ARNO®
WERKZEUGE

We have a passion for precision.

VHM-/PM-HSS WERKZEUGE

Solid carbide-/PM-HSS Tools

Hochleistungswerkzeuge zum Fräsen und Bohren

High performance tools for milling and drilling

www.arno.de

TÜV SÜD ISO 9001

ARNO®
WERKZEUGE

We have a passion for precision.

PM-HSS-FRÄSER

PM and HSS milling cutters

Ausführung

FP - für Stahl, rostfreien Stahl und Gusswerkstoffe

FS - für Stahl, rostfreien Stahl und Gusswerkstoffe

Design

FP - for steel, stainless steel and cast materials

FS - for steel, stainless steel and cast materials

Übersicht pulvermetallurgische HSS-Fräser — Overview powder metal HSS milling

Bezeichnung Description	**Schneiden** Flutes	**Fräsertyp** Type	**Ausführung** Design	**Spiralwinkel** Helix angle	**Abb.** Picture	**Seite** Page
FP - Universalfräser für Stahl, rostfreien Stahl, Gusswerkstoffe / Universal cutter for steel, stainless steel and cast materials						
FP60120-...	2	PM-HSS Schaftfräser PM-HSS end-mill	kurz short	30°		**312**
FP60121-...	2	PM-HSS Schaftfräser PM-HSS end mill	lang long	30°		**313**
FP60320-...	2	PM-HSS-Radiusfräser PM-HSS ball-nose end-mill	kurz short	30°		**314**
FP60321-...	2	PM-HSS-Radiusfräser PM-HSS ball-nose end-mill	lang long	30°		**315**
FP60135-...	3	PM-HSS Schaftfräser PM-HSS end-mill	extra kurz extra short	30°		**316**
FP60130-...	3	PM-HSS Schaftfräser PM-HSS end-mill	kurz short	30°		**317**
FP601.0-...	4 - 6	PM-HSS Schaftfräser PM-HSS end-mill	kurz short	30°		**318**
FP601.1-...	4 - 6	PM-HSS Schaftfräser PM-HSS end-mill	lang long	30°		**319**
FP618.0-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	kurz short	30°		**320**
FP618.6-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	mittellang mid-length	30°		**321**
FP618.1-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	lang long	30°		**322**

Übersicht pulvermetallurgische HSS-Fräser — Overview Solid carbide milling cutter

Bezeichnung Description	**Schneiden** Flutes	**Fräsertyp** Type	**Ausführung** Design	**Spiralwinkel** Helix angle	**Abb.** Picture	**Seite** Page
FP - Universalfräser für Stahl, rostfreien Stahl, Gusswerkstoffe / Universal cutter for steel, stainless steel and cast materials						
FP619.5-...	4 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	extra kurz extra short	45°		**323**
FP619.0-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	kurz short	45°		**324**
FP620.0-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	kurz short	30°		**325**
FP620.1-...	3 - 6	PM-HSS Schruppfräser PM-HSS roughing end-mill	lang long	30°		**326**
FP623.1-... / **FP618.1-...** NEU NEW	4 - 5	PM-HSS Schruppfräser PM-HSS roughing end-mill	extra lang extra long	30°		**327**
FS - Universalfräser für Stahl, rostfreien Stahl, Gusswerkstoffe / Universal cutter for steel, stainless steel and cast materials						
FS60120-...	2	HSS Schaftfräser HSS end-mill	kurz short	30°		**330**
FS60320-...	2	HSS-Radiusfräser HSS ball-nose end-mill	kurz short	30°		**331**
FS60140-...	4	HSS Schaftfräser HSS end-mill	kurz short	30°		**332**
FS618.0-...	3 - 4	HSS-Schruppfräser HSS roughing end-mill	kurz short	30°		**333**
FS620.0-...	3 - 4	HSS-Schruppfräser HSS roughing end-mill	kurz short	30°		**334**

Weitere Highlights unserer Frässysteme.

Other highlights from our milling range.

ARNO®-Frässystem DUO-MILL

Eckfräsen und HFC-Fräsen
mit nur einem Werkzeug.

ARNO® milling-system DUO-MILL

Square shoulder and high feed
(HFC) milling with just one tool.

ARNO®-Frässystem FTA

Der universelle Planfräser
zur Kostenreduzierung.

ARNO® milling-system FTA

Face milling tool for cost reduction.

ARNO®-Frässystem FOA

Der positiv weichschneidende
Planfräser, der eine Rundplatte
und eine oktogonale Wend-
schneidplatte in einem
Plattensitz vereint.

ARNO® milling-system FOA

The positive face-milling-cutter,
in which both a round and an
octogonal insert can be used.

Informationen zu diesen Produkten finden Sie unter www.arno.de oder direkt bei ARNO®.
For more information on these products please see our website www.arno.de or contact ARNO®.

ARNO®
WERKZEUGE

Weitere Informationen finden Sie unter:
For more information see:

www.arno.de

ARNO®
WERKZEUGE
We have a passion for precision.

AUSFÜHRUNG FP

Design FP

Maximale Schnittleistung und minimaler Verschleiß bei der Bearbeitung von Stahl, rostfreiem Stahl, exotischen Materialien und Gusswerkstoffen.

Great performance and minimal wear for machining steel, stainless steel, exotics and cast materials.

Die TiAlN beschichteten Universalfräser aus pulvermetallurgischem HSS Schneidstoff sind extrem robust, zäh und verschleißfest. Dadurch ergeben sich deutlich verbesserte Standzeiten.

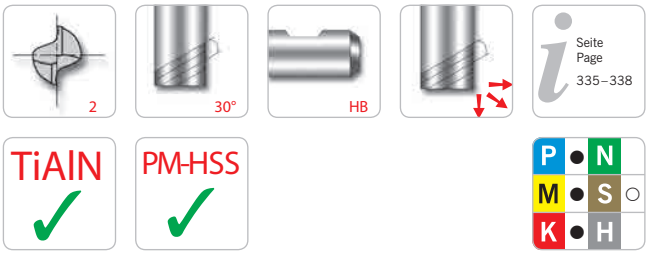
These universal powder metal cutters with their TiAlN coating are extremely strong, tough and wear resistant, therefore achieving excellent tool life.

PM-HSS-Schaftfräser

2 Schneiden, kurze Ausführung

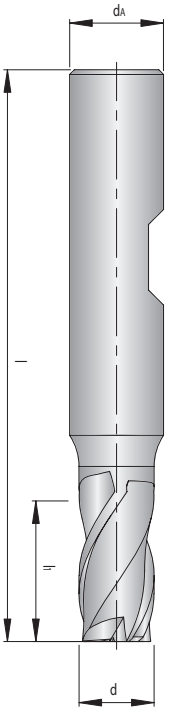
PM-HSS end-mill

2 flutes, short design



FP60120-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l
FP60120-020	2,0	6	4	48
FP60120-030	3,0	6	5	49
FP60120-040	4,0	6	7	51
FP60120-050	5,0	6	8	52
FP60120-060	6,0	6	8	52
FP60120-070	7,0	10	10	60
FP60120-080	8,0	10	11	61
FP60120-090	9,0	10	11	61
FP60120-100	10,0	10	13	63
FP60120-120	12,0	12	16	73
FP60120-140	14,0	12	16	73
FP60120-160	16,0	16	19	79
FP60120-180	18,0	16	19	79
FP60120-200	20,0	20	22	88
FP60120-220	22,0	20	22	88
FP60120-250	25,0	25	26	102



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

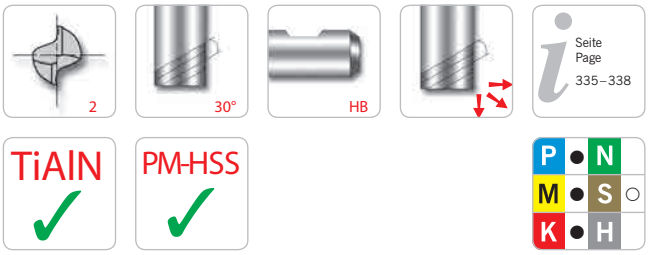
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schaftfräser

2 Schneiden, lange Ausführung

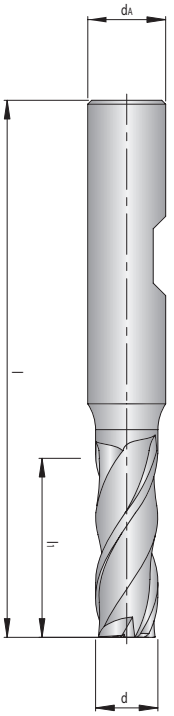
PM-HSS end-mill

2 flutes, long design



FP60121-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l
FP60121-020	2,0	6	7	51
FP60121-030	3,0	6	8	52
FP60121-040	4,0	6	11	55
FP60121-050	5,0	6	13	57
FP60121-060	6,0	6	13	57
FP60121-070	7,0	10	16	66
FP60121-080	8,0	10	19	69
FP60121-090	9,0	10	19	69
FP60121-100	10,0	10	22	72
FP60121-120	12,0	12	26	83
FP60121-140	14,0	12	26	83
FP60121-160	16,0	16	32	92
FP60121-180	18,0	16	32	92
FP60121-200	20,0	20	38	104
FP60121-220	22,0	20	38	104
FP60121-250	25,0	25	45	121



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

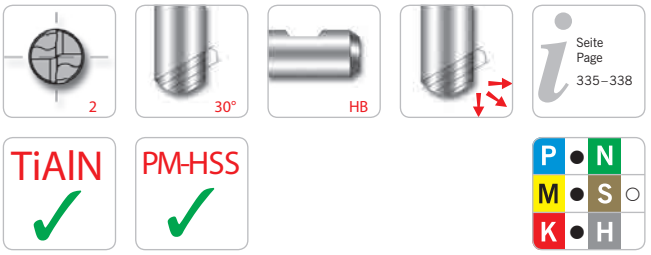
Alle Angaben in mm / Dimensions in mm

PM-HSS-Radiusfräser

2 Schneiden, kurze Ausführung

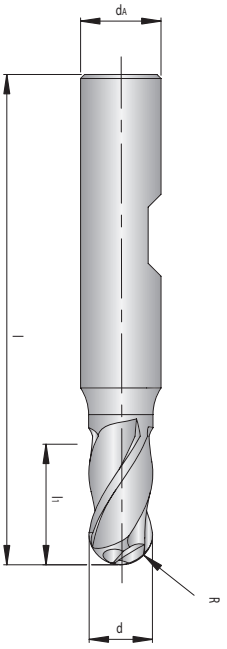
PM-HSS ball-nose end-mill

2 flutes, short design



FP60320-...

Schaft / Shank DIN 6535HB	d	d_A	l_1	l	R
FP60320-020	2,0	6	4	48	1,00
FP60320-030	3,0	6	5	49	1,50
FP60320-040	4,0	6	7	51	2,00
FP60320-050	5,0	6	8	52	2,50
FP60320-060	6,0	6	8	52	3,00
FP60320-070	7,0	10	10	60	3,50
FP60320-080	8,0	10	11	61	4,00
FP60320-090	9,0	10	11	61	4,50
FP60320-100	10,0	10	13	63	5,00
FP60320-120	12,0	12	16	73	6,00
FP60320-140	14,0	12	16	73	7,00
FP60320-160	16,0	16	19	79	8,00
FP60320-180	18,0	16	19	79	9,00
FP60320-200	20,0	20	22	88	10,00
FP60320-220	22,0	20	22	88	11,00
FP60320-250	25,0	25	26	102	12,50



Toleranz / Tolerance	
Fräser / Mill	0 -0,03
Radius / Radius	±0,02
Schaft / Shank	h6

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

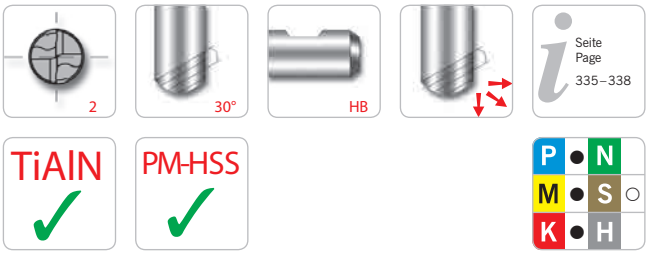
Alle Angaben in mm / Dimensions in mm

PM-HSS-Radiusfräser

2 Schneiden, lange Ausführung

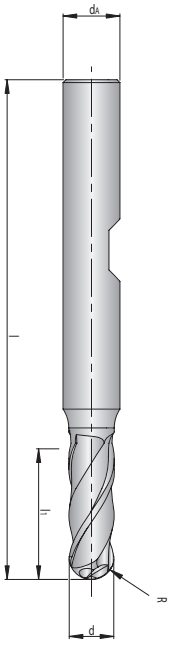
PM-HSS ball-nose end-mill

2 flutes, long design



FP60321-...

Schaft / Shank DIN 6535HB	d	d_A	l_1	l	R
FP60321-030	3,0	6	8	56	1,50
FP60321-040	4,0	6	11	63	2,00
FP60321-050	5,0	6	13	68	2,50
FP60321-060	6,0	6	13	68	3,00
FP60321-070	7,0	10	16	80	3,50
FP60321-080	8,0	10	19	88	4,00
FP60321-090	9,0	10	19	88	4,50
FP60321-100	10,0	10	22	95	5,00
FP60321-120	12,0	12	26	110	6,00
FP60321-140	14,0	12	26	110	7,00
FP60321-160	16,0	16	32	123	8,00
FP60321-180	18,0	16	32	123	9,00
FP60321-200	20,0	20	38	141	10,00
FP60321-220	22,0	20	38	141	11,00
FP60321-250	25,0	25	45	166	12,50



Toleranz / Tolerance	
Fräser / Mill	0 -0,03
Radius / Radius	±0,02
Schaft / Shank	h6

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

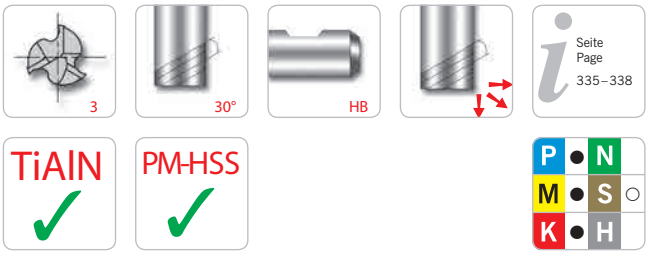
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schaftfräser

3 Schneiden, extra kurze Ausführung

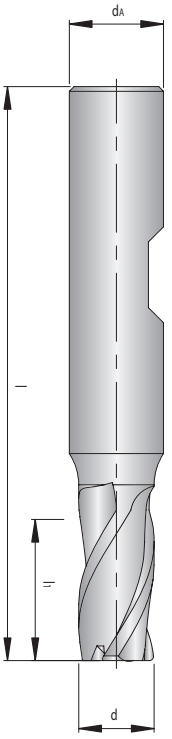
PM-HSS end-mill

3 flutes, extra short design



FP60135-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l
FP60135-020	2,0	6	4	48
FP60135-030	3,0	6	5	49
FP60135-040	4,0	6	7	51
FP60135-050	5,0	6	8	52
FP60135-060	6,0	6	8	52
FP60135-070	7,0	10	10	60
FP60135-080	8,0	10	11	61
FP60135-090	9,0	10	11	61
FP60135-100	10,0	10	13	63
FP60135-120	12,0	12	16	73
FP60135-140	14,0	12	16	73
FP60135-160	16,0	16	19	79
FP60135-180	18,0	16	19	79
FP60135-200	20,0	20	22	88
FP60135-220	22,0	20	22	88
FP60135-250	25,0	25	26	102



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

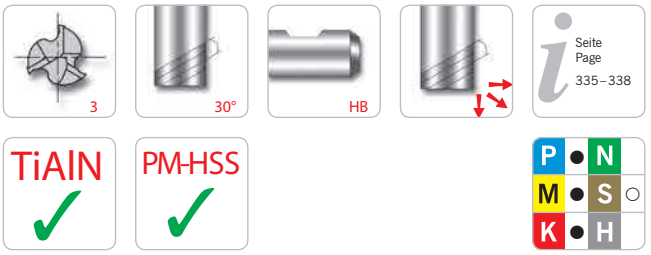
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schaftfräser

3 Schneiden, kurze Ausführung

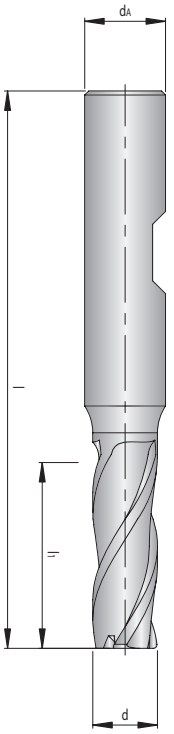
PM-HSS end-mill

3 flutes, short design



FP60130-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l
FP60130-020	2,0	6	7	51
FP60130-030	3,0	6	8	52
FP60130-040	4,0	6	11	55
FP60130-050	5,0	6	13	57
FP60130-060	6,0	6	13	57
FP60130-070	7,0	10	16	66
FP60130-080	8,0	10	19	69
FP60130-090	9,0	10	19	69
FP60130-100	10,0	10	22	72
FP60130-120	12,0	12	26	83
FP60130-140	14,0	12	26	83
FP60130-160	16,0	16	32	92
FP60130-180	18,0	16	32	92
FP60130-200	20,0	20	38	104
FP60130-220	22,0	20	38	104
FP60130-250	25,0	25	45	121



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

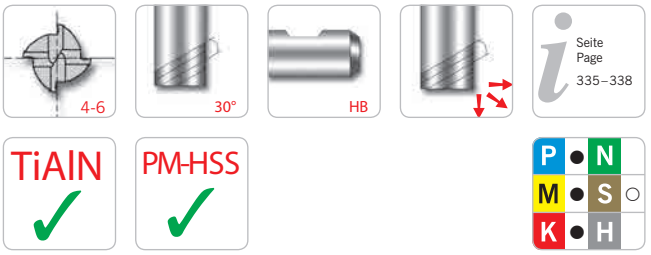
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schaftfräser

4 - 6 Schneiden, kurze Ausführung

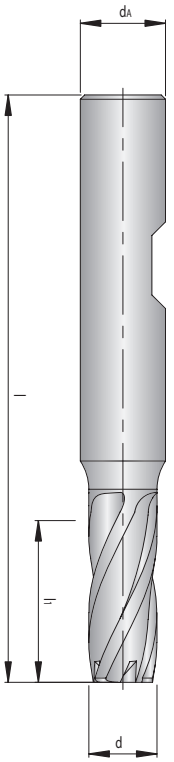
PM-HSS end-mill

4 - 6 flutes, short design



FP601.0-...

Schaft / Shank DIN 6535HB	d	d_A	l_1	l	z
FP60140-020	2,0	6	7	51	4
FP60140-030	3,0	6	8	52	4
FP60140-040	4,0	6	11	55	4
FP60140-050	5,0	6	13	57	4
FP60140-060	6,0	6	13	57	4
FP60140-070	7,0	10	16	66	4
FP60140-080	8,0	10	19	69	4
FP60140-090	9,0	10	19	69	4
FP60140-100	10,0	10	22	72	4
FP60140-120	12,0	12	26	83	4
FP60140-140	14,0	12	26	83	4
FP60140-160	16,0	16	32	92	4
FP60140-180	18,0	16	32	92	4
FP60140-200	20,0	20	38	104	4
FP60140-220	22,0	20	38	104	4
FP60140-250	25,0	25	45	121	4
FP60160-280	28,0	25	45	121	6
FP60160-300	30,0	25	45	121	6
FP60160-320	32,0	32	53	133	6



Toleranz / Tolerance	
Fräser / Mill	+ 0,03 0
Schaft / Shank	h6

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

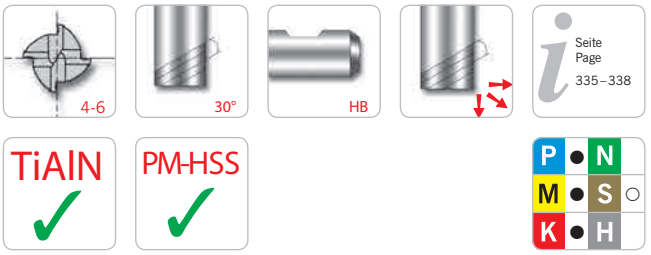
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schaftfräser

4 - 6 Schneiden, lange Ausführung

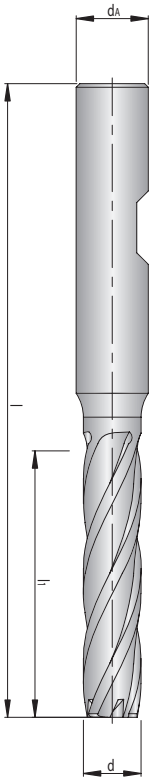
PM-HSS end-mill

4 - 6 flutes, long design



FP601.1-...

Schaft / Shank DIN 6535HB	d	d_A	l_1	l	z
FP60141-020	2,0	6	10	54	4
FP60141-030	3,0	6	12	56	4
FP60141-040	4,0	6	19	63	4
FP60141-050	5,0	6	24	68	4
FP60141-060	6,0	6	24	68	4
FP60141-070	7,0	10	30	80	4
FP60141-080	8,0	10	38	88	4
FP60141-090	9,0	10	38	88	4
FP60141-100	10,0	10	45	95	4
FP60141-120	12,0	12	53	110	4
FP60141-140	14,0	12	53	110	4
FP60141-160	16,0	16	63	123	4
FP60141-180	18,0	16	63	123	4
FP60141-200	20,0	20	75	141	4
FP60141-220	22,0	20	75	141	4
FP60141-250	25,0	25	90	166	4
FP60161-280	28,0	25	90	166	6
FP60161-300	30,0	25	90	166	6
FP60161-320	32,0	32	106	186	6



Toleranz / Tolerance	
Fräser / Mill	+ 0,03 0
Schaft / Shank	h6

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

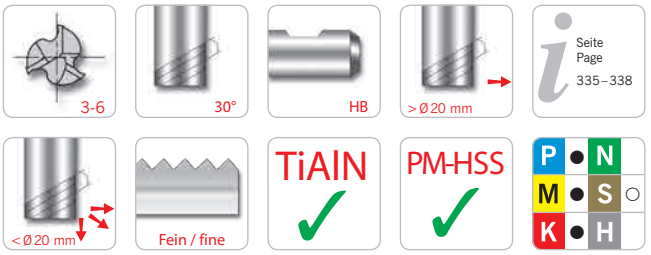
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, kurze Ausführung

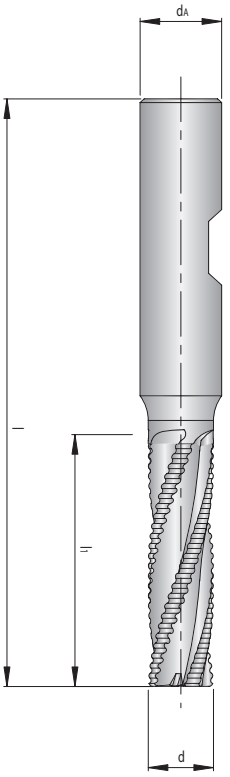
PM-HSS roughing end-mill

3 - 6 flutes, short design



FP618.0-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FP61830-060	6,0	6	13	57	3
FP61830-070	7,0	10	16	66	3
FP61830-080	8,0	10	19	69	3
FP61830-090	9,0	10	19	69	3
FP61840-100	10,0	10	22	72	4
FP61840-120	12,0	12	26	83	4
FP61840-140	14,0	12	26	83	4
FP61840-160	16,0	16	32	92	4
FP61840-180	18,0	16	32	92	4
FP61840-200	20,0	20	38	104	4
FP61850-220	22,0	20	38	104	5
FP61850-250	25,0	25	45	121	5
FP61860-280	28,0	25	45	121	6
FP61860-300	30,0	25	45	121	6
FP61860-320	32,0	32	53	133	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>6 -10**	**>10 -18**	**>18 -30**	**30 -50**
js12	±75	±90	±105	±125
h6	0 -9	0 -11	0 -13	0 -16

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

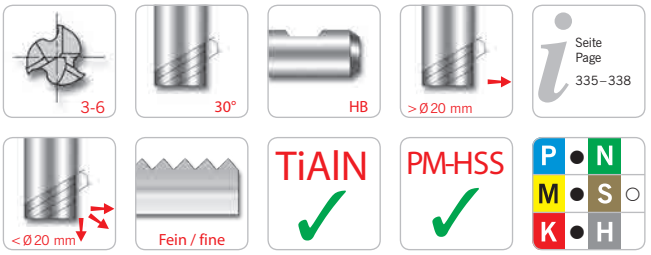
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, mittellange Ausführung

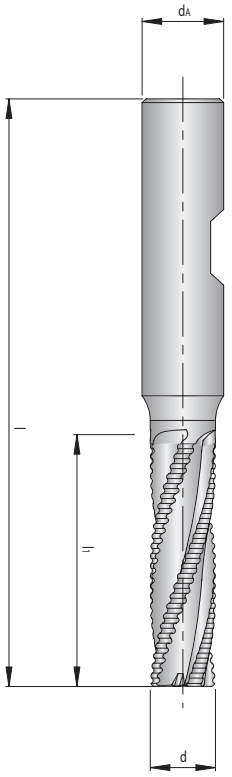
PM-HSS roughing end-mill

3 - 6 flutes, mid-length design



FP618.6-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FP61836-060	6,0	6	19	63	3
FP61836-070	7,0	6	19	63	3
FP61836-080	8,0	10	28	74	3
FP61836-090	9,0	10	28	74	3
FP61846-100	10,0	10	35	84	4
FP61846-120	12,0	12	40	97	4
FP61846-140	14,0	12	40	97	4
FP61846-160	16,0	16	48	108	4
FP61846-180	18,0	16	48	108	4
FP61846-200	20,0	20	58	122	4
FP61856-220	22,0	20	58	122	5
FP61856-250	25,0	25	68	144	5
FP61866-280	28,0	25	68	144	6
FP61866-300	30,0	25	68	144	6
FP61866-320	32,0	32	78	158	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>6 -10**	**>10 -18**	**>18 -30**	**30 -50**
js12	±75	±90	±105	±125
h6	0 -9	0 -11	0 -13	0 -16

SET-FP61836 TiAlN

SET-Inhalt SET, contains [Stück / Pcs.]	Schaft Shank	d js12	d_A h6	l_1	l	z
2x -->	FP61836-060	6,0	6	19	63	3
2x -->	FP61836-080	8,0	10	28	74	3
2x -->	FP61836-100	10,0	10	35	84	4
2x -->	FP61836-120	12,0	12	40	97	4

Bestellbezeichnung / Ordering description: SET-FP61836 TiAlN

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

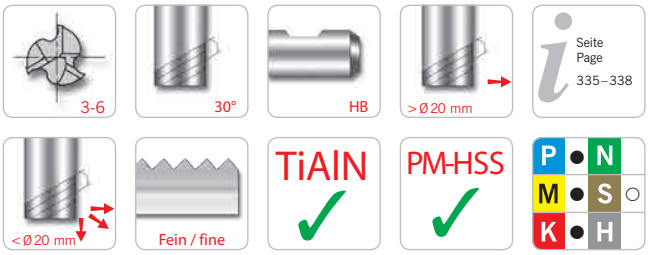
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, lange Ausführung

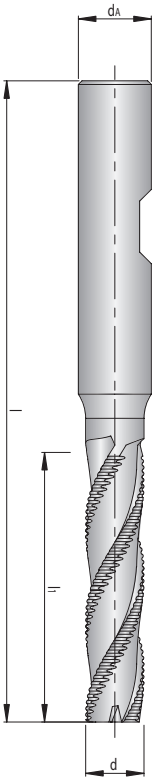
PM-HSS roughing end-mill

3 - 6 flutes, long design



FP618.1-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FP61831-060	6,0	6	24	68	3
FP61831-070	7,0	10	30	80	3
FP61831-080	8,0	10	38	88	3
FP61831-090	9,0	10	38	88	3
FP61841-100	10,0	10	45	95	4
FP61841-120	12,0	12	53	110	4
FP61841-140	14,0	12	53	110	4
FP61841-160	16,0	16	63	123	4
FP61841-180	18,0	16	63	123	4
FP61841-200	20,0	20	75	141	4
FP61851-220	22,0	20	75	141	5
FP61851-250	25,0	25	90	166	5
FP61861-280	28,0	25	90	166	6
FP61861-300	30,0	25	90	166	6
FP61861-320	32,0	32	106	186	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>6 -10**	**>10 -18**	**>18 -30**	**30 -50**
js12	±75	±90	±105	±125
h6	0 -9	0 -11	0 -13	0 -16

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

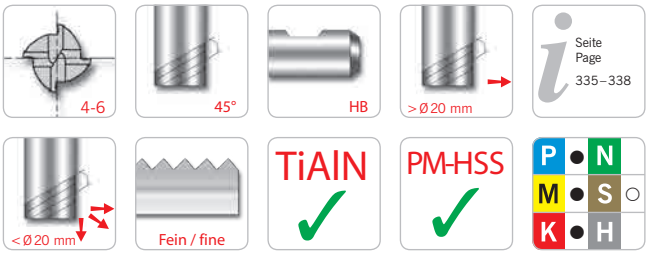
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

4 - 6 Schneiden, extra kurze Ausführung

PM-HSS roughing end-mill

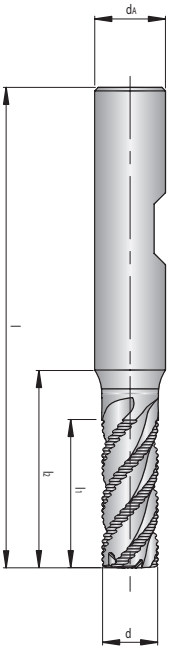
4 - 6 flutes, extra short design



FP619.5-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l_2	l	z
FP61945-060	6,0	6	8	-	52	4
FP61945-080	8,0	10	11	-	61	4
FP61945-100	10,0	10	13	23,0	63	4
FP61945-120	12,0	12	16	28,0	73	4
FP61955-140	14,0	12	16	-	73	5
FP61955-160	16,0	16	19	31,0	79	5
FP61965-180	18,0	16	19	-	79	6
FP61965-200	20,0	20	22	38,0	88	6
FP61965-250	25,0	25	26	46,0	102	6

Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)		
(µm)	**>6 -10**	**>10 -18**	**>18 -30**
js12	±75	±90	±105
h6	0 -9	0 -11	0 -13



FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

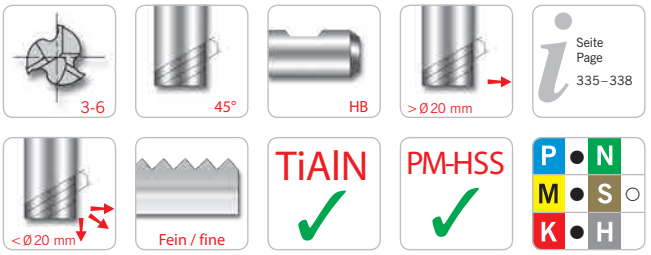
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, kurze Ausführung

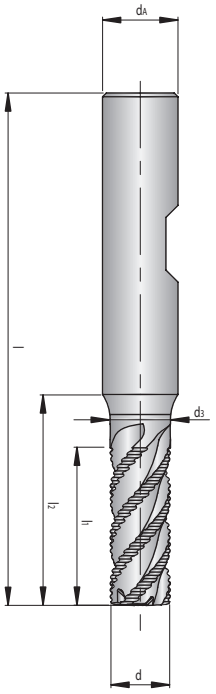
PM-HSS roughing end-mill

3 - 6 flutes, short design



FP619.0-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	d_3	l_1	l_2	l	z
FP61930-040	4,0	6	-	11	-	57	3
FP61940-050	5,0	6	-	13	-	57	4
FP61940-060	6,0	6	-	13	-	57	4
FP61940-070	7,0	10	-	16	-	66	4
FP61940-080	8,0	10	-	19	-	69	4
FP61940-090	9,0	10	-	19	-	69	4
FP61940-100	10,0	10	9,50	22	31,0	72	4
FP61940-110	11,0	12	10,50	22	27,0	80	4
FP61940-120	12,0	12	11,50	26	37,0	83	4
FP61940-130	13,0	12	-	26	-	84	4
FP61950-140	14,0	12	-	26	-	83	5
FP61950-150	15,0	12	-	26	-	85	5
FP61950-160	16,0	16	15,00	32	44,0	92	5
FP61960-180	18,0	16	-	32	-	92	6
FP61960-200	20,0	20	19,00	38	54,0	104	6
FP61960-250	25,0	25	24,00	45	63,0	121	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
js12	±60	±75	±90	±105
h6	0 -8	0 -9	0 -11	0 -13

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

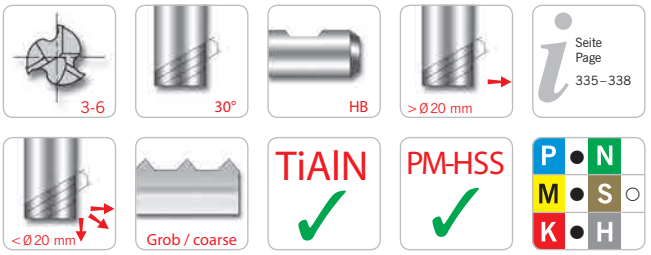
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, kurze Ausführung

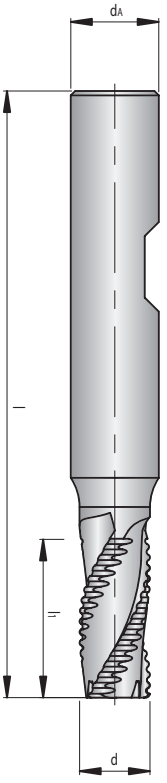
PM-HSS roughing end-mill

3 - 6 flutes, short design



FP620.0-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FP62030-060	6,0	6	13	57	3
FP62030-070	7,0	10	16	66	3
FP62030-080	8,0	10	19	69	3
FP62030-090	9,0	10	19	69	3
FP62040-100	10,0	10	22	72	4
FP62040-120	12,0	12	26	83	4
FP62040-140	14,0	12	26	83	4
FP62040-160	16,0	16	32	92	4
FP62040-180	18,0	16	32	92	4
FP62040-200	20,0	20	38	104	4
FP62050-220	22,0	20	38	104	5
FP62050-250	25,0	25	45	121	5
FP62060-300	30,0	25	45	121	6
FP62060-320	32,0	32	53	133	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>6 -10**	**>10 -18**	**>18 -30**	**30 -50**
js12	±75	±90	±105	±125
h6	0 -9	0 -11	0 -13	0 -16

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

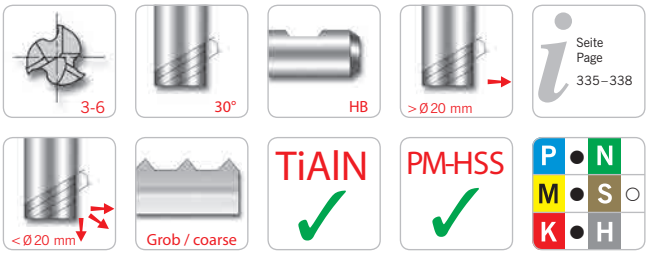
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

3 - 6 Schneiden, lange Ausführung

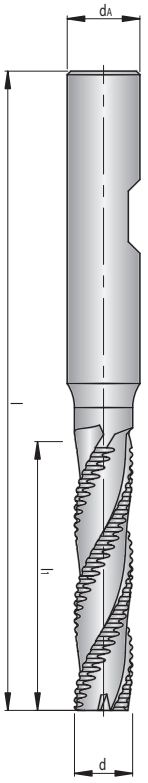
PM-HSS roughing end-mill

3 - 6 flutes, long design



FP620.1-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FP62031-060	6,0	6	24	68	3
FP62031-070	7,0	10	30	80	3
FP62031-080	8,0	10	38	88	3
FP62031-090	9,0	10	38	88	3
FP62041-100	10,0	10	45	95	4
FP62041-120	12,0	12	53	110	4
FP62041-140	14,0	12	53	110	4
FP62041-160	16,0	16	63	123	4
FP62041-180	18,0	16	63	123	4
FP62041-200	20,0	20	75	141	4
FP62051-220	22,0	20	75	141	5
FP62051-250	25,0	25	90	166	5
FP62061-280	28,0	25	90	166	6
FP62061-300	30,0	25	90	166	6
FP62061-320	32,0	32	106	186	6



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)			
(µm)	**>6 -10**	**>10 -18**	**>18 -30**	**30 -50**
js12	±75	±90	±105	±125
h6	0 -9	0 -11	0 -13	0 -16

FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

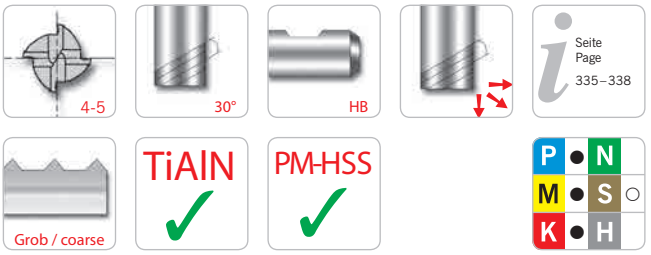
Alle Angaben in mm / Dimensions in mm

PM-HSS-Schruppfräser

4-5 Schneiden, extra lange Ausführung

PM-HSS roughing end-mill

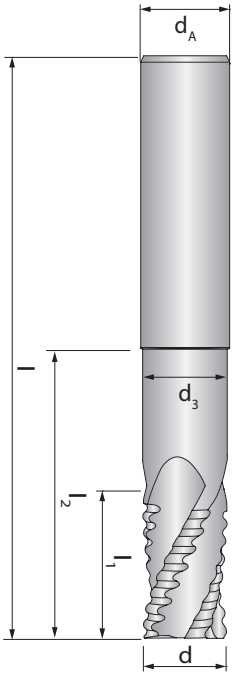
4-5 flutes, extra long design



FP623.1-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	d_3	l_1	l_2	l	z
FP62341-100 N	10,0	10	8,50	22	69,0	110	4
FP62341-120 N	12,0	12	10,50	26	78,0	125	4
FP62341-160 N	16,0	16	14,00	32	87,0	138	4
FP62341-200 N	20,0	20	18,00	38	108,0	160	4
FP62351-250 N	25,0	25	23,00	45	155,0	216	5

Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)		
(µm)	**>6 -10**	**>10 -18**	**>18 -30**
js12	±75	±90	±105
h6	0 -9	0 -11	0 -13



FP

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

ARNO®
WERKZEUGE

Weitere Informationen finden Sie unter:
For more information see:

www.arno.de

ARNO®
WERKZEUGE
We have a passion for precision.

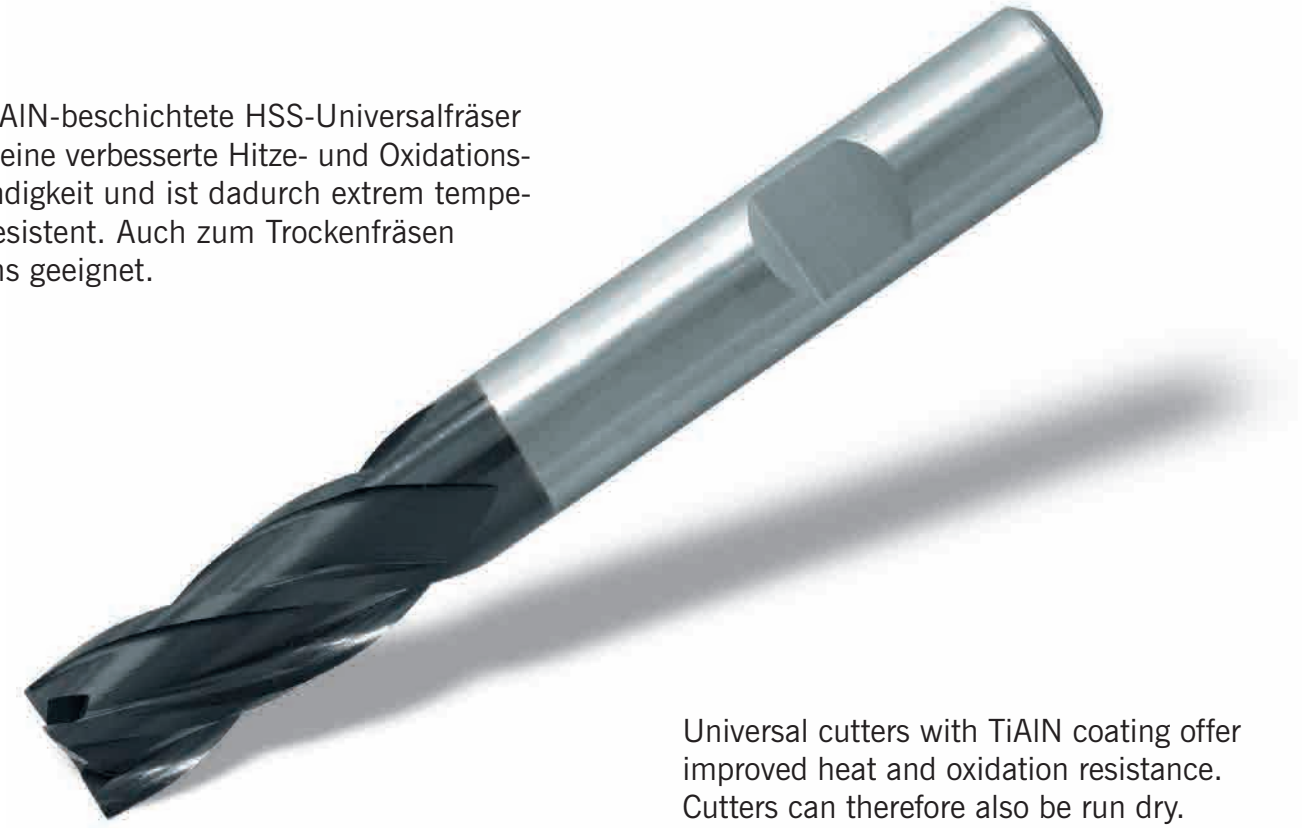
AUSFÜHRUNG FS

Design FS

Beste Leistungen beim Zerspanen von Stahl, rostfreiem Stahl und Gusswerkstoffen.

General purpose for steel, stainless steel and cast materials.

Der TiAlN-beschichtete HSS-Universalfräser bietet eine verbesserte Hitze- und Oxidationsbeständigkeit und ist dadurch extrem temperaturresistent. Auch zum Trockenfräsen bestens geeignet.



Universal cutters with TiAlN coating offer improved heat and oxidation resistance. Cutters can therefore also be run dry.

HSS-Schaftfräser

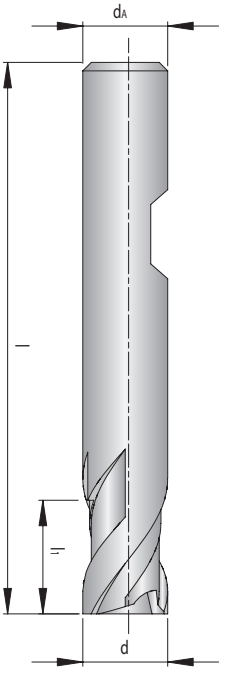
2 Schneiden, kurze Ausführung

HSS end-mill

2 flutes, short design

FS60120-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l
FS60120-010	1,0	6	2,5	47
FS60120-015	1,5	6	3	47
FS60120-020	2,0	6	4	48
FS60120-030	3,0	6	5	49
FS60120-040	4,0	6	7	51
FS60120-050	5,0	6	8	52
FS60120-060	6,0	6	8	52
FS60120-080	8,0	10	11	61
FS60120-100	10,0	10	13	63
FS60120-120	12,0	12	16	73
FS60120-140	14,0	12	16	73
FS60120-160	16,0	16	19	79
FS60120-180	18,0	16	19	79
FS60120-200	20,0	20	22	88



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FS

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

HSS-Radiusfräser

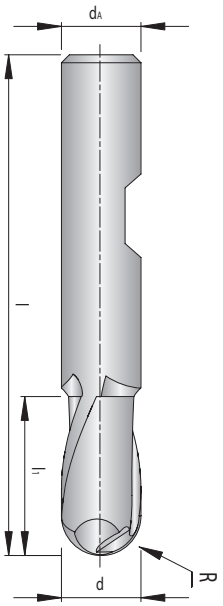
2 Schneiden, kurze Ausführung

HSS ball-nose end-mill

2 flutes, short design

FS60320-...

Schaft / Shank DIN 6535HB	d e8	d_A h6	l_1	l	R +/- 0,02
FS60320-020	2,0	6	4	48	1,00
FS60320-030	3,0	6	5	49	1,50
FS60320-040	4,0	6	7	51	2,00
FS60320-050	5,0	6	8	52	2,50
FS60320-060	6,0	6	8	52	3,00
FS60320-080	8,0	10	11	61	4,00
FS60320-100	10,0	10	13	63	5,00
FS60320-120	12,0	12	16	73	6,00
FS60320-160	16,0	16	19	79	8,00
FS60320-200	20,0	20	22	88	10,00



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)				
(µm)	**≥1 -3**	**>3 -6**	**>6 -10**	**>10 -18**	**>18 -30**
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

FS

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

HSS-Schaftfräser

4 Schneiden, kurze Ausführung

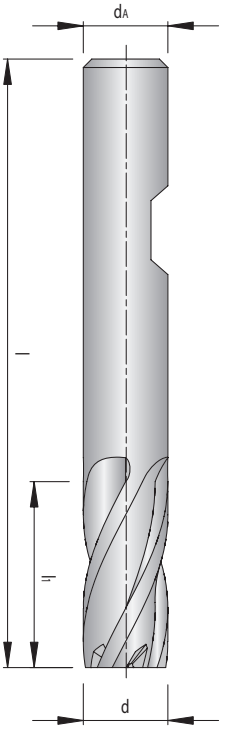
HSS end-mill

4 flutes, short design

FS60140-...

Schaft / Shank DIN 6535HB	d	d_A	l_1	l
FS60140-020	2,0	6	7	51
FS60140-030	3,0	6	8	52
FS60140-040	4,0	6	11	55
FS60140-050	5,0	6	13	57
FS60140-060	6,0	6	13	57
FS60140-080	8,0	10	19	69
FS60140-100	10,0	10	22	72
FS60140-120	12,0	12	26	83
FS60140-140	14,0	12	26	83
FS60140-160	16,0	16	32	92
FS60140-180	18,0	16	32	92
FS60140-200	20,0	20	38	104

Toleranz / Tolerance	
Fräser / Mill	+ 0,04 0
Schaft / Shank	h6



FS

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

HSS-Schruppfräser

3-4 Schneiden, kurze Ausführung

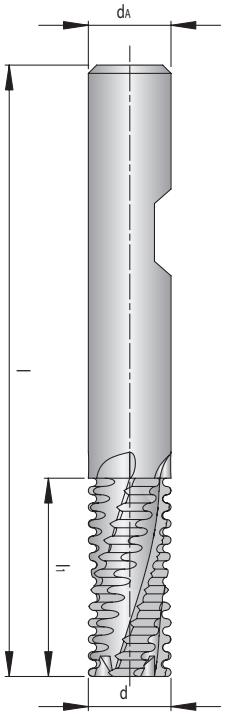
HSS-roughing end-mill

3-4 flutes, short design

FS618.0-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FS61830-060	6,0	6	13	57	3
FS61830-080	8,0	10	19	69	3
FS61840-100	10,0	10	22	72	4
FS61840-120	12,0	12	26	83	4
FS61840-140	14,0	12	26	83	4
FS61840-160	16,0	16	32	92	4
FS61840-180	18,0	16	32	92	4
FS61840-200	20,0	20	38	104	4

Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)		
(µm)	**>6 -10**	**>10 -18**	**>18 -30**
js12	±75	±90	±105
h6	0 -9	0 -11	0 -13



FS

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

HSS-Schruppfräser

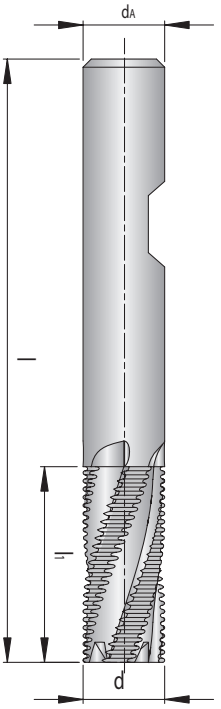
3-4 Schneiden, kurze Ausführung

HSS-roughing end-mill

3-4 flutes, short design

FS620.0-...

Schaft / Shank DIN 6535HB	d js12	d_A h6	l_1	l	z
FS62030-060	6,0	6	13	57	3
FS62030-080	8,0	10	19	69	3
FS62040-100	10,0	10	22	72	4
FS62040-120	12,0	12	26	83	4
FS62040-140	14,0	12	26	83	4
FS62040-160	16,0	16	32	92	4
FS62040-180	18,0	16	32	92	4
FS62040-200	20,0	20	38	104	4



Toleranz / Tolerance	**Nennwertbereich** / Diameter range (mm)		
(µm)	**>6 -10**	**>10 -18**	**>18 -30**
js12	±75	±90	±105
h6	0 -9	0 -11	0 -13

FS

● = Hauptanwendung / Main application
○ = Nebenanwendung / Suitable

Alle Angaben in mm / Dimensions in mm

Empfohlene Schnittwerte PM- und HSS-Schaftfräser

Ausführung FP, FS

ISO	Werkstoff	Festigkeit [N/mm²]	Vorschub-Korrekturfaktor [x f_z]	beschichtet V_c [m/min]
P	Allgemeiner Baustahl	< 800	1,2	60-85
	Automatenstahl	< 800	1,2	50-70
	Einsatzstahl, unlegiert	< 800	1,2	45-60
	Einsatzstahl, legiert	< 1000	1	40-60
	Vergütungsstahl, unlegiert	< 850	1,2	45-60
	Vergütungsstahl, unlegiert	< 1000	1	30-40
	Vergütungsstahl, legiert	< 800	1,2	40-60
	Vergütungsstahl, legiert	< 1300	0,8	30-40
	Stahlguss	< 850	1,2	45-60
	Nitrierstahl	< 1000	1	30-40
	Nitrierstahl	< 1200	0,8	30-40
	Wälzlagerstahl	< 1200	0,8	30-40
	Federstahl	< 1200		
	Schnellarbeitsstahl	< 1300		
	Werkzeugstahl für Kaltarbeit	< 1300	0,8	25-35
	Werkzeugstahl für Warmarbeit	< 1300	0,8	20-30
M	Stahl und Stahlguss, rostfrei geschwefelt	< 850	1	20-30
	Nichtrostender Stahl, ferritisch	< 750	1	20-30
	Nichtrostender Stahl, martensitisch	< 900	1	15-25
	Nichtrostender Stahl, ferritisch/martensitisch	< 1100	0,9	15-20
	Nichtrostender Stahl, austentisch/ferritisch	< 850	1	10-15
	Nichtrostender Stahl, austenitisch	< 750	1	20-30
	Hitzebeständig	< 1100		
K	Grauguss mit Lammellengraphit	100-350	1	35-50
	Grauguss mit Lammellengraphit	300-1000	1	25-35
	Kugelgraphitguss	300-500	1	30-40
	Kugelgraphitguss	550-800	1	30-40
	Temperguss, weiß	350-450	1	35-45
	Temperguss, weiß	500-650	1	35-45
	Temperguss, schwarz	350-450	1	30-40
	Temperguss, schwarz	500-700	0,8	25-35
N	Aluminium (unlegiert, niedrig legiert)	< 350	1,9	250-280
	Aluminiumlegierungen < 0,5% Si	< 500	1,9	140-170
	Aluminiumlegierungen 0,5-10% Si	< 400	1,8	120-150
	Aluminiumlegierungen 10-15% Si	< 400	1,7	70-140
	Aluminiumlegierungen > 15% Si	< 400		
	Kupfer (unlegiert, niedrig legiert)	< 350	1,2	70-90
	Kupfer-Knetlegierungen	< 700	1,1	120-160
	Kupfer-Sonderlegierungen	< 200 HB	0,9	15-20
	Kupfer-Sonderlegierungen	< 300 HB		
	Kupfer-Sonderlegierungen	> 300 HB		
	Messing kurzspanend, Bronze, Rotguss	< 600	1,1	120-160
	Messing langspanend	< 600	1,1	130-170
	Thermoplaste		2	30-50
	Duroplaste		2	60-80
	Faserverstärkte Kunststoffe			
	Magnesium und Magnesiumlegierungen	< 850	1,8	150-180
	Graphit		1	35-45
	Wolfram und Wolframlegierungen		1,1	10-20
	Molybdän und Molybdänlegierungen			
S	Reinnickel		1,1	10-15
	Nickellegierungen			
	Nickellegierungen	< 850	1,1	16-25
	Nickel-Chromlegierungen			
	Nickel- und Kobaltlegierungen	< 1300	0,7	15-20
	Hochwarmfeste Legierungen	< 1300		
	Nickel-Kobalt-(Chrom-)legierungen	< 1400	0,9	10-16
	Nickel- und Kobaltlegierungen	< 1300	1	9-14
	Reintitan	< 900	1	20-30
	Titanlegierungen	< 700	1,1	20-25
	Titanlegierungen	< 1200		
H	Stahl gehärtet	< 45 HRC		
		46-55 HRC		
		56-60 HRC		
		61-65 HRC		
		65-70 HRC		

Achtung: Für das Vollnutfräsen ist der Vorschub um 15–20% zu reduzieren.

Die Tabellenwerte sind Richtwerte. Es kann notwendig sein, die Werte den jeweiligen Bearbeitungsumständen anzupassen.

Recommended cutting PM- and HSS end-mill

Design FP, FS

ISO	Material	Strength [N/mm²]	Correction factor [x f_z]	coated V_c [m/min]
P	General construction steel	< 800	1,2	60-85
	Free cutting steel	< 800	1,2	50-70
	Case hardened steel, non alloyed	< 800	1,2	45-60
	Alloyed case hardened steel	< 1000	1	40-60
	Tempering steel, non alloyed	< 850	1,2	45-60
	Tempering steel, non alloyed	< 1000	1	30-40
	Tempering steel, alloyed	< 800	1,2	40-60
	Tempering steel, alloyed	< 1300	0,8	30-40
	Steel castings	< 850	1,2	45-60
	Nitriding steel	< 1000	1	30-40
	Nitriding steel	< 1200	0,8	30-40
	Roller bearing steel	< 1200	0,8	30-40
	Spring steel	< 1200		
	High-speed steel	< 1300		
	Cold working tool steel	< 1300	0,8	25-35
	Hot working tool steel	< 1300	0,8	20-30
M	Steel and sulphured cast stainless steel	< 850	1	20-30
	Stainless steel, ferritic	< 750	1	20-30
	Stainless steel, martensitic	< 900	1	15-25
	Stainless steel, ferritic/martensitic	< 1100	0,9	15-20
	Stainless steel, austenitic/ferritic	< 850	1	10-15
	Stainless steel, austenitic	< 750	1	20-30
	Heat resistant steel	< 1100		
K	Grey cast iron with lamellar graphite	100-350	1	35-50
	Grey cast iron with lamellar graphite	300-1000	1	25-35
	Speroidal cast iron	300-500	1	30-40
	Speroidal cast iron	550-800	1	30-40
	White cast iron, tempered	350-450	1	35-45
	White cast iron, tempered	500-650	1	35-45
	Black cast iron, tempered	350-450	1	30-40
	Black cast iron, tempered	500-700	0,8	25-35
N	Aluminium (non alloyed, low alloyed)	< 350	1,9	250-280
	Aluminium alloys < 0,5% Si	< 500	1,9	140-170
	Aluminium alloys 0,5%-10% Si	< 400	1,8	120-150
	Aluminium alloys 10%-15% Si	< 400	1,7	70-140
	Aluminium alloys > 15% Si	< 400		
	Copper (non alloyed, low alloyed)	< 350	1,2	70-90
	Copper wrought alloys	< 700	1,1	120-160
	Special copper alloys	< 200 HB	0,9	15-20
	Special copper alloys	< 300 HB		
	Special copper alloys	> 300 HB		
	Short-chipping brass, bronze, red bronze	< 600	1,1	120-160
	Long-chipping brass	< 600	1,1	130-170
	Thermoplastics		2	30-50
	Duroplastics		2	60-80
	Fibre-reinforced plastics			
	Magnesium and magnesium alloys	< 850	1,8	150-180
	Graphite		1	35-45
	Tungsten and tungsten alloys		1,1	10-20
	Molybdenum and molybdenum alloys			
S	Pure nickel		1,1	10-15
	Nickel alloys			
	Nickel alloys	< 850	1,1	16-25
	Nickel-chromium alloys			
	Nickel and cobalt alloys	< 1300	0,7	15-20
	Nickel and cobalt alloys	< 1300		
	Heat resistant alloys	< 1400	0,9	10-16
	Nickel-cobalt-chromium alloys	< 1300	1	9-14
	Pure titanium	< 900	1	20-30
	Titanium alloys	< 700	1,1	20-25
	Titanium alloys	< 1200		
H	Tempered steel	< 45 HRC		
		46-55 HRC		
		56-60 HRC		
		61-65 HRC		
		65-70 HRC		

Attention: For full slot machining reduce V_c around 15–20%.

The recommended cutting data are only approximate values.It may be necessary to adjust them to each individual machining application.

Empfohlene Schnittwerte Vorschubtabellen

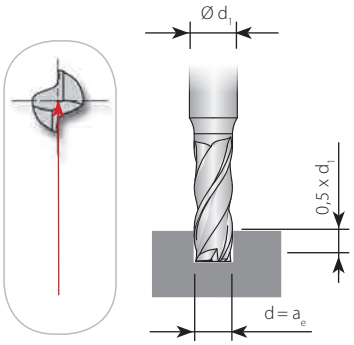
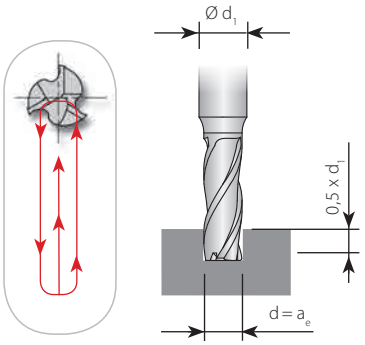
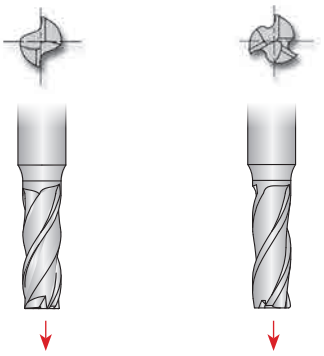
Ausführung FP, FS

Recommended cutting data feed tables

Design FP, FS

Vorschub pro Zahn f_z [mm]

Feed per tooth f_z [mm]

	Vollmaßfräsen (in einem Schnitt) Full slot miliing (in one cut)	**Untermaßfräsen (im Rahmen)** Profile slot milling (internal profile milling)		**Bohrfräsen** Circular ramping	
					
	beschichtet / coated	**beschichtet** / coated		**beschichtet** / coated	**beschichtet** / coated
d_1		**Schruppen / Roughing**	**Schlichten / Fine cutting**		
[mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
1,0	0,003	0,003	0,005	0,002	0,001
1,5	0,005	0,005	0,007	0,002	0,001
2,0	0,006	0,006	0,009	0,003	0,002
3,0	0,010	0,010	0,016	0,005	0,003
4,0	0,013	0,013	0,024	0,007	0,004
5,0	0,017	0,017	0,033	0,009	0,006
6,0	0,022	0,022	0,043	0,011	0,007
7,0	0,026	0,025	0,051	0,012	0,008
8,0	0,029	0,029	0,061	0,014	0,010
9,0	0,032	0,032	0,071	0,016	0,011
10,0	0,037	0,037	0,082	0,019	0,012
12,0	0,044	0,044	0,101	0,022	0,015
14,0	0,054	0,054	0,118	0,027	0,018
16,0	0,062	0,062	0,135	0,031	0,021
18,0	0,072	0,072	0,151	0,036	0,024
20,0	0,078	0,078	0,167	0,039	0,026
22,0	0,088	0,088	0,184	0,044	0,029
25,0	0,098	0,098	0,208	0,049	0,033
28,0	0,108	0,108	0,217	0,052	0,039
30,0	0,120	0,120	0,230	0,060	0,041
32,0	0,135	0,135	0,251	0,071	0,048
40,0	0,150	0,150	0,260	0,070	0,050

Achtung:
Optimale Ergebnisse werden im Gleichlauffräsen erzielt.

Attention:
For optimal results it is recommended to climb mill.

Generelle Berechnungsformeln/General rule:
Vorschub pro Zahn/Feed per tooth: = fz • Kf (fz)

Bohrvorschub (Fräsen in axialer Richtung): = **Tabellenwert**/Zähnezahl
For axial plunge milling: = **Table value**/Number of teeth

Alle Angaben in mm / Dimensions in mm

Schnittdatenrichtwerte Vorschubtabellen

Ausführung FP, FS

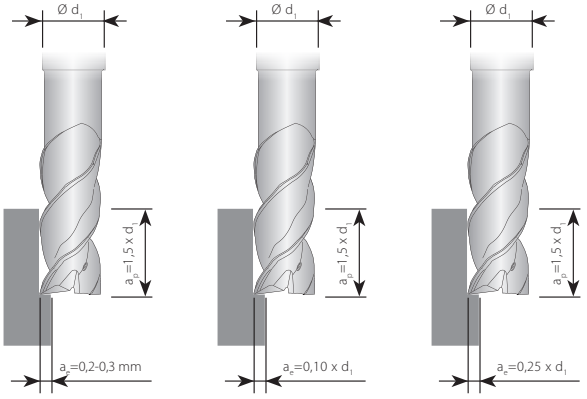
Recommended cutting data feed tables

Design FP, FS

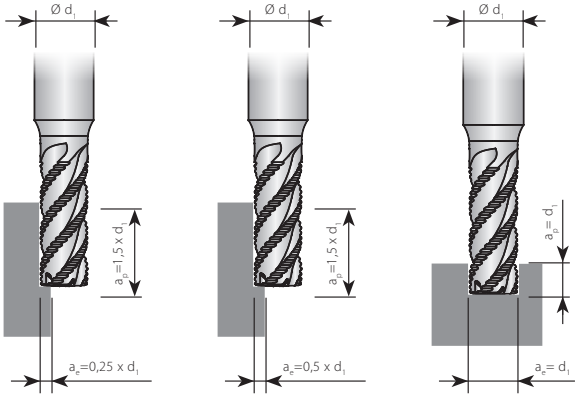
Vorschub pro Zahn f_z [mm]

Feed per tooth f_z [mm]

Schlichten
Fine cutting



Schruppen
Roughing



	beschichtet / coated			**beschichtet** / coated		
d_1	**Schlichtgeometrie** / Geometry for peripheral milling			**Schruppgeometrie** / Geometry for roughing		
[mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
1,0	0,005	0,005	0,005	0,005	0,005	0,005
1,5	0,007	0,007	0,007	0,007	0,007	0,007
2,0	0,009	0,009	0,009	0,010	0,010	0,008
3,0	0,012	0,012	0,010	0,013	0,012	0,010
4,0	0,018	0,015	0,014	0,016	0,014	0,012
5,0	0,026	0,020	0,015	0,021	0,018	0,016
6,0	0,035	0,024	0,017	0,027	0,022	0,019
7,0	0,045	0,028	0,021	0,031	0,027	0,022
8,0	0,051	0,032	0,022	0,036	0,030	0,026
9,0	0,061	0,036	0,025	0,052	0,034	0,031
10,0	0,072	0,041	0,028	0,047	0,039	0,034
12,0	0,091	0,049	0,034	0,057	0,047	0,041
14,0	0,106	0,059	0,041	0,069	0,058	0,050
16,0	0,121	0,067	0,046	0,079	0,066	0,057
18,0	0,136	0,077	0,053	0,093	0,078	0,067
20,0	0,151	0,083	0,057	0,101	0,084	0,073
22,0	0,166	0,094	0,065	0,114	0,096	0,082
25,0	0,188	0,104	0,072	0,129	0,108	0,093
28,0	0,210	0,120	0,083	0,150	0,125	0,108
30,0	0,225	0,127	0,088	0,161	0,135	0,116
32,0	0,240	0,137	0,094	0,173	0,145	0,125
40,0	0,240	0,170	0,120	0,200	0,160	0,140

Achtung:
Optimale Ergebnisse werden im Gleichlauffräsen erzielt.

Attention:
For optimal results it is recommended to climb mill.

Generelle Berechnungsformeln/General rule:
Vorschub pro Zahn/Feed per tooth: = fz • Kf (fz)

Bohrvorschub (Fräsen in axialer Richtung): = **Tabellenwert**/Zähnezahl
For axial plunge milling: = **Table value**/Number of teeth

Alle Angaben in mm / Dimensions in mm

FP
FS

ARNO®
WERKZEUGE
We have a passion for precision.

VHM- UND PM-HSS-NC-ENTGRATER

PM and HSS deburring cutters

Ausführung

AE - 4 Schneiden, 60°
- 4 Schneiden, 90°
- 4 Schneiden, 120°

Design

AE - 4 flutes, 60°
- 4 flutes, 90°
- 4 flutes, 120°

Übersicht VHM- und PM-HSS-NC-Entgrater — Overview PM and HSS deburring cutters

Bezeichnung Description	**Schneiden** Flutes	**Fräsertyp** Type	**Ausführung** Design	**Spiralwinkel** Helix angle	**Abb.** Picture	**Seite** Page
AE - VHM NC-Entgrater / Solid carbide deburring cutter						
AE63041-...	4	VHM NC-Entgrater Solid carbide deburring cutter	kurz short	60°		**396**
AE63141-...	4	VHM NC-Entgrater Solid carbide deburring cutter	kurz short	90°		**398**
AE63241-...	4	VHM NC-Entgrater Solid carbide deburring cutter	kurz short	120°		**400**
AE - PM-HSS NC-Entgrater / Powder metal deburring cutter						
AE63041-...-PM	4	PM-HSS NC-Entgrater Powder metal deburring cutter	kurz short	60°		**397**
AE63141-...-PM	4	PM-HSS NC-Entgrater Powder metal deburring cutter	kurz short	90°		**399**
AE63241-...-PM	4	PM-HSS NC-Entgrater Powder metal deburring cutter	kurz short	120°		**401**

ARNO®
WERKZEUGE
We have a passion for precision.

AUSFÜHRUNG AE

Design AE

Schneller als die Konkurrenz.

Coated for speed.

Dank der TiAlN Beschichtung überzeugt der ARNO® Vollhartmetall NC-Entgrater durch eine um 50 % höhere Schnittgeschwindigkeit als ein unbeschichteter Entgrater. Er ist optimal für das Anfasen, Entgraten und Kontur-bearbeiten nahezu aller gängigen Werkstoffe geeignet. Auch MMS oder Trockenbearbeitung ist möglich.

Thanks to the TiAlN coating this NC-drill can be up to 50 % faster than the equivalent uncoated version. Suitable for nearly all materials. The tools can be used with micro lubrication coolant or run dry.

Vollhartmetall NC-Entgrater

4 Schneiden, 60°

Solid carbide deburring cutter

4 flutes, 60°

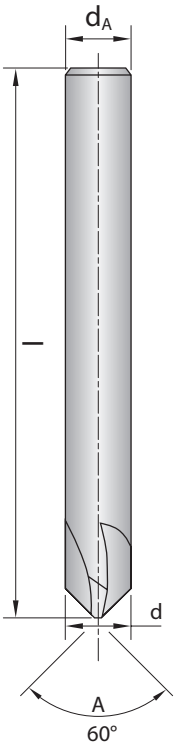
60° ✓

TiAlN ✓

Feinstkorn
Ultra micro granulation ✓

AE63041-...

Schaft / Shank	d	d_A	l	A
AE63041-040	4,00	4,00	54	60°
AE63041-060	6,00	6,00	54	60°
AE63041-080	8,00	8,00	58	60°
AE63041-100	10,00	10,00	66	60°
AE63041-120	12,00	12,00	73	60°



AE

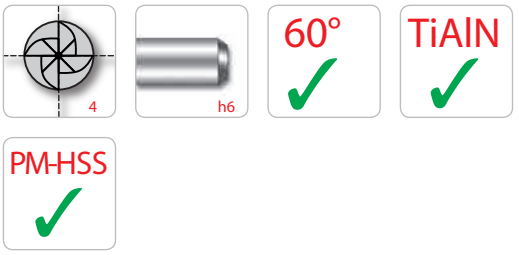
Alle Angaben in mm / Dimensions in mm

PM-HSS NC-Entgrater

4 Schneiden, 60°

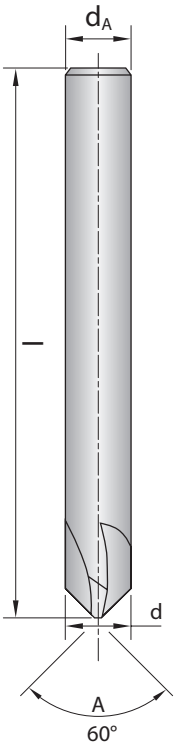
Powder metal deburring cutter

4 flutes, 60°



AE63041-...-PM

Schaft / Shank	d	d_A	l	A
AE63041-040-PM	4,00	4,00	54	60°
AE63041-060-PM	6,00	6,00	54	60°
AE63041-080-PM	8,00	8,00	58	60°
AE63041-100-PM	10,00	10,00	66	60°
AE63041-120-PM	12,00	12,00	73	60°



AE

Vollhartmetall NC-Entgrater

4 Schneiden, 90 °

Solid carbide deburring cutter

4 flutes, 90°

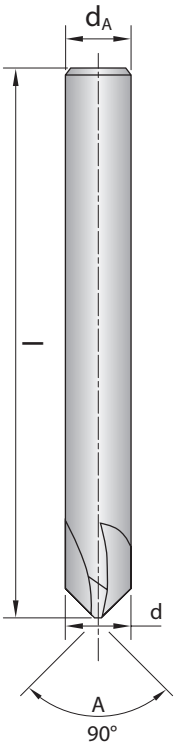
90° ✓

TiAlN ✓

Feinstkorn
Ultra micro granulation ✓

AE63141-...

Schaft / Shank	d	d_A	l	A
AE63141-040	4,00	4,00	54	90°
AE63141-060	6,00	6,00	54	90°
AE63141-080	8,00	8,00	58	90°
AE63141-100	10,00	10,00	66	90°
AE63141-120	12,00	12,00	73	90°



AE

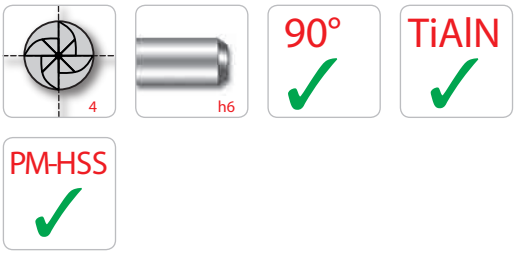
Alle Angaben in mm / Dimensions in mm

PM-HSS NC-Entgrater

4 Schneiden, 90 °

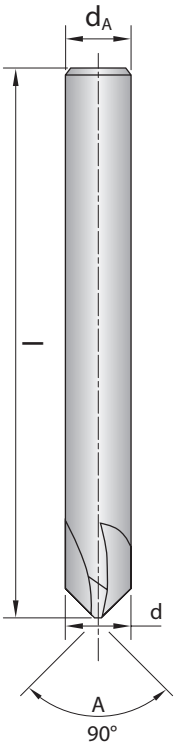
Powder metal deburring cutter

4 flutes, 90°



AE63141-...-PM

Schaft / Shank	d	d_A	l	A
AE63141-040-PM	4,00	4,00	54	90°
AE63141-060-PM	6,00	6,00	54	90°
AE63141-080-PM	8,00	8,00	58	90°
AE63141-100-PM	10,00	10,00	66	90°
AE63141-120-PM	12,00	12,00	73	90°



AE

Vollhartmetall NC-Entgrater

4 Schneiden, 120°

Solid carbide deburring cutter

4 flutes, 120°

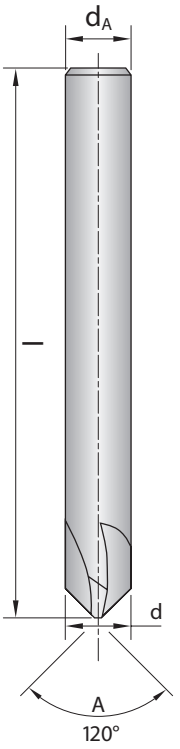
120° ✓

TiAlN ✓

Feinstkorn
Ultra micro granulation ✓

AE63241-...

Schaft / Shank	d	d_A	l	A
AE63241-040	4,00	4,00	54	120°
AE63241-060	6,00	6,00	54	120°
AE63241-080	8,00	8,00	58	120°
AE63241-100	10,00	10,00	66	120°
AE63241-120	12,00	12,00	73	120°



AE

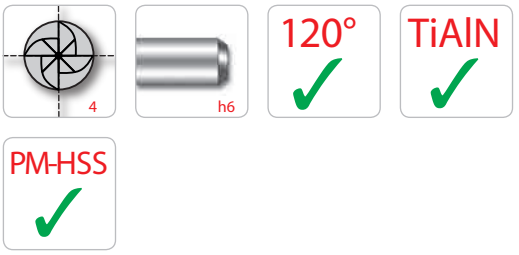
Alle Angaben in mm / Dimensions in mm

PM-HSS NC-Entgrater

4 Schneiden, 120°

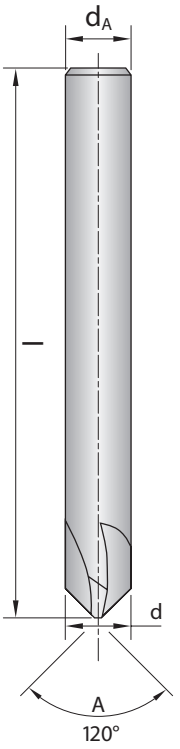
Powder metal deburring cutter

4 flutes, 120°



AE63241-...-PM

Schaft / Shank	d	d_A	l	A
AE63241-040-PM	4,00	4,00	54	120°
AE63241-060-PM	6,00	6,00	54	120°
AE63241-080-PM	8,00	8,00	58	120°
AE63241-100-PM	10,00	10,00	66	120°
AE63241-120-PM	12,00	12,00	73	120°



AE