



Pilana

Mills

Drills



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✓ in stock

* production on request

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✓ in stock
✱ production on request

CARBIDE END MILLS

2 TEETH

OR201

OR202

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron | copper

Applicable:

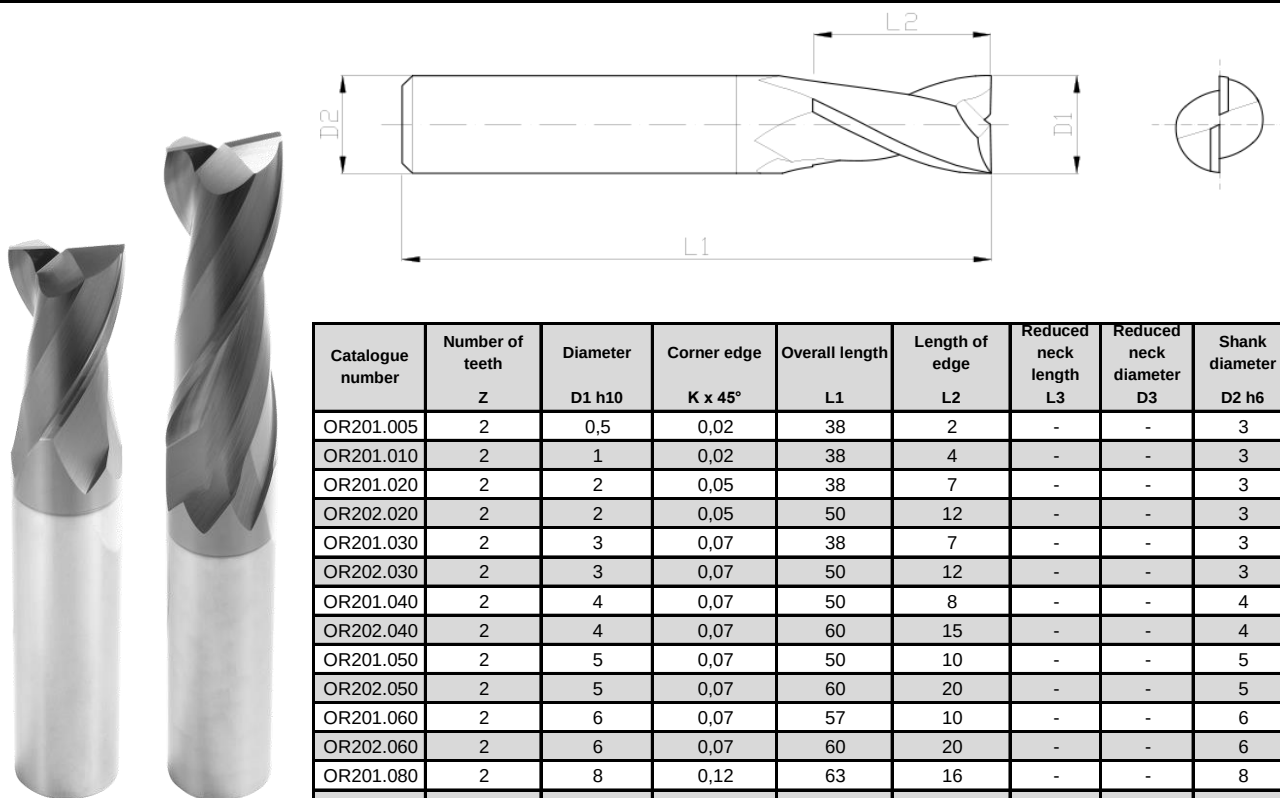
aluminium

Coating:

AlTiN

Geometry:

λ 30°, γ 8°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR201.005	2	0,5	0,02	38	2	-	-	3
OR201.010	2	1	0,02	38	4	-	-	3
OR201.020	2	2	0,05	38	7	-	-	3
OR202.020	2	2	0,05	50	12	-	-	3
OR201.030	2	3	0,07	38	7	-	-	3
OR202.030	2	3	0,07	50	12	-	-	3
OR201.040	2	4	0,07	50	8	-	-	4
OR202.040	2	4	0,07	60	15	-	-	4
OR201.050	2	5	0,07	50	10	-	-	5
OR202.050	2	5	0,07	60	20	-	-	5
OR201.060	2	6	0,07	57	10	-	-	6
OR202.060	2	6	0,07	60	20	-	-	6
OR201.080	2	8	0,12	63	16	-	-	8
OR202.080	2	8	0,12	70	25	-	-	8
OR201.100	2	10	0,2	72	19	-	-	10
OR202.100	2	10	0,2	110	30	-	-	10
OR201.120	2	12	0,2	83	22	-	-	12
OR202.120	2	12	0,2	110	30	-	-	12
OR201.140	2	14	0,2	83	22	-	-	14
OR202.140	2	14	0,2	110	40	-	-	14
OR201.160	2	16	0,2	92	26	-	-	16
OR202.160	2	16	0,2	110	50	-	-	16
OR201.180	2	18	0,2	92	26	-	-	18
OR202.180	2	18	0,2	110	50	-	-	18
OR201.200	2	20	0,3	104	32	-	-	20
OR202.200	2	20	0,3	110	55	-	-	20

Cutting conditions on page 35.

CARBIDE END MILLS

3 TEETH

OR301

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron | copper

Applicable:

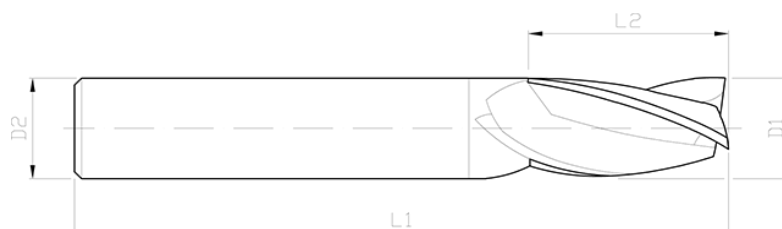
aluminium

Coating:

AlTiN

Geometry:

$\lambda 30^\circ, \gamma 8^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR301.030	3	3	0,07	38	7	-	-	3
OR301.040	3	4	0,07	50	8	-	-	4
OR301.050	3	5	0,07	50	10	-	-	5
OR301.060	3	6	0,07	57	10	-	-	6
OR301.080	3	8	0,12	63	16	-	-	8
OR301.100	3	10	0,2	72	19	-	-	10
OR301.120	3	12	0,2	83	22	-	-	12
OR301.140	3	14	0,2	83	22	-	-	14
OR301.160	3	16	0,2	92	26	-	-	16
OR301.180	3	18	0,2	92	26	-	-	18
OR301.200	3	20	0,3	104	32	-	-	20

Cutting conditions on page 35.

CARBIDE END MILLS

4 TEETH

OR401

OR402

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron | copper

Applicable:

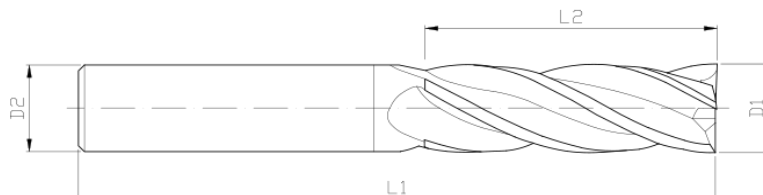
aluminium

Coating:

AlTiN

Geometry:

λ 30°, γ 8°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR401.030	4	3	0,07	38	10	-	-	3
OR402.030	4	3	0,07	65	20	-	-	3
OR401.040	4	4	0,07	50	11	-	-	4
OR402.040	4	4	0,07	65	25	-	-	4
OR401.050	4	5	0,07	50	13	-	-	5
OR402.050	4	5	0,07	70	30	-	-	5
OR401.060	4	6	0,07	57	13	-	-	6
OR402.060	4	6	0,07	70	30	-	-	6
OR401.080	4	8	0,12	63	19	-	-	8
OR402.080	4	8	0,12	100	40	-	-	8
OR401.100	4	10	0,2	72	22	-	-	10
OR402.100	4	10	0,2	110	40	-	-	10
OR401.120	4	12	0,2	83	26	-	-	12
OR402.120	4	12	0,2	110	45	-	-	12
OR401.140	4	14	0,2	83	26	-	-	14
OR402.140	4	14	0,2	110	45	-	-	14
OR401.160	4	16	0,2	92	32	-	-	16
OR402.160	4	16	0,2	124	65	-	-	16
OR401.180	4	18	0,2	92	32	-	-	18
OR402.180	4	18	0,2	124	65	-	-	18
OR401.200	4	20	0,3	104	38	-	-	20
OR402.200	4	20	0,3	150	65	-	-	20
OR402.250	4	25	0,3	165	80	-	-	25

Cutting conditions on page 35.

CARBIDE END MILLS

4 TEETH WITH HELIX 45°

OR452

Recommended for use:

< 60 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

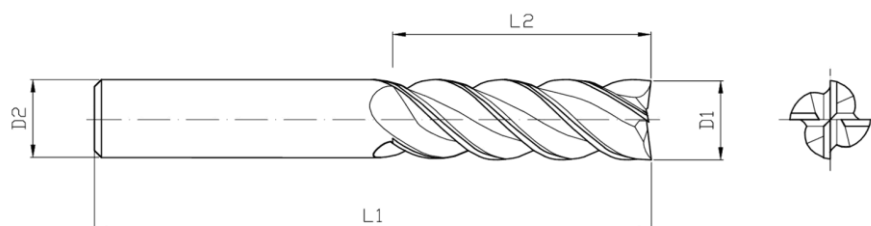
aluminium

Coating:

AlCrN

Geometry:

λ 45°, γ 8°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR452.040	4	4	0,07	50	10	-	-	4
OR452.060	4	6	0,07	62	18	-	-	6
OR452.080	4	8	0,12	70	24	-	-	8
OR452.100	4	10	0,2	80	30	-	-	10
OR452.120	4	12	0,2	90	36	-	-	12
OR452.140	4	14	0,2	100	42	-	-	14
OR452.160	4	16	0,2	110	48	-	-	16
OR452.200	4	20	0,3	124	65	-	-	20

Cutting conditions on page 35.

CARBIDE END MILLS

FOR HIGH SPEED CUTTING 4 TEETH

HSC401

Recommended for use:

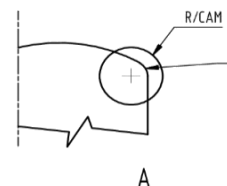
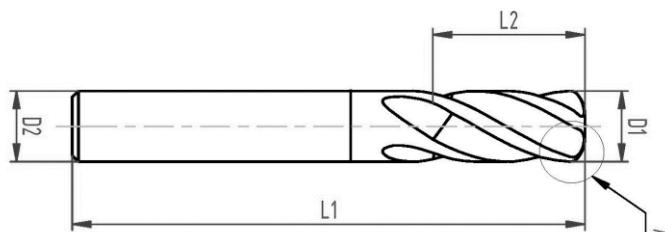
< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Coating:

AlTiN

Geometry:

$\lambda 45^\circ \gamma 4^\circ$



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

OR411

Recommended for use:

< 60 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

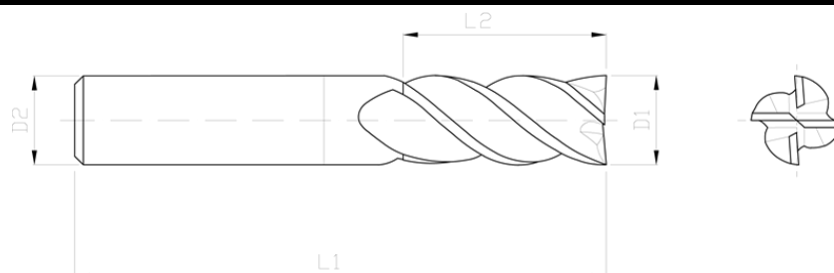
aluminium

Coating:

AlCrN

Geometry:

λ 35°/38°, γ 8°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR411.020	4	2	0,05	50	5	-	-	4
OR411.030	4	3	0,07	57	8	-	-	6
OR411.040	4	4	0,07	57	12	-	-	6
OR411.050	4	5	0,07	57	13	-	-	6
OR411.060	4	6	0,07	57	15	-	-	6
OR411.080	4	8	0,12	63	19	-	-	8
OR411.100	4	10	0,2	72	24	-	-	10
OR411.120	4	12	0,2	83	28	-	-	12
OR411.140	4	14	0,2	83	28	-	-	14
OR411.160	4	16	0,2	92	35	-	-	16
OR411.200	4	20	0,3	110	42	-	-	20
OR411.250	4	25	0,3	125	55	-	-	25

Cutting conditions on page 35.

CARBIDE END MILLS 4 TEETH WITH DOUBLE HELIX - INOX

NR411

Recommended for use:

stainless steels | < 55 HRc | < 1600 N/mm²

Applicable:

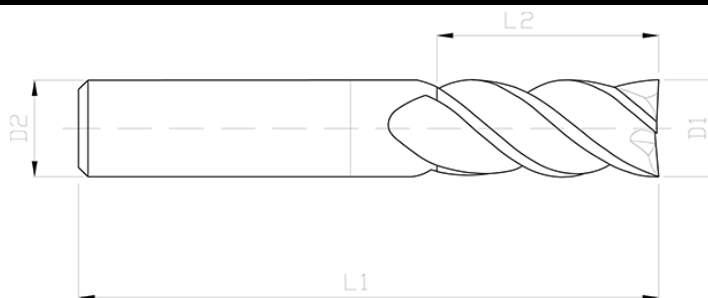
copper, aluminium

Coating:

AlCrN

Geometry:

λ 38°/40°, γ 12°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
NR411.030	4	3	0,07	57	10	-	-	6
NR411.040	4	4	0,07	57	12	-	-	6
NR411.050	4	5	0,07	57	15	-	-	6
NR411.060	4	6	0,07	57	17	-	-	6
NR411.080	4	8	0,12	63	21	-	-	8
NR411.100	4	10	0,2	72	26	-	-	10
NR411.120	4	12	0,2	83	31	-	-	12
NR411.160	4	16	0,2	92	35	-	-	16
NR411.200	4	20	0,3	110	42	-	-	20

Cutting conditions on page 35.

CARBIDE END MILLS 3 TEETH WITH TRIPLE HELIX FOR ALUMINIUM

AR311

Recommended for use:

aluminium and its alloys | copper | plastics

Applicable:

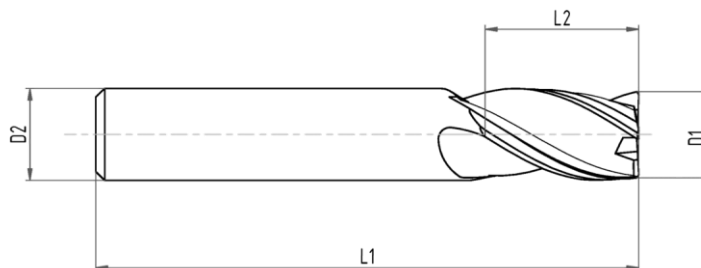
< 55 HRc

Coating:

without coating

Geometry:

λ 38°/40°, γ 15°



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
AR311.030	3	3	0,07	57	10	-	-	6
AR311.040	3	4	0,07	57	12	-	-	6
AR311.050	3	5	0,07	57	13	-	-	6
AR311.060	3	6	0,07	57	15	-	-	6
AR311.080	3	8	0,12	63	19	-	-	8
AR311.100	3	10	0,2	72	24	-	-	10
AR311.120	3	12	0,2	83	28	-	-	12
AR311.160	3	16	0,2	92	35	-	-	16
AR311.200	3	20	0,3	110	42	-	-	20

Cutting conditions on page 35.

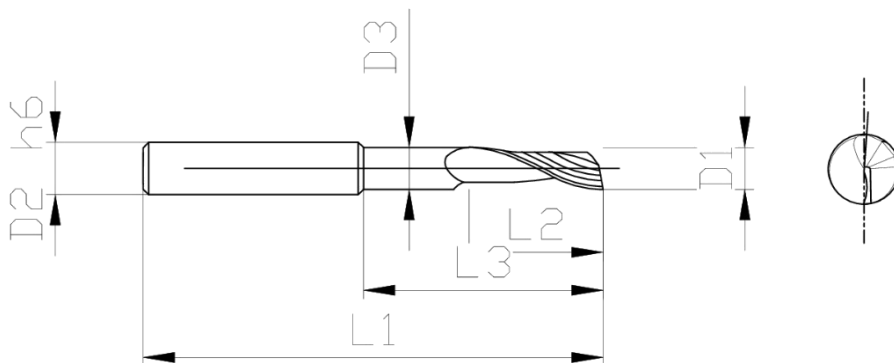
CARBIDE END MILLS 1 TEETH

AR101
AR102

Recommended for use:
aluminium and its alloys | plastics

Coating:
without coating

Geometry:
 $\lambda 25^\circ, \gamma 20^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
✓ AR101.030	1	3	-	54	15	-	-	6
* AR102.030	1	3	-	100	15	-	-	6
✓ AR101.040	1	4	-	54	15	-	-	6
* AR102.040	1	4	-	100	15	-	-	6
✓ AR101.050	1	5	-	54	17	-	-	6
* AR102.050	1	5	-	100	17	-	-	6
✓ AR101.060	1	6	-	60	20	-	-	6
* AR102.060	1	6	-	100	20	-	-	6
✓ AR101.080	1	8	-	63	22	-	-	8
* AR102.080	1	8	-	100	22	-	-	8
✓ AR101.100	1	10	-	72	25	-	-	10
* AR102.100	1	10	-	100	25	-	-	10
✓ AR101.120	1	12	-	83	30	-	-	12
* AR102.120	1	12	-	100	35	-	-	12
* AR101.140	1	14	-	92	30	-	-	14
* AR102.140	1	14	-	100	35	-	-	14
* AR101.160	1	16	-	92	35	-	-	16
* AR102.160	1	16	-	110	40	-	-	16

Pozn.:



on stock



production on request - the price is valid for the production of at least 5 pieces

Cutting conditions on page 35.

CARBIDE END MILLS

ROUGHING 4 TEETH

OH401

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

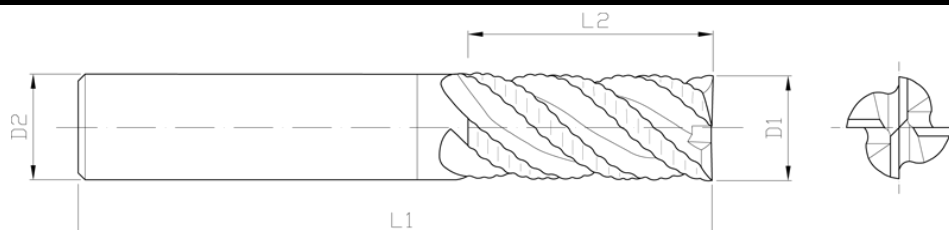
aluminium

Coating:

AlCrN

Geometry:

NR profile, λ 40°, γ 7°



Catalogue number	Number of teeth Z	Diameter D1 h11	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OH401.050	4	5	0,15	57	13	-	-	6
OH401.060	4	6	0,15	57	13	-	-	6
OH401.080	4	8	0,2	63	19	-	-	8
OH401.100	4	10	0,2	72	22	-	-	10
OH401.120	4	12	0,25	83	26	-	-	12
OH401.160	4	16	0,35	92	32	-	-	16
OH401.200	4	20	0,4	104	42	-	-	20

Cutting conditions on page 35.

CARBIDE END MILLS

ROUGHING-FINISHING 4 TEETH

RF401

Recommended for use:

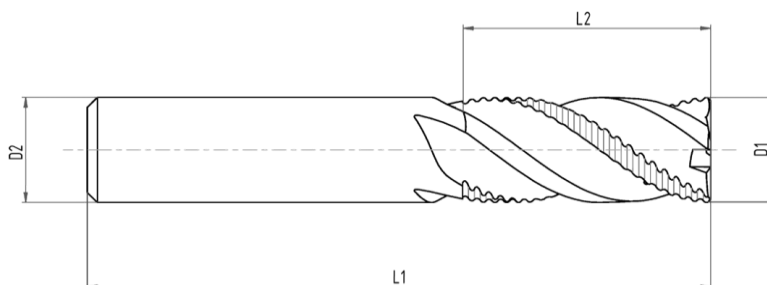
< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Coating:

AlTiN

Geometry:

NR profile, λ 40°, γ 8°



Catalogue number	Number of teeth Z	Diameter D1 h11	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
RF401.060	4	6	0,15	57	15	-	-	6
RF401.080	4	8	0,2	63	22	-	-	8
RF401.100	4	10	0,2	72	26	-	-	10
RF401.120	4	12	0,25	83	30	-	-	12
RF401.160	4	16	0,35	92	36	-	-	16
RF401.200	4	20	0,4	104	42	-	-	20

NEW
RF401

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

i The prices are valid for year 2020.

Higher performance (V_c, f_z) compared to carbide end mills OH401 about 30%.

Leaving a clean surface (Ra 1,6 ÷ 3,2).

CARBIDE END MILLS

ROUGHING-FINISHING 4 TEETH

WITH INTERNAL COOLING

RF401-IK

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels

Applicable:

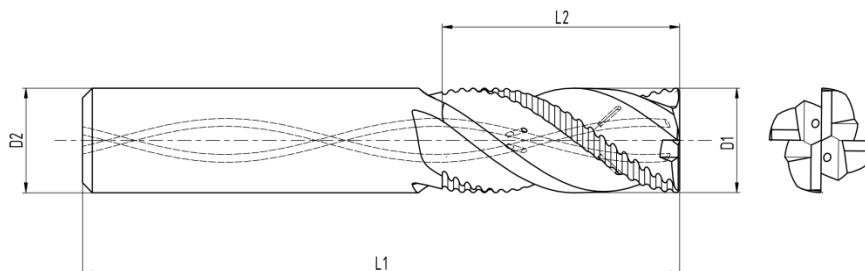
inconel | heat resistant steels

Coating:

AlTiN

Geometry:

NR profile, λ 40°, γ 10°



Catalogue number	Number of teeth Z	Diameter D1 h11	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
RF401.060 IK	4	6	0,15	57	15	-	-	6
RF401.080 IK	4	8	0,2	63	22	-	-	8
RF401.100 IK	4	10	0,2	72	26	-	-	10
RF401.120 IK	4	12	0,25	83	30	-	-	12
RF401.160 IK	4	16	0,35	92	36	-	-	16
RF401.200 IK	4	20	0,4	104	42	-	-	20

NEW

RF401-IK

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

i The prices are valid for year 2020.

Higher performance (V_c, f_z) compared to carbide end mills OH401 about 30%.

Leaving a clean surface (Ra 1,6 ÷ 3,2).

CARBIDE END MILLS

FINISHING

OR601
OR602

Recommended for use:

< 60 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

aluminium

Coating:

AlCrN

Geometry:

$\lambda 45^\circ, \gamma 7^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h10	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OR601.050	6	5	0,02	54	13	-	-	5
OR601.060	6	6	0,03	57	13	-	-	6
OR602.060	6	6	0,03	70	26	-	-	6
OR601.080	6	8	0,04	63	19	-	-	8
OR602.080	6	8	0,04	90	36	-	-	8
OR601.100	6	10	0,05	72	22	-	-	10
OR602.100	6	10	0,05	100	46	-	-	10
OR601.120	6	12	0,05	83	26	-	-	12
OR602.120	6	12	0,05	110	56	-	-	12
OR601.160	6	16	0,06	92	32	-	-	16
OR602.160	6	16	0,06	130	66	-	-	16
OR601.180	6	18	0,06	92	32	-	-	18
OR801.200	8	20	0,07	104	38	-	-	20
OR802.200	8	20	0,07	140	76	-	-	20
OR1001.250	10	25	0,08	121	50	-	-	25
OR1002.250	10	25	0,08	180	92	-	-	25

Cutting conditions on page 35.

CARBIDE FINISHING END MILLS

FOR HARD MATERIALS

KR

Recommended for use:

< 65 HRc | hardened steel | stainless steels | cast iron

Applicable:

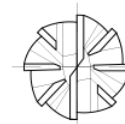
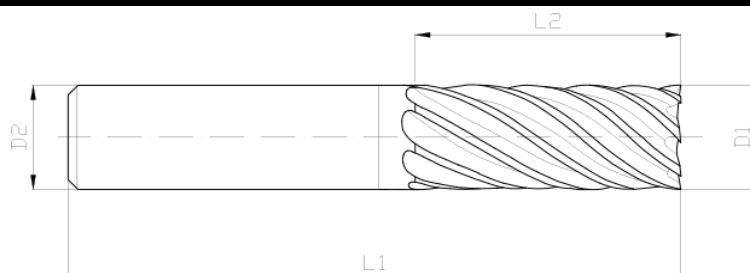
< 55 HRc

Coating:

AlCrN

Geometry:

λ 30° – 45°, γ 0°



Catalogue number	Number of teeth Z	Diameter D1 e8	Corner edge K x 45°	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
KR401.030	4	3	0,02	57	12	-	-	6
KR401.040	4	4	0,02	57	13	-	-	6
KR601.050	6	5	0,02	57	15	-	-	6
KR601.060	6	6	0,03	57	16	-	-	6
KR601.080	6	8	0,04	70	22	-	-	8
KR601.100	6	10	0,05	72	25	-	-	10
KR601.120	6	12	0,05	83	28	-	-	12
KR601.140	6	14	0,06	83	30	-	-	14
KR801.160	8	16	0,06	92	35	-	-	16
KR1001.200	10	20	0,07	104	40	-	-	20
KR1002.200	10	20	0,07	135	70	85	19,8	20
KR1202.250	12	25	0,07	186	55	132	24	25

Cutting conditions on page 35.

CARBIDE BALL-NOSE END MILLS

2 TEETH

OK201
OK202

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

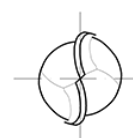
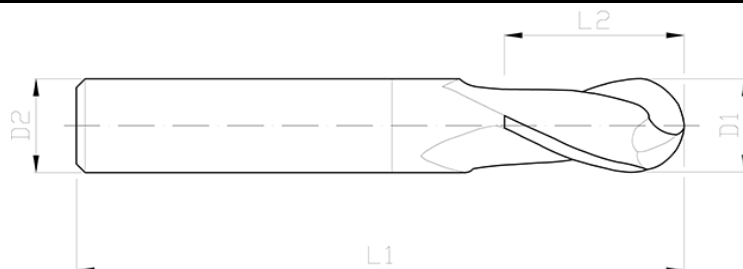
aluminium

Coating:

AlTiN

Geometry:

$\lambda 30^\circ, \gamma 8^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h8	Corner radius R 0/-0,02	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OK201.010	2	1	0,5	38	3	-	-	3
OK201.020	2	2	1	38	5	-	-	3
OK201.030	2	3	1,5	38	7	-	-	3
OK202.030	2	3	1,5	60	8	-	-	3
OK201.040	2	4	2	50	8	-	-	4
OK202.040	2	4	2	70	8	-	-	4
OK201.050	2	5	2,5	50	10	-	-	5
OK202.050	2	5	2,5	80	10	-	-	5
OK201.060	2	6	3	57	10	-	-	6
OK202.060	2	6	3	90	12	-	-	6
OK201.080	2	8	4	63	16	-	-	8
OK202.080	2	8	4	110	14	-	-	8
OK201.100	2	10	5	72	19	-	-	10
OK202.100	2	10	5	110	18	-	-	10
OK201.120	2	12	6	83	22	-	-	12
OK202.120	2	12	6	110	22	-	-	12
OK201.140	2	14	7	83	22	-	-	14
OK202.140	2	14	7	110	26	-	-	14
OK201.160	2	16	8	92	26	-	-	16
OK202.160	2	16	8	140	30	-	-	16
OK201.180	2	18	9	92	26	-	-	18
OK201.200	2	20	10	104	32	-	-	20
OK202.200	2	20	10	160	38	-	-	20

Cutting conditions on page 35.

CARBIDE BALL-NOSE END MILLS

4 TEETH

OK401
OK402

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

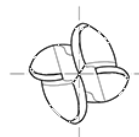
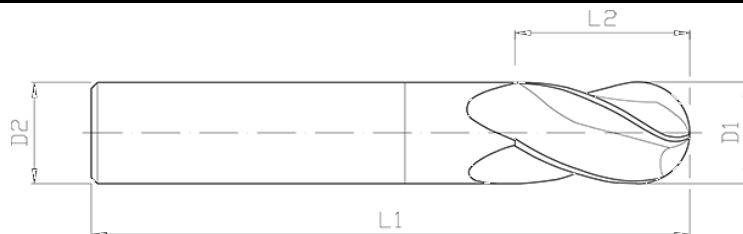
aluminium

Coating:

AlTiN

Geometry:

$\lambda 30^\circ, \gamma 8^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h8	Corner radius R 0/-0,02	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OK401.030	4	3	1,5	38	7	-	-	3
OK402.030	4	3	1,5	60	8	-	-	3
OK401.040	4	4	2	50	8	-	-	4
OK402.040	4	4	2	70	8	-	-	4
OK401.050	4	5	2,5	50	10	-	-	5
OK402.050	4	5	2,5	80	10	-	-	5
OK401.060	4	6	3	57	10	-	-	6
OK402.060	4	6	3	90	12	-	-	6
OK401.080	4	8	4	63	16	-	-	8
OK402.080	4	8	4	110	14	-	-	8
OK401.100	4	10	5	72	19	-	-	10
OK402.100	4	10	5	110	18	-	-	10
OK401.120	4	12	6	83	22	-	-	12
OK402.120	4	12	6	110	22	-	-	12
OK401.140	4	14	7	83	22	-	-	14
OK402.140	4	14	7	110	26	-	-	14
OK401.160	4	16	8	92	26	-	-	16
OK402.160	4	16	8	140	30	-	-	16
OK401.180	4	18	9	92	26	-	-	18
OK401.200	4	20	10	104	32	-	-	20
OK402.200	4	20	10	160	38	-	-	20

Cutting conditions on page 35.

CARBIDE BALL-NOSE END MILLS FOR HARD MATERIALS

KK201
KK202

Recommended for use:

< 65 HRC | hardened steel | stainless steels | cast iron

Applicable:

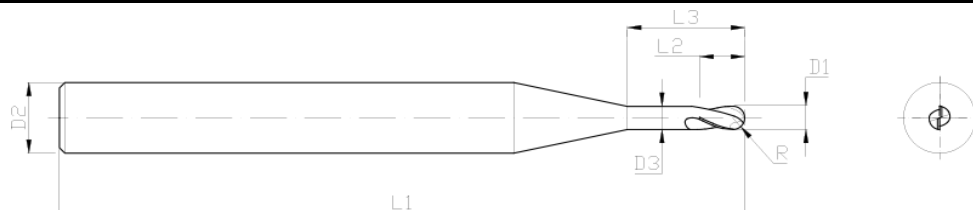
< 55 HRC

Coating:

AlCrN

Geometry:

$\lambda 20^\circ, \gamma 0^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h8	Corner radius R 0/-0,02	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
KK201.010	2	1	0,5	57	2	3	0,95	6
KK201.015	2	1,5	0,75	57	2,5	4,5	1,45	6
KK201.020	2	2	1	57	3	7	1,9	6
KK202.020	2	2	1	70	3	17	1,9	6
KK201.030	2	3	1,5	57	4	8	2,8	6
KK202.030	2	3	1,5	70	4	18	2,8	6
KK201.040	2	4	2	57	5	14	3,8	6
KK202.040	2	4	2	80	5	19	3,8	6
KK201.050	2	5	2,5	57	6	21	4,8	6
KK202.050	2	5	2,5	80	6	44	4,8	6
KK201.060	2	6	3	57	7	21	5,8	6
KK202.060	2	6	3	80	7	44	5,8	6
KK201.080	2	8	4	63	9	27	7,6	8
KK202.080	2	8	4	90	9	54	7,6	8
KK201.100	2	10	5	72	11	32	9,6	10
KK202.100	2	10	5	100	11	60	9,6	10
KK201.120	2	12	6	83	13	38	11,5	12
KK202.120	2	12	6	110	13	65	11,5	12
KK401.160	4	16	8	92	17	44	15,5	16
KK402.160	4	16	8	130	17	82	15,5	16

Cutting conditions on page 35.

CARBIDE BALL-NOSE END MILLS FOR EXTRA HARD MATERIALS

KK251
KK252

Recommended for use:

< 70 HRC | hardened steel

Applicable:

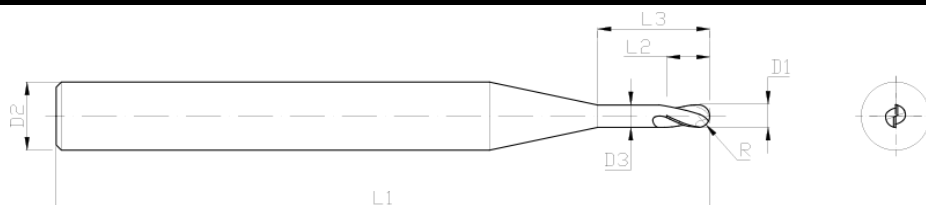
cast iron

Coating:

AlCrN

Geometry:

$\lambda 20^\circ, \gamma -2^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h8	Corner radius R 0/-0,02	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h5
KK251.020	2	2	1	57	2	7	1,9	6
KK252.020	2	2	1	70	2	17	1,9	6
KK251.030	2	3	1,5	57	3	8	2,8	6
KK252.030	2	3	1,5	70	3	18	2,8	6
KK251.040	2	4	2	57	4	14	3,8	6
KK252.040	2	4	2	80	4	19	3,8	6
KK251.050	2	5	2,5	57	5	21	4,8	6
KK252.050	2	5	2,5	80	5	44	4,8	6
KK251.060	2	6	3	57	6	21	5,8	6
KK252.060	2	6	3	80	6	44	5,8	6
KK251.080	2	8	4	63	8	27	7,6	8
KK252.080	2	8	4	90	8	54	7,6	8
KK251.100	2	10	5	72	10	32	9,6	10
KK252.100	2	10	5	100	10	60	9,6	10
KK251.120	2	12	6	83	12	38	11,5	12
KK252.120	2	12	6	110	12	65	11,5	12
KK451.160	4	16	8	92	16	44	15,5	16
KK452.160	4	16	8	130	16	82	15,5	16

Cutting conditions on page 35.

CARBIDE END MILLS WITH CORNER RADIUS

4 TEETH

KT401

KT402

Recommended for use:

< 65 HRC | hardened steel | stainless steels | cast iron

Applicable:

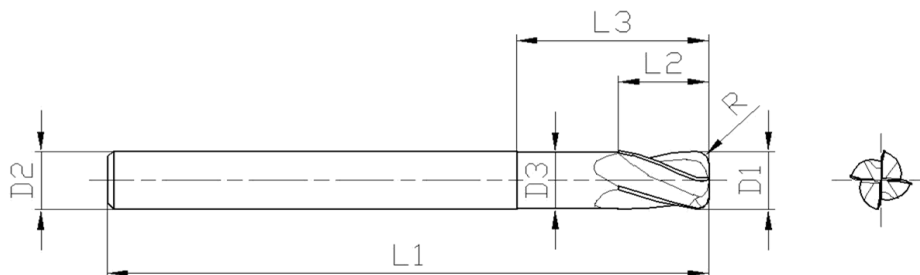
< 55 HRC

Coating:

AlCrN

Geometry:

$\lambda 30^\circ, \gamma 4^\circ$



Catalogue number	Number of teeth Z	Diameter D1 h8	Corner radius R 0/-0,02	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
KT401.030.03	4	3	0,3	57	4	14	2,9	6
KT401.030.05	4	3	0,5	57	4	14	2,9	6
KT401.040.03	4	4	0,3	57	4	14,5	3,8	6
KT402.040.03	4	4	0,3	80	4	16	3,8	6
KT401.040.05	4	4	0,5	57	4	14,5	3,8	6
KT402.040.05	4	4	0,5	80	4	16	3,8	6
KT401.050.05	4	5	0,5	57	6	14,5	3,8	6
KT401.060.05	4	6	0,5	57	6	21	5,8	6
KT402.060.05	4	6	0,5	90	9	21	5,8	6
KT401.060.10	4	6	1	57	6	21	5,8	6
KT402.060.10	4	6	1	90	9	21	5,8	6
KT401.060.15	4	6	1,5	57	6	21	5,8	6
KT401.080.05	4	8	0,5	63	8	27	7,6	8
KT402.080.05	4	8	0,5	100	12	27	7,6	8
KT401.080.10	4	8	1	63	8	27	7,6	8
KT402.080.10	4	8	1	100	12	27	7,6	8
KT401.080.20	4	8	2	63	8	27	7,6	8
KT401.100.05	4	10	0,5	72	10	32	9,6	10
KT402.100.05	4	10	0,5	100	15	32	9,6	10
KT401.100.10	4	10	1	72	10	32	9,6	10
KT402.100.10	4	10	1	100	15	32	9,6	10
KT401.100.20	4	10	2	72	10	32	9,6	10
KT402.100.20	4	10	2	100	15	32	9,6	10
KT401.120.05	4	12	0,5	83	12	38	11,5	12
KT402.120.05	4	12	0,5	110	18	38	11,5	12
KT401.120.10	4	12	1	83	12	38	11,5	12
KT402.120.10	4	12	1	110	18	38	11,5	12
KT401.120.15	4	12	1,5	83	12	38	11,5	12
KT401.120.20	4	12	2	83	12	38	11,5	12
KT402.120.20	4	12	2	110	18	38	11,5	12
KT401.120.30	4	12	3	83	12	38	11,5	12
KT401.160.10	4	16	1	92	16	44	15,5	16
KT401.160.15	4	16	1,5	92	16	44	15,5	16
KT401.160.20	4	16	2	92	16	44	15,5	16

Cutting conditions on page 35.

CARBIDE NC SPOT DRILLS

NC090

NC120

Recommended for use:

< 55 HRc | < 1600 N/mm² | hardened steel | stainless steels | cast iron

Applicable:

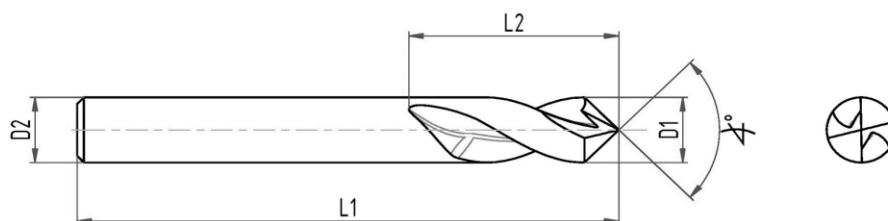
copper, aluminium

Coating:

AlTiN

Geometry:

λ 30°



Catalogue number	Number of teeth Z	Diameter D1	λ	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
NC090.030	2	3	90	40	8	-	-	3
NC120.030	2	3	120	40	8	-	-	3
NC090.040	2	4	90	50	10	-	-	4
NC120.040	2	4	120	50	10	-	-	4
NC090.050	2	5	90	50	13	-	-	5
NC120.050	2	5	120	50	13	-	-	5
NC090.060	2	6	90	57	13	-	-	6
NC120.060	2	6	120	57	13	-	-	6
NC090.080	2	8	90	63	23	-	-	8
NC120.080	2	8	120	63	23	-	-	8
NC090.100	2	10	90	72	24	-	-	10
NC120.100	2	10	120	72	24	-	-	10
NC090.120	2	12	90	82	24	-	-	12
NC120.120	2	12	120	82	24	-	-	12
NC090.140	2	14	90	82	26	-	-	14
NC120.140	2	14	120	82	26	-	-	14
NC090.160	2	16	90	82	29	-	-	16
NC120.160	2	16	120	82	29	-	-	16
NC090.200	2	20	90	110	35	-	-	20
NC120.200	2	20	120	110	35	-	-	20

CARBIDE DRILLS 3xD WITHOUT INTERNAL COOLING

VS302

Recommended for use:

< 55 HRc | < 1600 N/mm² | hardened steel | stainless steels | cast iron

Applicable:

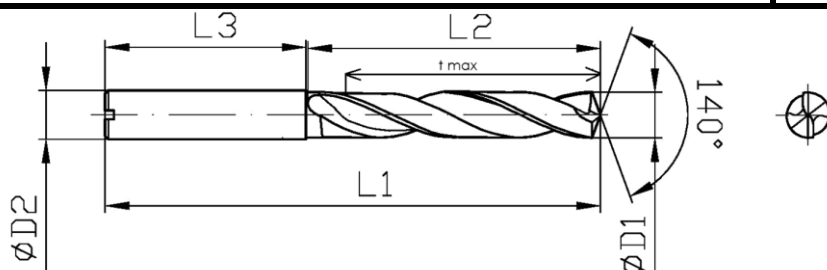
copper, aluminium

Coating:

AlTiN

Geometry:

λ 30°



Catalogue number	Diameter D1	Overall length L1	Length of helix L2	Length of shank L3	Max. drilling depth t _{max}	Diameter tolerance m7	Shank diameter D2 h6
VS302.0300 ↓ VS302.0370	3,0 - 3,7	62	20	36	14	0,004/0,016	6
VS302.0380 ↓ VS302.0470	3,8 - 4,7	66	24	36	17	0,004/0,016	6
VS302.0480 ↓ VS302.0600	4,8 - 6,0	66	28	36	20	0,004/0,016	6
VS302.0610 ↓ VS302.0700	6,1 - 7,0	79	34	36	24	0,006/0,021	8
VS302.0710 ↓ VS302.0800	7,1 - 8,0	79	41	36	29	0,006/0,021	8
VS302.0810 ↓ VS302.1000	8,1 - 10,0	89	47	40	35	0,006/0,021	10
VS302.1010 ↓ VS302.1200	10,1 - 12,0	102	55	45	40	0,007/0,025	12
VS302.1215 ↓ VS302.1400	12,1 - 14,0	107	60	45	43	0,007/0,025	14
VS302.1420 ↓ VS302.1600	14,1 - 16,0	115	65	48	45	0,007/0,025	16
VS302.1605 ↓ VS302.1800	16,1 - 18,0	123	73	48	51	0,007/0,025	18
VS302.1850 ↓ VS302.2000	18,1 - 20,0	131	79	50	55	0,008/0,029	20

Production on request.

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

Cutting conditions on page 36.

CARBIDE DRILLS 5xD WITH INTERNAL COOLING

VS501

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

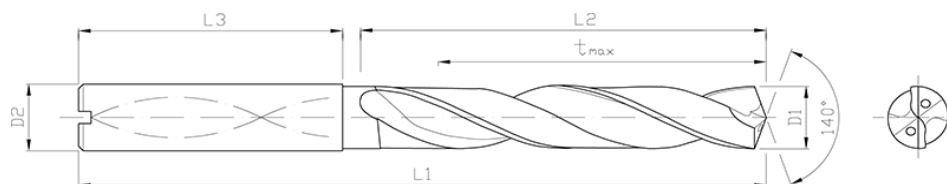
copper, aluminium

Coating:

AlTiN

Geometry:

(λ 30°)



Catalogue number	Diameter D1	Overall length L1	Length of helix L2	Length of shank L3	Max. drilling depth t _{max}	Diameter tolerance m7	Shank diameter D2 h6
VS501.0300 ↓ VS501.0370	3,0 - 3,7	66	28	36	23	0,004/0,016	6
VS501.0380 ↓ VS501.0470	3,8 - 4,7	74	36	36	29	0,004/0,016	6
VS501.0480 ↓ VS501.0600	4,8 - 6,0	82	44	36	35	0,004/0,016	6
VS501.0610 ↓ VS501.0800	6,1 - 8,0	91	53	36	43	0,006/0,021	8
VS501.0810 ↓ VS501.1000	8,1 - 10,0	103	61	40	49	0,006/0,021	10
VS501.1010 ↓ VS501.1200	10,1 - 12,0	118	71	45	56	0,007/0,025	12
VS501.1210 ↓ VS501.1400	12,1 - 14,0	124	77	45	60	0,007/0,025	14
VS501.1410 ↓ VS501.1600	14,1 - 16,0	133	83	48	63	0,007/0,025	16
VS501.1610 ↓ VS501.1800	16,1 - 18,0	143	93	48	71	0,007/0,025	18
VS501.1810 ↓ VS501.2000	18,1 - 20,0	153	101	50	77	0,008/0,029	20

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.

Cutting conditions on page 36.

CARBIDE MICRO DRILLS 5xD WITHOUT INTERNAL COOLING

VM502

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

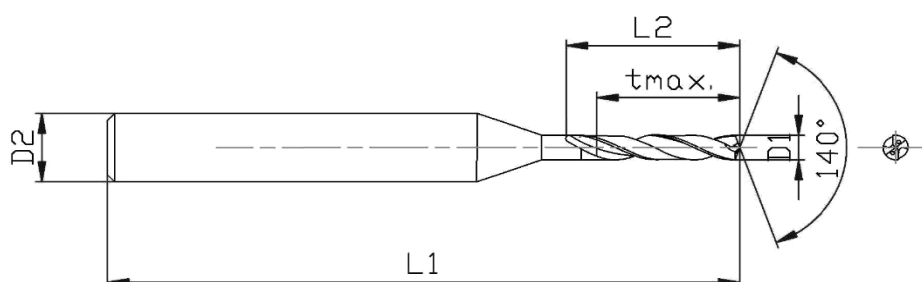
copper, aluminium

Coating:

AlTiN

Geometry:

λ 30°



Catalogue number	Diameter	Overall length	Length of helix	Max. drilling depth	Shank diameter
	D1m7	L1	L2	t _{max}	D2 h6
VM502.0050 ↓ VM502.0070	0,5 - 0,7	45	4,5	3,5	3
VM502.0075 ↓ VM502.0100	0,75 - 1,0	45	6,5	5	3
VM502.0110 ↓ VM502.0150	1,1 - 1,5	54	10	7,5	3
VM502.0160 ↓ VM502.0200	1,6 - 2,0	54	13	10	3
VM502.0210 ↓ VM502.0250	2,1 - 2,5	65	17	12,5	3
VM502.0260 ↓ VM502.0290	2,6 - 2,9	65	20	15	3

Production on request.

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

Cutting conditions on page 36.

CARBIDE DRILLS 8xD WITH INTERNAL COOLING

VS801

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

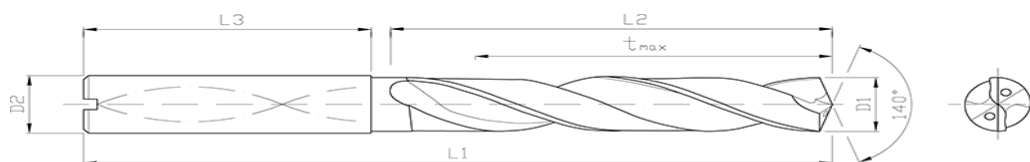
copper, aluminium

Coating:

AlTiN

Geometry:

(λ 30°)



Catalogue number	Diameter D1	Overall length L1	Length of helix L2	Length of shank L3	Max. drilling depth t _{max}	Diameter tolerance m7	Shank diameter D2 h6
VS801.0300 ↓ VS801.0370	3,0 - 3,7	72	34	36	29	0,004/0,016	6
VS801.0380 ↓ VS801.0470	3,8 - 4,7	81	43	36	36	0,004/0,016	6
VS801.0480 ↓ VS801.0600	4,8 - 6,0	95	57	36	48	0,004/0,016	6
VS801.0610 ↓ VS801.0800	6,1 - 8,0	114	76	36	64	0,006/0,021	8
VS801.0810 ↓ VS801.1000	8,1 - 10,0	142	95	40	80	0,006/0,021	10
VS801.1010 ↓ VS801.1200	10,1 - 12,0	162	114	45	96	0,007/0,025	12
VS801.1250 VS801.1300 VS801.1350 VS801.1400	12,5 - 14,0	178	133	45	110	0,007/0,025	14
VS801.1450 VS801.1500 VS801.1550 VS801.1600	14,5 - 16,0	203	152	48	128	0,007/0,025	16
VS801.1650 VS801.1700 VS801.1750 VS801.1800	16,5 - 18,0	222	171	48	144	0,007/0,025	18
VS801.1850 VS801.1900 VS801.1950 VS801.2000	18,5 - 20,0	243	190	50	160	0,008/0,029	20

Production on request.

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

Cutting conditions on page 36.

CARBIDE DRILLS 12xD WITH INTERNAL COOLING

VS1201

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

copper, aluminium

Coating:

AlTiN

Geometry:

(λ 30°)



Catalogue number	Diameter D1	Overall length L1	Length of helix L2	Length of shank L3	Max. drilling depth t _{max}	Diameter tolerance m7	Shank diameter D2 h6
VS1201.0300 ↓ VS1201.0370	3,0 - 3,7	92	54	36	48	0,004/0,016	6
VS1201.0380 ↓ VS1201.0470	3,8 - 4,7	102	64	36	58	0,004/0,016	6
VS1201.0480 ↓ VS1201.0600	4,8 - 6,0	116	78	36	70	0,004/0,016	6
VS1201.0610 ↓ VS1201.0800	6,1 - 8,0	146	108	36	94	0,006/0,021	8
VS1201.0810 ↓ VS1201.1000	8,1 - 10,0	162	120	40	110	0,006/0,021	10
VS1201.1010 ↓ VS1201.1200	10,1 - 12,0	204	156	45	142	0,007/0,025	12
VS1201.1210 ↓ VS1201.1400	12,1 - 14,0	230	182	45	166	0,007/0,025	14
VS1201.1410 ↓ VS1201.1600	14,1 - 16,0	260	208	48	192	0,007/0,025	16
VS1201.1610 ↓ VS1201.1800	16,1 - 18,0	285	234	48	216	0,007/0,025	18
VS1201.1810 ↓ VS1201.2000	18,1 - 20,0	310	258	50	240	0,008/0,029	20

Production on request.

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

Cutting conditions on page 36.

CARBIDE DRILLS 4xD FOR HARD MATERIALS

VK402

Recommended for use:

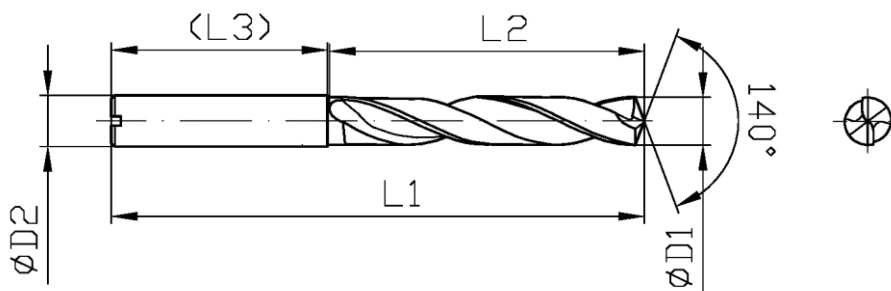
45 ÷ 65 HRc | hardened steel | cast iron

Coating:

AlTiSiN

Geometry:

$\lambda 15^\circ$



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

Production on request.

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

Cutting conditions on page 36.

CARBIDE CHAMFER MILLS

SINGLE END 90°

JS401

Recommended for use:

< 55 HRC | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

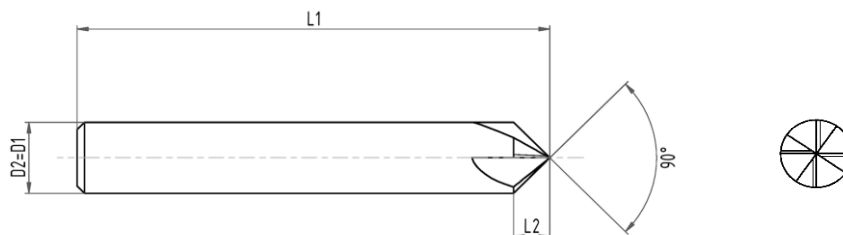
copper, aluminium

Coating:

AlTiN

Geometry:

λ 0°



Catalogue number	Number of teeth Z	Diameter D1	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
JS401.030	4	3	50	1,5	-	-	3
JS401.040	4	4	54	2	-	-	4
JS401.050	4	5	54	2,5	-	-	5
JS401.060	4	6	57	3	-	-	6
JS401.080	4	8	59	4	-	-	8
JS401.100	4	10	65	5	-	-	10
JS401.120	4	12	74	6	-	-	12

CARBIDE CHAMFER MILLS

DOUBLE END 90°

OS401

OS402

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron

Applicable:

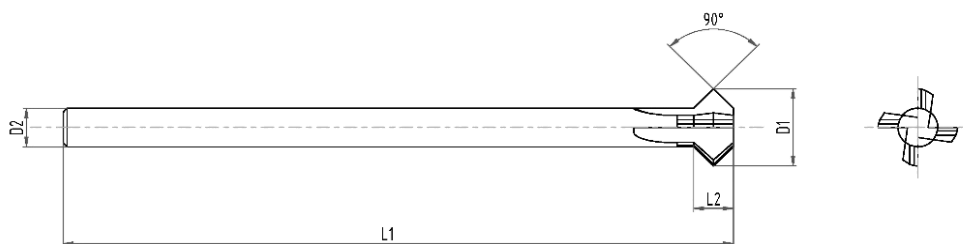
copper, aluminium

Coating:

AlTiN

Geometry:

λ 0°



Catalogue number	Number of teeth Z	Diameter D1	Overall length L1	Length of edge L2	Reduced neck length L3	Reduced neck diameter D3	Shank diameter D2 h6
OS402.030	4	3	75	2	12	2	3
OS402.040	4	4	82	2,7	17,5	2,9	4
OS401.050	4	5	54	-	25	2,9	5
OS402.050	4	5	100	3	19,5	2,9	5
OS401.060	4	6	54	-	20,5	3,9	6
OS402.060	4	6	100	4	20,5	3,6	6
OS401.080	4	8	82	-	40	6	8
OS402.080	4	8	100	2	-	-	6
OS402.100	4	10	100	4	-	-	6
OS402.120	4	12	100	6	-	-	6

CORNER ROUNDING MILLING CUTTERS

OC301

OC401

Recommended for use:

< 55 HRc | < 1600 N/mm² | steel | stainless steels | cast iron | copper

Applicable:

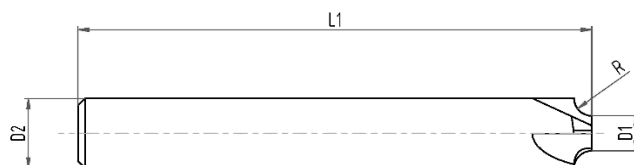
aluminium

Coating:

AlTiN

Geometry:

$\lambda 0^\circ, \gamma 0^\circ$



Catalogue number	Corner radius R	Diameter D1 h10	Shank diameter D2 h6	Overall length L1	Length of edge L2	Reduced neck length L3	Number of teeth Z
OC301.060.050	0,5	5	6	57		-	3
OC301.060.075	0,75	4,5	6	57		-	3
OC301.060.080	0,8	4,5	6	57		-	3
OC401.080.100	1	6	8	63		-	4
OC401.080.125	1,25	5,5	8	63		-	4
OC401.080.150	1,5	5	8	63		-	4
OC401.100.200	2	6	10	72		-	4
OC401.100.250	2,5	5	10	72		-	4
OC401.120.300	3	6	12	82		-	4
OC401.140.350	3,5	7	14	82		-	4
OC401.160.400	4	8	16	92		-	4
OC401.160.450	4,5	7	16	92		-	4
OC401.160.500	5	6	16	92		-	4
OC401.200.600	6	8	20	104		-	4
OC401.220.800	8	6	22	110		-	4
OC401.250.900	9	7	25	110		-	4

Cutting conditions on page 35.

SPECIAL CARBIDE TOOLS

MILLING

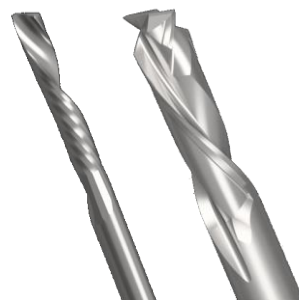
According to a tool drawing or requirement of machining.
Diameter range of tool: 0,2 mm - 40 mm.
Coating on request.



FOR GRAPHITE



FOR TROCHOIDAL
MILLING



FOR WOOD,
PLASTIC, LAMINATE



FOR THREADING



FOR DEBURRING



FOR ENGRAVING



CONCAVE



CROWN



PROFILED

SPECIAL CARBIDE TOOLS

DRILLING



DRILLS FOR
HARDENED MATERIAL



LONG DRILLS



STEP DRILLS



COUNTERSINKS



REAMERS



DRILL-REAMERS

TURNING, PLASTIC WORKING ETC.



TURNING TOOLS



PUNCHES



ADJUSTMENT OF CUTTING INSERTS



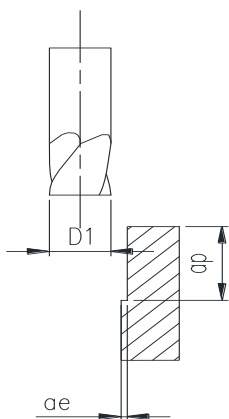
CYLINDRICAL GRINDING

RECOMMENDED CUTTING CONDITIONS FOR CARBIDE END MILLS

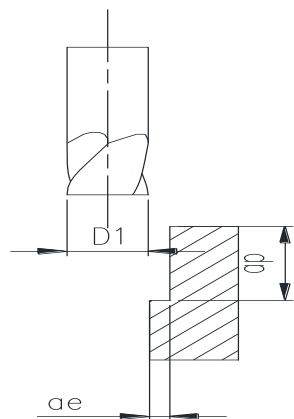
	Machined material	Material strength N/mm ²	Cutting speed Vc (m/min)	Feed per tooth fz (mm)				
				Ø 2-3	Ø 4-5	Ø 6-10	Ø 12-16	Ø 20
Cutting speed Vc: $Vc = \frac{D1 \cdot \pi \cdot n}{1000}$ m/min	Free cutting steels General construction steels	< 600	200	0,02	0,04	0,05	0,08	0,12
	General construction steels Non alloyed steel castings Low alloyed steel castings	< 750	180	0,02	0,03	0,04	0,07	0,08
Revolutions n: $n = \frac{Vc \cdot 1000}{D1 \cdot \pi}$ ot/min	Heat resistant steels Alloyed steel castings	< 1100	100	0,02	0,025	0,04	0,07	0,08
	Castings steels Inconel	< 1400	20	0,01	0,01	0,02	0,04	0,05
Rate of feed Vf: $Vf = fz \cdot z \cdot n \cdot f1$ mm/min	Nitriding steels Cementation steels	< 950	130	0,02	0,03	0,04	0,07	0,08
	Tool steels	< 1400	90	0,01	0,01	0,02	0,035	0,05
Feed per tooth fz: $fz = \frac{Vf}{z \cdot n}$ mm	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
Feed per revolutions f: $f = fz \cdot z$ mm	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 Malleable cast iron	< 240 HB	150	0,02	0,03	0,05	0,08	0,12
	Ductile cast iron Alloyed cast iron	< 800 HB	110	0,01	0,02	0,04	0,07	0,1
	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

Coefficients for reducing of the feed rate f1:

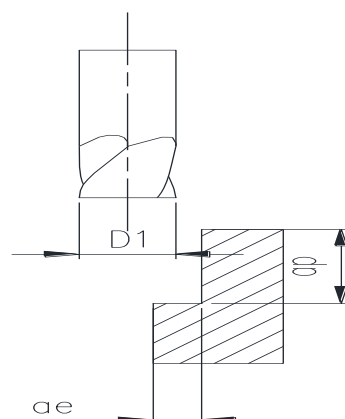
$$\begin{aligned} ae &= 0,1 \times D1 \\ ap &= 1,5 \times D1 \\ f1 &= 1 \end{aligned}$$



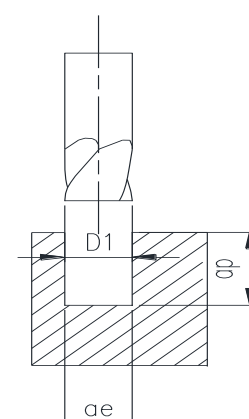
$$\begin{aligned} ae &= 0,25 \times D1 \\ ap &= 1,5 \times D1 \\ f1 &= 0,8 \end{aligned}$$



$$\begin{aligned} ae &= 0,5 \times D1 \\ ap &= 1,5 \times D1 \\ f1 &= 0,5 \end{aligned}$$



$$\begin{aligned} ae &= D1 \\ ap &= 0,5 \times D1 \\ f1 &= 0,5 \end{aligned}$$



RECOMMENDED CUTTING CONDITIONS FOR CARBIDE DRILLS

Machined material	Material strength N/mm ²	Vc (m/mm) with internal cooling	Vc (m/min) without internal cooling	Rate of feed (mm/ot.)				
				ø 3-4	ø 5-6	ø 7-11	ø 12-16	ø 18-20
Free cutting steels General construction steels	<600	150	110	0,16	0,23	0,29	0,35	0,42
General construction steels Non alloyed steel castings Low alloyed steel castings	<750	115	80	0,14	0,18	0,24	0,29	0,35
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:

$$V_c = \frac{D_1 \cdot \pi \cdot n}{1000} \text{ m/min}$$

Revolutions n:

$$n = \frac{V_c \cdot 1000}{D_1 \cdot \pi} \text{ ot/min}$$

Rate of feed Vf:

$$V_f = f_z \cdot z \cdot n \cdot f_1 \text{ mm/min}$$

Feed per tooth fz:

$$f_z = \frac{V_f}{z \cdot n} \text{ mm}$$

Feed per revolutions

f:

$$f = f_z \cdot z \text{ mm}$$

NOTES