



Leading Through Innovation



SOLID CARBIDE

ALU-POWER END MILLS

Alu - Power VHM/HSS-PM - Fräser

- For Aluminium Alloys and Silent Cutting
- Für Aluminiumlegierungen und geräuscharmen Schnitt

SELECTION GUIDE



SOLID CARBIDE
ALU POWER
END MILLS

Aluminium Alloys and Silent Cutting



⊙ : Excellent ○ : Good

Recommended cutting conditions : P 494

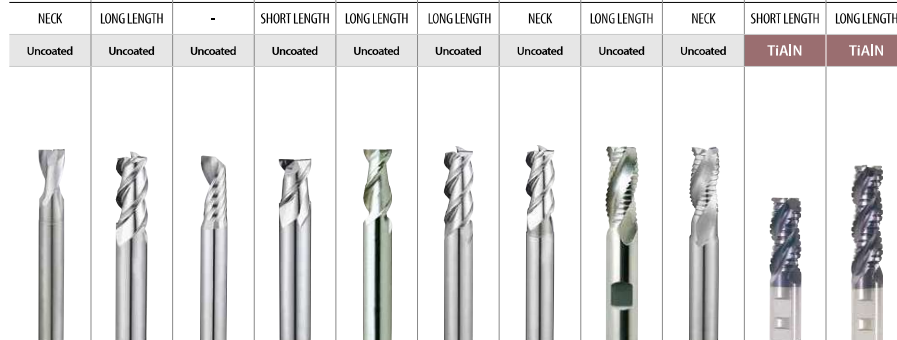
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRC	
P	1	Non-alloy steel	About 0.15% C Annealed	125		
	2		About 0.45% C Annealed	190	13	
	3		About 0.45% C Quenched & Tempered	250	25	
	4		About 0.75% C Annealed	270	28	
	5		About 0.75% C Quenched & Tempered	300	32	
	6	Low 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	
	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 Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26		Copper and Copper Alloys (Bronze / Brass)	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 Rubber, Wood, etc.		
	30	S	Heat Resistant Super Alloys	Fe Based Annealed	200	15
32	Cured			280	30	
33	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	550	55	

SERIES	E5910	E5908	E5909
FLUTE	2	3	2
HELIX ANGLE	50°	40°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R3.0	R1.0	D4.0
SIZE MAX	R10.0	R8.0	D20.0
PAGE	480	481	482

	NECK	NECK	NECK
	Uncoated	Uncoated	Uncoated



E5930	E5E51	E5E47	E5E48	E5522 E5521	E5E49	E5E50	E5742 E5711	E5E39 E5E40	EP922 EP923	EP924 EP925
2	3	1	2	2	3	3	3	3	3	3
25°	45°	30°	45°	45°	45°	45°	30°	30°	42°	42°
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING
D2.0	D3.0	D2.0	D3.0	D3.0	D3.0	D3.0	D6.0	D6.0	D12.0	D12.0
D20.0	D20.0	D12.0	D20.0	D20.0	D20.0	D20.0	D25.0	D20.0	D28.0	D32.0
483	484	485	486	487	488	489	490	491	492	493
NECK	LONG LENGTH	-	SHORT LENGTH	LONG LENGTH	LONG LENGTH	NECK	LONG LENGTH	NECK	SHORT LENGTH	LONG LENGTH
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	TIAIN	TIAIN



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	
	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 Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75		
	24		≤ 12% Si, Curable Hardened	90		
	25		> 12% Si, Not Curable	130		
	26		Copper and Copper Alloys (Bronze / Brass)	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 Rubber, Wood, etc.		
	30	S	Heat Resistant Super Alloys	Fe Based Annealed	200	15
32	Cured			280	30	
33	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	550	55	

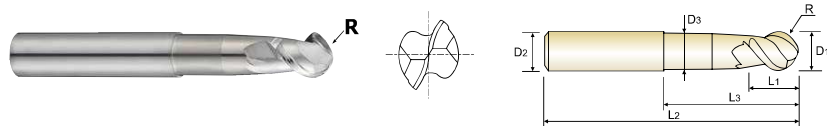


PLAIN SHANK **E5910** SERIES

CARBIDE, 2 FLUTE 50° HELIX BALL NOSE with NECK

● VOLLHARTMETALL, 2 SCHNEIDEN 50° RECHTSSPIRALE STIRNRADIUS mit ABGESETZTEM SCHAFTTETEL
 (1) Fraise carbure, 2 dents, hémisphérique, hélice 50°, détalonnée
 (2) 2 TAGLIANTI, ELICA 50°, SEMISFERICA, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter		Length of Cut		Overall Length	Neck Diameter
	R(±0.02)	D1	D2	D3	L1	L3	L2	D3
E5910060	R3.0	6.0	6	6	5.5	25	55	5.4
E5910080	R4.0	8.0	8	8	7	30	65	7.2
E5910100	R5.0	10.0	10	10	8.5	35	75	9
E5910120	R6.0	12.0	12	12	10.5	40	75	11
E5910160	R8.0	16.0	16	16	14	50	90	14.5
E5910200	R10.0	20.0	20	20	17	50	100	18

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

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
± 0.02	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	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				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	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41					
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎																		

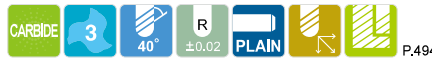
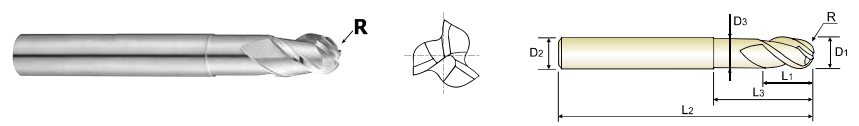


PLAIN SHANK **E5908** SERIES

CARBIDE, 3 FLUTE 40° HELIX BALL NOSE with NECK

● VOLLHARTMETALL, 3 SCHNEIDEN 40° RECHTSSPIRALE STIRNRADIUS mit ABGESETZTEM SCHAFTTETEL
 (1) Fraise carbure, 3 dents, hémisphérique, hélice 40°, détalonnée
 (2) 3 TAGLIANTI, ELICA 40°, SEMISFERICA, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.



EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter		Length of Cut		Overall Length	Neck Diameter
	R(±0.02)	D1	D2	D3	L1	L3	L2	D3
E5908020	R1.0	2.0	6	6	3	5	60	1.9
E5908025	R1.25	2.5	6	6	4	6	60	2.4
E5908030	R1.5	3.0	6	6	4.5	6.5	60	2.8
E5908035	R1.75	3.5	6	6	5	7	65	3.2
E5908040	R2.0	4.0	6	6	6	8	65	3.7
E5908050	R2.5	5.0	6	6	7.5	10	65	4.6
E5908060	R3.0	6.0	6	6	9	12	75	5.6
E5908080	R4.0	8.0	8	8	12	25	75	7.4
E5908100	R5.0	10.0	10	10	15	30	80	9.4
E5908120	R6.0	12.0	12	12	18	36	90	11.4
E5908160	R8.0	16.0	16	16	24	40	100	15.4

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

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	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				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	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41					
HB	60	100	75	90	130	110	90	100			15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	◎	◎	◎																		



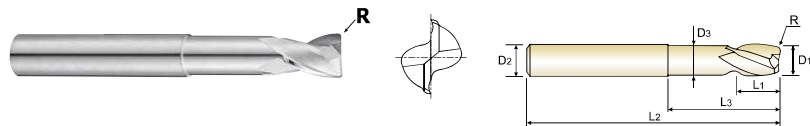
PLAIN SHANK **E5909** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETEL**
- ▶ **Fraise carbure, 2 dents, torique, détalonnée**
- ▶ **2 TAGLIENTI, TORICA, SCARICATA**

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation
- ▶ Reduces chipping of corner edges

- ▶ **Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer**
- ▶ **Verbesserte Standzeiten und höhere Fräsgenauigkeit.**
- ▶ **Spiegel-Oberfläche - Hervorragendes Oberflächenfinish.**
- ▶ **Überlegene Spanabfuhr**
- ▶ **Reduzierung von Schneideckenausbrüchen.**



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
E5909040	R0.3	4.0	6.0	5	10	50	3.6
E5909060	R0.5	6.0	6.0	8	20	60	5.4
E5909080	R0.6	8.0	8.0	10	30	70	7.2
E5909100	R0.8	10.0	10.0	12	36	80	9
E5909120	R1.0	12.0	12.0	14	40	90	11
E5909160	R1.3	16.0	16.0	18	45	100	14.5
E5909200	R1.6	20.0	20.0	24	45	100	18

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

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	38	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
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○													



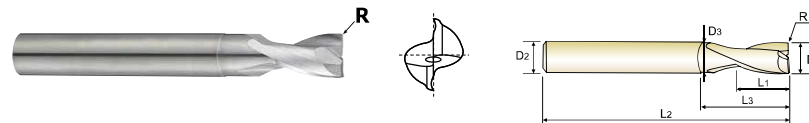
PLAIN SHANK **E5930** SERIES

CARBIDE, 2 FLUTE 25° HELIX CORNER RADIUS with NECK

- ▶ **VOLLHARTMETALL, 2 SCHNEIDEN 25° RECHTSSPIRALE ECKENRADIUS mit ABGESETZTEM SCHAFTTETEL**
- ▶ **Fraise carbure, 2 dents, torique, hélice 25°, détalonnée**
- ▶ **2 TAGLIENTI, ELICA 25°, TORICA, SCARICATA**

- ▶ Designed for machining aluminum, aluminum alloys and non-ferrous material
- ▶ Mirror surface - Excellent surface finish
- ▶ Increased tool life and higher cutting accuracy
- ▶ Maximum-metal removal rate
- ▶ Superior chip evacuation
- ▶ Corner Radius to avoid chipping problems

- ▶ **Entwickelt für die Bearbeitung von Aluminium, Aluminiumlegierungen, NE-Metalle**
- ▶ **Spiegel-Oberfläche - Hervorragendes Oberflächenfinish.**
- ▶ **Verbesserte Standzeiten und höhere Fräsgenauigkeit.**
- ▶ **Maximale Zerspanungsleistung.**
- ▶ **Überlegene Spanabfuhr**
- ▶ **Eckradien verhindern Schneidkantenabrüche**



EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
E5930020	R0.2	2.0	3	3	6	40	1.9
E5930030	R0.2	3.0	3	4	8	40	2.9
E5930040	R0.2	4.0	4	5	12	50	3.8
E5930050	R0.2	5.0	5	8	14	50	4.8
E5930060	R0.2	6.0	6	8	18	65	5.7
E5930080	R0.2	8.0	8	10	22	70	7.7
E5930100	R0.2	10.0	10	14	28	80	9.7
E5930120	R0.2	12.0	12	16	35	90	11.5
E5930160	R0.2	16.0	16	20	40	90	15.5
E5930200	R0.2	20.0	20	25	50	100	19.5

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

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	38	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
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○													



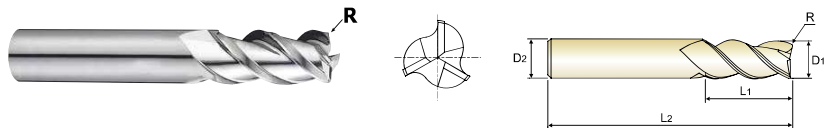
PLAIN SHANK **E5E51** SERIES

CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG ECKENRADIUS
 (1) Fraise carbure, 3 dents, torique, hélice 45°, longue
 (1) TAGLIANTI, ELICA 45°, TORICA, SERIE LUNGA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation
- ▶ Reduces chipping of corner edges

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- ▶ Überlegene Spanabfuhr
- ▶ Reduzierung von Schneideckenausbrüchen.

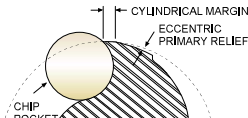


Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut		Overall Length
	R	D1	D2	L1	L2	
E5E51030	R0.5	3.0	6	12	57	
E5E51901	R1.0	3.0	6	12	57	
E5E51040	R0.5	4.0	6	15	57	
E5E51902	R1.0	4.0	6	15	57	
E5E51050	R0.5	5.0	6	20	57	
E5E51903	R1.0	5.0	6	20	57	
E5E51060	R0.5	6.0	6	20	65	
E5E51904	R1.0	6.0	6	20	65	
E5E51080	R0.5	8.0	8	22	65	
E5E51905	R1.0	8.0	8	22	65	
E5E51100	R0.5	10.0	10	25	70	
E5E51906	R1.0	10.0	10	25	70	
E5E51907	R2.0	10.0	10	25	70	
E5E51120	R0.5	12.0	12	25	75	
E5E51908	R1.0	12.0	12	25	75	
E5E51909	R2.0	12.0	12	25	75	
E5E51160	R0.5	16.0	16	35	90	
E5E51910	R1.0	16.0	16	35	90	
E5E51911	R2.0	16.0	16	35	90	
E5E51200	R0.5	20.0	20	40	100	
E5E51912	R1.0	20.0	20	40	100	
E5E51913	R2.0	20.0	20	40	100	

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

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h5



◎ : Excellent ○ : Good

ISO	P								M				K								
Material Description	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	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													
Material Description	Aluminum-wrought alloy		Aluminum-cast. alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron										
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			
HRc	60	100	75	90	130	110	90	100			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	◎	◎	◎	◎	◎	◎	◎	◎																



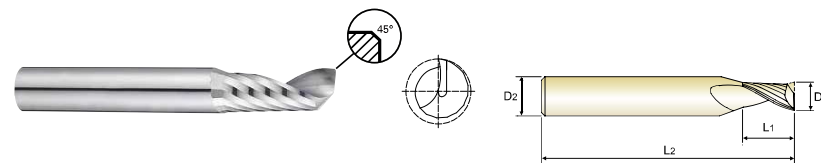
PLAIN SHANK **E5E47** SERIES

CARBIDE, 1 FLUTE

VOLLHARTMETALL, 1 SCHNEIDEN
 (1) Fraise carbure, 1 dent
 (1) TAGLIENTE

- ▶ Designed for non-ferrous material, non-metal like aluminum and acrylic
- ▶ 1 Flute allows excellent finished workpiece and chip evacuation

- ▶ Entwickelt für NE-Metalle und nichtmetallische Werkstoffe wie Aluminium und Acryl
- ▶ 1 Spannute ermöglicht hervorragende Werkstückoberflächen und Spanabfuhr

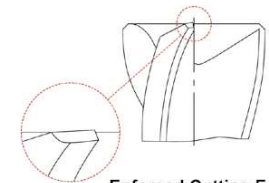


Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length		Chamfer
	D1	D2	L1	L2		
E5E47020	2.0	3	8	50	0.04	
E5E47030	3.0	3	12	50	0.05	
E5E47040	4.0	4	15	60	0.07	
E5E47050	5.0	5	17	60	0.09	
E5E47060	6.0	6	20	65	0.10	
E5E47080	8.0	8	22	65	0.14	
E5E47100	10.0	10	25	75	0.14	
E5E47120	12.0	12	30	80	0.14	

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

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



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P								M				K									
Material Description	Non-alloy steel				Low alloy steel				High alloyed steel and tool steel				Stainless steel		Grey cast iron	Nodular cast iron	Malleable cast iron					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	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													
Material Description	Aluminum-wrought alloy		Aluminum-cast. alloyed		Copper and Copper Alloys (Bronze / Brass)	Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron										
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			
HRc	60	100	75	90	130	110	90	100			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

YG ALU-POWER END MILLS

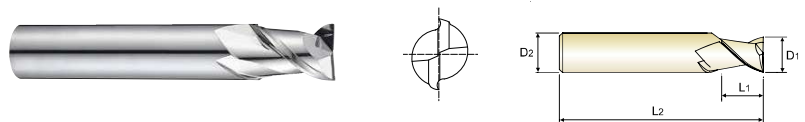
PLAIN SHANK **E5E48** SERIES

CARBIDE, 2 FLUTE 45° HELIX SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN 45° RECHTSSPIRALE KURZ
 () Fraise carbure, 2 dents, hélice 45°, courte
 () 2 TAGLIENTI, ELICA 45°, SERIE CORTA

- Suitable for high speed machining in aluminum and other non-ferrous materials
- Mirror surface - Excellent surface finish
- Superior chip evacuation

- Zur HSC- Bearbeitung von Aluminium und anderen Nichteisenmetallen.
- Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- Überlegene Spanabfuhr

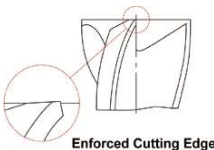
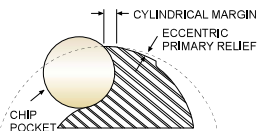


Unit : mm

EDP No.	Mill Diameter		Shank Diameter		Length of Cut		Overall Length	
	D1	D2	D1	D2	L1	L2	L1	L2
E5E48030	3.0	6	6	6	5	50		
E5E48040	4.0	6	6	6	8	54		
E5E48050	5.0	6	6	6	9	54		
E5E48060	6.0	6	6	6	10	54		
E5E48080	8.0	8	8	8	12	58		
E5E48100	10.0	10	10	10	14	66		
E5E48120	12.0	12	12	12	16	73		
E5E48140	14.0	14	14	14	18	75		
E5E48160	16.0	16	16	16	22	82		
E5E48180	18.0	18	18	18	24	84		
E5E48200	20.0	20	20	20	26	92		

► TIN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.015	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	19	21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230			
Recommend																							

HSS

YG ALU-POWER END MILLS

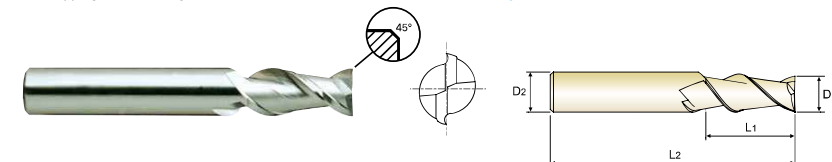
PLAIN SHANK **E5522** SERIES
 FLAT SHANK **E5521** SERIES

CARBIDE, 2 FLUTE 45° HELIX LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN 45° RECHTSSPIRALE LANG
 () Fraise carbure, 2 dents, hélice 45°, longue
 () 2 TAGLIENTI, ELICA 45°, SERIE LUNGA

- Suitable for high speed machining in aluminum and other non-ferrous materials
- Mirror surface - Excellent surface finish
- Superior chip evacuation
- Reduces chipping of corner edges

- Zur HSC- Bearbeitung von Aluminium und anderen Nichteisenmetallen.
- Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- Überlegene Spanabfuhr
- Reduzierung von Schneideckenausbrüchen.

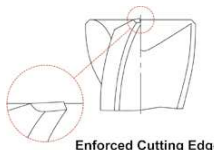
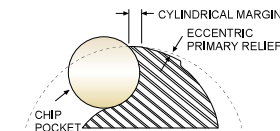


Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall length		Chamfer
				L1	L2	
PLAIN	FLAT	D1	D2	L1	L2	
E5522030	E5521030	3.0	6	8	57	0.05
E5522040	E5521040	4.0	6	11	57	0.05
E5522050	E5521050	5.0	6	13	57	0.05
E5522060	E5521060	6.0	6	13	57	0.05
E5522080	E5521080	8.0	8	19	63	0.05
E5522100	E5521100	10.0	10	22	72	0.10
E5522120	E5521120	12.0	12	26	83	0.10
E5522140	E5521140	14.0	14	26	83	0.10
E5522160	E5521160	16.0	16	32	92	0.10
E5522180	E5521180	18.0	18	32	92	0.10
E5522200	E5521200	20.0	20	38	104	0.10

► TIN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.015	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	19	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 **E5E49** 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

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing
- ▶ Überlegene Spanabfuhr

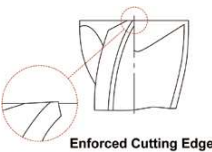
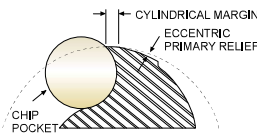


EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
E5E49030	3.0	6	12	57
E5E49040	4.0	6	15	57
E5E49050	5.0	6	20	57
E5E49060	6.0	6	20	65
E5E49080	8.0	8	22	65
E5E49100	10.0	10	25	70
E5E49120	12.0	12	25	75
E5E49160	16.0	16	35	90
E5E49200	20.0	20	40	100

Unit : mm

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

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h5



Enforced Cutting Edge

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																				

◎ : Excellent ○ : Good

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	◎	◎	◎	◎	◎	◎	◎	◎													



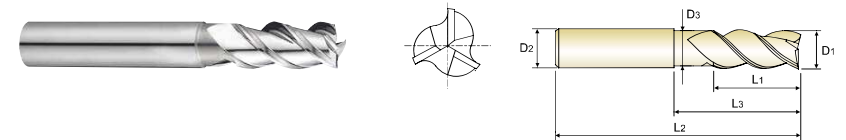
PLAIN SHANK **E5E50** SERIES

CARBIDE, 3 FLUTE 45° HELIX with NECK

- VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE mit ABGESETZTEM SCHAFTTETEL**
- Fraise carbure, 3 dents, hélice 45°, détalonnée
- 3 TAGLIENTI, ELICA 45°, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing
- ▶ Überlegene Spanabfuhr

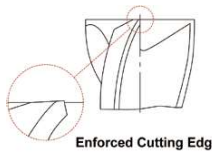
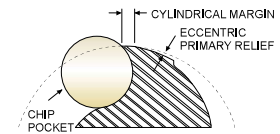


EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
E5E50030	3.0	6	8	12	57	2.7
E5E50040	4.0	6	11	18	57	3.7
E5E50050	5.0	6	13	18	57	4.7
E5E50060	6.0	6	13	18	57	5.7
E5E50080	8.0	8	21	25	63	7.4
E5E50100	10.0	10	22	30	72	9.2
E5E50120	12.0	12	26	36	83	11
E5E50160	16.0	16	36	42	92	15
E5E50200	20.0	20	41	52	104	19

Unit : mm

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

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h5



Enforced Cutting Edge

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																				

◎ : Excellent ○ : Good

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 **E5742** SERIES

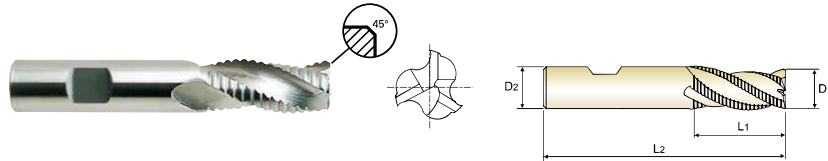
FLAT SHANK **E5711** SERIES

CARBIDE, 3 FLUTE LONG LENGTH ROUGHING

- VOLLHARTMETALL, 3 SCHNEIDEN LANG SCHRUPPFRÄSER
- (1) Fraise carbure, 3 dents, ébauche, longue
- (1) 3 TAGLIENTI, PER SGROSSATURA, SERIE LUNGA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.



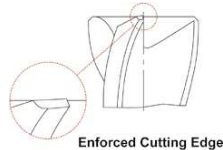
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall length	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
E5742060	E5711060	6.0	6	16	57	0.60
E5742070	E5711070	7.0	8	16	63	0.60
E5742080	E5711080	8.0	8	16	63	0.60
E5742090	E5711090	9.0	10	19	72	0.60
E5742100	E5711100	10.0	10	22	72	0.60
E5742120	E5711120	12.0	12	26	83	0.60
E5742140	E5711140	14.0	14	26	83	0.91
E5742160	E5711160	16.0	16	32	92	0.91
E5742180	E5711180	18.0	18	32	92	0.91
E5742200	E5711200	20.0	20	38	104	0.91
E5742250	E5711250	25.0	25	45	121	0.91

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

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



◎ : 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	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 **E5E39** SERIES

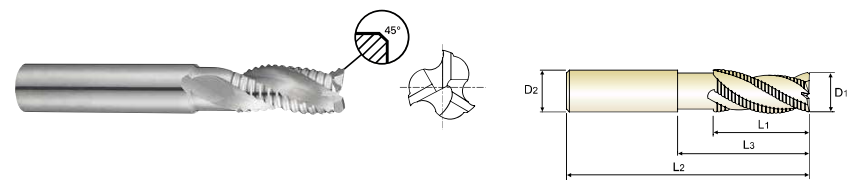
FLAT SHANK **E5E40** SERIES

CARBIDE, 3 FLUTE ROUGHING with NECK

- VOLLHARTMETALL, 3 SCHNEIDEN SCHRUPPFRÄSER mit ABGESETZTEM SCHAFTTETEL
- (1) Fraise carbure, 3 dents, ébauche détalonnée
- (1) 3 TAGLIENTI, PER SGROSSATURA, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.



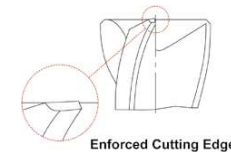
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall length	Neck Diameter	Chamfer
PLAIN	FLAT	D1	D2	L1	L3	L2	D3	
E5E39060	E5E40060	6.0	6	16	20	57	5	0.60
E5E39080	E5E40080	8.0	8	16	25	63	7	0.60
E5E39100	E5E40100	10.0	10	22	30	72	9	0.60
E5E39120	E5E40120	12.0	12	26	36	83	10.5	0.60
E5E39160	E5E40160	16.0	16	32	42	92	14.5	0.91
E5E39200	E5E40200	20.0	20	38	52	104	18.5	0.91

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

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



◎ : 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	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 **EP922** SERIES

FLAT SHANK **EP923** SERIES

PLAIN SHANK **EP924** SERIES

FLAT SHANK **EP925** SERIES

YPM, 3 FLUTE 42° HELIX SHORT LENGTH ROUGHING TiAIN COATED

PREMIUM HSS-PM, 3 SCHNEIDEN 42° RECHTSSPIRALE KURZ SCHRUPPFÄSER TiAIN-BESCHICHTET
 () Fraise YPM, 3 dents, ébauche, hélice 42°, revêtue TiAIN, courte
 () 3 TAGLIANTI, CORTA, ELICA 42°, RIVESTITA TiAIN PER SGROSSATURA - HSS PM

- ▶ Maximum metal removal rate at High Speed Condition
- ▶ Reduces vibrations and improves surface roughness
- ▶ Reduces chipping of corner edges
- ▶ Maximale Zerspanungsleistung bei der High-Speed-Bearbeitung (HSC)
- ▶ Reduziert Vibrationen und verbessert die Oberflächenrauigkeit
- ▶ Reduzierung von Schneidkrenausrüchten.



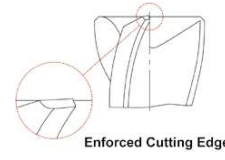
HSS PM
WR
3
42°
PLAIN
FLAT
C x 45°
P.498

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall length	Chamfer
PLAIN	FLAT	D1 (js12)	D2(h6)	L1	L2	
▲ EP922120	▲ EP923120	12.0	12	26	83	1.10
▲ EP922140	▲ EP923140	14.0	12	26	83	1.10
▲ EP922160	▲ EP923160	16.0	16	32	92	1.10
▲ EP922180	▲ EP923180	18.0	16	32	92	1.10
▲ EP922200	▲ EP923200	20.0	20	38	104	1.10
▲ EP922220	▲ EP923220	22.0	20	38	104	1.10
▲ EP922250	▲ EP923250	25.0	25	45	121	1.10
▲ EP922280	▲ EP923280	28.0	25	45	121	1.22

▲ : Only available till stock runs out

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	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



◎ : 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		21
HB	125	190	250	270	300	180	275	300	350	200	240	180	180	260	160	250	130	230		
Recommend												○	○	○	○	○	○	○	○	○

YPM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING TiAIN COATED

PREMIUM HSS-PM, 3 SCHNEIDEN 42° RECHTSSPIRALE LANG SCHRUPPFÄSER TiAIN-BESCHICHTET
 () Fraise YPM, 3 dents, ébauche, hélice 42°, revêtue TiAIN, longue
 () 3 TAGLIANTI, CORTA, ELICA 42°, RIVESTITA TiAIN PER SGROSSATURA - HSS PM

- ▶ Maximum metal removal rate at High Speed Condition
- ▶ Reduces vibrations and improves surface roughness
- ▶ Reduces chipping of corner edges
- ▶ Maximale Zerspanungsleistung bei der High-Speed-Bearbeitung (HSC)
- ▶ Reduziert Vibrationen und verbessert die Oberflächenrauigkeit
- ▶ Reduzierung von Schneidkrenausrüchten.



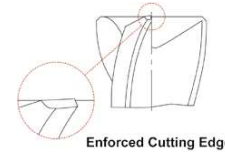
HSS PM
WR
3
42°
PLAIN
FLAT
C x 45°
P.498

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall length	Chamfer
PLAIN	FLAT	D1 (js12)	D2(h6)	L1	L2	
▲ EP924120	▲ EP925120	12.0	12	53	110	1.10
-	▲ EP925140	14.0	12	53	110	1.10
▲ EP924160	▲ EP925160	16.0	16	63	123	1.10
▲ EP924200	▲ EP925200	20.0	20	75	141	1.10
▲ EP924220	-	22.0	20	75	141	1.10
-	▲ EP925250	25.0	25	90	166	1.10
-	▲ EP925280	28.0	25	90	166	1.22
▲ EP924320	▲ EP925320	32.0	32	106	186	1.22

▲ : Only available till stock runs out

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	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



◎ : 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		21
HB	125	190	250	270	300	180	275	300	350	200	240	180	180	260	160	250	130	230		
Recommend												○	○	○	○	○	○	○	○	○

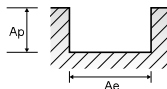
YG ALU-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDPARAMETER

E5E47 SERIES 1 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)																	
						2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	15.0	20.0								
N	21~22	Aluminum-wrought alloy	1.0D	1.5D	Vc	145	170	190	190	190	195	190	190	190									
					fz	0.065	0.094	0.120	0.150	0.180	0.244	0.333	0.440										
					RPM	23077	18038	15120	12096	10080	7759	6048	5040										
					FEED	1500	1696	1814	1814	1814	1893	2014	2218										
N	23~24	Aluminum-cast, alloyed	1.0D	1.5D	Vc	94	111	124	124	124	127	124	124	124									
					fz	0.065	0.094	0.120	0.150	0.180	0.244	0.333	0.440										
					RPM	15000	11724	9828	7862	6552	5043	3931	3276										
					FEED	975	1102	1179	1179	1179	1231	1309	1441										
N	29.1	Non Metallic Materials (Duroplastic)	1.0D	1.5D	Vc	200	235	250	235	250	250	250	255	255									
					fz	0.069	0.096	0.120	0.147	0.170	0.240	0.300	0.343										
					RPM	31831	24934	19894	14961	13528	9947	7958	6764										
					FEED	2196	2394	2387	2199	2300	2387	2387	2320										



YG ALU-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDPARAMETER

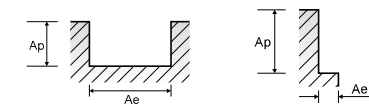
E5E49, E5E50 SERIES

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	16.0	20.0										
N	21~22	Aluminum-wrought alloy	1.0D	0.5D	Vc	65	90	110	130	140	160	175	210	210	175									
					fz	0.035	0.045	0.050	0.060	0.088	0.097	0.106	0.131	0.158	0.200									
					RPM	6897	7162	7003	6897	5570	5659	5570	5570	4178	2785									
					FEED	724	967	1050	1241	1471	1647	1771	2189	1980	1671									
N	23~24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	42	59	72	85	91	104	114	137	137	114									
					fz	0.035	0.045	0.050	0.060	0.088	0.097	0.106	0.131	0.158	0.200									
					RPM	4483	4655	4552	4483	3621	3678	3621	3621	2716	1810									
					FEED	471	628	683	807	956	1070	1151	1423	1287	1086									

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)																		
						3.0	4.0	5.0	6.0	8.0	9.0	10.0	12.0	16.0	20.0									
N	21~22	Aluminum-wrought alloy	0.15D	1.5D ~ 2.5D	Vc	65	90	110	130	140	160	175	210	210	175									
					fz	0.045	0.055	0.065	0.075	0.113	0.122	0.131	0.163	0.200	0.238									
					RPM	6897	7162	7003	6897	5570	5659	5570	5570	4178	2785									
					FEED	931	1182	1366	1552	1888	2071	2189	2724	2507	1989									
N	23~24	Aluminum-cast, alloyed	0.15D	1.5D ~ 2.5D	Vc	42	59	72	85	91	104	114	137	137	114									
					fz	0.045	0.055	0.065	0.075	0.113	0.122	0.131	0.163	0.200	0.238									
					RPM	4483	4655	4552	4483	3621	3678	3621	3621	2716	1810									
					FEED	605	768	888	1009	1227	1346	1423	1771	1629	1293									



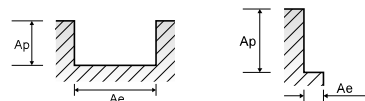
E5E48, E5522, E5521 SERIES

2 FLUTE - SLOTTING

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									
N	21~22	Aluminum-wrought alloy	1.0D	0.5D	Vc	95	125	155	190	200	250	300	265	300	225	250									
					fz	0.035	0.045	0.050	0.060	0.088	0.106	0.131	0.150	0.158	0.175	0.200									
					RPM	10080	9947	9868	10080	7958	7958	7958	6025	5968	3979	3979									
					FEED	706	895	987	1210	1401	1687	2085	1808	1886	1393	1592									
N	23~24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	62	81	101	124	130	163	195	172	195	146	163									
					fz	0.035	0.045	0.050	0.060	0.088	0.106	0.131	0.150	0.158	0.175	0.200									
					RPM	6552	6466	6414	6552	5173	5173	3916	3879	2586	2586										
					FEED	459	582	641	786	910	1097	1355	1175	1226	905	1035									

2 FLUTE - SIDE CUTTING

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									
N	21~22	Aluminum-wrought alloy	0.8~0.10-0.25D 0.12~0.20-0.5D	1.0D	Vc	95	125	155	190	200	250	300	265	300	225	250									
					fz	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.183	0.200	0.225	0.238									
					RPM	10080	9947	9868	10080	7958	7958	7958	6025	5968	3979	3979									
					FEED	907	1094	1283	1512	1798	2085	2594	2205	2387	1790	1894									
N	23~24	Aluminum-cast, alloyed	0.8~0.10-0.25D 0.12~0.20-0.5D	1.0D	Vc	62	81	101	124	130	163	195	172	195	146	163									
					fz	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.183	0.200	0.225	0.238									
					RPM	6552	6466	6414	6552	5173	5173	3916	3879	2586	2586										
					FEED	590	711	834	983	1169	1355	1686	1433	1552	1164	1231									



EP922, EP923, EP924, EP925 SERIES

3 FLUTE ROUGHING - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)										
						12.0	14.0	16.0	18.0	20.0	22.0	25.0	28.0	32.0		
N	21~22	Aluminum-wrought alloy	1.0D	0.5D	Vc	105	110	110	110	105	110	110	110	110	110	
					fz	0.049	0.060	0.070	0.087	0.103	0.107	0.111	0.135	0.159		
					RPM	2785	2501	2188	1945	1671	1592	1401	1251	1094		
						FEED	409	450	460	508	516	511	466	506	522	
		23~24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	68	72	72	72	68	72	72	72	72	72
	fz					0.049	0.060	0.070	0.087	0.103	0.107	0.111	0.135	0.159		
RPM	1810					1626	1422	1264	1086	1035	910	813	711			
					FEED	266	293	299	330	336	332	303	329	339		

3 FLUTE ROUGHING - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)										
						12.0	14.0	16.0	18.0	20.0	22.0	25.0	28.0	32.0		
N	21~22	Aluminum-wrought alloy	0.5D	1.5D	Vc	105	110	110	110	105	110	110	110	110	110	
					fz	0.065	0.080	0.095	0.116	0.137	0.143	0.149	0.180	0.212		
					RPM	2785	2501	2188	1945	1671	1592	1401	1251	1094		
						FEED	543	600	624	677	687	683	626	675	696	
		23~24	Aluminum-cast, alloyed	0.5D	1.5D	Vc	68	72	72	72	68	72	72	72	72	72
	fz					0.065	0.080	0.095	0.116	0.137	0.143	0.149	0.180	0.212		
RPM	1810					1626	1422	1264	1086	1035	910	813	711			
					FEED	353	390	405	440	446	444	407	439	452		

