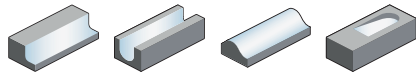
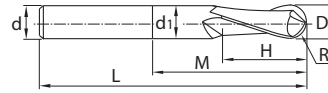


Ball nose cutter long shank High performance machining of heat-resistant alloys

5566R302NH



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		YK40F
5566R302NH-0300		3	1.5	6	2.8	6	9	75	2	●
5566R302NH-0400		4	2	6	3.7	8	12	75	2	●
5566R302NH-0500		5	2.5	6	4.6	10	15	80	2	●
5566R302NH-0600		6	3	6	5.5	12	20	80	2	●
5566R302NH-0800		8	4	8	7.4	16	26	90	2	●
5566R302NH-1000		10	5	10	9.2	20	31	100	2	●
5566R302NH-1200		12	6	12	11	24	37	120	2	●
5566R302NH-1600		16	8	16	15	32	43	140	2	●

● Ex stock ○ On demand

* With internal cooling

Application field					
P	M	K	N	S	H
			✓		

- ✓ Very suitable
- ✓ Suitable

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

System code > B268

Cutting data > B436

Nonstandard order > B477



End mill – AL series

	Material group	Composition / structure / heat treatment	Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]									
					AL-1E AL-2E AL-3E (W) ALG-2E				AL-2EL AL-3EL					
					Slot milling		Shoulder milling		Slot milling		Shoulder milling			
					\varnothing [mm]	a_p max	\varnothing [mm]	a_e max	\varnothing [mm]	a_p max	\varnothing [mm]	a_e max		
					$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$	$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$		
					$12 \leq x \leq 20$	$1.0 \times D$			$12 \leq x \leq 20$	$1.0 \times D$				
					YK30F / YK40F				YK30F					
					a_e / D				a_e / D					
					1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group		
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1									
		approx. 0,45 % C	annealed	190	2									
		approx. 0,45 % C	tempered	250	3									
		approx. 0,75 % C	annealed	270	4									
		approx. 0,75 % C	tempered	300	5									
P	Low-alloyed steel		annealed	180	6									
			tempered	275	7									
			tempered	300	8									
			tempered	350	9									
P	High-alloyed steel and high-alloyed tool steel		annealed	200	10									
			hardened and tempered	325	11									
M	Stainless steel	ferritic/martensitic	annealed	200	12									
			tempered	240	13									
		austenitic	quench hardened	180	14									
			austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16									
			perlitic (martensitic)	260	17									
K	Cast iron with spheroidal graphite	ferritic		160	18									
			perlitic	250	19									
			ferritic	130	20									
K	Malleable cast iron		perlitic	230	21									
N	Aluminium wrought alloys	cannot be hardened		60	22	920	1100	1200	4	830	990	1080	4	
			hardenable	hardened	100	23	555	660	720	4	500	595	650	4
	Cast aluminium alloys	$\leq 12\% \text{ Si}$, cannot be hardened		75	24	370	440	480	4	335	400	435	4	
			$\leq 12\% \text{ Si}$, hardenable	hardened	90	25	460	550	600	4	415	495	540	4
			$> 12\% \text{ Si}$, cannot be hardened		130	26	140	165	180	4	125	150	165	4
N	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%		110	27	280	330	360	4	250	300	325	4	
		CuZn, CuSnZn		90	28	325	385	420	4	295	350	380	4	
		CuSn, Pb-free copper, electrolytic copper		100	29	280	330	360	4	250	300	325	4	
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30									
				hardened	280	31								
		Ni or Co base	annealed	250	32									
				hardened	350	33								
		cast	320	34										
S	Titanium alloys	pure titanium		R_m 400	35									
			α and β alloys	hardened	R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37									
			hardened and tempered	60 HRC	38									
	Hard cast iron		cast	400	39									
X	Non-metallic materials		hardened and tempered	55 HRC	40									
		Thermoplasts			41									
		Thermosetting plastics			42									
		Plastic, glass-fibre reinforced GFRP			43									
		Plastic, carbon fibre reinforced CFRP			44									
		Graphite			45									
Wood			46											

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 Feed rate recommendations on page B460.
 For examples of material for cutting tool groups view page D22.

Recommended feed rate

Solid carbide milling group 1 – Square shoulder mills PM series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		$\emptyset 0,5$	$\emptyset 0,8$	$\emptyset 1$	$\emptyset 2$	$\emptyset 3$	$\emptyset 4$	$\emptyset 5$	$\emptyset 6$	$\emptyset 8$	$\emptyset 10$	$\emptyset 12$	$\emptyset 14$	$\emptyset 16$	$\emptyset 18$	$\emptyset 20$	
P	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,05	0,07	0,08	0,08	0,09	0,09	0,10
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,06	0,09	0,10	0,10	0,12	0,12	0,13	
	1/10	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,20	
M	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,06	0,06	0,07	0,07	0,08
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,04	0,04	0,05	0,07	0,08	0,08	0,10	0,10	0,11
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,05	0,05	0,07	0,11	0,13	0,13	0,15	0,15	0,16	
K	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,05	0,07	0,08	0,08	0,09	0,09	0,10	
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,06	0,09	0,10	0,10	0,12	0,12	0,13	
	1/10	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,20	
H	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,06	0,06	0,07	0,07	0,08	
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,04	0,04	0,05	0,07	0,08	0,08	0,10	0,10	0,11	
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,05	0,05	0,07	0,11	0,13	0,13	0,15	0,15	0,16	

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Solid carbide milling group 2 – Square shoulder mills GM series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		$\emptyset 0,5$	$\emptyset 0,8$	$\emptyset 1$	$\emptyset 2$	$\emptyset 3$	$\emptyset 4$	$\emptyset 5$	$\emptyset 6$	$\emptyset 8$	$\emptyset 10$	$\emptyset 12$	$\emptyset 14$	$\emptyset 16$	$\emptyset 18$	$\emptyset 20$	
P	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,05	0,08	0,09	0,09	0,10	0,10	0,12	
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18	
M	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07	
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/10	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,10	0,11	0,11	0,13	0,13	0,15	
K	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,05	0,08	0,09	0,09	0,10	0,10	0,12	
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18	

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Solid carbide milling group 3 – Square shoulder mills HM series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		$\emptyset 0,5$	$\emptyset 0,8$	$\emptyset 1$	$\emptyset 2$	$\emptyset 3$	$\emptyset 4$	$\emptyset 5$	$\emptyset 6$	$\emptyset 8$	$\emptyset 10$	$\emptyset 12$	$\emptyset 14$	$\emptyset 16$	$\emptyset 18$	$\emptyset 20$	
H	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07	
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/10	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,10	0,11	0,11	0,13	0,13	0,15	

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Solid carbide milling group 4 – Square shoulder mills AL/NM series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		$\emptyset 0,5$	$\emptyset 0,8$	$\emptyset 1$	$\emptyset 2$	$\emptyset 3$	$\emptyset 4$	$\emptyset 5$	$\emptyset 6$	$\emptyset 8$	$\emptyset 10$	$\emptyset 12$	$\emptyset 14$	$\emptyset 16$	$\emptyset 18$	$\emptyset 20$	
N	1/1	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,09	0,11	0,11	0,12	0,12	0,14	
	3/4	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18	
	1/10	0,03	0,06	0,06	0,06	0,06	0,06	0,09	0,09	0,12	0,19	0,22	0,22	0,25	0,25	0,28	
	1/20	0,04	0,08	0,08	0,08	0,08	0,08	0,12	0,12	0,16	0,23	0,27	0,27	0,31	0,31	0,35	

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

AL series

For machining of aluminium alloys

- Newly developed geometries expand our standard program:
 - ALP for high-speed roughing
 - ALG for finishing with very good surface quality
 - AIR torus mills for ultra high-speed machining
- With our diamond-like carbon grade KMD401, tool life is significantly increased.
- End mills, ball nose cutters, torus mills and rippers
- Diameter range 1.0–20.0 mm



Solid carbide milling System code – DIN-ISO series

5 5 0 1 R 30 2 GM R05 0800

1 2 3 4 5 6 7 8 9 10

A

Turning

Type	
Code	Description
5	Milling cutter

Shank type	
Code	Description
1	Shank
5	DIN 6535 HA
6	Weldon shank DIN 6535 HB
7	Whistle Notch DIN 6535 HE
9	Morse taper shank

B

1

2

Milling

Cutting edge type	
Code	Description
0	Square shoulder mill
6	Ball nose cutter
8	Torus mill

Tool length	
Code	Description
1	DIN 6527 K
2	DIN 6527 L
5	Factory standard ZCC-A
6	Factory standard ZCC-B
8	DIN 6528
9	Factory standard ZCC-D

3

4

C

Drilling

Rotation direction	
Code	Description
R	Right
L	Left

Helix angle	
Code	Description
20	20°
30	30°
3841	38°/41°
45	45°
55	55°
60	60°

Number of teeth	
Code	Description
2	2
...	
M	Indicated when different diameters have a different number of teeth

5

6

7

D

Technical Information

Application	
Code	Description
GM	Semi-finishing
GF	Finishing
HM	Hard machining
MHH	High-speed hard machining
NH	High-performance machining of heat-resistant alloys

Radius [mm]	
Code	Description
R03	0,3
R15	1,5
R30	3,0
...	

Diameter [mm]	
Code	Description
0100	1,0
0800	8,0
2000	20,0
...	

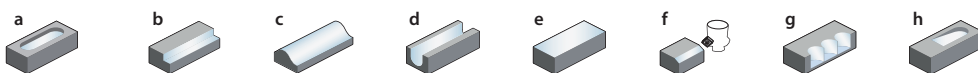
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9

10

E

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a Groove milling
g Plunge milling
b Square shoulder milling
h Circular milling/Ramping
c Profile milling
d Slot milling
e Face milling
f Chamfer milling

A

Turning

Coated cemented carbide PVD

Grade	Grade description
KMD401	PVD coated carbide substrate for high performance milling application of non-ferrous metals, CFRP and GFRP and organic materials. The DLC layer has very good wear protection and high thermal stability.

B

Milling

KMG303	PVD coated carbide substrate for universal milling application of steel (up to HRC<=48), stainless steel and cast iron.
---------------	-------------------------------------------------------------------------------------------------------------------------

KMG405	PVD coated carbide substrate for high performance milling application of steel (up to HRC <55), stainless steel, super alloy material and cast iron. High wear resistance and toughness for a wide application field.
---------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

C

Drilling

KMG555	PVD coated carbide substrate for hard milling application of steel (HRC 55–68), highest wear resistance and toughness for best cutting result.
---------------	------------------------------------------------------------------------------------------------------------------------------------------------

KMG309	PVD coated carbide substrate for non ferrous materials. High wear resistance even in abrasive materials.
---------------	----------------------------------------------------------------------------------------------------------

D

Technical Information

Uncoated cemented carbide










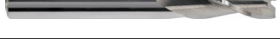

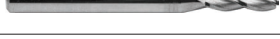









Grade	Grade description
YK30F	Uncoated K30 carbide substrate for steel, stainless steel, cast iron and non ferrous materials.

E

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YK40F	Uncoated K20–K30/N20–N30 carbide substrate for cast iron and non ferrous materials.
--------------	-------------------------------------------------------------------------------------

Aluminium and aluminium alloys

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
AL-2E		2	1.0-20.0				✓			End mills	B386
AL-2EL		2	3.0-20.0				✓			End mills	B387
ALG-2E		2	1.0-20.0				✓			End mills	B388
ALG-2R		2	6.0-25.0				✓			Torus mills	B403
ALG-2R-W		2	6.0-25.0				✓			Torus mills	B404
AL-3E		3	1.0-20.0				✓			End mills	B389
AL-3EL		3	3.0-20.0				✓			End mills	B390
ALG-3E		3	1.0-20.0				✓			End mills	B391
ALG-3E-W		3	3.0-20.0				✓			End mills	B392
ALP-3E		3	1.0-20.0				✓			End mills	B393
ALP-3E-W		3	3.0-20.0				✓			End mills	B394
ALP-4E		4	3.0-20.0				✓			End mills	B395
ALP-4E-W		4	3.0-20.0				✓			End mills	B396
AL-3W		3	6.0-20.0				✓			Rippers	B397
5565R302NH		2	3.0-16.0				✓			Ball nose cutters	B398
5566R302NH		2	3.0-16.0				✓			Ball nose cutters	B399
AL-2B		2	2.0-12.0				✓			Ball nose cutters	B400
AL-2R-AIR		2	6.0-20.0				✓			High performance torus mills	B401
AL-2RL-AIR		2	6.0-20.0				✓			High performance torus mills	B402
AL-3R-AIR		3	12.0-20.0				✓			High performance torus mills	B405
AL-3RL-AIR		3	12.0-20.0				✓			High performance torus mills	B406

✓ Very suitable ✓ Suitable

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index