



Pilana

Mills

Drills



CATALOGUE 2023

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✓ in stock

* production on request

Carbide end mills

2 flutes

OR201
OR202

- 2 cutting edges to the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

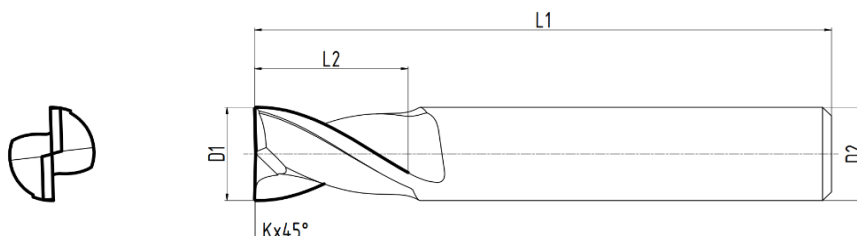
Applicable: aluminium, copper

Geometry: λ 30°, γ 8°

Coating: AlTiN

On request:

- clamping shank with weldon
- tapering of the neck



Short version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR201.005	0,5	3	38	2	0,02
OR201.010	1	3	38	4	0,02
OR201.020	2	3	38	7	0,05
OR201.030	3	3	38	7	0,07
OR201.040	4	4	50	8	0,07
OR201.050	5	5	50	10	0,07
OR201.060	6	6	57	10	0,07
OR201.080	8	8	63	16	0,12
OR201.100	10	10	72	19	0,2
OR201.120	12	12	83	22	0,2
OR201.140	14	14	83	22	0,2
OR201.160	16	16	92	26	0,2
OR201.180	18	18	92	26	0,2
OR201.200	20	20	104	32	0,3

Long version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR202.020	2	3	50	12	0,05
OR202.030	3	3	50	12	0,07
OR202.040	4	4	60	15	0,07
OR202.050	5	5	60	20	0,07
OR202.060	6	6	60	20	0,07
OR202.080	8	8	70	25	0,12
OR202.100	10	10	110	30	0,2
OR202.120	12	12	110	30	0,2
OR202.140	14	14	110	40	0,2
OR202.160	16	16	110	50	0,2
OR202.180	18	18	110	50	0,2
OR202.200	20	20	110	55	0,3

Recommended cutting conditions on page 38.

Carbide end mills

3 flutes

OR301

- 3 cutting edges, one through the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

On request:

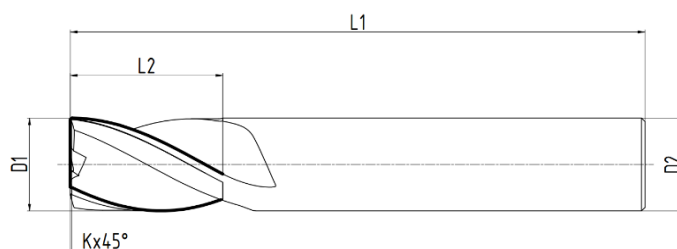
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium, copper

Geometry: λ 30°, γ 8°

Coating: AlTiN



Catalogue number	Diameter		Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6			
OR301.030	3	3	38	7	0,07
OR301.040	4	4	50	8	0,07
OR301.050	5	5	50	10	0,07
OR301.060	6	6	57	10	0,07
OR301.080	8	8	63	16	0,12
OR301.100	10	10	72	19	0,2
OR301.120	12	12	83	22	0,2
OR301.140	14	14	83	22	0,2
OR301.160	16	16	92	26	0,2
OR301.180	18	18	92	26	0,2
OR301.200	20	20	104	32	0,3

Recommended cutting conditions on page 38.

Carbide end mills

4 flutes

OR401
OR402

- 4 cutting edges, of which 2 cutting edges to the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

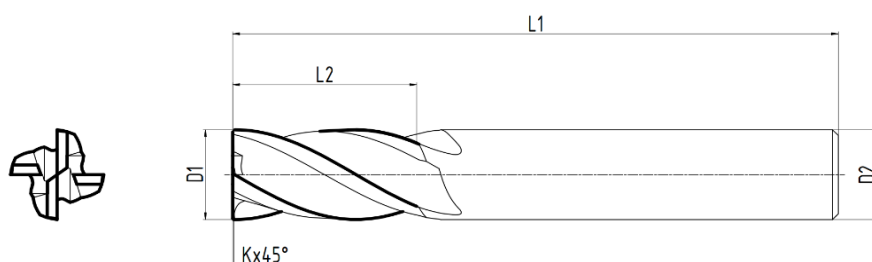
Applicable: aluminium, copper

Geometry: λ 30°, γ 8°

Coating: AlTiN

On request:

- clamping shank with weldon
- tapering of the neck



Short version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR401.030	3	3	38	10	0,07
OR401.040	4	4	50	11	0,07
OR401.050	5	5	50	13	0,07
OR401.060	6	6	57	13	0,07
OR401.080	8	8	63	19	0,12
OR401.100	10	10	72	22	0,2
OR401.120	12	12	83	26	0,2
OR401.140	14	14	83	26	0,2
OR401.160	16	16	92	32	0,2
OR401.180	18	18	92	32	0,2
OR401.200	20	20	104	38	0,3

Long version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR402.030	3	3	65	20	0,07
OR402.040	4	4	65	25	0,07
OR402.050	5	5	70	30	0,07
OR402.060	6	6	70	30	0,07
OR402.080	8	8	100	40	0,12
OR402.100	10	10	110	40	0,2
OR402.120	12	12	110	45	0,2
OR402.140	14	14	110	45	0,2
OR402.160	16	16	124	65	0,2
OR402.180	18	18	124	65	0,2
OR402.200	20	20	150	65	0,3
OR402.250	25	25	165	80	0,3

Recommended cutting conditions on page 38.

Carbide end mills

4 flutes, helix 45°

OR452

- 4 cutting edges, of which 2 cutting edges to the centre, helix 45°
- clamping shank DIN 6535 HA (plain)

On request:

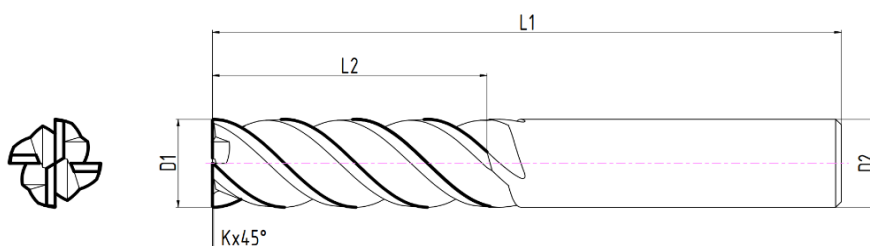
- clamping shank with weldon
- tapering of the neck

Recommended use: < 60 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium, copper

Geometry: λ 45°, γ 8°

Coating: AlCrN



Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR452.040	4	4	50	10	0,07
OR452.060	6	6	62	18	0,07
OR452.080	8	8	70	24	0,12
OR452.100	10	10	80	30	0,2
OR452.120	12	12	90	36	0,2
OR452.140	14	14	100	42	0,2
OR452.160	16	16	110	48	0,2
OR452.200	20	20	124	65	0,3

Short version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
OR451.200	20	20	104	42	0,3

Recommended cutting conditions on page 38.

Carbide high-feed end mills 4 flutes

HSC401

- 4 cutting edges, helix 45°
- clamping shank DIN 6535 HA (plain)

On request:

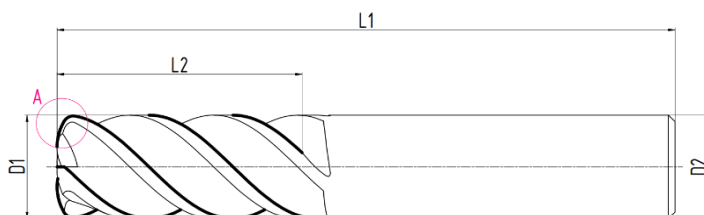
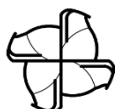
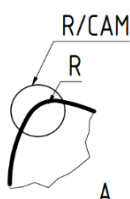
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable:

Geometry: λ 45°, γ 4°

Coating: AlTiN



Catalogue number	Diameter D1 +/-0,01	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner radius R	R/CAM	Cutting depth a _p
HSC401.040	4	6	57	11	0,5	0,67	0,2
HSC401.060	6	6	57	15	0,5	0,76	0,3
HSC401.080	8	8	63	20	1	1,38	0,5
HSC401.100	10	10	72	26	1,5	1,99	0,7
HSC401.120	12	12	83	30	1,5	2,1	0,8
HSC401.160	16	16	92	36	2	2,75	1

General construction steels <600Nmm ²												
D	ø 4	ø 4	ø 6	ø 6	ø 8	ø 8	ø 10	ø 10	ø 12	ø 12	ø 16	ø 16
ap (mm)	0.2	-	0.3	-	0.4	-	0.45	-	0.5	-	0.65	-
	-	0.15	-	0.2	-	0.3	-	0.4	-	0.45	-	0.5
Vc (mm/min)	65	-	65	-	65	-	65	-	65	-	65	-
	-	130	-	130	-	130	-	130	-	130	-	130
fz (mm/z)	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8	-
	-	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8

Alloyed steels <1100Nmm ²												
D	ø 4	ø 4	ø 6	ø 6	ø 8	ø 8	ø 10	ø 10	ø 12	ø 12	ø 16	ø 16
ap (mm)	0.2	-	0.3	-	0.4	-	0.45	-	0.5	-	0.65	-
	-	0.15	-	0.2	-	0.3	-	0.4	-	0.45	-	0.5
Vc (mm/min)	60	-	60	-	60	-	60	-	60	-	60	-
	-	120	-	120	-	120	-	120	-	120	-	120
fz (mm/z)	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8	-
	-	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8

Castings steels, Inconel <1400Nmm ²												
D	ø 4	ø 4	ø 6	ø 6	ø 8	ø 8	ø 10	ø 10	ø 12	ø 12	ø 16	ø 16
ap (mm)	0.15	-	0.2	-	0.25	-	0.3	-	0.35	-	0.45	-
	-	0.12	-	0.15	-	0.2	-	0.25	-	0.3	-	0.4
Vc (mm/min)	50	-	50	-	50	-	50	-	50	-	50	-
	-	95	-	95	-	95	-	95	-	95	-	95
fz (mm/z)	0.15	-	0.25	-	0.35	-	0.4	-	0.45	-	0.6	-
	-	0.15	-	0.25	-	0.35	-	0.4	-	0.45	-	0.6

High speed steels <1100Nmm ²												
D	ø 4	ø 4	ø 6	ø 6	ø 8	ø 8	ø 10	ø 10	ø 12	ø 12	ø 16	ø 16
ap (mm)	0.17	-	0.22	-	0.27	-	0.35	-	0.42	-	0.55	-
	-	0.12	-	0.17	-	0.22	-	0.28	-	0.35	-	0.45
Vc (mm/min)	55	-	55	-	55	-	55	-	55	-	55	-
	-	100	-	100	-	100	-	100	-	100	-	100
fz (mm/z)	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8	-
	-	0.2	-	0.35	-	0.45	-	0.5	-	0.6	-	0.8

Carbide end mills

4 flutes with double helix

OR411

- 4 cutting edges, of which 2 cutting edges to the centre, helix 35°/38°
- more resistant to vibration
- high tool rigidity, also suitable for trochoidal milling
- clamping shank DIN 6535 HA (plain)

On request:

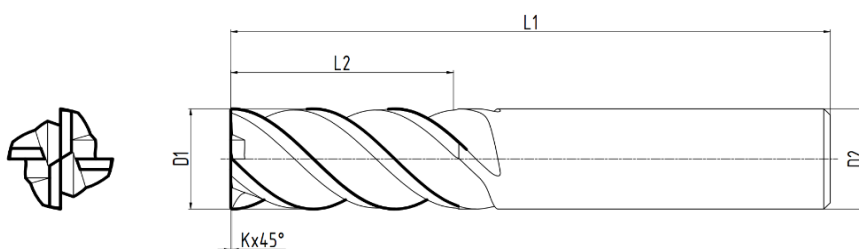
- clamping shank with weldon
- tapering of the neck

Recommended use: < 60 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Geometry: λ 35°/38°, γ 8°

Coating: AlCrN



Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner bevel K x 45°
OR411.020	2	4	50	5	0,05
OR411.030	3	6	57	8	0,07
OR411.040	4	6	57	12	0,07
OR411.050	5	6	57	13	0,07
OR411.060	6	6	57	15	0,07
OR411.080	8	8	63	19	0,12
OR411.100	10	10	72	24	0,2
OR411.120	12	12	83	28	0,2
OR411.140	14	14	83	28	0,2
OR411.160	16	16	92	35	0,2
OR411.200	20	20	110	42	0,3
OR411.250	25	25	125	55	0,3

Recommended cutting conditions on page 38.

Carbide end mills

4 flutes with double helix - INOX

NR411

- 4 cutting edges, of which 2 cutting edges to the centre, helix 38°/40°
- more resistant to vibration
- clamping shank DIN 6535 HA (plain)

On request:

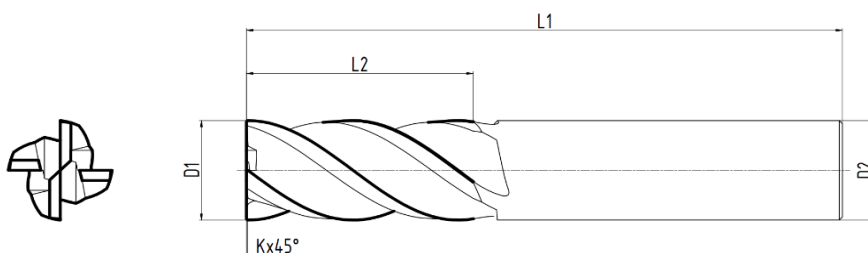
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², stainless steel

Applicable: copper, aluminium

Geometry: λ 38°/40°, γ 12°

Coating: AlCrN



Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
NR411.030	3	6	57	10	0,07
NR411.040	4	6	57	12	0,07
NR411.050	5	6	57	15	0,07
NR411.060	6	6	57	17	0,07
NR411.080	8	8	63	21	0,12
NR411.100	10	10	72	26	0,2
NR411.120	12	12	83	31	0,2
NR411.160	16	16	92	35	0,2
NR411.200	20	20	110	42	0,3

Recommended cutting conditions on page 38.

Carbide end mills

3 flutes with triple helix - ALU

AR311

- 3 cutting edges, one through the centre
- multispiral, helix 37°/39°/41°
- more resistant to vibration
- polished finish
- clamping shank DIN 6535 HA (plain)

On request:

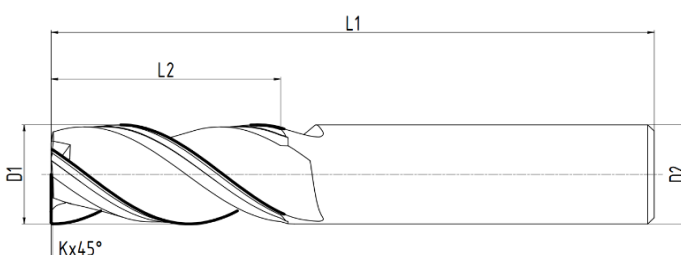
- clamping shank with weldon
- tapering of the neck

Recommended use: aluminium and its alloys, copper, plastic

Applicable: < 55 HRc

Geometry: λ 37°/39°/41°, γ 15°

Coating: uncoated



Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner bevel K x 45°
AR311.030	3	6	57	10	0,07
AR311.040	4	6	57	12	0,07
AR311.050	5	6	57	13	0,07
AR311.060	6	6	57	15	0,07
AR311.080	8	8	63	19	0,12
AR311.100	10	10	72	24	0,2
AR311.120	12	12	83	28	0,2
AR311.160	16	16	92	35	0,2
AR311.200	20	20	110	42	0,3

Recommended cutting conditions on page 38.

Carbide end mills

1 flute

AR101
AR102

- 1 cutting edge through the centre, helix 25°
- polished surface
- clamping shank DIN 6535 HA (plain)

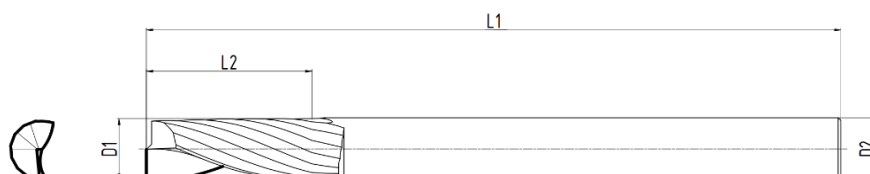
On request:

- clamping shank with weldon
- tapering of the neck

Recommended use: aluminium, plastic

Geometry: λ 25°, γ 20°

Coating: uncoated



Short version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length
	D1 h10	D2 h6	L1	L2
✓ AR101.030	3	6	54	15
✓ AR101.040	4	6	54	15
✓ AR101.050	5	6	54	17
✓ AR101.060	6	6	60	20
✓ AR101.080	8	8	63	22
✓ AR101.100	10	10	72	25
✓ AR101.120	12	12	83	30
* AR101.140	14	14	92	30
* AR101.160	16	16	92	35

Long version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length
	D1 h10	D2 h6	L1	L2
* AR102.030	3	6	100	15
* AR102.040	4	6	100	15
* AR102.050	5	6	100	17
* AR102.060	6	6	100	20
* AR102.080	8	8	100	22
* AR102.100	10	10	100	25
* AR102.120	12	12	100	35
* AR102.140	14	14	100	35
* AR102.160	16	16	110	40

✓ in stock

* production on request

Recommended cutting conditions on page 38.

Carbide roughing end mills

4 flutes

OH401

- 4 cutting edges, of which 2 cutting edges to the centre
- NR profile, helix 40°
- irregular edge spacing
- cutting edge rectification
- clamping shank DIN 6535 HA (plain)

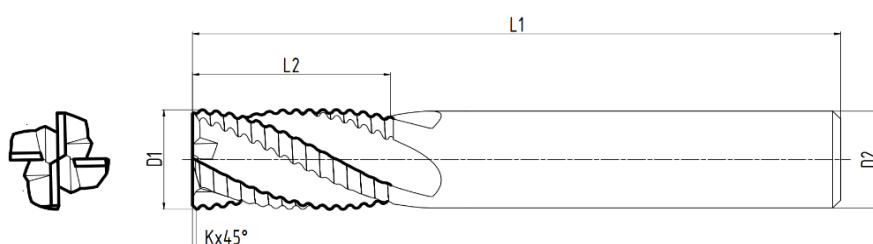
On request:

- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Geometry: NR profile, λ 40°, γ 7°

Coating: AlCrN



Catalogue number	Diameter		Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6			
OH401.050	5	6	57	13	0,15
OH401.060	6	6	57	13	0,15
OH401.080	8	8	63	19	0,2
OH401.100	10	10	72	22	0,2
OH401.120	12	12	83	26	0,25
OH401.160	16	16	92	32	0,35
OH401.200	20	20	104	42	0,4
OH401.200-L	20	20	110	50	0,4

INNOVATED

Recommended cutting conditions on page 38.

Carbide roughing-finishing end mills

4 flutes

RF401

- 4 cutting edges, of which 2 cutting edges to the centre, helix 40°, NR profile
- higher performance (V_c , f_z) compared to OH401 end mills by approx. 30 %
- smooth surface
- clamping shank DIN 6535 HA (plain)

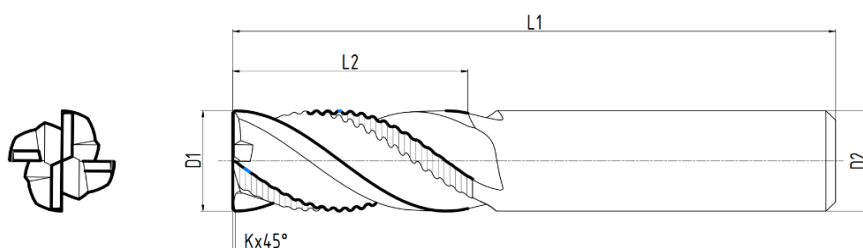
On request:

- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Geometry: NR profile, λ 40°, γ 8°

Coating: AlTiN



Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner bevel K x 45°
RF401.060	6	6	57	15	0,15
RF401.080	8	8	63	22	0,2
RF401.100	10	10	72	26	0,2
RF401.120	12	12	83	30	0,25
RF401.160	16	16	92	36	0,35
RF401.200	20	20	104	42	0,4

General construction steels 600N/mm ²		
D	V_c	f_z
6 - 8	160 - 220	0,03 - 0,09
8 - 10	150 - 180	0,04 - 0,10
12 - 16	150 - 180	0,05 - 0,11
≤ 20	140 - 180	0,06 - 0,12

Alloyed steels 1100N/mm ²		
D	V_c	f_z
6 - 8	100 - 150	0,03 - 0,08
8 - 10	90 - 140	0,03 - 0,09
12 - 16	90 - 140	0,04 - 0,10
≤ 20	85 - 140	0,05 - 0,11

Castings steels ≤ 240HB		
D	V_c	f_z
6 - 8	130 - 240	0,04 - 0,09
8 - 10	115 - 200	0,04 - 0,10
12 - 16	100 - 190	0,05 - 0,11
≤ 20	95 - 180	0,06 - 0,12

Heat resistant steels ≤ 850N/mm ²		
D	V_c	f_z
6 - 8	80 - 160	0,03 - 0,08
8 - 10	70 - 130	0,04 - 0,09
12 - 16	60 - 120	0,05 - 0,10
≤ 20	50 - 120	0,05 - 0,12

High speed steels 1100N/mm ²		
D	V_c	f_z
6 - 8	100 - 150	0,03 - 0,08
8 - 10	95 - 140	0,03 - 0,09
12 - 16	90 - 120	0,04 - 0,10
≤ 20	80 - 120	0,05 - 0,11

Carbide roughing-finishing end mills

4 flutes with internal cooling

RF401-IC

- 4 cutting edges, of which 2 cutting edges to the centre, helix 40°, NR profile
- front and side cooling outlets
- higher performance (V_c , f_z) compared to OH401 end mills by approx. 30 %
- smooth surface
- clamping shank DIN 6535 HA (plain)

On request:

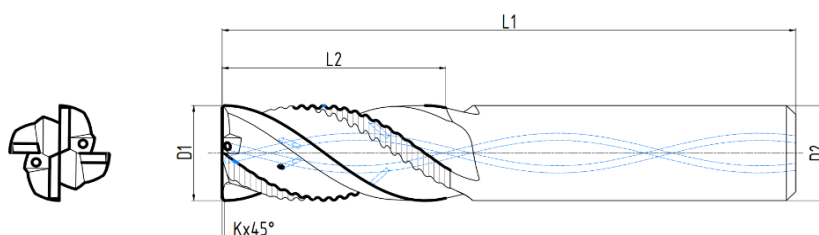
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel

Applicable: heat resistant steel, inconel

Geometry: NR profile, λ 40°, γ 10°

Coating: AlCrN



Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner bevel
	D1 h10	D2 h6	L1	L2	K x 45°
RF401.060 IK	6	6	57	15	0,15
RF401.080 IK	8	8	63	22	0,2
RF401.100 IK	10	10	72	26	0,2
RF401.120 IK	12	12	83	30	0,25
RF401.160 IK	16	16	92	36	0,35
RF401.200 IK	20	20	104	42	0,4

General construction steels 600N/mm ²		
D	V_c	f_z
6 - 8	160 - 220	0,03 - 0,09
8 - 10	150 - 180	0,04 - 0,10
12 - 16	150 - 180	0,05 - 0,11
≤ 20	140 - 180	0,06 - 0,12

Alloyed steels 1100N/mm ²		
D	V_c	f_z
6 - 8	100 - 150	0,03 - 0,08
8 - 10	90 - 140	0,03 - 0,09
12 - 16	90 - 140	0,04 - 0,10
≤ 20	85 - 140	0,05 - 0,11

Castings steels ≤ 240HB		
D	V_c	f_z
6 - 8	130 - 240	0,04 - 0,09
8 - 10	115 - 200	0,04 - 0,10
12 - 16	100 - 190	0,05 - 0,11
≤ 20	95 - 180	0,06 - 0,12

Heat resistant steels ≤ 850N/mm ²		
D	V_c	f_z
6 - 8	80 - 160	0,03 - 0,08
8 - 10	70 - 130	0,04 - 0,09
12 - 16	60 - 120	0,05 - 0,10
≤ 20	50 - 120	0,05 - 0,12

High speed steels 1100N/mm ²		
D	V_c	f_z
6 - 8	100 - 150	0,03 - 0,08
8 - 10	95 - 140	0,03 - 0,09
12 - 16	90 - 120	0,04 - 0,10
≤ 20	80 - 120	0,05 - 0,11

Carbide finishing multi-flute end mills

OR601
OR602

- 6-10 cutting edges, of which 2 cutting edges to the centre, helix 45°
- clamping shank DIN 6535 HA (plain)

On request:

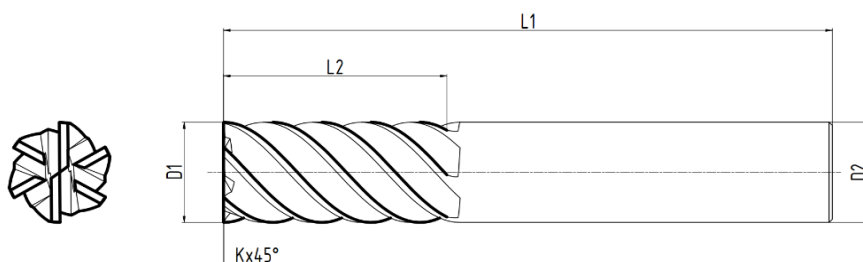
- clamping shank with weldon
- tapering of the neck

Recommended use: < 60 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Geometry: λ 45°, γ 7°

Coating: AlCrN



Short version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Number of cutting edges Z	Corner bevel K x 45°
OR601.050	5	5	54	13	6	0,02
OR601.060	6	6	57	13	6	0,03
OR601.080	8	8	63	19	6	0,04
OR601.100	10	10	72	22	6	0,05
OR601.120	12	12	83	26	6	0,05
OR601.160	16	16	92	32	6	0,06
OR601.180	18	18	92	32	6	0,06
OR801.200	20	20	104	38	8	0,07
OR1001.250	25	25	121	50	10	0,08

Long version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Number of cutting edges Z	Corner bevel K x 45°
OR602.060	6	6	70	26	6	0,03
OR602.080	8	8	90	36	6	0,04
OR602.100	10	10	100	46	6	0,05
OR602.120	12	12	110	56	6	0,05
OR602.160	16	16	130	66	6	0,06
OR802.200	20	20	140	76	8	0,07
OR1002.250	25	25	180	92	10	0,08

Recommended cutting conditions on page 38.

Carbide finishing end mills for hard materials

KR

- 4-12 cutting edges, of which 2 edges to the centre, variable helix 30° - 45°
- more resistant to vibration
- clamping shank DIN 6535 HA (plain)

On request:

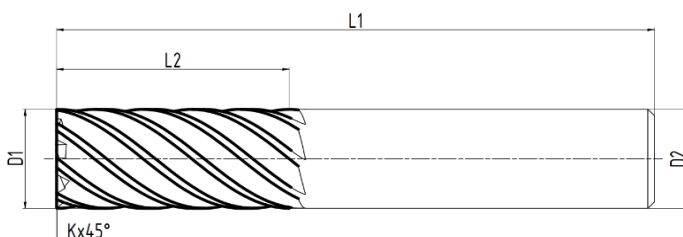
- clamping shank with weldon
- tapering of the neck

Recommended use: < 65 HRc, hardened steel, stainless steel, cast iron

Applicable: < 55 HRc

Geometry: λ 30° - 45°, γ 0°

Coating: AlCrN



Short version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Number of cutting edges Z	Corner bevel K x 45°
KR401.030	3	6	57	12	4	0,02
KR401.040	4	6	57	13	4	0,02
KR601.050	5	6	57	15	6	0,02
KR601.060	6	6	57	16	6	0,03
KR601.080	8	8	70	22	6	0,04
KR601.100	10	10	72	25	6	0,05
KR601.120	12	12	83	28	6	0,05
KR601.140	14	14	83	30	6	0,06
KR801.160	16	16	92	35	8	0,06
KR1001.200	20	20	104	40	10	0,07

Long version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Cutting edge length L2	Neck length L3	Number of cutting edges Z	Corner bevel K x 45°
KR1002.200	20	20	19,8	135	70	85	10	0,07
KR1202.250	25	25	24	186	55	132	12	0,07

Recommended cutting conditions on page 38.

Carbide ball-nose end mills

2 flutes

OK201
OK202

- 2 cutting edges to the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

On request:

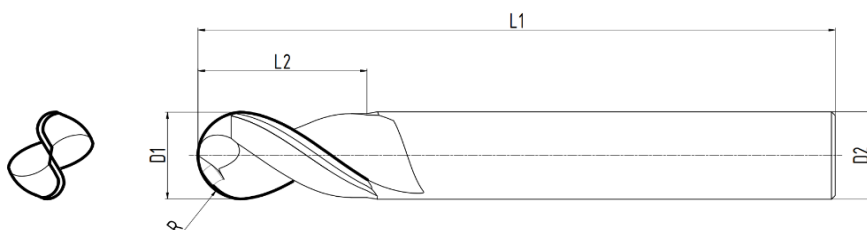
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Geometry: λ 30°, γ 8°

Coating: AlTiN



Short version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner radius
	D1 h10	D2 h6	L1	L2	R0/-0,02
OK201.010	1	3	38	3	0,5
OK201.020	2	3	38	5	1
OK201.030	3	3	38	7	1,5
OK201.040	4	4	50	8	2
OK201.050	5	5	50	10	2,5
OK201.060	6	6	57	10	3
OK201.080	8	8	63	16	4
OK201.100	10	10	72	19	5
OK201.120	12	12	83	22	6
OK201.140	14	14	83	22	7
OK201.160	16	16	92	26	8
OK201.180	18	18	92	26	9
OK201.200	20	20	104	32	10

Long version

Catalogue number	Diameter	Shank diameter	Overall length	Cutting edge length	Corner radius
	D1 h10	D2 h6	L1	L2	R0/-0,02
OK202.030	3	3	60	8	1,5
OK202.040	4	4	70	8	2
OK202.050	5	5	80	10	2,5
OK202.060	6	6	90	12	3
OK202.080	8	8	110	14	4
OK202.100	10	10	110	18	5
OK202.120	12	12	110	22	6
OK202.140	14	14	110	26	7
OK202.160	16	16	140	30	8
OK202.200	20	20	160	38	10

Recommended cutting conditions on page 38.

Carbide ball-nose end mills

4 flutes

OK401
OK402

- 4 cutting edges, of which 2 cutting edges to the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

On request:

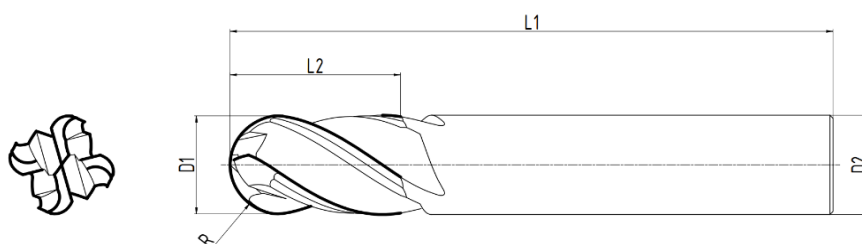
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Geometry: λ 30°, γ 8°

Coating: AlTiN



Short version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner radius R0/-0,02
OK401.030	3	3	38	7	1,5
OK401.040	4	4	50	8	2
OK401.050	5	5	50	10	2,5
OK401.060	6	6	57	10	3
OK401.080	8	8	63	16	4
OK401.100	10	10	72	19	5
OK401.120	12	12	83	22	6
OK401.140	14	14	83	22	7
OK401.160	16	16	92	26	8
OK401.180	18	18	92	26	9
OK401.200	20	20	104	32	10

Long version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Cutting edge length L2	Corner radius R0/-0,02
OK402.030	3	3	60	8	1,5
OK402.040	4	4	70	8	2
OK402.050	5	5	80	10	2,5
OK402.060	6	6	90	12	3
OK402.080	8	8	110	14	4
OK402.100	10	10	110	18	5
OK402.120	12	12	110	22	6
OK402.140	14	14	110	26	7
OK402.160	16	16	140	30	8
OK402.200	20	20	160	38	10

Recommended cutting conditions on page 38.

Carbide ball-nose end mills for hard materials

KK201
KK202

- 2 cutting edges to the centre, helix 20°
- end mills diameter 16 mm 4 cutting edges, of which 2 edges to the centre
- clamping shank DIN 6535 HA (plain)

On request:

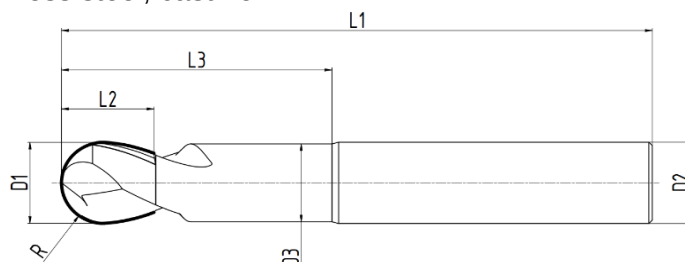
- clamping shank with weldon
- tapering of the neck

Recommended use: < 65 HRc, hardened steel, stainless steel, cast iron

Applicable: < 55 HRc

Geometry: λ 20°, γ 0°

Coating: AlCrN



Short version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Cutting edge length L2	Neck length L3	Corner radius R0/-0,02
KK201.010	1	6	0,95	57	2	3	0,5
KK201.015	1,5	6	1,45	57	2,5	5	0,75
KK201.020	2	6	1,9	57	3	7	1
KK201.030	3	6	2,8	57	4	8	1,5
KK201.040	4	6	3,8	57	5	14	2
KK201.050	5	6	4,8	57	6	21	2,5
KK201.060	6	6	5,8	57	7	21	3
KK201.080	8	8	7,6	63	9	27	4
KK201.100	10	10	9,6	72	11	32	5
KK201.120	12	12	11,5	83	13	38	6
KK401.160	16	16	15,5	92	17	44	8

Long version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Cutting edge length L2	Neck length L3	Corner radius R0/-0,02
KK202.020	2	6	1,9	70	3	17	1
KK202.030	3	6	2,8	70	4	18	1,5
KK202.040	4	6	3,8	80	5	19	2
KK202.050	5	6	4,8	80	6	44	2,5
KK202.060	6	6	5,8	80	7	44	3
KK202.080	8	8	7,6	90	9	54	4
KK202.100	10	10	9,6	100	11	60	5
KK202.120	12	12	11,5	110	13	65	6
KK402.160	16	16	15,5	130	17	82	8

Recommended cutting conditions on page 38.

Carbide ball-nose end mills for extra hard materials

KK251
KK252

- 2 cutting edges to the centre, helix 20°
- end mills diameter 16 mm 4 cutting edges, of which 2 edges to the centre
- clamping shank DIN 6535 HA (plain)

On request:

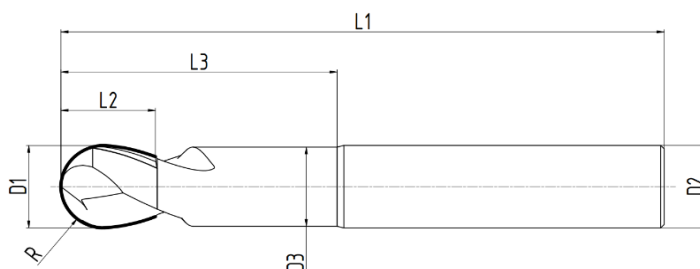
- clamping shank with weldon
- tapering of the neck

Recommended use: < 70 HRc, hardened steel

Applicable: cast iron

Geometry: λ 20°, γ -2°

Coating: AlCrN



Short version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Cutting edge length L2	Neck length L3	Corner radius R0/-0,02
KK251.020	2	6	1,9	57	2	7	1
KK251.030	3	6	2,8	57	3	8	1,5
KK251.040	4	6	3,8	57	4	14	2
KK251.050	5	6	4,8	57	5	21	2,5
KK251.060	6	6	5,8	57	6	21	3
KK251.080	8	8	7,6	63	8	27	4
KK251.100	10	10	9,6	72	10	32	5
KK251.120	12	12	11,5	83	12	38	6
KK451.160	16	16	15,5	92	16	44	8

Long version

Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Cutting edge length L2	Neck length L3	Corner radius R0/-0,02
KK252.020	2	6	1,9	70	2	17	1
KK252.030	3	6	2,8	70	3	18	1,5
KK252.040	4	6	3,8	80	4	19	2
KK252.050	5	6	4,8	80	5	44	2,5
KK252.060	6	6	5,8	80	6	44	3
KK252.080	8	8	7,6	90	8	54	4
KK252.100	10	10	9,6	100	10	60	5
KK252.120	12	12	11,5	110	12	65	6
KK452.160	16	16	15,5	130	16	82	8

Recommended cutting conditions on page 38.

Carbide end mills with corner radius 4 flutes

KT401
KT402

- 4 cutting edges, of which 2 cutting edges to the centre, helix 30°
- clamping shank DIN 6535 HA (plain)

On request:

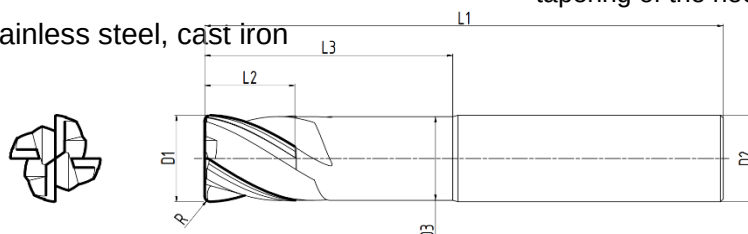
- clamping shank with weldon
- tapering of the neck

Recommended use: < 65 HRC, steel, stainless steel, cast iron

Applicable: < 55 HRC

Geometry: λ 30°, γ 4°

Coating: AlCrN



Short version

Catalogue number	Diameter	Shank diameter	Neck diameter	Overall length	Cutting edge length	Neck length	Corner radius
	D1 h10	D2 h6	D3	L1	L2	L3	R0/-0,02
KT401.030.03	3	6	2,9	57	4	14	0,3
KT401.030.05	3	6	2,9	57	4	14	0,5
KT401.040.03	4	6	3,8	57	4	14,5	0,3
KT401.040.05	4	6	3,8	57	4	14,5	0,5
KT401.050.05	5	6	4,8	57	6	14,5	0,5
KT401.060.05	6	6	5,8	57	6	21	0,5
KT401.060.10	6	6	5,8	57	6	21	1
KT401.060.15	6	6	5,8	57	6	21	1,5
KT401.080.05	8	8	7,6	63	8	27	0,5
KT401.080.10	8	8	7,6	63	8	27	1
KT401.080.20	8	8	7,6	63	8	27	2
KT401.100.05	10	10	9,6	72	10	32	0,5
KT401.100.10	10	10	9,6	72	10	32	1
KT401.100.20	10	10	9,6	72	10	32	2
KT401.120.05	12	12	11,5	83	12	38	0,5
KT401.120.10	12	12	11,5	83	12	38	1
KT401.120.15	12	12	11,5	83	12	38	1,5
KT401.120.20	12	12	11,5	83	12	38	2
KT401.120.30	12	12	11,5	83	12	38	3
KT401.160.10	16	16	15,5	92	16	44	1
KT401.160.15	16	16	15,5	92	16	44	1,5
KT401.160.20	16	16	15,5	92	16	44	2

Long version

Catalogue number	Diameter	Shank diameter	Neck diameter	Overall length	Cutting edge length	Neck length	Corner radius
	D1 h10	D2 h6	D3	L1	L2	L3	R0/-0,02
KT402.040.03	4	6	3,8	80	4	16	0,3
KT402.040.05	4	6	3,8	80	4	16	0,5
KT402.060.05	6	6	5,8	90	9	21	0,5
KT402.060.10	6	6	5,8	90	9	21	1
KT402.080.05	8	8	7,6	100	12	27	0,5
KT402.080.10	8	8	7,6	100	12	27	1
KT402.100.05	10	10	9,6	100	15	32	0,5
KT402.100.10	10	10	9,6	100	15	32	1
KT402.100.20	10	10	9,6	100	15	32	2
KT402.120.05	12	12	11,5	110	18	38	0,5
KT402.120.10	12	12	11,5	110	18	38	1
KT402.120.20	12	12	11,5	110	18	38	2

Recommended cutting conditions on page 38.

Carbide NC spot drills

NC090
NC120

- 2 cutting edges, helix 30°
- clamping shank DIN 6535 HA (plain)

On request:

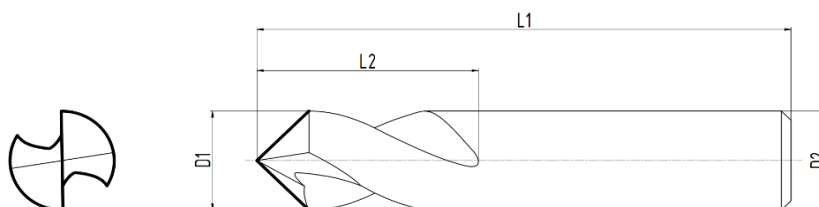
- clamping shank with weldon

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: λ 30°

Coating: AlTiN



Point angle 90°

Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2
NC090.030	3	3	40	8
NC090.040	4	4	50	10
NC090.050	5	5	50	13
NC090.060	6	6	57	13
NC090.080	8	8	63	23
NC090.100	10	10	72	24
NC090.120	12	12	82	24
NC090.140	14	14	82	26
NC090.160	16	16	82	29
NC090.200	20	20	110	35

Point angle 120°

Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2
NC120.030	3	3	40	8
NC120.040	4	4	50	10
NC120.050	5	5	50	13
NC120.060	6	6	57	13
NC120.080	8	8	63	23
NC120.100	10	10	72	24
NC120.120	12	12	82	24
NC120.140	14	14	82	26
NC120.160	16	16	82	29
NC120.200	20	20	110	35

Carbide drills 3xD without internal cooling

VS302

- 2 cutting edges, helix 30°, point angle 140°
- clamping shank DIN 6535 HA (plain)

On request:

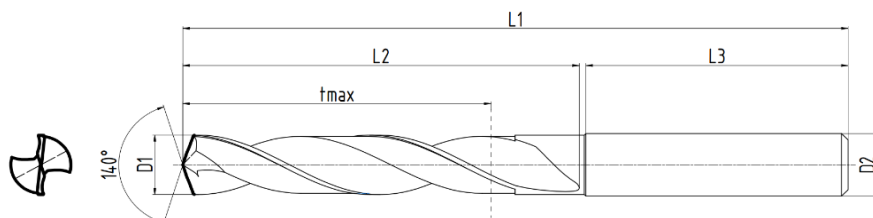
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: λ 30°

Coating: AlTiN



Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2	Shank length L3	Max. drilling depth t _{max}	Diameter tolerance m7
VS302.0300							
↓	3,0 - 3,7	6	62	20	36	14	0,004/0,016
VS302.0370							
↓	3,8 - 4,7	6	66	24	36	17	0,004/0,016
VS302.0470							
↓	4,8 - 6,0	6	66	28	36	20	0,004/0,016
VS302.0600							
↓	6,1 - 7,0	8	79	34	36	24	0,006/0,021
VS302.0700							
↓	7,1 - 8,0	8	79	41	36	29	0,006/0,021
VS302.0800							
↓	8,1 - 10,0	10	89	47	40	35	0,006/0,021
VS302.1000							
↓	10,1 - 12,0	12	102	55	45	40	0,007/0,025
VS302.1200							
↓	12,1 - 14,0	14	107	60	45	43	0,007/0,025
VS302.1400							
↓	14,1 - 16,0	16	115	65	48	45	0,007/0,025
VS302.1600							
↓	16,1 - 18,0	18	123	73	48	51	0,007/0,025
VS302.1800							
↓	18,1 - 20,0	20	131	79	50	55	0,008/0,029
VS302.2000							

Production on request. The price is valid for the production of at least 5 pieces.

Recommended cutting conditions on page 39.

Carbide drills 5xD with internal cooling

VS501

- 2 cutting edges, helix 30°, point angle 140°
- clamping shank DIN 6535 HA (plain)

On request:

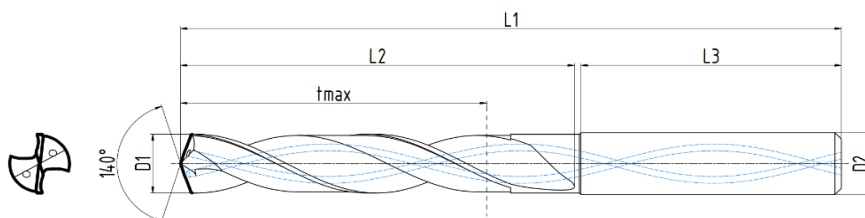
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: (λ 30°)

Coating: AlTiN



Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2	Shank length L3	Max. drilling depth t _{max}	Diameter tolerance m7
VS501.0300							
↓	3,0 - 3,7	6	66	28	36	23	0,004/0,016
VS501.0370							
↓	3,8 - 4,7	6	74	36	36	29	0,004/0,016
VS501.0470							
↓	4,8 - 6,0	6	82	44	36	35	0,004/0,016
VS501.0600							
↓	6,1 - 8,0	8	91	53	36	43	0,006/0,021
VS501.0800							
↓	8,1 - 10,0	10	103	61	40	49	0,006/0,021
VS501.1000							
↓	10,1 - 12,0	12	118	71	45	56	0,007/0,025
VS501.1200							
↓	12,1 - 14,0	14	124	77	45	60	0,007/0,025
VS501.1400							
↓	14,1 - 16,0	16	133	83	48	63	0,007/0,025
VS501.1600							
↓	16,1 - 18,0	18	143	93	48	71	0,007/0,025
VS501.1800							
↓	18,1 - 20,0	20	153	101	50	77	0,008/0,029
VS501.2000							

The price is valid only for the most commonly used diameters of drills, which we keep in stock.

The current list of available items, we will provide on request.

Recommended cutting conditions on page 39.

Carbide micro drills 5xD without internal cooling

VM502

- 2 cutting edges, helix 30°, point angle 140°
- clamping shank DIN 6535 HA (plain)

On request:

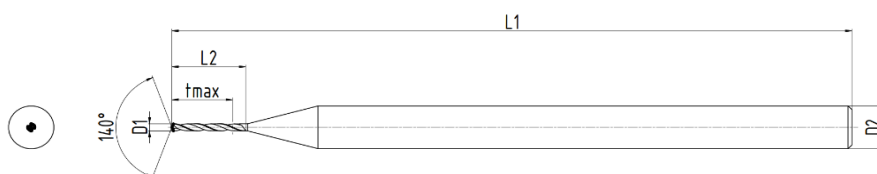
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: λ 30°

Coating: AlTiN



Catalogue number	Diameter D1 m7	Shank diameter D2 h6	Overall length L1	Helix length L2	Max. drilling depth t _{max}
VM502.0050					
↓	0,5 - 0,7	3	45	4,5	3,5
VM502.0070					
↓	0,75 - 1,0	3	45	6,5	5
VM502.0100					
↓	1,1 - 1,5	3	54	10	7,5
VM502.0150					
↓	1,6 - 2,0	3	54	13	10
VM502.0200					
↓	2,1 - 2,5	3	65	17	12,5
VM502.0250					
↓	2,6 - 2,9	3	65	20	15
VM502.0290					

Production on request. The price is valid for the production of at least 10 pieces.

Recommended cutting conditions on page 39.

Carbide drills 8xD with internal cooling

VS801

- 2 cutting edges, helix 30°, point angle 140°
- clamping shank DIN 6535 HA (plain)

On request:

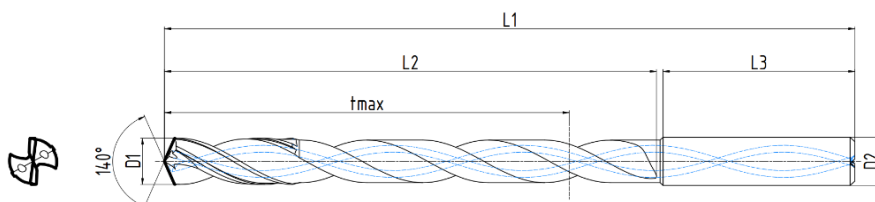
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: (λ 30°)

Coating: AlTiN



Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2	Shank length L3	Max. drilling depth t _{max}	Diameter tolerance m7
VS801.0300							
↓	3,0 - 3,7	6	72	34	36	29	0,004/0,016
VS801.0370							
↓	3,8 - 4,7	6	81	43	36	36	0,004/0,016
VS801.0470							
↓	4,8 - 6,0	6	95	57	36	48	0,004/0,016
VS801.0600							
↓	6,1 - 8,0	8	114	76	36	64	0,006/0,021
VS801.0800							
↓	8,1 - 10,0	10	142	95	40	80	0,006/0,021
VS801.1000							
↓	10,1 - 12,0	12	162	114	45	96	0,007/0,025
VS801.1200							
↓	12,1 - 14,0	14	178	133	45	110	0,007/0,025
VS801.1400							
↓	14,1 - 16,0	16	203	152	48	128	0,007/0,025
VS801.1600							
↓	16,1 - 18,0	18	222	171	48	144	0,007/0,025
VS801.1800							
↓	18,1 - 20,0	20	243	190	50	160	0,008/0,029
VS801.2000							

Production on request. The price is valid for the production of at least 5 pieces.

Recommended cutting conditions on page 39.

Carbide drills 12xD with internal cooling

VS1201

- 2 cutting edges, helix 30°, point angle 140°
- clamping shank DIN 6535 HA (plain)

On request:

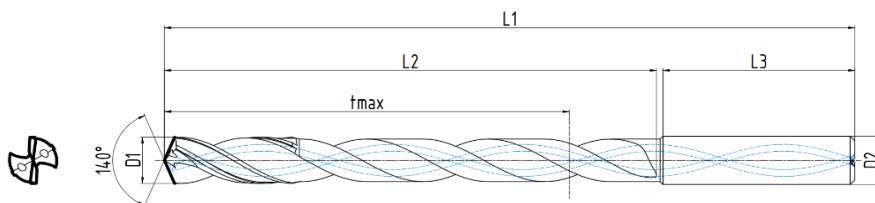
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: (λ 30°)

Coating: AlTiN



Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2	Shank length L3	Max. drilling depth t _{max}	Diameter tolerance m7
VS1201.0300							
↓	3,0 - 3,7	6	92	54	36	48	0,004/0,016
VS1201.0370							
↓	3,8 - 4,7	6	102	64	36	58	0,004/0,016
VS1201.0470							
↓	4,8 - 6,0	6	116	78	36	70	0,004/0,016
VS1201.0600							
↓	6,1 - 8,0	8	146	108	36	94	0,006/0,021
VS1201.0800							
↓	8,1 - 10,0	10	162	120	40	110	0,006/0,021
VS1201.1000							
↓	10,1 - 12,0	12	204	156	45	142	0,007/0,025
VS1201.1200							
↓	12,1 - 14,0	14	230	182	45	166	0,007/0,025
VS1201.1400							
↓	14,1 - 16,0	16	260	208	48	192	0,007/0,025
VS1201.1600							
↓	16,1 - 18,0	18	285	234	48	216	0,007/0,025
VS1201.1800							
↓	18,1 - 20,0	20	310	258	50	240	0,008/0,029
VS1201.2000							

Production on request. The price is valid for the production of at least 5 pieces.

Recommended cutting conditions on page 39.

Carbide drills 4xD for hard materials

VK402

- 2 cutting edges, helix 15°, point angle 140°
- clamping shank DIN 6535 HA (plain)

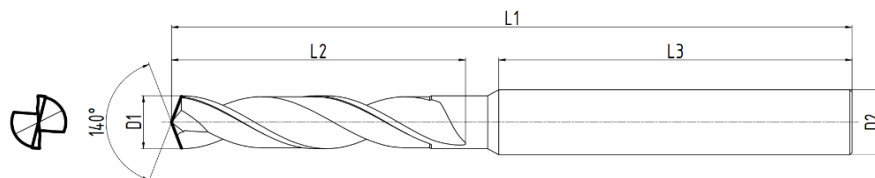
On request:

- clamping shank with weldon
- tapering of the neck

Recommended use: 45 - 65 HRc, hardened steel, cast iron

Geometry: λ 15°

Coating: AlTiSiN



Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Helix length L2	Shank length L3	Diameter tolerance m7
VK402.0200						
↓	2,0 - 2,9	4	54	13	36	0,004/0,016
VK402.0290						
VK402.0300						
↓	3,0 - 3,7	6	65	24	36	0,004/0,016
VK402.0370						
VK402.0380						
↓	3,8 - 4,7	6	74	28	36	0,004/0,016
VK402.0470						
VK402.0480						
↓	4,8 - 6,0	6	82	35	36	0,004/0,016
VK402.0600						
VK402.0610						
↓	6,1 - 8,0	8	91	50	36	0,006/0,021
VK402.0800						
VK402.0810						
↓	8,1 - 10,0	10	103	63	40	0,006/0,021
VK402.1000						
VK402.1010						
↓	10,1 - 12,0	12	118	71	45	0,007/0,025
VK402.1200						
VK402.1210						
↓	12,1 - 14,0	14	124	77	45	0,007/0,025
VK402.1400						
VK402.1410						
↓	14,1 - 16,0	16	133	83	48	0,007/0,025
VK402.1600						

Production on request. The price is valid for the production of at least 5 pieces.

Recommended cutting conditions on page 39.

Carbide chamfer mills

60° and 90° chamfer angle

JS090
JS060

- 4 cutting edges
- clamping shank DIN 6535 HA (plain)

On request:

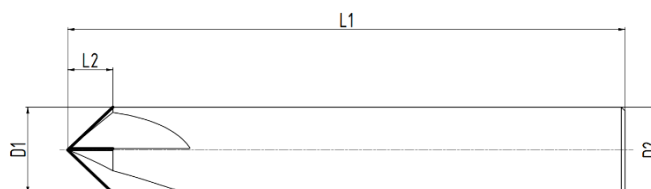
- clamping shank with weldon

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: λ 0°

Coating: AlTiN



Chamfer angle 90°

Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Flute length L2
JS090.030	3	3	50	1,5
JS090.040	4	4	54	2
JS090.050	5	5	54	2,5
JS090.060	6	6	57	3
JS090.080	8	8	59	4
JS090.100	10	10	65	5
JS090.120	12	12	74	6

Chamfer angle 60°

Catalogue number	Diameter D1	Shank diameter D2 h6	Overall length L1	Flute length L2
JS060.030	3	3	50	1,5
JS060.040	4	4	54	2
JS060.050	5	5	54	2,5
JS060.060	6	6	57	3
JS060.080	8	8	59	4
JS060.100	10	10	65	5
JS060.120	12	12	74	6

Carbide chamfer mills front/back deburring tools

OS401
OS402

- 4 cutting edges, 45° front and back chamfer angle
- clamping shank DIN 6535 HA (plain)

On request:

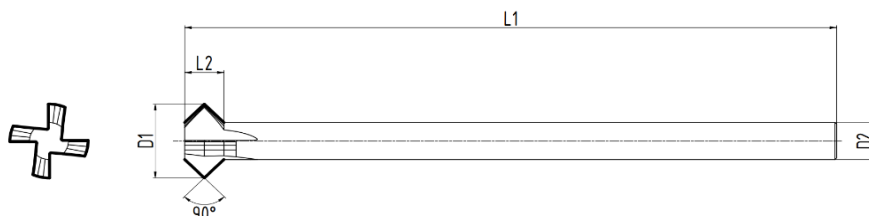
- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: copper, aluminium

Geometry: λ 0°

Coating: AlTiN



Short version

Catalogue number	Diameter D1	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Flute length L2	Neck length L3
OS401.050	5	5	2,9	54	-	25
OS401.060	6	6	3,9	54	-	20,5
OS401.080	8	8	6	82	-	40

Long version

Catalogue number	Diameter D1	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Flute length L2	Neck length L3
OS402.030	3	3	2	75	2	12
OS402.040	4	4	2,9	82	3	17,5
OS402.050	5	5	2,9	100	3	19,5
OS402.060	6	6	3,6	100	4	20,5
OS402.080	8	6	-	100	2	-
OS402.100	10	6	-	100	4	-
OS402.120	12	6	-	100	6	-

Spherical carbide end mills

4 flutes

OS451

- 4 cutting edges
- clamping shank DIN 6535 HA (plain)

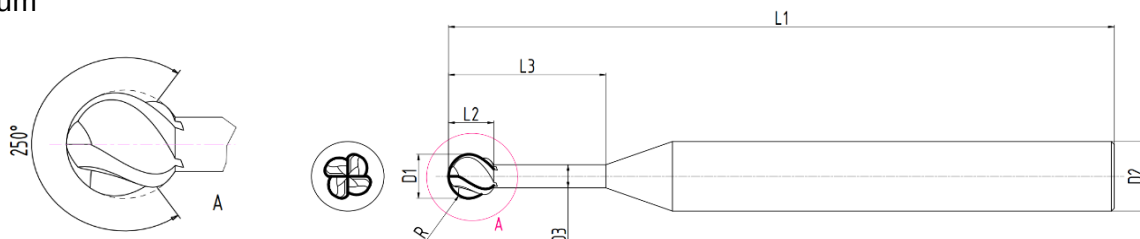
On request:

- clamping shank with weldon
- tapering of the neck

Recommended use: < 55 HRC, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Coating: AlTiN



Catalogue number	Diameter D1 h10	Shank diameter D2 h6	Neck diameter D3	Overall length L1	Neck length L3	Corner radius R
OS451.030	3	3	1,5	60	6	1,5
OS451.040	4	4	2	54	8	2
OS451.050	5	5	2,5	70	10	2,5
OS451.060	6	6	3	80	12	3
OS451.080	8	8	4	80	14	4
OS451.100	10	10	5	100	16	5
OS451.120	12	12	6	125	18	6

Recommended cutting conditions on page 38.

Corner rounding end mills

OC301
OC401

- 3-4 cutting edges
- clamping shank DIN 6535 HA (plain)

On request:

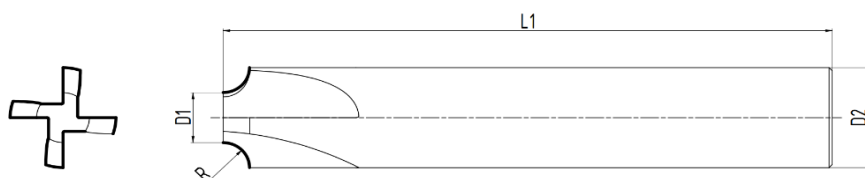
- clamping shank with weldon

Recommended use: < 55 HRc, < 1600 N/mm², steel, stainless steel, cast iron

Applicable: aluminium

Geometry: λ 0°, γ 0°

Coating: AlTiN



Catalogue number	Corner radius R	Shank diameter D2 h6	Overall length L1	Number of cutting edges Z	Diameter D1 h10
OC301.060.050	0,5	6	57	3	5
OC301.060.075	0,75	6	57	3	4,5
OC301.060.080	0,8	6	57	3	4,5
OC401.080.100	1	8	63	4	6
OC401.080.125	1,25	8	63	4	5,5
OC401.080.150	1,5	8	63	4	5
OC401.100.200	2	10	72	4	6
OC401.100.250	2,5	10	72	4	5
OC401.120.300	3	12	82	4	6
OC401.140.350	3,5	14	82	4	7
OC401.160.400	4	16	92	4	8
OC401.160.450	4,5	16	92	4	7
OC401.160.500	5	16	92	4	6
OC401.200.600	6	20	104	4	8
OC401.220.800	8	22	110	4	6
OC401.250.900	9	25	110	4	7

Recommended cutting conditions on page 38.

Carbide thread end mills for metric internal threads ISO

OZ301
OZ401

- 3-4 cutting edges, helix 15°
- clamping shank DIN 6535 HA (plain)
- dimensions M6 - M20 with internal cooling (IC)
- thread depth: max. 1.5xD

On request:

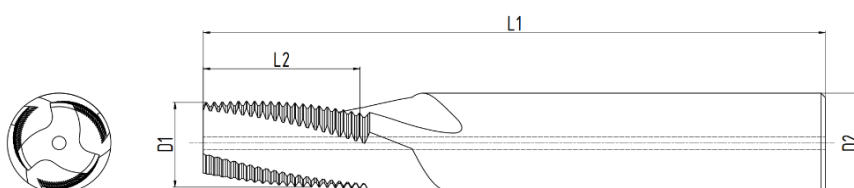
- clamping shank with weldon
- tapering of the neck

Recommended use: < 1300 N/mm², steel, stainless steel, cast iron, non-ferrous metals

Applicable: hardened steels <55 HRC

Geometry: λ 15°

Coating: AlTiN



Catalogue number	Thread	Diameter	Shank diameter	Overall length	Cutting edge length	Number of cutting edges	Thread pitch
		D1 h10	D2 h6	L1	L2	Z	p
OZ301.M4	M4	3,1	6	54	6	3	0,7
OZ301.M5	M5	4	6	54	8	3	0,8
OZ301.M6	M6	4,5	6	54	9	3	1
OZ301.M8	M8	6	8	65	13	3	1,25
OZ301.M10	M10	7,5	10	72	15	3	1,5
OZ401.M12	M12	9	10	72	19	4	1,75
OZ401.M14	M14	10,5	12	82	21	4	2
OZ401.M16	M16	12	12	82	24	4	2
OZ401.M18	M18	13,5	14	92	28	4	2,5
OZ401.M20	M20	15	16	92	30	4	2,5

Calculation of feed correction for milling internal threads

$$V_{cnc} = V_f * \frac{(d_1 - D_2)}{d_1}$$

V_{cnc} = input feed rate (mm/min)

V_f = basic feed rate (mm/min) - see page 38

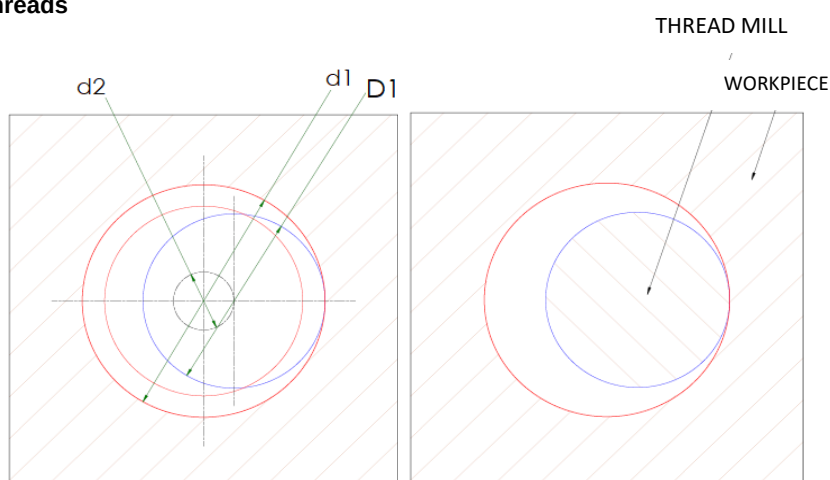
d_1 = large thread diameter (mm)

d_2 = Ø of tool axis trajectory (mm)

$$d_2 = d_1 - D_1$$

D_1 = Ø of the cutting section of the tool (mm)

Recommended running-in the bore: 1/8 to 1/2 revolution.



In addition to these catalogue tools, we also supply
a range of custom-made milling cutters for threading technology.

Special carbide cutting tools

Milling

Our technological capabilities allow us to offer a wide range of milling tools.

We are able to provide customers with a drawing of the required tool as early as the quotation process and help them choose the most suitable machining strategy. Once the tooling is made, our support can continue with technical advice or assistance with production start-up.

Technical functional limits:

- minimum tool diameter 0.2 mm
- maximum diameter of cylindrical shank 40 mm
- maximum tool unloading length from the chuck 350 mm

- trochoidal end mills
- end mills for adaptive machining
- thread end mills
- copy and radius end mills
- end mills with chip breakers
- conical end mills
- shape end mills
- crown end mills
- disc milling cutters
- T-slot cutters
- dovetail end mills
- profile end mills
- modular end mills for gear production
- drilling-milling cutters
- countersinking end mills
- deburring tools
- tapered and angle end mills
- spherical cutters
- multifunctional end mills
- end mills for machining HARDOX
- end mills for machining superalloys
- end mills for machining of graphite
- end mills for wood machining
- end mills for plastics and composites
- engraving end mills and needles



Special carbide cutting tools

Hole machining

We produce special tools for hole machining on request.

In this way, we are able to solve customer problems when it is not possible to use catalogue tools for a given application or when it is appropriate to combine several operations in order to reduce production times.

Simply provide a drawing of the workpiece and our engineering office will design customized tools for you.

Technical functional limits:

- minimum tool diameter 0.2 mm
- maximum diameter of cylindrical shank 40 mm
- maximum tool unloading length from the chuck 350 mm

Drilling & Boring

- micro drills
- step drills
- shape drills
- drills for hardened material
- spot drill bits
- pilot drills
- flat lance drills
- single-edged drills
- drills for deep holes
- combined and multi-purpose tools



Core drilling and reaming

- machine reamers
- drill reamers
- step reamers
- taper reamers
- shape reamers
- reamers with guide



Countersinking

- tapered countersinks
- edge chamfers
- stepped countersinks
- shaped countersinks
- reverse countersinks
- combined tools

Special carbide cutting tools

Indexable cutter bodies for screw-in inserts

Modular cutting tools

We produce to order indexable cutting bodies for replaceable inserts.

Based on the customer's needs, we will prepare a design solution as well as 2D and 3D documentation. The technological solution covers the tool for screw-in inserts according to the client's specifications and also the recommended cutting parameters.

Technical functional limits:

- maximum diameter of cylindrical shank 40 mm
- tapered shank option for HSK, ISO clamping systems (other clamping systems by agreement)
- maximum tool unloading length from the toolholder 200 mm

1. Cutter bodies

Milling

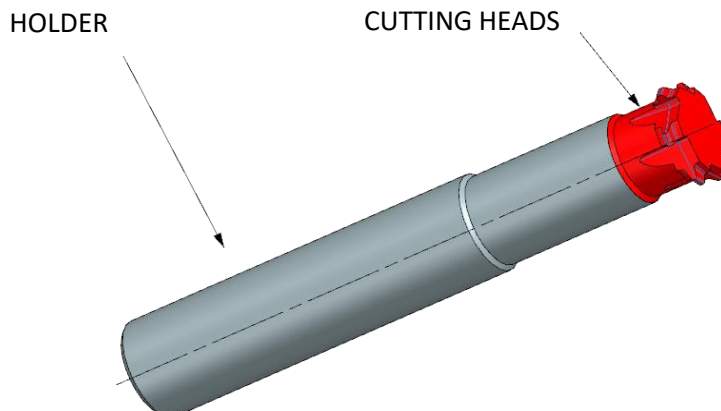
- shank, socket and disc milling tools
- milling tools with internal cooling
- combined milling tools
- tool cartridges

Drilling & Boring

- drills with screw-in inserts in 2D and 3D lengths
- boring step tools
- drills and countersinks with internal cooling
- drills and countersinks fitted with adjustable cartridges
- combined screw-in inserts tools
- special combined tools



2. Modular tools with solid carbide cutting heads



Special carbide cutting tools

Turning, forming and others

The product portfolio of our custom tools is not limited to milling and hole machining, but covers the entire range of machining. Therefore, we can provide customers with almost any tool they need for their applications.

Turning

- turning knives
- modifications of cutting insert
- cartridges for screw-in inserts

Forming

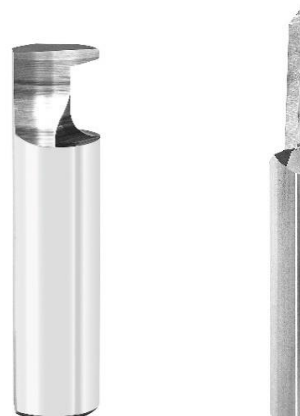
- solid carbide punches
- solid carbide broaches

Engraving, cutting

- engraving needles
- knives for CNC routers

Cooperation

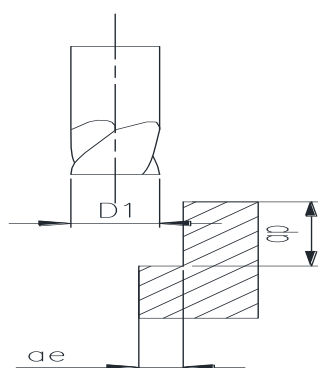
- round grinding
(carbide parts, blanks and tools)
- precision 5-axis machining



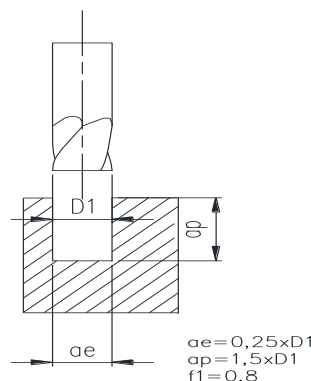
Recommended cutting conditions for carbide end mills

Machined material	Material strength N/mm ²	Cutting speed Vc (m/min)	Feed per tooth fz (mm)				
			Ø 2-3	Ø 4-5	Ø 6-10	Ø 12-16	Ø 20
General construction steels							
Non alloyed steel castings	< 750	160	0,02	0,03	0,04	0,07	0,08
Low alloyed steel castings							
Free cutting steels	< 600	180	0,02	0,04	0,05	0,08	0,12
General construction steels							
Heat resistant steels	< 1100	100	0,02	0,025	0,04	0,07	0,08
Alloyed steel castings							
Castings steels	< 1400	20	0,01	0,01	0,02	0,04	0,05
Inconel							
Nitriding steels	< 950	130	0,02	0,03	0,04	0,07	0,08
Cementation steels							
Tool steels	< 1400	90	0,01	0,01	0,02	0,035	0,05
High speed steels	< 1100	110	0,015	0,02	0,035	0,07	0,08
Heat resistant alloys	< 850	60	0,01	0,015	0,02	0,04	0,05
Hardened steels	< 55 HRC	80	0,015	0,02	0,04	0,07	0,09
Hardened steels	< 70 HRC	65	0,01	0,015	0,02	0,03	0,04
Stainless steels	< 900	80	0,01	0,015	0,02	0,04	0,05
Grey cast iron	< 240 HB	150	0,02	0,03	0,05	0,08	0,12
Malleable cast iron							
Ductile cast iron	< 800 HB	110	0,01	0,02	0,04	0,07	0,1
Alloyed cast iron							
Aluminium alloys <10%Si	< 400	800	0,02	0,03	0,055	0,085	0,12
Aluminium alloys >10%Si	< 600	450	0,01	0,02	0,04	0,06	0,1
Copper	< 500	280	0,01	0,02	0,04	0,07	0,1
Copper alloys	< 700	250	0,01	0,02	0,04	0,07	0,1

ae=0,5xD1
ap=1,5xD1
f1=0,5



ae=D1
ap=0,5xD1
f1=0,5



Cutting speed Vc:

$$Vc = \frac{D1 \times \pi \times n}{1000} \quad \text{m/min}$$

Revolutions n:

$$n = \frac{Vc \times 1000}{D1 \times \pi} \quad \text{ot/min}$$

Rate of feed Vf:

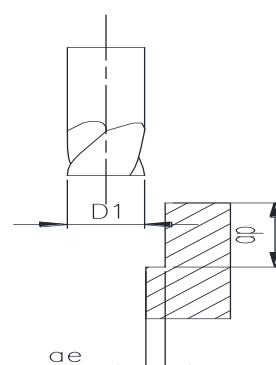
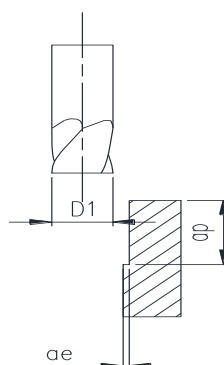
$$Vf = fz \times z \times n \times f1 \quad \text{mm/min}$$

Feed per tooth fz:

$$fz = \frac{Vf}{z \times n} \quad \text{mm}$$

Feed per revolutions f:

$$f = fz \times z \quad \text{mm}$$



Recommended cutting conditions for carbide drills

Machined material	Material strenght N/mm ²	Vc (m/mm) with IC	Vc (m/min) without IC	Rate of feed (mm/ot.)				
				ø 3-4	ø 5-6	ø 7-11	ø 12-16	ø 18-20
General construction steels								
Non alloyed steel castings	<750	115	80	0,14	0,18	0,24	0,29	0,35
Low alloyed steel castings								
Free cutting steels								
General construction steels	<600	150	110	0,16	0,23	0,29	0,35	0,42
Heat resistant steels								
Alloyed steel castings	<1100	75	60	0,11	0,13	0,16	0,21	0,25
Castings steels								
Inconel	<1400	55	50	0,1	0,15	0,19	0,23	0,26
Nitriding steels								
Cementation steels	<950	70	50	0,08	0,11	0,16	0,18	0,22
Tool steels	<1400	55	40	0,1	0,12	0,16	0,2	0,24
High speed steels	<1100	65	45	0,09	0,11	0,15	0,18	0,22
Heat resistant alloys	<850	35	30	0,06	0,08	0,1	0,12	0,15
Hardened steels	<55 HRC	60	50	0,06	0,08	0,11	0,14	0,17
Stainless steels	<900	45	35	0,08	0,11	0,15	0,19	0,22
Grey cast iron								
Malleable cast iron	<240 HB	90	80	0,14	0,19	0,24	0,3	0,35
Ductile cast iron								
Alloyed cast iron	<800 HB	55	45	0,15	0,2	0,25	0,33	0,39
Aluminium alloys <10%Si	<400	300	250	0,16	0,21	0,25	0,31	0,35
Aluminium alloys >10%Si	<600	300	250	0,17	0,25	0,3	0,35	0,42
Copper	<500	220	100	0,15	0,22	0,26	0,32	0,37
Copper alloys	<700	200	100	0,13	0,18	0,23	0,27	0,32

Cutting speed Vc:

$$Vc = \frac{D1 \cdot \pi \cdot n}{1000} \quad \text{m/min}$$

Revolutions n:

$$n = \frac{Vc \times 1000}{D1 \times \pi} \quad \text{ot/min}$$

Rate of feed Vf:

$$Vf = fz \times z \times n \times f1 \quad \text{mm/min}$$

Feed per tooth fz:

$$fz = \frac{Vf}{z \times n} \quad \text{mm}$$

Feed per revolutions f:

$$f = fz \times z \quad \text{mm}$$

Notes

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