Graphite

High-performance end mills with CVD diamond coating for HSC of graphite.

Hochleistungs-Schaftfräser mit CVD-Diamant Beschichtung für die HSC von Graphit.

			New 	New 		New 		
Tool code		GE 235	GELN 435	GBLS 235	GBLN 235	GRLS 430	GRLN 230	
Number of teeth		Z=2	Z=4	Z=2	Z=2	Z=4	Z=2	
Page		117	118	119	120	121	122	
		VHM	VHM	VHM	VHM	VHM	VHM	
		DIA Coating	DIA Coating	DIA Coating	DIA Coating	DIA Coating	DIA Coating	
		35°	35°	35°	35°	30°	30°	
		90°	90°			R	R	
		HSC	HSC	HSC	HSC	HSC	HSC	
N	Graphite	◎	◎	◎	◎	◎	◎	
N	Al-alloy	○	○	○	○	○	○	
N	CFRP	○	○	○	○	○	○	

VHM	35°	HSC
DIA Coating	90°	

Diamond coated end mills
For HSC of Graphite

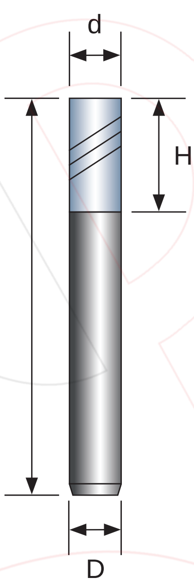
CVD-Diamant beschichtet Schaftfräser
Für die HSC von Graphit

Example: Order code GE 235 005-02004

d-Code	d x H x D	L	GE 235 Z=2
005-02004	0.5 x 2.0 x C 4	50	●
010-03004	1.0 x 3.0 x C 4	50	●
015-04004	1.5 x 4.0 x C 4	50	●
020-06004	2.0 x 6.0 x C 4	50	●
030-08004	3.0 x 8.0 x C 4	50	●
040-11004	4.0 x 11.0 x C 4	50	●

N	Graphite	◎
	Al-alloy	○
	CFRP	○

Cutting data, P123



Tolerance / Toleranz

Range	Diameter
1 ≤ d < 8	0 / -0.02
8 ≤ d < 18	0 / -0.03

Graphite

VHM | 35° | HSC

DIA Coating | 90°

Diamond coated end mills
Long neck for deep milling of Graphite

CVD-Diamant beschichtet Schaftfräser, überlaufhals
Für die HSC von Graphit

New

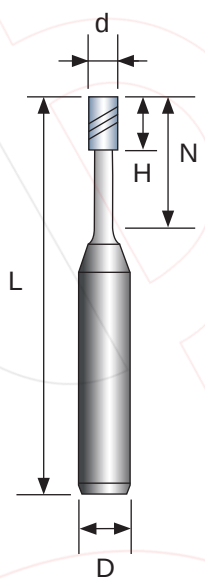
GELN 435

Z=4

Example: Order code GELN 435 020-12004

N		
	Graphite	◎
	Al-alloy	○
	CFRP	○

d-Code	d x N x D	H	L	Z=4	
020-12004	2.0 x N 12 x C 4	3.0	50	◇	
020-20004	2.0 x N 20 x C 4	3.0	60	◇	
030-16006	3.0 x N 16 x C 6	4.5	60	◇	
030-30006	3.0 x N 30 x C 6	4.5	75	◇	
040-40006	4.0 x N 40 x C 6	6.0	100	◇	



Tolerance / Toleranz

Range	Diameter
1 ≤ d < 8	0 / -0.02

Graphite

● Stock item, subject to confirmation ◇ On request

VHM	35°	HSC
DIA Coating		

Diamond coated ball nose end mills, long shank

For HSC of Graphite
On demand: available with working depth

CVD-Diamant beschichtet Kugelkopffräser, langer schaft

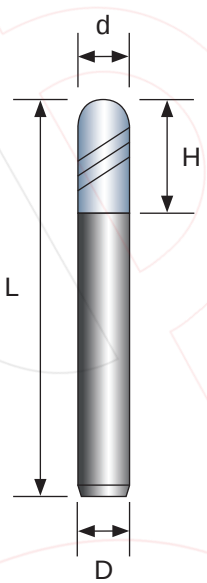
Für die HSC von Graphit
Auf Wunsch mit Arbeitstiefe lieferbar

Example: Order code GBLS 230 080-16308

d-Code	d x L x D	H	GBLS 235 Z=2	
080-16308	R4.0 x L100 x C 8	16	●	
080-16508	R4.0 x L150 x C 8	16	●	
100-20310	R5.0 x L100 x C10	20	●	
100-20510	R5.0 x L150 x C10	20	●	
120-24312	R6.0 x L100 x C12	24	◇	
120-24512	R6.0 x L150 x C12	24	◇	

N	Graphite	◎
	Al-alloy	○
	CFRP	○

Cutting data, P123



Tolerance / Toleranz

Range	Diameter
8 ≤ d < 18	0 / -0.03

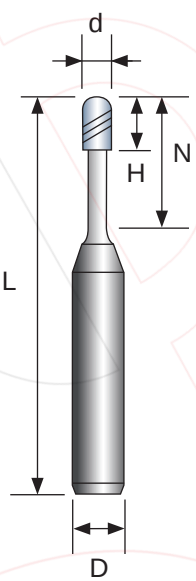
VHM | 35° | HSC

DIA Coating

Diamond coated ball nose end mills
Long neck for deep milling of Graphite

CVD-Diamant beschichtet Kugelkopffräser, überlaufhals
Für die HSC von Graphit

N	
Graphite	◎
Al-alloy	○
CFRP	○



Tolerance / Toleranz

Range	Diameter
d < 1	0 / -0.015
1 ≤ d < 8	0 / -0.02

Example: Order code GBLN 235 004-02004

d-Code	d x N x D	H	L	GBLN 235 Z=2
004-02004	R0.2 x N 2 x C 4	0.4	50	◇
004-04004	R0.2 x N 4 x C 4	0.4	50	●
006-04004	R0.3 x N 4 x C 4	0.6	50	◇
006-06004	R0.3 x N 6 x C 4	0.6	50	●
006-10004	R0.3 x N 10 x C 4	0.6	50	◇
010-10004	R0.5 x N 10 x C 4	1.0	50	●
010-16004	R0.5 x N 16 x C 4	1.0	60	●
010-20004	R0.5 x N 20 x C 4	1.0	60	●
020-10004	R1.0 x N 10 x C 4	2.0	50	●
020-20004	R1.0 x N 20 x C 4	2.0	60	●
020-30004	R1.0 x N 30 x C 4	2.0	75	●
030-20006	R1.5 x N 20 x C 6	3.0	75	●
030-30006	R1.5 x N 30 x C 6	3.0	75	●
040-20006	R2.0 x N 20 x C 6	4.0	75	●
040-40006	R2.0 x N 40 x C 6	4.0	100	●
060-30006	R3.0 x N 30 x C 6	6.0	75	●
060-60006	R3.0 x N 60 x C 6	6.0	100	●

● Stock item, subject to confirmation ◇ On request

VHM	30°	HSC
DIA Coating	R	

Diamond coated corner radius end mills, long shank

For HSC of Graphite
On demand: available with working depth

CVD-Diamant beschichtet Eckradiusfräser, langer schaft

Für die HSC von Graphit
Auf Wunsch mit Arbeitstiefe lieferbar

New

GRLS 430

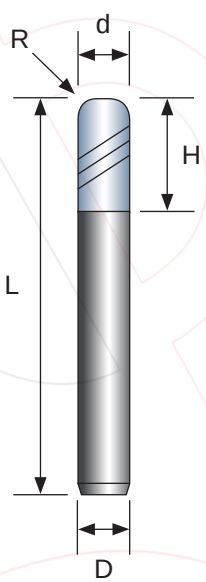
Z=4

Example: Order code GRLS 430 060-05306

	Graphite	◎
N	Al-alloy	○
	CFRP	○

d-Code	d x R x L x D	H	GRLS 430 Z=4
060-05306	6.0 x R0.5 x L100 x C 6	12	●
060-10306	6.0 x R1.0 x L100 x C 6	12	●
080-05308	8.0 x R0.5 x L100 x C 8	16	●
080-10308	8.0 x R1.0 x L100 x C 8	16	●
100-05510	10.0 x R0.5 x L150 x C10	20	◇
100-10510	10.0 x R1.0 x L150 x C10	20	●
120-05512	12.0 x R0.5 x L150 x C12	24	◇
120-10512	12.0 x R1.0 x L150 x C12	24	◇

Cutting data, P124



Tolerance / Toleranz

Range	Diameter
1 ≤ d < 8	0 / -0.02
8 ≤ d < 18	0 / -0.03

VHM | 30° | HSC

DIA Coating | R

Diamond coated corner radius end mills, long neck
For deep milling of Graphite

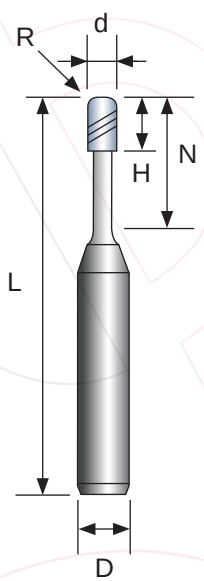
CVD-Diamant beschichtet Eckradiusfräser, überlaufhals
Für die HSC von Graphit

GRLN 230

Example: Order code GRLN 230 010-02006

N		
	Graphite	◎
	Al-alloy	○
	CFRP	○

d-Code	d x R x N x D	H	L	Z=2	
010-02064	1.0 x R0.2 x N 6 x C 4	1.2	50	◇	
010-02104	1.0 x R0.2 x N 10 x C 4	1.2	50	●	
015-02104	1.5 x R0.2 x N 10 x C 4	1.8	50	●	
015-02204	1.5 x R0.2 x N 20 x C 4	1.8	60	◇	
020-02124	2.0 x R0.2 x N 12 x C 4	2.4	50	●	
020-02204	2.0 x R0.2 x N 20 x C 4	2.4	60	●	
020-05124	2.0 x R0.5 x N 12 x C 4	2.4	50	◇	
020-05204	2.0 x R0.5 x N 20 x C 4	2.4	60	◇	
030-02246	3.0 x R0.2 x N 24 x C 6	3.6	75	●	
030-05246	3.0 x R0.5 x N 24 x C 6	3.6	75	●	
040-05246	4.0 x R0.5 x N 24 x C 6	4.8	75	●	

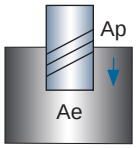


Tolerance / Toleranz

Range	Diameter
1 ≤ d < 8	0 / -0.02

● Stock item, subject to confirmation ◇ On request

Graphite — Slotting / Roughing

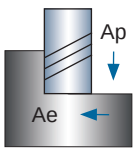


Ap = 0.1 x d [mm]
Ae = 1 x d [mm]

GE 235 (#1)

		Vc [m / min]	fz feed [mm / tooth] by diameter					
			0.5	1	1.5	2	3	4
N	Graphite	120 - 200	0.006	0.011	0.014	0.018	0.027	0.036

Graphite — Side milling / Roughing

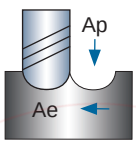


Ap = 2.0 x d [mm]
Ae = 0.05 x d [mm]

GE 235 (#1)

		Vc [m / min]	fz feed [mm / tooth] by diameter						
			0.5	1	1.5	2	3	4	6
N	Graphite	120 - 200	0.007	0.014	0.018	0.023	0.034	0.045	0.068

Graphite — Contour line / Roughing (HSC)

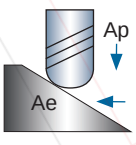


Ap = 0.1 x d [mm]
Ae = 0.3 x d [mm]

GBLS 235 (#1)

		Vc [m / min]	fz feed [mm / tooth] by diameter		
			8.0	10.0	12.0
N	Graphite	250 - 350	0.096	0.120	0.144

Graphite — Copy milling / Finishing (HSC)



Ap = 0.05 x d [mm]
Ae = 0.03 x d [mm]

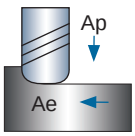
GBLS 235 (#1)

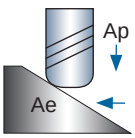
		Vc [m / min]	fz feed [mm / tooth] by diameter		
			8.0	10.0	12.0
N	Graphite	250 - 350	0.106	0.132	0.158

Notes

#1 For GE 235, the maxinum spindle speed (n) should be below 30000 rpm.
#2 For GBLS 235, adjust feed [mm / tooth](fz) and cutting speed (Vc) 10% - 30% lower according to the ratio of overhang length / cutting diameter.

- ▶ Graphite should be machined by the machining center designed for graphite machining.
- ▶ When handling with graphite material, dust collector and respirator are recommended to protect against graphite dust.
- ▶ Air blow cooling is recommended for the machining of graphite.
- ▶ Adjust both spindle speed and feed at the same rate when chattering.

Graphite	Contour line / Roughing (HSC)			
	Ap = 0.1 x d [mm] Ae = 0.6 x d [mm]	GRLS 430 (#1)		
	Vc [m / min]	fz feed [mm / tooth] by diameter		
		8.0	10.0	12.0
N Graphite	180 - 250	0.096	0.120	0.144

Graphite	Contour line / Finishing (HSC)			
	Ap = 0.15 x d [mm] Ae = 0.15 x d [mm]	GRLS 430 (#1)		
	Vc [m / min]	fz feed [mm / tooth] by diameter		
		8.0	10.0	12.0
N Graphite	250 - 350	0.096	0.120	0.144

Notes	
	#1 For GRLS 430, adjust feed [mm / tooth](fz) and cutting speed (Vc) 10% - 30% lower according to the ratio of overhang length / cutting diameter. ► Graphite should be machined by the machining center designed for graphite machining. ► When handling with graphite material, dust collector and respirator are recommended to protect against graphite dust. ► Air blow cooling is recommended for the machining of graphite. ► Adjust both spindle speed and feed at the same rate when chattering.