

# Info

## Overview of graphite milling cutters (I)

Brand	<b>HHW</b>	<b>ATORN®</b>	<b>ATORN®</b>	<b>ATORN®</b>
Article number	16702	16703	16704	16705
				
Number of cutting edges	2 - 3	4	2	2
Diameter range mm	2 - 12	4 - 16	0.2 - 12	0.2 - 12
Cutting material	VHM	VHM	VHM	VHM
Coating	Diamond	Diamond	Diamond	Diamond
Version	Long/overlong	Short/long	Short/long	Short/long
Type / Profile	GFK	GFK	GFK	GFK
Catalogue page	16.107	16.107	16.108	16.109

### Recommended application

Aluminium < 8% Si				
Aluminium > 8% Si				
Copper				
Plastic	●	●	●	●
Graphite	●	●	●	●
Steel < 520 N				
Steel < 750 N				
Steel < 900 N				
Steel < 1100 N				
Steel < 1200 N				
Steel < 1400 N				
Hardox				
< 50 HRC				
< 60 HRC				
< 67 HRC				
GG				
GGG				
VA < 900 N				
VA > 900 N				
Titanium				
Titanium alloy				
Nickel base				

16702

Solid carbide end mill for graphite



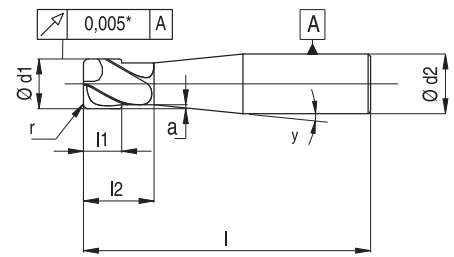
Design

Long and extra long, right cutting,  
2-3 cutting edges, right-hand twist approx. 40°,  
centre cutting, with smooth straight shank in  
accordance with DIN 6535 HA.

16702



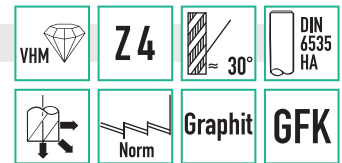
d <sub>1</sub> g7 mm	r mm	d <sub>2</sub> h5 mm	l mm	l <sub>1</sub> mm	Z	y (°)	16702	...
2.0	0.1	2	50	10	3	-		102
2.0	0.1	3	50	10	3	15		103
3.0	0.1	3	50	10	3	-		104
4.0	0.2	4	60	15	3	-		106
L 4.0	0.3	4	102	10	2	-		107
5.0	0.2	5	60	20	3	-		109
L 5.0	0.5	5	102	13	2	-		110
6.0	0.3	6	78	30	3	-		112
L 6.0	0.5	6	102	42	2	-		113
XL 6.0	0.5	6	150	26	2	-		114
8.0	0.3	8	78	30	3	-		116
L 8.0	0.5	8	150	41	2	-		117
10.0	0.3	10	78	30	3	-		119
L 10.0	0.5	10	150	42	2	-		120
12.0	0.3	12	89	30	3	-		122



Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA<900N	VA>900N	Ti alloy	GG(G)	Graphite
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200

16703

Solid carbide diamond copy milling cutter DC Ultra



Design

- Solid carbide cutter with crystalline diamond coating
- Special cemented carbide with excellent coating adhesion for the longest possible service life
- Shaft tolerance: h5
- Coating thickness: 6 + 2 µm

- Concentricity: 5 µm
- Radius accuracy: +/- 3 µm

Applications

For milling graphite, copper and GFRP materials.

16703



								Short									
d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16703	...									
4.0	0.40	8	16	50	3.7	4		101									
4.0	0.50	8	16	50	3.7	4		102									
4.0	1.00	8	16	50	3.7	4		103									
5.0	0.50	10	18	54	4.6	5		104									
5.0	1.00	10	18	54	4.6	5		105									
6.0	0.50	13	21	57	5.5	6		106									
6.0	1.00	13	21	57	5.5	6		107									
6.0	1.50	13	21	57	5.5	6		108									
8.0	0.50	15	27	63	7.4	8		109									
8.0	1.00	15	27	63	7.4	8		110									
8.0	1.50	15	27	63	7.4	8		111									
8.0	2.00	15	27	63	7.4	8		112									
10.0	0.50	18	32	72	9.2	10		113									
10.0	1.00	18	32	72	9.2	10		114									
10.0	1.50	18	32	72	9.2	10		115									
10.0	2.00	18	32	72	9.2	10		116									
12.0	0.50	26	38	83	11.0	12		117									
12.0	1.00	26	38	83	11.0	12		118									
12.0	1.50	26	38	83	11.0	12		119									
12.0	2.00	26	38	83	11.0	12		120									
16.0	0.50	32	50	92	15.0	16		121									
16.0	1.00	32	50	92	15.0	16		122									
16.0	1.50	32	50	92	15.0	16		123									
16.0	2.00	32	50	92	15.0	16		124									

								Long									
d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16703	...									
4.0	0.40	8	36	80	3.7	4		201									
4.0	0.50	8	36	80	3.7	4		202									
4.0	1.00	8	36	80	3.7	4		203									
5.0	0.50	10	40	80	4.6	5		204									
5.0	1.00	10	40	80	4.6	5		205									
6.0	0.50	13	44	90	5.5	6		206									
6.0	1.00	13	44	90	5.5	6		207									
6.0	1.50	13	44	90	5.5	6		208									
8.0	0.50	15	54	100	7.4	8		209									
8.0	1.00	15	54	100	7.4	8		210									
8.0	1.50	15	54	100	7.4	8		211									
8.0	2.00	15	54	100	7.4	8		212									
10.0	0.50	18	60	100	9.2	10		213									
10.0	1.00	18	60	100	9.2	10		214									
10.0	1.50	18	60	100	9.2	10		215									
10.0	2.00	18	60	100	9.2	10		216									
12.0	0.50	26	75	120	11.0	12		217									
12.0	1.00	26	75	120	11.0	12		218									
12.0	1.50	26	75	120	11.0	12		219									
12.0	2.00	26	75	120	11.0	12		220									
16.0	0.50	32	85	120	15.0	16		221									
16.0	1.00	32	85	120	15.0	16		222									
16.0	1.50	32	85	120	15.0	16		223									
16.0	2.00	32	85	120	15.0	16		224									

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA<900N	VA>900N	Ti alloy	GG(G)	Graphite
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140-340

16704

Solid carbide diamond radius cutter DC Ultra



Z2



DIN 6535 HA



Graphit

GFK

**ATORN®**

**Design**

- Solid carbide cutter with crystalline diamond coating (DiaDur)
- Special cemented carbide with excellent coating adhesion for the longest possible service life
- Shaft tolerance: h5
- Coating thickness: 10 + 2 µm
- Concentricity: 5 µm
- Radius accuracy: +/- 3 µm

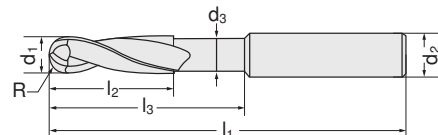
**Applications**

For milling graphite, copper and GFRP materials.

16704 101-151



16704 152-161



d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16704	...
0.2	0.10	0.2	1	55	0.18	4	101	
0.3	0.15	0.3	1	55	0.27	4	102	
0.3	0.15	0.3	3	55	0.27	4	103	
0.3	0.15	0.3	5	55	0.27	4	104	
0.3	0.15	0.3	8	55	0.27	4	105	
0.4	0.20	0.4	4	55	0.35	4	106	
0.4	0.20	0.4	6	55	0.35	4	107	
0.4	0.20	0.4	8	55	0.35	4	108	
0.5	0.25	0.5	5	55	0.45	4	109	
0.5	0.25	0.5	10	55	0.45	4	110	
0.6	0.30	0.6	6	55	0.56	4	111	
0.6	0.30	0.6	9	55	0.56	4	112	
0.6	0.30	0.6	12	55	0.56	4	113	
0.7	0.35	0.7	7	55	0.65	4	114	
0.7	0.35	0.7	14	55	0.65	4	115	
0.8	0.40	0.8	8	55	0.75	4	116	
0.8	0.40	0.8	12	55	0.75	4	117	
0.8	0.40	0.8	16	55	0.75	4	118	
1.0	0.50	1.0	5	55	0.90	4	119	
1.0	0.50	1.0	10	55	0.90	4	120	
1.0	0.50	1.0	15	55	0.90	4	121	
1.0	0.50	1.0	20	55	0.90	4	122	
1.0	0.50	1.0	25	55	0.90	4	123	
1.0	0.50	1.0	30	55	0.90	4	124	
1.2	0.60	1.2	5	55	1.10	4	125	
1.2	0.60	1.2	10	55	1.10	4	126	
1.2	0.60	1.2	15	55	1.10	4	127	
1.5	0.75	1.5	5	55	1.40	4	128	
1.5	0.75	1.5	10	55	1.40	4	129	
1.5	0.75	1.5	15	55	1.40	4	130	
1.5	0.75	1.5	20	55	1.40	4	131	

d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16704	...
1.5	0.75	1.5	25	55	1.40	4	132	
1.8	0.90	1.8	10	55	1.70	4	133	
1.8	0.90	1.8	20	55	1.70	4	134	
2.0	1.00	2	10	55	1.90	4	135	
2.0	1.00	2	15	55	1.90	4	136	
2.0	1.00	2	20	55	1.90	4	137	
2.0	1.00	2	25	65	1.90	4	138	
2.0	1.00	2	30	65	1.90	4	139	
3.0	1.50	3	10	65	2.90	4	140	
3.0	1.50	3	15	65	2.90	4	141	
3.0	1.50	3	20	65	2.90	4	142	
3.0	1.50	3	25	75	2.90	4	143	
3.0	1.50	3	30	75	2.90	4	144	
4.0	2.00	4	20	65	3.90	6	145	
4.0	2.00	4	30	75	3.90	6	146	
4.0	2.00	4	40	90	3.90	6	147	
5.0	2.50	5	20	65	4.90	6	148	
5.0	2.50	5	30	75	4.90	6	149	
5.0	2.50	5	40	90	4.90	6	150	
5.0	2.50	5	50	90	4.90	6	151	
6.0	3.00	6	30	75	5.90	6	152	
6.0	3.00	6	40	90	5.90	6	153	
6.0	3.00	6	50	90	5.90	6	154	
6.0	3.00	6	60	100	5.90	6	155	
8.0	4.00	8	30	80	7.80	8	156	
8.0	4.00	8	60	100	7.80	8	157	
10.0	5.00	10	30	80	9.80	10	158	
10.0	5.00	10	60	100	9.80	10	159	
12.0	6.00	12	30	80	11.80	12	160	
12.0	6.00	12	60	100	11.80	12	161	

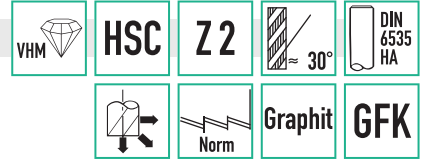
Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA<900N	VA>900N	Ti alloy	GG(G)	Graphite
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140-340

Milling Tools



16705

Solid carbide diamond torus milling cutter DC Ultra



**ATORN®**

**Design**

- Solid carbide cutter with crystalline diamond coating
- Special cemented carbide with excellent coating adhesion for the longest possible service life
- Shaft tolerance: h5
- Coating thickness: 10 + 2 µm
- Concentricity: 5 µm
- Radius accuracy: +/- 3 µm

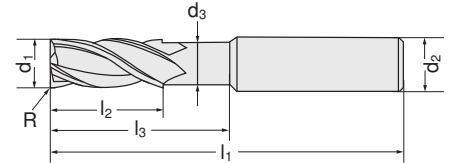
**Applications**

For milling graphite, copper and GFRP materials.

16705 201-257



16705 258-275



d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16705	...
0.2	0.05	0.20	1	55	0.19	4	201	
0.3	0.05	0.30	1	55	0.27	4	202	
0.3	0.05	0.30	3	55	0.27	4	203	
0.4	0.05	0.40	2	55	0.35	4	204	
0.4	0.05	0.40	4	55	0.35	4	205	
0.4	0.05	0.40	8	55	0.35	4	206	
0.5	0.05	0.50	2	55	0.45	4	207	
0.5	0.05	0.50	5	55	0.45	4	208	
0.5	0.05	0.50	10	55	0.45	4	209	
0.6	0.06	0.80	3	55	0.56	4	210	
0.6	0.06	0.80	6	55	0.56	4	211	
0.6	0.06	0.80	9	55	0.56	4	212	
0.6	0.06	1.80	12	55	0.56	4	213	
0.8	0.08	1.00	4	55	0.75	4	214	
0.8	0.08	1.00	8	55	0.75	4	215	
0.8	0.08	1.00	12	55	0.75	4	216	
0.8	0.08	1.00	16	55	0.75	4	217	
1.0	0.10	1.00	5	55	0.90	4	218	
1.0	0.10	1.00	10	55	0.90	4	219	
1.0	0.10	1.00	15	55	0.90	4	220	
1.0	0.10	1.00	20	55	0.90	4	221	
1.0	0.10	1.00	25	55	0.90	4	222	
1.2	0.12	1.50	5	55	1.10	4	223	
1.2	0.12	1.50	10	55	1.10	4	224	
1.2	0.12	1.50	15	55	1.10	4	225	
1.5	0.15	2.00	5	55	1.50	4	226	
1.5	0.15	2.00	10	55	1.50	4	227	
1.5	0.15	2.00	15	55	1.50	4	228	
1.5	0.15	2.00	20	55	1.50	4	229	
1.5	0.15	2.00	25	55	1.50	4	230	
1.8	0.18	2.00	10	55	1.70	4	231	
1.8	0.18	2.00	20	55	1.70	4	232	
2.0	0.20	2.00	10	56	1.90	4	233	
2.0	0.20	2.00	15	56	1.90	4	234	
2.0	0.20	2.00	20	56	1.90	4	235	
2.0	0.20	2.00	25	56	1.90	4	236	
2.0	0.50	2.00	10	56	1.90	4	237	
2.0	0.50	2.00	15	56	1.90	4	238	

d <sub>1</sub> mm	R mm	l <sub>2</sub> mm	l <sub>3</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>2</sub> (h5) mm	16705	...
2.0	0.50	2.00	20	65	1.90	4	239	
2.0	0.50	2.00	25	65	1.90	4	240	
3.0	0.30	3.00	15	65	2.90	4	241	
3.0	0.30	3.00	25	75	2.90	4	242	
3.0	0.50	3.00	10	65	2.90	4	243	
3.0	0.50	3.00	15	65	2.90	4	244	
3.0	0.50	3.00	20	65	2.90	4	245	
3.0	0.50	3.00	25	75	2.90	4	246	
3.0	0.50	3.00	30	75	2.90	4	247	
4.0	0.30	4.00	15	65	3.90	6	248	
4.0	0.40	4.00	15	65	3.90	6	249	
4.0	0.40	4.00	25	75	3.90	6	250	
4.0	0.50	4.00	20	65	3.90	6	251	
4.0	0.50	4.00	30	75	3.90	6	252	
4.0	0.50	5.00	40	90	3.90	6	253	
5.0	0.50	5.00	20	75	4.90	6	254	
5.0	0.50	5.00	30	75	4.90	6	255	
5.0	0.50	5.00	40	90	4.90	6	256	
5.0	0.50	5.00	50	90	4.90	6	257	
6.0	0.50	6.00	30	75	5.90	6	258	
6.0	0.50	6.00	40	90	5.90	6	259	
6.0	0.50	6.00	50	90	5.90	6	260	
6.0	0.50	6.00	60	90	5.90	6	261	
6.0	1.00	6.00	30	75	5.90	6	262	
6.0	1.00	6.00	40	90	5.90	6	263	
8.0	0.50	8.00	30	80	7.80	8	264	
8.0	0.50	8.00	60	100	8.80	8	265	
8.0	1.00	8.00	30	80	9.80	8	266	
8.0	1.00	8.00	60	100	10.80	8	267	
10.0	0.50	10.00	30	80	9.80	10	268	
10.0	0.50	10.00	60	100	9.80	10	269	
10.0	1.00	10.00	30	80	9.80	10	270	
10.0	1.00	10.00	60	100	9.80	10	271	
12.0	0.50	12.00	30	80	11.80	12	272	
12.0	0.50	12.00	60	100	11.80	12	273	
12.0	1.00	12.00	30	80	11.80	12	274	
12.0	1.00	12.00	60	100	11.80	12	275	

Al<10%Si	Al>10%Si	Cu	St<520N	St<750N	St<900N	St<1100N	St<1200N	St<1400N	<45HRC	<55HRC	<60HRC	<67HRC	VA<900N	VA>900N	Ti alloy	GG(G)	Graphite
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140-340