	42-54	42-53		
		fz	0.002-0.006	0.002-0.006	0.003-0.008	0.003-0.008	0.003-0.010	0.005-0.012	0.006-0.015		

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

▶ NEXT PAGE



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9B80 SERIES 2 FLUTE - SLOTTING

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

VDI 3323	Parameter	Mill Diameter (Ø)									
		1.2	1.4	1.5	1.6	1.8	2.0	2.5	3.0	4.0	
1-4	Vc	58-72	60-75	59-73	60-75	62-79	63-79	63-79	64-80	64-82	
	fz	0.008-0.020	0.009-0.023	0.010-0.025	0.010-0.026	0.011-0.027	0.012-0.031	0.015-0.038	0.018-0.045	0.024-0.059	
	RPM	15500-19000	13600-17000	12500-15500	12000-15000	11000-14000	10000-12500	8000-10000	6800-8500	5100-6500	
5	FEED	240-765	240-765	240-765	240-765	240-765	240-765	240-765	240-765	240-765	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.112-0.235	0.135-0.270	0.180-0.360	
	Vc	41-53	43-53	42-54	44-55	44-55	44-56	45-57	44-57	44-57	
6-7	fz	0.007-0.018	0.008-0.021	0.009-0.022	0.009-0.023	0.010-0.026	0.011-0.027	0.012-0.031	0.015-0.038	0.018-0.045	
	RPM	11000-14000	9800-12000	8950-11500	8700-10900	7800-9800	7000-8950	5700-7200	4700-6000	3500-4500	
	FEED	160-510	160-510	160-510	160-510	160-510	160-510	160-510	160-510	160-510	
8-9	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.112-0.235	0.135-0.270	0.180-0.360	
	Vc	58-72	60-75	59-73	60-75	62-79	63-79	63-79	64-80	64-82	
	fz	0.008-0.020	0.009-0.023	0.010-0.025	0.010-0.026	0.011-0.027	0.012-0.031	0.015-0.038	0.018-0.045	0.024-0.059	
10	RPM	15500-19000	13600-17000	12500-15500	12000-15000	11000-14000	10000-12500	8000-10000	6800-8500	5100-6500	
	FEED	240-765	240-765	240-765	240-765	240-765	240-765	240-765	240-765	240-765	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.112-0.235	0.135-0.270	0.180-0.360	
11.1 - 11.2	Vc	41-53	43-53	42-54	44-55	44-55	44-56	45-57	44-57	44-57	
	fz	0.007-0.018	0.008-0.021	0.009-0.022	0.009-0.023	0.010-0.026	0.011-0.027	0.012-0.031	0.015-0.038	0.018-0.045	
	RPM	11000-14000	9800-12000	8950-11500	8700-10900	7800-9800	7000-8950	5700-7200	4700-6000	3500-4500	
11.2	FEED	160-510	160-510	160-510	160-510	160-510	160-510	160-510	160-510	160-510	
	Ap	0.055-0.100	0.062-0.125	0.070-0.135	0.075-0.145	0.080-0.160	0.090-0.180	0.112-0.235	0.135-0.270	0.180-0.360	



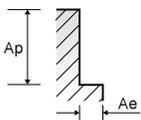
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9432, G9G50, G9A69, G9448, G9540, G9449, G9G51, G9453 SERIES 4 FLUTE - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)															
						1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0			
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	90	90	90	90	90	90	90	
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432	1194	875	639
	5	Non-alloy steel	0.1D	1.0D	Vc	30	35	40	45	50	55	55	55	55	55	55	55	55	55	55	
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.038	0.037	0.037	0.037	0.037	0.037	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875	639	428	313
	6-7	Low alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	90	90	90	90	90	90	90	
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432	1194	875	639
	8-9	Low alloy steel	0.1D	1.0D	Vc	30	35	40	45	50	55	55	55	55	55	55	55	55	55	55	
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.038	0.037	0.037	0.037	0.037	0.037	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875	639	428	313
10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	90	90	90	90	90	90	90		
				fz	0.002	0.005	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.038	0.037	0.037	0.037	0.037	0.037	0.037	
				RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432	1194	875	639	
11.1 - 11.2	High alloyed steel, and tool steel	0.1D	1.0D	Vc	30	35	40	45	50	55	55	55	55	55	55	55	55	55	55		
				fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.038	0.037	0.037	0.037	0.037	0.037	0.037	
				RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875	639	428	313	
M	14.1	Stainless steel	0.1D	1.0D	Vc	25	35	35	35	40	45	45	45	45	45	45	45	45	45	45	
					fz	0.002	0.004	0.006	0.009	0.018	0.024	0.029	0.042	0.044	0.045	0.045	0.045	0.045	0.045	0.045	0.045
					RPM	7958	7427	5570	3714	3183	2546	2387	1790	1432	1194	1023	995	716	544	428	313
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	64	119	134	134	229	244	277	301	252	215	184	179	132	132	132	
					fz	0.008	0.013	0.017	0.026	0.035	0.044	0.065	0.093	0.116	0.155	0.182	0.22	0.288	0.288	0.288	0.288
					RPM	19099	11671	9549	5836	4775	3501	2918	2188	1910	1459	1251	1094	875	639	428	313
N	21~22	Aluminum-wrought alloy	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	145	140		
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163	0.163	0.163	
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228	1453	948	796
	23~25	Aluminum-cast, alloyed	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	140	140		
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163	0.163	0.163	
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228	1453	948	796
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105	105	105	
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.162	0.162	0.162	
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671	1083	875	639
	29.1	Non Metallic Materials	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105	105	105	
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.162	0.162	0.162	
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671	1083	875	639
H	40	Chilled Cast Iron	0.1D	1.0D	Vc	30	35	40	45	50	55	55	55	55	55	55	55	55	55		
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.038	0.037	0.037	0.037	0.037	0.037	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875	639	428	313

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



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9F45, G9F46 SERIES 4&6 FLUTE - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)															
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0					
P	1-4	Non-alloy steel	0.05D	1.5D	Vc	82	83	98	98	97	99	98	98	98	98	98	98	98	97	97	
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544	1432	1194	1019	875	639
	5	Non-alloy steel	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	66	65	65	64	64	64	64	
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019	875	639	428	313	218
	6-7	Low alloy steel	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	98	98	98	97	97	97	
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544	1432	1194	1019	875	639
	8-9	Low alloy steel	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	66	65	65	64	64	64	64	
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019	875	639	428	313	218
10	High alloyed steel, and tool steel	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	98	98	97	97	97	97		
				fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065	
				RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544	1432	1194	1019	875	639	
11.1 - 11.2	High alloyed steel, and tool steel	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	66	65	65	64	64	64	64		
				fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065	
				RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019	875	639	428	313	218	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	98	98	97	97	97		
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544	1432	1194	1019	875	639
H	38.1	Hardened steel	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	66	65	65	64	64	64		
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.065	0.065	0.065	0.065	0.065	0.065	0.065
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019	875	639	428	313	218
	38.2 - 39.1	Hardened steel	0.03D	1.5D	Vc	45	45	50	50	50	50	50	50	50	50	50	50	50	50	50	
					fz	0.018	0.025	0.02	0.023	0.029	0.033	0.029	0.041	0.046	0.05	0.052	0.052	0.052	0.052	0.052	0.052
					RPM	4775	3581	3183	2653	1989	1592	1326	1137	995	884	796	707	653	604	557	511
	39.2	Hardened steel	0.02D	1D	Vc	35	35	40	40</												



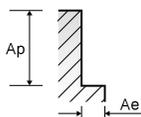
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9A42 SERIES MULTI FLUTE ROUGHING - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)																																						
						6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0																														
P	1-4	Non-alloy steel	0.3D	1.5D	Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
					Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
					Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
	5	Non-alloy steel	0.3D	1.5D	Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
					Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
					Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
	6-7	Low alloy steel	0.3D	1.5D	Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
					Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
					Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
	8-9	Low alloy steel	0.3D	1.5D	Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
					Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814	
					Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521
10	High alloyed steel, and tool steel	0.3D	1.5D	Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814		
				Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521	
				Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814		
11.1 ~ 11.2	High alloyed steel, and tool steel	0.3D	1.5D	Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521	
				Vc	250	250	245	255	255	250	260	285	fz	0.05	0.067	0.063	0.075	0.088	0.1	0.112	0.112	0.1	RPM	13263	9947	7799	6764	5798	5073	4421	4138	3629	FEED	1989	1999	1965	2029	2041	2029	1981	1854	1814		
				Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521	
M	14.1	Stainless steel	0.05D	1.0D	Vc	135	135	135	135	135	140	130	130	145	fz	0.022	0.022	0.028	0.034	0.039	0.038	0.038	0.038	RPM	7162	5371	4297	3581	3069	2785	2299	2069	1846	FEED	473	355	481	487	479	423	359	314	351	
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	Vc	40	40	35	40	35	35	35	40	40	fz	0.026	0.024	0.036	0.04	0.037	0.032	0.038	0.041	0.06	RPM	2122	1592	1114	1061	796	696	619	557	509	FEED	166	115	160	170	118	89	94	91	153
H	40	Chilled Cast Iron	0.3D	1.5D	Vc	200	195	205	190	195	205	210	190	210	fz	0.022	0.023	0.028	0.033	0.04	0.041	0.039	0.039	0.039	RPM	10610	7759	6525	5040	4434	4078	3714	3024	2674	FEED	700	535	731	665	709	653	609	472	521

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



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9400 SERIES 2 FLUTE DRILL MILLS - CHAMFERING

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

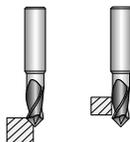
ISO	VDI 3323	Material Description	Parameter	Mill Diameter (Ø)																																								
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0																																
P	1-2	Non-alloy steel	Vc	60	65	65	60	60	65	70	70	85	fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137	RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353	FEED	318	321	331	331	339	343	371	348	371		
			Vc	45	55	55	55	55	55	60	65	65	fz	0.023	0.027	0.036	0.043	0.058	0.073	0.091	0.105	0.14	RPM	4775	4377	3501	2918	2188	1751	1592	1293	1035	FEED	220	236	252	251	254	256	290	272	290		
			Vc	40	45	45	40	40	50	50	55	fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134	RPM	4244	3581	2865	2122	1592	1592	1326	995	875	FEED	195	201	201	187	191	210	220	229	235			
	3-4	Non-alloy steel	0.3D	1.5D	Vc	60	65	65	60	60	65	70	70	85	fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137	RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353	FEED	318	321	331	331	339	343	371	348	371
					Vc	45	55	55	55	55	55	60	65	65	fz	0.023	0.027	0.036	0.043	0.058	0.073	0.091	0.105	0.14	RPM	4775	4377	3501	2918	2188	1751	1592	1293	1035	FEED	220	236	252	251	254	256	290	272	290
					Vc	40	45	45	40	40	50	50	55	fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134	RPM	4244	3581	2865	2122	1592	1592	1326	995	875	FEED	195	201	201	187	191	210	220	229	235	
	5	Low alloy steel	0.3D	1.5D	Vc	60	65	65	60	60	65	70	70	85	fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137	RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353	FEED	318	321	331	331	339	343	371	348	371
					Vc	45	55	55	55	55	55	60	65	65	fz	0.023	0.027	0.036	0.043	0.058	0.073	0.091	0.105	0.14	RPM	4775	4377	3501	2918	2188	1751	1592	1293	1035	FEED	220	236	252	251	254	256	290	272	290
					Vc	40	45	45	40	40	50	50	55	fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134	RPM	4244	3581	2865	2122	1592	1592	1326	995	875	FEED	195	201	201	187	191	210	220	229	235	
	6	Low alloy steel	0.3D																																									

G9400 SERIES 2 FLUTE DRILL MILLS - CHAMFERING & SIDE CUTTING

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

ISO	VDI 3323	Material Description	Parameter	Mill Diameter (Ø)																		
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0										
P	1-2	Non-alloy steel	Vc	80	85	85	80	80	90	95	90	95										
			fz	0.008	0.01	0.013	0.018	0.025	0.03	0.037	0.054	0.063										
			RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512										
	FEED		136	135	141	153	159	172	186	193	191											
	Vc		50	55	55	55	55	55	60	65	60											
	fz		0.008	0.01	0.013	0.018	0.024	0.03	0.041	0.05	0.064											
	RPM	5305	4377	3501	2918	2188	1751	1592	1293	955												
	FEED	85	88	91	105	105	105	131	129	122												
	Vc	45	50	50	50	45	55	55	55	55												
	fz	0.008	0.009	0.012	0.017	0.025	0.027	0.036	0.046	0.06												
	RPM	4775	3979	3183	2653	1790	1751	1459	1094	875												
FEED	76	72	76	90	90	95	105	101	105													
6	Low alloy steel	Vc	80	85	85	80	80	90	95	90	95											
		fz	0.008	0.01	0.013	0.018	0.025	0.03	0.037	0.054	0.063											
		RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512											
		FEED	136	135	141	153	159	172	186	193	191											
		Vc	50	55	55	55	55	55	60	65	60											
		fz	0.008	0.01	0.013	0.018	0.024	0.03	0.041	0.05	0.064											
RPM	5305	4377	3501	2918	2188	1751	1592	1293	955													
FEED	85	88	91	105	105	105	131	129	122													
8-9	High alloyed steel, and tool steel	Vc	45	50	50	50	45	55	55	55												
		fz	0.008	0.009	0.012	0.017	0.025	0.027	0.036	0.046	0.06											
		RPM	4775	3979	3183	2653	1790	1751	1459	1094	875											
FEED	76	72	76	90	90	95	105	101	105													
10	High alloyed steel, and tool steel	Vc	80	85	85	80	80	90	95	90	95											
		fz	0.008	0.01	0.013	0.018	0.025	0.03	0.037	0.054	0.063											
		RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512											
FEED	136	135	141	153	159	172	186	193	191													
11.1	High alloyed steel, and tool steel	Vc	45	50	50	50	45	55	55	55												
		fz	0.008	0.009	0.012	0.017	0.025	0.027	0.036	0.046	0.06											
		RPM	4775	3979	3183	2653	1790	1751	1459	1094	875											
FEED	76	72	76	90	90	95	105	101	105													
M	14.1	Stainless steel	Vc	30	35	40	35	40	45	45	45	40										
			fz	0.008	0.01	0.013	0.018	0.024	0.027	0.036	0.046	0.069										
			RPM	3183	2785	2546	1857	1592	1432	1194	895	637										
FEED	51	56	66	67	76	77	86	82	88													
N	21~22	Aluminum-wrought alloy	Vc	185	210	210	205	205	225	230	230	230										
			fz	0.008	0.01	0.013	0.019	0.03	0.037	0.045	0.05	0.064										
			RPM	19629	16711	13369	10876	8157	7162	6101	4576	3661										
	FEED	314	334	348	413	489	530	549	458	469												
	23~25	Aluminum-cast, alloyed	Vc	185	210	210	205	205	225	230	230	230										
			fz	0.008	0.01	0.013	0.019	0.03	0.037	0.045	0.05	0.064										
RPM			19629	16711	13369	10876	8157	7162	6101	4576	3661											
FEED	314	334	348	413	489	530	549	458	469													
S	36-37	Titanium Alloys	Vc	30	35	40	35	40	45	45	45	40										
			fz	0.008	0.01	0.013	0.018	0.024	0.027	0.036	0.046	0.069										
			RPM	3183	2785	2546	1857	1592	1432	1194	895	637										
FEED	51	56	66	67	76	77	86	82	88													

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



G9400 SERIES 2 FLUTE DRILL MILLS - V-GROOVING

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

ISO	VDI 3323	Material Description	Parameter	Mill Diameter (Ø)																		
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0										
P	1-2	Non-alloy steel	Vc	80	85	85	80	80	90	95	90	95										
			fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029										
			RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512										
	FEED		85	81	87	85	89	92	91	92	88											
	Vc		55	60	55	55	55	55	55	60	60											
	fz		0.004	0.004	0.006	0.007	0.012	0.014	0.015	0.018	0.022	0.028										
	RPM	5836	4775	3501	2918	2188	1751	1459	1094	875												
	FEED	47	38	42	41	53	49	58	57	53												
	Vc	45	50	50	50	45	55	55	55	55												
	fz	0.004	0.004	0.006	0.008	0.01	0.014	0.015	0.018	0.023	0.03											
	RPM	4775	3979	3183	2653	1790	1751	1459	1094	875												
FEED	38	32	38	42	50	53	53	50	53													
6	Low alloy steel	Vc	80	85	85	80	80	90	95	90	95											
		fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029											
		RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512											
		FEED	85	81	87	85	89	92	91	92	88											
		Vc	55	60	55	55	55	55	55	60	60											
		fz	0.004	0.004	0.006	0.007	0.012	0.014	0.015	0.018	0.022	0.028										
RPM	5836	4775	3501	2918	2188	1751	1459	1094	875													
FEED	47	38	42	41	53	49	58	57	53													
8-9	High alloyed steel, and tool steel	Vc	45	50	50	50	45	55	55	55												
		fz	0.004	0.004	0.006	0.008	0.014	0.015	0.018	0.023	0.03											
		RPM	4775	3979	3183	2653	1790	1751	1459	1094	875											
FEED	38	32	38	42	50	53	53	50	53													
10	High alloyed steel, and tool steel	Vc	80	85	85	80	80	90	95	90	95											
		fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029											
		RPM	8488	6764	5411	4244	3183	2865	2520	1790	1512											
FEED	85	81	87	85	89	92	91	92	88													
11.1	High alloyed steel, and tool steel	Vc	45	50	50	50	45	55	55	55												
		fz	0.004	0.004	0.006	0.008	0.014	0.015	0.018	0.023	0.03											
		RPM	4775	3979	3183	2653	1790	1751	1459	1094	875											
FEED	38	32	38	42	50	53	53	50	53													
M	14.1	Stainless steel	Vc	30	35	40	35	40	45	45	45	40										
			fz	0.004	0.005	0.006	0.008	0.01	0.011	0.013	0.019	0.028										
			RPM	3183	2785	2546	1857	1592	1432	1194	895	637										
FEED	25	28	31	30	32	32	31	34	36													