

HIGH PRECISION MACHINING TOOLS



EUROPE STOCK CATALOGUE
SEPTEMBER 2026

PRECISION CUTTING TOOLS, MADE BY HPMT

We manufacture over two million precision cutting tools each year — from 0.08 mm micro tools to diameters above 30 mm. Solid carbide end mills, drills, reamers, special tools and indexable systems.

Every tool exists for a clear purpose: better machining performance, higher process reliability, lower cost per component. Behind each one is our own carbide expertise, precision grinding and application knowledge, built over decades in demanding materials.

A cutting tool is only the start. Cutting parameters, toolholding, application support and delivery decide tool life, part quality and cost — which is why we support European customers locally, not from a distance.

And when no standard tool solves the application, we design a special around your component, your material and your process.

We measure our work the same way you do: stable processes, longer tool life, shorter cycle times, lower cost per component.



ABOUT HPMT

We started in 1978 as a distributor of European and Japanese cutting tools. Twenty years of selling other manufacturers' products taught us where they fell short. In 2000 we began making our own in Malaysia.

Today we are the largest solid carbide cutting tool manufacturer in Southeast Asia, with a distribution network across more than 35 countries and subsidiaries in Germany and China.

Design, grinding, PVD coating and inspection are all ours. Nothing critical is subcontracted.



Listed on Bursa Malaysia
KLSE: HPMT (5291)

Product Portfolio

Universal Tools

Versatile cutting tools designed for a wide range of materials and machining applications.



Specialised Tools

Application-focused tools engineered to maximise performance in specific materials and machining conditions.



Customised Tools

Produced according to your design or fully developed from your workpiece drawing.



In Europe

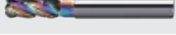
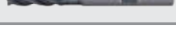
HPMT Deutschland GmbH — our wholly owned subsidiary, since 2011

A Local Team

Sales and application support on tool selection, cutting parameters and process improvement, with direct access to the factory behind them.

Local stock

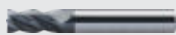
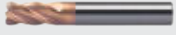
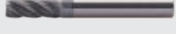
Inventory held in Germany to reach you fast.

	EDP Number			N° Z	Helix Angle	Coating	Recess
Endmills for Aluminium and Non-Ferrous Materials							
Aluminium and Non-Ferrous Metal	303C	AL SE Endmill		3	50°	D0600	
	301	AL SE Endmill		2	50°	UC	
	G51	AL SE Long Endmill		3	40°	UC	
	K41	XQ ALU DP/DH/DF Endmill with Chip Breaker and Recess		4	$\alpha^\circ \neq b^\circ$	D0600	•
	K43	XQ ALU DP/DH/DF Torus Endmill with Chip Breaker and Recess		4	$\alpha^\circ \neq b^\circ$	D0600	•
	K61	XQ Alu Cutters DP/DH/DF Endmill, with Oil Hole, Flute Polished, Chip Breaker and Recess		4	$\alpha^\circ \neq b^\circ$	UC	•
Universal Endmills for General Engineering							
≤35 HRC	824	SE 30 Long Endmill		4	40°	B0819	
	828	SE 30 Extra-Long Endmill		4	40°	B0819	
≤45 HRC	918DH	Optimum DP/DH Endmill		4	$\alpha^\circ \neq b^\circ$	G6110	
	981DH	Optimum DP/DH Endmill with Recess		4	$\alpha^\circ \neq b^\circ$	G6110	•
	986DH	Optimum DP/DH Endmill with Recess and Weldon		4	$\alpha^\circ \neq b^\circ$	G6110	•
	K52DH	Optimum DP/DH R-Like Endmill with Recess		4	$\alpha^\circ \neq b^\circ$	G6110	•
	K53DH	Optimum DP/DH R-Like Endmill with Recess and Weldon		4	$\alpha^\circ \neq b^\circ$	G6110	•
36-50HRC	929	BN 45 Ballnose Cutters		2	30°	B0819	

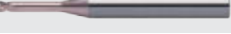
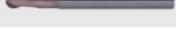
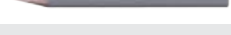
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	EDP Number			N° Z	Helix Angle	Coating	Recess
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Endmills for Stainless Steels, Titanium and Heat-Resistant Superalloys

≤45 HRC	949	NiTiCo 30 DP/DH Endmill		4	$\alpha^\circ \neq \beta^\circ$	G6110	
	C64	NiTiCo 30 DP Roughing Endmill with Weldon		4	40°	G6110	
	A1R	NiTiCo 30 DP/DH Torus Endmill		4	$\alpha^\circ \neq \beta^\circ$	B0909	
	C48	NiTiCo 30 DP/DH Torus Endmill		4	$\alpha^\circ \neq \beta^\circ$	G6110	
	J89	NiTiCo 30 DH Endmill		5	$\alpha^\circ \neq \beta^\circ$	G6110	
	K50	NiTiCo 30 DH Endmill, with Chip Breaker, Recess and Weldon		5	$\alpha^\circ \neq \beta^\circ$	G6110	●
	K65	NiTiCo 30 DH Endmill, with Internal Oil Hole, Chip Breaker, Recess and Weldon		5	$\alpha^\circ \neq \beta^\circ$	G6110	●
	J92	NiTiCo 30 DH Long Endmill		5	$\alpha^\circ \neq \beta^\circ$	G6110	
	J93	NiTiCo 30 DH Long Endmill with Weldon		5	$\alpha^\circ \neq \beta^\circ$	G6110	
	K51	NiTiCo 30 DH Long Endmill, with Chip Breaker, Recess and Weldon		5	$\alpha^\circ \neq \beta^\circ$	G6110	●
	K67	NiTiCo 30 DH Long Endmill, with Internal Oil Hole, Chip Breaker, Recess and Weldon		5	$\alpha^\circ \neq \beta^\circ$	G6110	●
	M01	NiTiCo 30 DP Multiflute Torus Endmill with Recess		9	37°	G6110	●
	M02	NiTiCo 30 Long DP Multiflute Torus Endmill with Chip Breaker and Recess		9	37°	G6110	●
	M14	NiTiCo 30 Oil Hole High Feed Endmill with Recess		4/5/6/7/8	40°	G6110	●

Endmills for Mould & Die and Hard Milling

50 - 70 HRC	A6M	DM70X DP Endmill with Recess		4	40°	B0909X	●
	A6J	DM70X DP Torus Endmill with Recess		4	40°	B0909X	●
	A6D	DM70X Miniature Endmill with Long Neck		2	30°	B0909X	
	A6E	DM70X Miniature Endmill with Long Neck		4	30°	B0909X	
	A6G	DM70X Miniature Torus Endmill with Long Neck		2/4	30°	B0909X	
	A6Q	DM70X Ballnose Cutters		2	30°	B0909X	
	A6R	DM70X Ballnose Cutters with Recess		2	30°	B0909X	●
	A6S	DM70X Miniature Ballnose Cutters with Long Neck		2	30°	B0909X	
	M17	DM70X High Feed Endmill with Recess		4/5/6	25°	B0909X	●

Application				Working Material														Page			
				P			M		K		N			S			H		O		
				P01	P02	P03	M01	M02	K01	K02	N01	N02	N03	S01	S02	S03	H01		H02	O01	O02
				Carbon Steel	Alloy Steel	Prehardened Steel, 35 ± HRC < 45	Stainless Steel, High Machinability	Stainless Steel, Low Machinability	Grey Sast Iron	Ductile Cast Iron	Aluminum Wrought Alloy, Si < 9%	Aluminum Cast Alloy, Si ≥ 9%	Copper Alloy	Titanium Alloy	Nickel Alloy	Cobalt Alloy	Hardened steel, 45 ± HRC < 52		Hardened steel, ≥ 52 HRC	Thermoplastics	Graphite

Endmills for Exotic Material, Stainless Steel & Super Alloy

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Endmills for Mould & Die and Hard Milling

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Roughing & Finishing						○											•	•			96
Roughing & Finishing						○											•	•			97
Profilling						○											•	•			100
																	•	•			105

	EDP Number			N° Z	Helix Angle	Coating	Recess
Drills							
≤ 35 HRC	955	NC Spotting Drill, 90° Point Angle		2	30°	B0819	
≤ 45 HRC	W15	Flat Drill 180° Point Angle - 2 x Ø		2	20°	T8090	
	W08	DR-S Twist Drill - 3 x Ø		2	30°	T8090	
	W09	DR-S Twist Drill - 5 x Ø		2	30°	T8090	
	W10	DR-S Oil Feed Twist Drill - 3 x Ø		2	30°	T8090	
	W11	DR-S Oil Feed Twist Drill - 5 x Ø		2	30°	T8090	
	W12	DR-S Oil Feed Twist Drill - 8 x Ø		2	30°	T8090	
	H03	DR Mini Oil Feed Twist Drill - 5 x Ø, 8x Ø, Ø12 x Ø, 15x Ø, 20x Ø, 25x Ø, 30x Ø		2	30°	G6110	
	W05	DR-LX SB Spiral Burnishing Oil Feed Twist Drill - 12 x Ø, 15x Ø, 20x Ø, 25x Ø, 30x Ø		2	30°	T8090	
≤ 60 HRC	823	DR 60 Twist Drill - 3 X Ø		2	15°	D0120	

Application				Working Material														Page			
				P			M		K		N			S			H		O		
				P01	P02	P03	M01	M02	K01	K02	N01	N02	N03	S01	S02	S03	H01		H02	O01	O02
				Carbon Steel	Alloy Steel	Prehardened Steel, 35 ≤ HRC < 45	Stainless Steel, High Machinability	Stainless Steel, Low Machinability	Grey Sast Iron	Ductile Cast Iron	Aluminum Wrought Alloy, Si < 9%	Aluminum Cast Alloy, Si ≥ 9%	Copper Alloy	Titanium Alloy	Nickel Alloy	Cobalt Alloy	Hardened steel, 45 ≤ HRC < 52		Hardened steel, ≥ 52 HRC	Thermoplastics	Graphite
Drills																					
Spotting				●	●	●	●	●	●	●	●	●	●	●							110
Drilling				●	●	●	●	●	●	●	●	●									114
Drilling				●	●	●	○	○	●	●	○	○	○	●	●						117
Drilling				●	●	●	○	○	●	●	○	○	○	●	●						121
Drilling				●	●	●	○	○	●	●	○	○	○	●	●						127
Drilling				●	●	●	○	○	●	●	○	○	○	●	●						131
Drilling				●	●	●	○	○	●	●	○	○	○	●	●						137
Drilling				●	●	●	●	●	●	●	●	●	●	●	●						143
Drilling				●	●	●	●	●	●	●	●	●	●	●							148
Drilling																●	●				158



ENDMILLS

For Aluminium
and Non-ferrous
materials

FEATURES & BENEFITS

AL SE



1. 3 Flutes Design



Excellent chip evacuation.

2. Cutting Edge Preparation



Enhances tool life

- Less material adheres to the cutting edge.
- For stable machining.

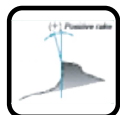
3. The Perfect Edge Design



Prolongs tool life

- Provides a stable cutting edge with much reduced possibility of chipping.

4. Positive Rake Angle



Enables smooth chip evacuation due to small chips generated.

303C



5. D0600 Coating



- **High Wear Resistance:**
Extends tool life, reducing the need for frequent replacements and maintenance.
- **Low Friction Coefficient:**
Minimizes heat generation and improves machining efficiency.
- **Thermal Stability:**
Suitable for high-speed machining operations, maintaining performance under extreme conditions.
- **Versatility:**
Effective on a wide range of non-ferrous materials including aluminium, copper, and brass

6. Suitable for Material Groups:



Technical drawing of a 303C drill bit. The drawing shows the bit's profile with dimensions: D (outer diameter), d_2 (minor diameter), l_1 (flute length), and L (total length). The material is labeled 303C.



Order Number	D	I1	I2	L	d2 h6	Availability
303C 0100 040 03	1	3		40	3	●
303C 0100 040 04				40	4	●
303C 0150 040 03	1.5	4.5		40	3	●
303C 0150 040 04				40	4	●
303C 0200 040 03	2	6.5		40	3	●
303C 0200 040 04				40	4	●
303C 0250 040 03	2.5			40	3	●
303C 0250 040 04				40	4	●
303C 0300	3	9		40	3	●
303C 0300 050 06				50	6	●
303C 0400	4	12		50	4	●
303C 0400 050 06				50	6	●
303C 0500	5	15		50	5	●
303C 0500 050 06				50	6	●
303C 0600 050	6	16		50	6	●
303C 0600 060		20		60	6	●
303C 0800	8			64	8	●
303C 1000 070	10	22		70	10	●
303C 1200	12	25		75	12	●
303C 1600	16	32		90	16	●

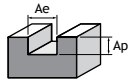
- Ex Stock (Germany)

Recommended Cutting Data

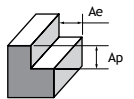
Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



AL SE Endmill, 3 Flutes - 303C



Slotting	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si < 9%		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	330	0.008	290	0.006	200	0.003	310	0.007
2		0.010		0.008		0.006		0.009
3		0.016		0.014		0.010		0.015
4		0.026		0.022		0.017		0.024
5		0.033		0.029		0.023		0.031
6		0.041		0.036		0.029		0.038
8		0.056		0.049		0.040		0.052
10		0.071		0.063		0.053		0.067
12		0.088		0.078		0.067		0.084
16		0.112		0.098		0.083		0.106



AL SE Endmill, 3 Flutes - 303C

Side Milling	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si < 9%		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.30 × D		0.30 × D		0.30 × D		0.30 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	380	0.011	340	0.009	250	0.006	360	0.010
2		0.013		0.010		0.008		0.010
3		0.018		0.016		0.014		0.017
4		0.030		0.027		0.022		0.028
5		0.038		0.035		0.029		0.036
6		0.047		0.042		0.036		0.045
8		0.064		0.058		0.050		0.061
10		0.081		0.074		0.064		0.078
12		0.099		0.091		0.080		0.096
16		0.128		0.116		0.101		0.123

AL SE Endmill, 2 Flutes



Order Number	D	l1	l2	L	d2 h6	Availability
301 0150 040 03	1.5	4.5		40	3	●
301 0200 040 03	2	6.5		40	3	●
301 0250 040 03	2.5	6.5		40	3	●
301 0300	3	9		40	3	●
301 0400	4	12		50	4	●
301 0500 050 06	5	15		50	6	●
301 0600 050	6	16		50	6	●
301 0800	8	20		64	8	●
301 1000 075	10	22		75	10	●
301 1200	12	25		75	12	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

●

●

●

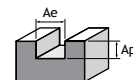
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

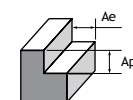


AL SE Endmill, 2 Flutes - 301



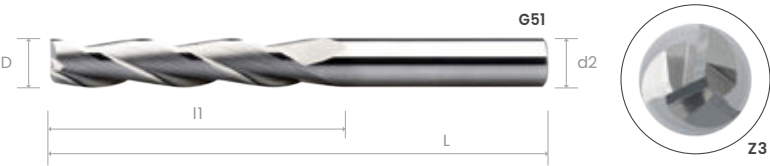
Slotting	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si ≥ 9%		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
2	310	0.012	270	0.011	180	0.008	290	0.011
3		0.021		0.019		0.015		0.019
4		0.035		0.031		0.024		0.031
5		0.045		0.040		0.031		0.041
6		0.056		0.049		0.038		0.051
8		0.077		0.067		0.052		0.070
10		0.098		0.085		0.067		0.091
12		0.122		0.105		0.084		0.113

AL SE Endmill, 2 Flutes - 301



Side Milling	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si ≥ 9%		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D	
Ae (mm)	0.30 x D		0.30 x D		0.30 x D		0.30 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
2	360	0.016	320	0.012	230	0.010	340	0.013
3		0.025		0.021		0.018		0.022
4		0.041		0.035		0.030		0.037
5		0.052		0.045		0.039		0.048
6		0.064		0.056		0.049		0.059
8		0.087		0.076		0.068		0.081
10		0.111		0.098		0.088		0.104
12		0.136		0.121		0.111		0.128

AL SE Long Endmill, 3 Flutes



Order Number	D	I1	I2	L	d2 h6	Availability
G51 0300 075 06	3	19		75	6	●
G51 0400 075 06	4	19		75	6	●
G51 0600 075	6	31		75	6	●
G51 0600 100		38		100	6	●
G51 0800 100	8	41		100	8	●
G51 1000 100		50		100	10	●
G51 1000 125	10	57		125	10	●
G51 1200 100		50		100	12	●
G51 1200 150	12	75		150	12	●
G51 1600	16	57		125	16	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

●

●

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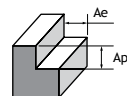
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



AL SE Long Endmill, 3 Flutes - G51



Side Milling	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si ≥ 9%		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D	
Ae (mm)	0.30 x D		0.30 x D		0.30 x D		0.30 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
3	305	0.015	270	0.013	200	0.011	285	0.014
4		0.024		0.021		0.018		0.022
5		0.031		0.028		0.024		0.029
6		0.038		0.034		0.029		0.035
8		0.051		0.047		0.040		0.048
10		0.065		0.059		0.052		0.062
12		0.080		0.073		0.065		0.077
14		0.092		0.083		0.073		0.088
16		0.104		0.094		0.083		0.099

FEATURES & BENEFITS

XQ ALU CUTTER

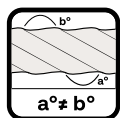


1. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Differential Fluting (DF)



With optimized core diameter, counteracts the forces generated and ensures greater milling performance.

4. Polished Flute

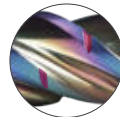


Ensures fast and effective chip evacuation and drastically reduces built-up edge.

K41



5. Chip Breakers



Efficiently shears work materials and shortens chips for improved chips removal.

6. D0600 Coating

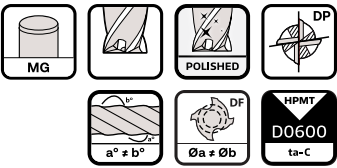
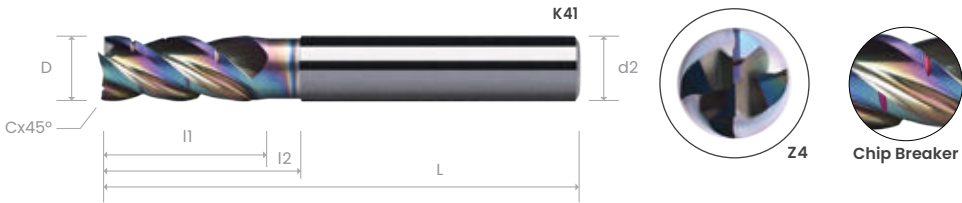


- **High Wear Resistance:**
Extends tool life, reducing the need for frequent replacements and maintenance.
- **Low Friction Coefficient:**
Minimizes heat generation and improves machining efficiency.
- **Thermal Stability:**
Suitable for high-speed machining operations, maintaining performance under extreme conditions.
- **Versatility:**
Effective on a wide range of non-ferrous materials including aluminium, copper, and brass

7. Suitable for Material Groups:



XQ ALU DP/DH/DF Endmill with Chip Breaker and Recess, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	C	Availability
K41 0500 075 *	5	22	30	75	6	0.1	●
K41 0600 075 *	6	26	32	75	6	0.1	●
K41 0800 075 *	8	32	38	75	8	0.1	●
K41 1000 100 *	10	42	52	100	10	0.2	●
K41 1200 083 *	12	30	37	83	12	0.2	●
K41 1200 100 *		48	54	100	12	0.2	●
K41 1600 100 *	16	40	51	100	16	0.2	●
K41 1600 125 *		64	76	125	16	0.2	●
K41 2000 125 *	20	50	74	125	20	0.3	●
K41 2000 150 *		80	99	150	20	0.3	●
K41 2500 130 *	25	63	73	130	25	0.3	●
K41 2500 175 *		100	118	175	25	0.3	●

*- DIN 6535

Stock Availability

● Ex Stock (Germany)

CNC Repeatability

Ø1 - Ø3 within 10µm

Ø4 - Ø8 within 15µm

≥ Ø10 within 20µm

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

FEATURES & BENEFITS

XQ ALU CUTTER

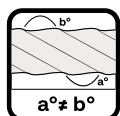


1. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Differential Fluting (DF)



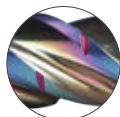
With optimized core diameter, counteracts the forces generated and ensures greater milling performance.

4. Polished Flutes



Ensures fast and effective chip evacuation and drastically reduces built-up edge

5. Chip Breakers



Efficiently shears work materials and shortens chips for improved chips removal



6. Corner Radius



- Reduces chipping and provides longer tool life.
- Standardized corner radius for aerospace components.

7. D0600 Coating

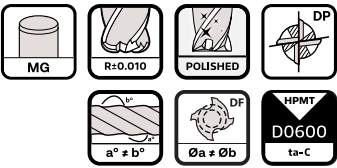
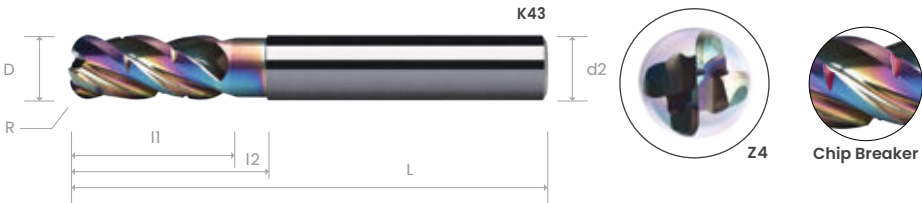


- **High Wear Resistance:**
Extends tool life, reducing the need for frequent replacements and maintenance.
- **Low Friction Coefficient:**
Minimizes heat generation and improves machining efficiency.
- **Thermal Stability:**
Suitable for high-speed machining operations, maintaining performance under extreme conditions.
- **Versatility:**
Effective on a wide range of non-ferrous materials including aluminium, copper, and brass

8. Suitable for Material Groups:



XQ AL DP/DH/DF Torus Endmill with Chip Breaker and Recess, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	R	Availability
K43 1000 100 1000 050 *	10	42	52	100	10	0.5	●
K43 1200 083 1200 300 *	12	30	37	83	12	3	●
K43 1200 083 1200 400 *			37	83	12	4	●
K43 1200 100 1200 300 *		48	54	100	12	3	●
K43 1200 100 1200 400 *			54	100	12	4	●
K43 1600 100 1600 300 *	16	40	51	100	16	3	●
K43 1600 100 1600 400 *			51	100	16	4	●
K43 1600 125 1600 300 *		64	76	125	16	3	●
K43 1600 125 1600 400 *			76	125	16	4	●

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

CNC Repeatability
Ø1 - Ø3 within 10µm
Ø4 - Ø8 within 15µm
≥ Ø10 within 20µm

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

●

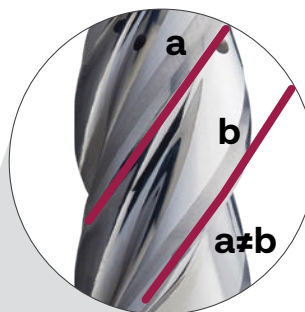
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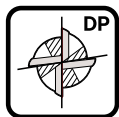
FEATURES & BENEFITS

XQ ALU CUTTER



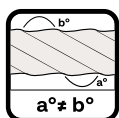
K61

1. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Differential Fluting (DF)



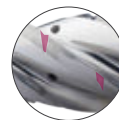
With optimized core diameter, counteracts the forces generated and ensures greater milling performance.

4. Polished Flute



Ensures fast and effective chip evacuation and drastically reduces built-up edge.

5. Chip Breakers



Efficiently shears work materials and shortens chips for improved chips removal.

6. Oil Hole for High Performance Milling

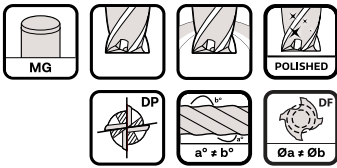
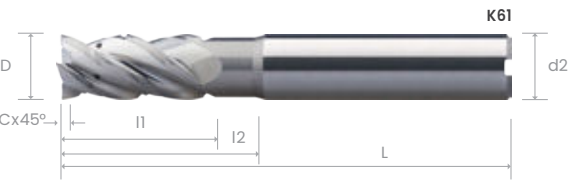


- Improves welding resistance.
- Enables a wide range of machining processes.
- Especially beneficial for difficult to cut materials, offering stable machining.

7. Suitable for Material Groups:



XQ ALU DP/DH/DF Endmill with Oil Hole, Chip Breaker and Recess, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	C	Availability
K61 0600 *	6	13	20	57	6	0.1	●
K61 0800 *	8	20	26	64	8	0.1	●
K61 1000 *	10	22	30	72	10	0.2	●
K61 1200 *	12	26	36	83	12	0.2	●
K61 1600 *	16	32	42	92	16	0.2	●
K61 2000 *	20	38	52	104	20	0.3	●

*- DIN 6535

Stock Availability
● Ex Stock (Germany)

CNC Repeatability
Ø1 - Ø3 within 10µm
Ø4 - Ø8 within 15µm
≥ Ø10 within 20µm

Material Group

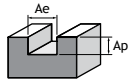
N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

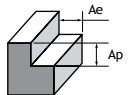


XQ Alu Cutters DP/DH/DF Endmill, Flute Polished and Recess, 4 Flutes – K41, K43, K61



Slotting	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si < 9%		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	650	0.034	550	0.027	400	0.023	600	0.030
8		0.046		0.037		0.032		0.040
10		0.059		0.048		0.042		0.051
12		0.073		0.060		0.054		0.063
14		0.083		0.068		0.060		0.071
16		0.093		0.075		0.065		0.078
18		0.102		0.081		0.069		0.084
20		0.111		0.087		0.073		0.090

XQ Alu Cutters DP/DH/DF Endmill, Flute Polished and Recess, 4 Flutes – K41, K43, K61



Side Milling	N						O	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Thermoplastic	
Properties	Si < 9%		Si < 9%		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.30 × D		0.30 × D		0.30 × D		0.30 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	750	0.039	700	0.030	500	0.025	720	0.033
8		0.053		0.042		0.034		0.045
10		0.067		0.054		0.045		0.057
12		0.082		0.067		0.057		0.070
14		0.094		0.077		0.063		0.080
16		0.105		0.086		0.069		0.089
18		0.116		0.094		0.075		0.097
20		0.126		0.102		0.080		0.105



UNIVERSAL ENDMILLS

For General Engineering

SE 30 Long Endmill, 4 Flutes



Order Number	D	l1	l2	L	d2 h6	Availability
824 0600	6	31		75	6	●
824 0800	8			75	8	●
824 1000 100	10	50		100	10	●
824 1200	12			100	12	●
824 1600	16	57		125	16	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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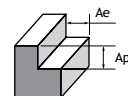
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



SE 30 Long Endmill, 4 Flutes - 824

Side Milling	N						K		P	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Carbon Steel	
Properties	Si < 9%		Si ≥ 9%		-		-		-	
Ap (mm)	1.50 x D		1.50 x D		1.50 x D		1.50 x D		1.50 x D	
Ae (mm)	0.25 x D		0.25 x D		0.25 x D		0.20 x D		0.20 x D	
D	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn
6	220	0.033	190	0.031	150	0.030	100	0.028	120	0.029
8		0.045		0.043		0.041		0.041		0.041
10		0.059		0.055		0.055		0.056		0.055
12		0.073		0.069		0.069		0.073		0.071
16		0.091		0.086		0.084		0.084		0.084

SE 30 Extra-Long Endmill, 4 Flutes



Order Number	D	L1	L2	L	d2 h6	Availability
828 0600	6	38		100	6	●
828 0800	8	41		100	8	●
828 1000	10	57		125	10	●
828 1200	12	75		150	12	●
828 1600	16			150	16	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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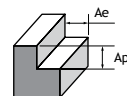
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



SE 30 Extra-Long Endmill, 4 Flutes - 828

Side Milling	N						K		P	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Carbon Steel	
Properties	Si < 9%		Si ≥ 9%		-		-		-	
Ap (mm)	2.00 x D		2.00 x D		2.00 x D		2.00 x D		2.00 x D	
Ae (mm)	0.22 x D		0.22 x D		0.22 x D		0.18 x D		0.18 x D	
D	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn
6	190	0.033	160	0.031	120	0.029	80	0.029	90	0.028
8		0.046		0.043		0.041		0.040		0.041
10		0.060		0.056		0.055		0.053		0.056
12		0.074		0.071		0.071		0.067		0.073
16		0.093		0.086		0.084		0.083		0.084

FEATURES & BENEFITS

OPTIMUM LINE



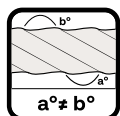
918DH

1. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

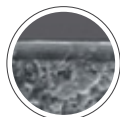
2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Superior Coating



Enhances heat resistance to prolong tool life.

4. Ideal Cutting Edge

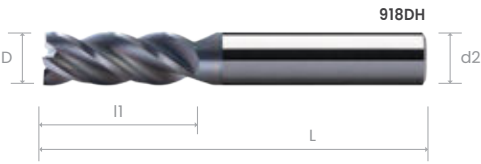


Provides edge protection to prolong tool life.

5. Suitable for Material Groups:



Optimum DP/DH Endmill, 4 Flutes



Order Number	D	L1	L2	L	d2 h6	Availability
918DH 0100 050 04	1	3		50	4	●
918DH 0150 050 04	1.5	4.5		50	4	●
918DH 0200 050 04	2	6.5		50	4	●
918DH 0250 050 04	2.5			50	4	●
918DH 0300 050 03	3	9		50	3	●
918DH 0300 050 04				50	4	●
918DH 0300 050 06				50	6	●
918DH 0400	4	12		50	4	●
918DH 0400 057 06				57	6	●
918DH 0500	5	15		50	5	●
918DH 0500 057 06				57	6	●
918DH 0600 060	6	20		60	6	●
918DH 0800 22	8	22		64	8	●
918DH 1000 072 27	10	27		72	10	●
918DH 1200 083	12	32		83	12	●
918DH 1400 083	14			83	14	●
918DH 1600 092	16			92	16	●
918DH 1800 092 32	18			92	18	●
918DH 2000	20	38		100	20	●

Stock Availability

● Ex Stock (Germany)

Ø mm	Tol. µm
3.0 ~ 6.0	-0 / -20
6.0 ~ 30.0	-0 / -25

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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Optimum DP/DH Endmill with Recess, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	Availability
981DH 0300 050 03	3	9	14	50	3	●
981DH 0300 050 04			14	50	4	●
981DH 0300 050 06			14	50	6	●
981DH 0400 *	4	12	20	50	4	●
981DH 0400 057 06 *			20	57	6	●
981DH 0500	5	15	22	50	5	●
981DH 0500 057 06			20	57	6	●
981DH 0600 060 *	6	20	24	60	6	●
981DH 0800 22 *	8	22	28	64	8	●
981DH 1000 072	10		32	72	10	●
981DH 1200 083 26 *	12	26	37	83	12	●
981DH 1400 083 26	14		37	83	14	●
981DH 1600 092 *	16	32	42	92	16	●
981DH 1800 092 32 *	18		42	92	18	●
981DH 2000 *	20	38	50	100	20	●

* - DIN 6535

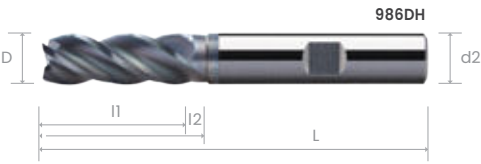
Stock Availability
● Ex Stock (Germany)

Ø mm	Tol. µm
3.0 ~ 6.0	-0 / -20
6.0 ~ 30.0	-0 / -25

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	○				

Optimum DP/DH | Endmill with Recess and Weldon, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	Availability
986DH 0300 050 06	3	9	14	50	6	●
986DH 0400 057 06	4	12	20	57	6	●
986DH 0500 057 06	5	15	20	57	6	●
986DH 0600 060	6	20	24	60	6	●
986DH 0800 22	8	22	28	64	8	●
986DH 1000 072	10		32	72	10	●
986DH 1200 083 26	12	26	37	83	12	●
986DH 1400 083 26	14		37	83	14	●
986DH 1600 092	16	32	42	92	16	●
986DH 1800 092 32	18		42	92	18	●
986DH 2000 100	20	38	50	100	20	●

Stock Availability

● Ex Stock (Germany)

Ø mm	Tol. µm
3.0 ~ 6.0	-0 / -20
6.0 ~ 30.0	-0 / -25

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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Optimum DP/DH R-Like Endmill with Recess, 4 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
K52DH 0300 050 06	3	9	14	50	6	0.1	●
K52DH 0400 057 06	4	12	20	57	6	0.1	●
K52DH 0500 057 06	5	15	20	57	6	0.1	●
K52DH 0600 060	6	20	24	60	6	0.1	●
K52DH 0800 22	8	22	28	64	8	0.2	●
K52DH 1000 072	10		32	72	10	0.2	●
K52DH 1200 083 26	12	26	37	83	12	0.2	●
K52DH 1400 083 26	14		37	83	14	0.2	●
K52DH 1600 092	16	32	42	92	16	0.2	●
K52DH 1800 092 32	18		42	92	18	0.2	●
K52DH 2000	20	38	50	100	20	0.2	●



R - Like is an enhanced edge protection.

Stock Availability
● Ex Stock (Germany)

Ø mm	Tol. µm
3.0 ~ 6.0	-0 / -20
6.0 ~ 30.0	-0 / -25

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
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Optimum DP/DH R-Like Endmill with Recess and Weldon, 4 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
K53DH 0300 050 06	3	9	14	50	6	0.1	●
K53DH 0400 057 06	4	12	20	57	6	0.1	●
K53DH 0500 057 06	5	15	20	57	6	0.1	●
K53DH 0600 060	6	20	24	60	6	0.1	●
K53DH 0800 22	8	22	28	64	8	0.2	●
K53DH 1000 072	10		32	72	10	0.2	●
K53DH 1200 083 26	12	26	37	83	12	0.2	●
K53DH 1400 083 26	14		37	83	14	0.2	●
K53DH 1600 092	16	32	42	92	16	0.2	●
K53DH 1800 092 32	18		42	92	18	0.2	●
K53DH 2000 100	20	38	50	100	20	0.2	●



R - Like is an enhanced edge protection.

Stock Availability

● Ex Stock (Germany)

Ø mm	Tol. µm
3.0 ~ 6.0	-0 / -20
6.0 ~ 30.0	-0 / -25

Material Group

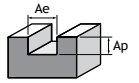
N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	○				

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

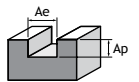


Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



Slotting	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		0.80 × D		0.40 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	330	0.005	300	0.004	280	0.004	170	0.003	110	0.003	60	0.004
2		0.007		0.006		0.006		0.006		0.006		0.009
3		0.011		0.010		0.010		0.009		0.009		0.014
4		0.016		0.015		0.015		0.012		0.013		0.019
5		0.021		0.020		0.020		0.016		0.017		0.024
6		0.026		0.026		0.026		0.019		0.021		0.030
8		0.037		0.036		0.038		0.026		0.028		0.040
10		0.048		0.047		0.050		0.033		0.035		0.051
12		0.060		0.061		0.062		0.041		0.043		0.063
14		0.068		0.070		0.071		0.047		0.049		0.072
16		0.075		0.078		0.080		0.054		0.055		0.080
18		0.083		0.080		0.088		0.060		0.061		0.088
20		0.090		0.086		0.096		0.066		0.067		0.096

Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



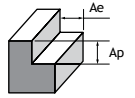
Slotting	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-	
Ap (mm)	1.00 × D		1.00 × D		0.80 × D		0.80 × D		0.40 × D		0.30 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	200	0.003	160	0.003	150	0.003	120	0.003	80	0.003	30	0.004
2		0.006		0.006		0.006		0.006		0.007		0.009
3		0.009		0.009		0.009		0.010		0.011		0.014
4		0.012		0.012		0.012		0.014		0.016		0.019
5		0.016		0.016		0.016		0.018		0.020		0.024
6		0.019		0.019		0.019		0.022		0.025		0.030
8		0.026		0.026		0.026		0.030		0.034		0.040
10		0.033		0.034		0.033		0.038		0.044		0.051
12		0.041		0.041		0.041		0.047		0.054		0.063
14		0.047		0.047		0.047		0.054		0.062		0.072
16		0.054		0.053		0.054		0.061		0.069		0.080
18		0.060		0.058		0.060		0.067		0.076		0.088
20		0.066		0.064		0.066		0.073		0.082		0.096

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

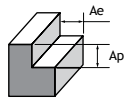


Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



Side Milling	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.30 × D		0.30 × D		0.30 × D		0.25 × D		0.18 × D		0.15 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	400	0.006	380	0.005	360	0.004	250	0.007	140	0.004	70	0.005
2		0.009		0.008		0.009		0.010		0.009		0.011
3		0.014		0.014		0.014		0.016		0.014		0.018
4		0.020		0.019		0.021		0.022		0.019		0.024
5		0.027		0.026		0.027		0.029		0.025		0.031
6		0.034		0.034		0.035		0.036		0.030		0.039
8		0.046		0.046		0.050		0.049		0.041		0.053
10		0.060		0.059		0.062		0.063		0.052		0.066
12		0.076		0.074		0.076		0.075		0.069		0.080
14		0.087		0.085		0.086		0.085		0.075		0.090
16		0.097		0.095		0.091		0.095		0.082		0.101
18		0.106		0.102		0.099		0.103		0.089		0.111
20		0.115		0.110		0.106		0.112		0.094		0.122

Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



Side Milling	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.25 × D		0.20 × D		0.18 × D		0.18 × D		0.15 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	280	0.005	230	0.006	190	0.005	160	0.004	100	0.005	40	0.004
2		0.009		0.009		0.009		0.009		0.011		0.008
3		0.017		0.014		0.014		0.014		0.017		0.013
4		0.023		0.020		0.019		0.020		0.024		0.018
5		0.030		0.025		0.024		0.025		0.030		0.025
6		0.036		0.031		0.031		0.031		0.037		0.033
8		0.049		0.043		0.042		0.043		0.049		0.046
10		0.062		0.056		0.056		0.056		0.062		0.061
12		0.075		0.070		0.070		0.070		0.076		0.075
14		0.086		0.079		0.080		0.078		0.085		0.081
16		0.094		0.087		0.090		0.086		0.093		0.089
18		0.103		0.092		0.098		0.092		0.102		0.094
20		0.113		0.098		0.104		0.099		0.107		0.102

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

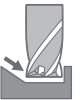


Optimum DP/DH R-Like | with Recess | Weldon Endmill – 918DH, 981DH, 986DH, K52DH, K53DH



Ramp/Helical	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping Angle	10°		10°		8°		5°		3°		2°	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	250	0.004	220	0.003	210	0.003	130	0.002	80	0.002	45	0.003
2		0.005		0.005		0.005		0.005		0.005		0.007
3		0.010		0.008		0.008		0.007		0.007		0.011
4		0.013		0.012		0.012		0.010		0.010		0.015
5		0.017		0.016		0.016		0.013		0.014		0.019
6		0.021		0.021		0.021		0.015		0.017		0.024
8		0.030		0.029		0.030		0.021		0.022		0.032
10		0.038		0.038		0.040		0.026		0.028		0.041
12		0.048		0.049		0.050		0.033		0.034		0.050
14		0.054		0.056		0.057		0.038		0.039		0.058
16		0.060		0.062		0.064		0.043		0.044		0.064
18		0.066		0.064		0.070		0.048		0.049		0.070
20		0.072		0.069		0.077		0.053		0.054		0.077

Optimum DP/DH R-Like | with Recess | Weldon Endmill – 918DH, 981DH, 986DH, K52DH, K53DH



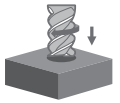
Ramp/Helical	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	–		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		–	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping Angle	5°		5°		3°		3°		2°		1°	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	150	0.002	120	0.002	110	0.002	90	0.002	60	0.002	20	0.003
2		0.005		0.005		0.005		0.005		0.006		0.007
3		0.007		0.007		0.007		0.008		0.009		0.011
4		0.010		0.010		0.010		0.011		0.013		0.015
5		0.013		0.013		0.013		0.014		0.016		0.019
6		0.015		0.015		0.015		0.018		0.020		0.024
8		0.021		0.021		0.021		0.024		0.027		0.032
10		0.026		0.027		0.026		0.030		0.035		0.041
12		0.033		0.033		0.033		0.038		0.043		0.050
14		0.038		0.038		0.038		0.043		0.050		0.058
16		0.043		0.042		0.043		0.049		0.055		0.064
18		0.048		0.046		0.048		0.054		0.061		0.070
20		0.053		0.051		0.053		0.058		0.066		0.077

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



Optimum DP/DH R-Like | with Recess | Weldon Endmill – 918DH, 981DH, 986DH, K52DH, K53DH



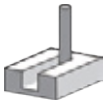
Plunging	N						K		P			
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Carbon Steel		Alloy Steel	
Properties	Si < 9%		Si ≥ 9%		–		–		–		520 < Rm < 1200	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	–		–		–		–		–		–	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	150	0.009	140	0.009	130	0.008	120	0.007	120	0.007	110	0.008
2		0.018		0.018		0.017		0.018		0.018		0.016
3		0.028		0.028		0.027		0.028		0.028		0.024
4		0.038		0.037		0.036		0.038		0.038		0.033
5		0.048		0.047		0.046		0.048		0.048		0.042
6		0.058		0.057		0.056		0.059		0.059		0.052
8		0.078		0.077		0.075		0.080		0.080		0.070
10		0.099		0.098		0.097		0.101		0.101		0.090
12		0.121		0.121		0.120		0.126		0.126		0.113
14		0.140		0.139		0.138		0.144		0.144		0.129
16		0.158		0.157		0.156		0.162		0.162		0.144
18		0.176		0.174		0.173		0.179		0.179		0.158
20		0.193		0.191		0.189		0.196		0.196		0.170

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

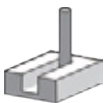


Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



Trochoidal Milling	N						M				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Nickel Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.12 × D		0.12 × D		0.12 × D		0.10 × D		0.10 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	450	0.020	420	0.019	380	0.018	320	0.015	170	0.010	45	0.003
2		0.021		0.020		0.019		0.016		0.018		0.008
3		0.024		0.024		0.025		0.025		0.029		0.013
4		0.032		0.032		0.034		0.034		0.040		0.020
5		0.041		0.041		0.043		0.043		0.052		0.027
6		0.050		0.050		0.053		0.053		0.065		0.036
8		0.070		0.070		0.074		0.073		0.092		0.054
10		0.091		0.092		0.096		0.095		0.122		0.079
12		0.113		0.114		0.119		0.118		0.155		0.105
14		0.128		0.130		0.135		0.133		0.174		0.110
16		0.142		0.144		0.149		0.147		0.189		0.111
18		0.155		0.156		0.162		0.160		0.202		0.109
20		0.168		0.168		0.174		0.172		0.212		0.104

Optimum DP/DH R-Like | with Recess | Weldon Endmill - 918DH, 981DH, 986DH, K52DH, K53DH



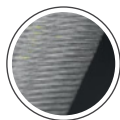
Trochoidal Milling	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.10 × D		0.10 × D		0.08 × D		0.10 × D		0.08 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	350	0.017	290	0.013	250	0.012	200	0.010	120	0.008	100	0.006
2		0.018		0.015		0.016		0.017		0.017		0.014
3		0.026		0.024		0.025		0.027		0.027		0.024
4		0.035		0.033		0.035		0.037		0.038		0.034
5		0.044		0.043		0.045		0.048		0.050		0.045
6		0.054		0.053		0.055		0.060		0.063		0.057
8		0.075		0.073		0.078		0.084		0.091		0.084
10		0.098		0.096		0.102		0.112		0.122		0.116
12		0.121		0.120		0.128		0.142		0.157		0.151
14		0.138		0.136		0.144		0.158		0.174		0.165
16		0.153		0.149		0.158		0.173		0.188		0.176
18		0.167		0.162		0.171		0.186		0.200		0.184
20		0.180		0.174		0.182		0.197		0.209		0.189

FEATURES & BENEFITS

BN 45



1. Eccentric Grinding



Optimum eccentric grinding in order to avoid rubbing, while maintaining maximum cutting tool strength.

2. Cutting Edge Preparation



- Enhances tool life.
- Reduced material adhere on the cutting edge for stable machining.
- Improves wear resistance and reduces excessive friction.

929



3. Superior Coating to Reduce Friction

- Increases hardness and higher abrasive wear resistance.
- Higher thermal resistance.
- Smoother chips evacuation.

4. Suitable for Material Groups:



BN 45 Ballnose Cutters, 2 Flutes



Order Number	D	R	I1	I2	L	d2 h6	Availability
929 0100 040 03	1	0.5	3		40	3	●
929 0150 040 03	1.5	0.75			40	3	●
929 0200 050 04	2	1	4		50	4	●
929 0250 050 04	2.5	1.25			50	4	●
929 0300	3	1.5	5		40	3	●
929 0300 050 06					50	6	●
929 0350 050 04	3.5	1.75	8		50	4	●
929 0400	4	2			50	4	●
929 0400 050 06					50	6	●
929 0450 050 05	4.5	2.25	9		50	5	●
929 0500 050 06	5	2.5			50	6	●
929 0600 050	6	3	10		50	6	●
929 0700 064 08	7	3.5	12		64	8	●
929 0800	8	4			64	8	●
929 0900 070 10	9	4.5	14		70	10	●
929 1000 070	10	5			70	10	●
929 1200	12	6	16		75	12	●
929 1600	16	8	32		90	16	●
929 2000	20	10	38		100	20	●

Stock Availability
● Ex Stock (Germany)

Material Group

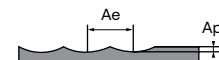
N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	●	○	○	○	●	○	○	○	●	○	●	○	●	○	○	○

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

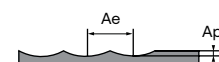


BN 45 Ballnose Cutters, 2 Flutes - 929



Roughing	K		P		M		S		H	
Working Material	Ductile Cast Iron		Prehardened Steel		Stainless Steel		Nickel Alloy		Hardened Steel	
Properties	-		35 ≤ HRC < 45		Low Machinability		-		45 ≤ HRC < 52	
Ap (mm)	0.10 × D		0.10 × D		0.08 × D		0.08 × D		0.10 × D	
Ae (mm)	0.30 × D		0.32 × D		0.24 × D		0.24 × D		0.30 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	160	0.008	185	0.013	70	0.006	40	0.006	140	0.009
2		0.018		0.023		0.012		0.013		0.020
3		0.029		0.036		0.018		0.020		0.032
4		0.043		0.050		0.025		0.028		0.044
5		0.059		0.065		0.032		0.035		0.056
6		0.075		0.081		0.038		0.043		0.068
8		0.104		0.112		0.051		0.058		0.098
10		0.135		0.146		0.065		0.074		0.130
12		0.168		0.183		0.080		0.090		0.162
16		0.206		0.230		0.103		0.115		0.198
20		0.238		0.270		0.125		0.138		0.224

BN 45 Ballnose Cutters, 2 Flutes - 929



Finishing	K		P		M		S		H	
Working Material	Ductile Cast Iron		Prehardened Steel		Stainless Steel		Nickel Alloy		Hardened Steel	
Properties	-		35 ≤ HRC < 45		Low Machinability		-		45 ≤ HRC < 52	
Ap (mm)	0.05 × D		0.05 × D		0.05 × D		0.05 × D		0.05 × D	
Ae (mm)	0.02 × D		0.02 × D		0.02 × D		0.02 × D		0.02 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
1	170	0.006	195	0.011	80	0.004	50	0.004	150	0.006
2		0.015		0.019		0.008		0.008		0.016
3		0.024		0.029		0.013		0.013		0.026
4		0.034		0.041		0.018		0.018		0.035
5		0.045		0.054		0.022		0.025		0.045
6		0.056		0.068		0.028		0.030		0.054
8		0.078		0.094		0.037		0.042		0.078
10		0.105		0.124		0.046		0.052		0.104
12		0.134		0.154		0.058		0.064		0.130
16		0.162		0.193		0.072		0.082		0.158
20		0.186		0.225		0.089		0.095		0.179



ENDMILLS

For Stainless Steels,
Titanium and
Heat-Resistant Superalloys

FEATURES & BENEFITS

NiTiCo 30 DP/DH



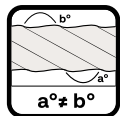
949

1. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Optimized Tool Geometry

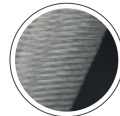
Allows for improved shearing and decreased spindle loads.

4. Small Corner Radius



For less chipping of the cutting edges and longer tool life.

5. The Perfect Edge Design

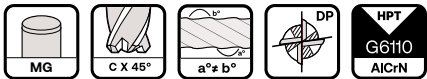


Provides a stable cutting edge with much reduced possibility of chipping while prolonging the tool life.

6. Suitable for Material Groups:



NiTiCo 30 DP/DH Endmill, 4 Flutes



Order Number	D	I1	I2	L	d2 h6	C	Availability
949 0600	6	13		57	6	0.1	●
949 0800	8	20		64	8	0.2	●
949 1000	10	22		72	10	0.2	●
949 1200	12	26		83	12	0.2	●
949 1600	16	32		92	16	0.3	●
949 2000	20	38		104	20	0.4	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01N02N03K01K02P01P02P03M01M02S01S02S03H01H02O01O02

●○●●●●○●

CNC Repeatability

Ø1 - Ø3 within 10µm

Ø4 - Ø8 within 15µm

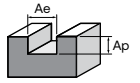
≥ Ø10 within 20µm

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

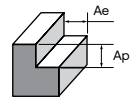


NiTiCo 30 DP/DH Endmill, 4 Flutes - 949



Slotting	K				P				M		S					
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	160	0.026	100	0.029	200	0.025	160	0.024	120	0.023	60	0.017	30	0.017	30	0.016
8		0.036		0.039		0.036		0.033		0.033		0.024		0.024		0.023
10		0.048		0.051		0.047		0.044		0.044		0.032		0.032		0.030
12		0.060		0.063		0.060		0.056		0.056		0.040		0.040		0.038
16		0.076		0.077		0.076		0.071		0.069		0.050		0.050		0.048
20		0.089		0.090		0.089		0.083		0.080		0.058		0.058		0.055

NiTiCo 30 DP/DH Endmill, 4 Flutes - 949



Side Milling	K				P				M		S					
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.5 × D		1.5 × D		1.00 × D	
Ae (mm)	0.25 × D		0.25 × D		0.25 × D		0.20 × D		0.18 × D		0.15 × D		0.15 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	220	0.035	140	0.039	250	0.035	200	0.033	130	0.038	60	0.038	30	0.038	30	0.036
8		0.050		0.054		0.050		0.047		0.052		0.052		0.052		0.049
10		0.066		0.070		0.066		0.061		0.067		0.068		0.068		0.065
12		0.083		0.087		0.083		0.077		0.082		0.084		0.084		0.080
16		0.106		0.108		0.107		0.099		0.103		0.101		0.101		0.096
20		0.126		0.128		0.129		0.118		0.121		0.115		0.115		0.109

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

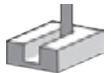


NiTiCo 30 DP/DH Endmill, 4 Flutes - 949



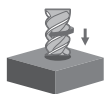
Ramp/Helical	K				P				M				S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Titanium Alloy	
Properties	-		-		-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping Angle	5°		5°		5°		5°		5°		3°		3°		2°	
Max Ramping Angle	15°		15°		15°		15°		15°		15°		15°		15°	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6																
8																
10																
12																
16																
20	190	0.090	150	0.091	200	0.108	140	0.106	133	0.109	80	0.123	60	0.138	50	0.093

NiTiCo 30 DP/DH Endmill, 4 Flutes - 949



Trochoidal Milling	K				P				M				S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Titanium Alloy	
Properties	-		-		-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.15 × D		0.10 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.10 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6																
8																
10																
12																
16																
20	220	0.172	150	0.175	200	0.180	140	0.174	130	0.174	200	0.197	150	0.221	50	0.189

NiTiCo 30 DP/DH Endmill, 4 Flutes - 949



Drilling / Plunging	K				P				M				S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Titanium Alloy	
Properties	-		-		-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6																
8																
10																
12																
16																
20	110	0.182	75	0.185	120	0.196	110	0.171	130	0.171	80	0.189	60	0.212	40	0.131

NiTiCo 30 DP Roughing Endmill with Weldon, 4 Flutes



Order Number	D	I1	I2	L	d2 h5	C	Availability
C64 0600 057	6	16		57	6	0.1	●
C64 0800 064	8	20		64	8	0.2	●
C64 1000 072	10	22		72	10	0.2	●
C64 1200 083	12	26		83	12	0.2	●
C64 1600 092	16	32		92	16	0.3	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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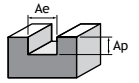
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

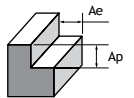


NiTiCo 30 DP Roughing with Weldon Endmill, 4 Flutes - C64



Slotting	K		P				M		S					
Working Material	Grey Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D		0.50 × D		1.00 × D		1.00 × D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		0.15 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	190	0.020	220	0.020	175	0.020	130	0.022	65	0.032	100	0.032	90	0.030
8		0.027		0.027		0.030		0.042		0.042		0.040		
10		0.035		0.035		0.039		0.054		0.054		0.052		
12		0.043		0.043		0.042		0.048		0.067		0.067		0.064
16		0.056		0.057		0.054		0.062		0.085		0.085		0.081

NiTiCo 30 DP Roughing with Weldon Endmill, 4 Flutes - C64



Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 × D		1.00 × D	
Ae (mm)	0.25 × D		0.25 × D		0.20 × D		0.18 × D		0.15 × D		0.15 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	275	0.035	310	0.037	255	0.034	175	0.036	95	0.043	135	0.002	120	0.002
8		0.048		0.050		0.046		0.048		0.059		0.003		0.003
10		0.060		0.063		0.059		0.061		0.075		0.005		0.005
12		0.075		0.076		0.072		0.075		0.093		0.007		0.007
16		0.095		0.096		0.093		0.095		0.119		0.012		0.011

NiTiCo 30 DP/DH Torus Endmill, 4 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
A1R 0400 057 0600 050	4	11		57	6	0.5	●
A1R 0500 057 0600 050	5	13		57	6	0.5	●
A1R 0600 057 0600 030	6			57	6	0.3	●
A1R 0800 064 0800 100	8	20		64	8	1	●
A1R 1000 072 1000 030	10	22		72	10	0.3	●
A1R 1000 072 1000 050				72	10	0.5	●
A1R 1200 083 1200 030	12	26		83	12	0.3	●
A1R 1200 083 1200 050				83	12	0.5	●
A1R 1200 083 1200 100				83	12	1	●
A1R 1200 083 1200 200				83	12	2	●
A1R 1200 083 1200 300				83	12	3	●
A1R 1600 092 1600 030	16	32		92	16	0.3	●
A1R 1600 092 1600 050				92	16	0.5	●
A1R 1600 092 1600 200				92	16	2	●

Stock Availability

● Ex Stock (Germany)

CNC Repeatability

Ø1 - Ø3 within 10µm

Ø4 - Ø8 within 15µm

≥ Ø10 within 20µm

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

●

○

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NiTiCo 30 DP/DH Torus Endmill, 4 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
C48 0400 057 0600 030	4	11		57	6	0.3	●
C48 0400 057 0600 050				57	6	0.5	●
C48 0500 057 0600 030	5			57	6	0.3	●
C48 0500 057 0600 050				57	6	0.5	●
C48 0600 057 0600 030	6	13		57	6	0.3	●
C48 0600 057 0600 050				57	6	0.5	●
C48 0600 057 0600 100				57	6	1	●
C48 0800 064 0800 030	8	20		64	8	0.3	●
C48 0800 064 0800 050				64	8	0.5	●
C48 0800 064 0800 100				64	8	1	●
C48 1000 072 1000 030	10	22		72	10	0.3	●
C48 1000 072 1000 050				72	10	0.5	●
C48 1000 072 1000 100				72	10	1	●
C48 1200 083 1200 030	12	26		83	12	0.3	●
C48 1200 083 1200 050				83	12	0.5	●
C48 1200 083 1200 100				83	12	1	●
C48 1200 083 1200 200				83	12	2	●
C48 1200 083 1200 250				83	12	2.5	●
C48 1200 083 1200 300	16	32		83	12	3	●
C48 1600 092 1600 030				92	16	0.3	●
C48 1600 092 1600 050				92	16	0.5	●
C48 1600 092 1600 100				92	16	1	●
C48 1600 092 1600 200				92	16	2	●
C48 1600 092 1600 250				92	16	2.5	●
C48 1600 092 1600 300				92	16	3	●
C48 1600 092 1600 400				92	16	4	●
C48 2000 104 2000 050	20	38		104	20	0.5	●
C48 2000 104 2000 100				104	20	1	●
C48 2000 104 2000 200				104	20	2	●
C48 2000 104 2000 300				104	20	3	●
C48 2000 104 2000 400				104	20	4	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

● ○ ● ● ● ● ○ ●

CNC Repeatability

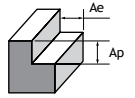
 Ø1 - Ø3 within 10µm
 Ø4 - Ø8 within 15µm
 ≥ Ø10 within 20µm

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



NiTiCo 30 DP/DH Endmill, 4 Flutes – A1R, C48



Side Milling	K				P				M		S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-	
Ap (mm)	1.25 x D		1.25 x D		1.25 x D		1.25 x D		1.25 x D		1.50 x D		1.00 x D	
Ae (mm)	0.25 x D		0.25 x D		0.25 x D		0.20 x D		0.18 x D		0.15 x D		0.10 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	220	0.022	140	0.024	250	0.022	200	0.021	130	0.025	60	0.024	30	0.023
5		0.029		0.031		0.029		0.027		0.031		0.031		0.029
6		0.035		0.039		0.035		0.033		0.038		0.038		0.036
8		0.050		0.054		0.050		0.047		0.052		0.052		0.049
10		0.066		0.070		0.066		0.061		0.067		0.068		0.065
12		0.083		0.087		0.083		0.077		0.082		0.084		0.080
16		0.106		0.108		0.107		0.099		0.103		0.101		0.096
20		0.126		0.128		0.129		0.118		0.121		0.115		0.109

NiTiCo 30 DP/DH Endmill, 4 Flutes – A1R, C48



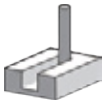
Ramp / Helical	K				P				M		S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D	
Ramping Angle	5°		5°		5°		5°		3°		2°		2°	
Max Ramping Angle	15°		15°		15°		15°		15°		15°		15°	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	190	0.017	150	0.018	200	0.020	140	0.019	80	0.021	50	0.014	85	0.030
5		0.021		0.022		0.027		0.024		0.028		0.020		0.037
6		0.027		0.030		0.033		0.031		0.035		0.025		0.051
8		0.038		0.041		0.047		0.045		0.055		0.037		0.065
10		0.050		0.053		0.062		0.058		0.076		0.055		0.081
12		0.063		0.066		0.076		0.074		0.102		0.072		0.103
16		0.078		0.079		0.095		0.092		0.118		0.086		0.140
20		0.090		0.091		0.108		0.106		0.123		0.093		0.200

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

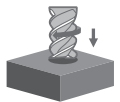


NiTiCo 30 DP/DH Endmill, 4 Flutes - A1R, C48



Trochoidal Milling	K				P				M		S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-	
Ap (mm)	1.50 x D		1.50 x D		1.50 x D		1.50 x D		1.50 x D		1.50 x D		1.50 x D	
Ae (mm)	0.10 x D		0.10 x D		0.10 x D		0.10 x D		0.10 x D		0.10 x D		0.10 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	320	0.034	150	0.037	350	0.035	290	0.033	200	0.037	100	0.034	85	0.030
5		0.043		0.046		0.044		0.043		0.048		0.045		0.037
6		0.053		0.059		0.054		0.053		0.060		0.057		0.051
8		0.073		0.079		0.075		0.073		0.084		0.084		0.065
10		0.095		0.101		0.098		0.096		0.112		0.116		0.081
12		0.118		0.124		0.121		0.120		0.142		0.151		0.103
16		0.147		0.150		0.153		0.149		0.173		0.176		0.140
20		0.172		0.175		0.180		0.174		0.197		0.189		0.200

NiTiCo 30 DP/DH Endmill, 4 Flutes - A1R, C48



Plunging / Drilling	K				P				M		S			
Working Material	Grey Cast Iron		Ductile Cast Iron		Carbon Steel		Alloy steel		Stainless Steel		Titanium Alloy		Cobalt Alloy	
Properties	-		-		-		520 < Rm < 1200		High Machinability		-		-	
Ap (mm)	1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D		1.00 x D	
Ae (mm)	-		-		-		-		-		-		-	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	110	0.035	75	0.038	120	0.038	110	0.033	80	0.035	40	0.024	85	0.030
5		0.044		0.047		0.048		0.042		0.044		0.031		0.037
6		0.054		0.060		0.058		0.051		0.054		0.038		0.051
8		0.074		0.079		0.080		0.070		0.074		0.052		0.065
10		0.095		0.100		0.102		0.091		0.095		0.067		0.081
12		0.116		0.122		0.126		0.113		0.118		0.083		0.103
16		0.150		0.153		0.162		0.144		0.154		0.107		0.140
20		0.182		0.185		0.196		0.171		0.189		0.131		0.200

FEATURES & BENEFITS

NiTiCo 30 DH (Without Oil Feed)



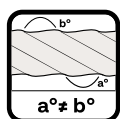
J89

1. 5 Flutes Design



Significantly increased feed rate
(25% higher than a 4-Flute design).

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Small Corner Radius



For less chipping of the cutting edges
and longer tool life.

4. Ideal Cutting Edge



Provide edge protection to prolong
tool life.

5. Suitable for Material Groups:



NiTiCo 30 DH Endmill, 5 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
J89 0400 057 06	4	12		57	6	0.1	●
J89 0500 057 06	5	13		57	6	0.1	●
J89 0600 057	6			57	6	0.1	●
J89 0800 064	8	20		64	8	0.2	●
J89 1000 072	10	22		72	10	0.2	●
J89 1200 083	12	26		83	12	0.3	●
J89 1600 092	16	32		92	16	0.3	●
J89 2000 104	20	38		104	20	0.3	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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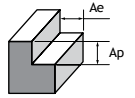
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

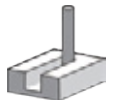


NiTiCo 30 DH Endmill, 5 Flutes – J89



Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.25 × D		0.25 × D		0.20 × D		0.18 × D		0.15 × D		0.10 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	250	0.017	280	0.018	230	0.018	160	0.018	85	0.024	60	0.020	50	0.019
5		0.022		0.023		0.022		0.023		0.030		0.027		0.026
6		0.027		0.028		0.027		0.028		0.037		0.034		0.032
8		0.036		0.038		0.038		0.039		0.051		0.047		0.045
10		0.049		0.048		0.049		0.050		0.065		0.062		0.059
12		0.059		0.057		0.062		0.063		0.081		0.079		0.075
16		0.077		0.074		0.076		0.077		0.103		0.096		0.092
20		0.086		0.089		0.086		0.088		0.122		0.111		0.106

NiTiCo 30 DH Endmill, 5 Flutes – J89



Trochoidal Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.08 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	300	0.015	330	0.015	280	0.016	200	0.017	110	0.024	70	0.018	60	0.017
5		0.021		0.020		0.022		0.023		0.031		0.023		0.022
6		0.027		0.028		0.030		0.031		0.038		0.029		0.028
8		0.038		0.039		0.043		0.044		0.054		0.042		0.040
10		0.051		0.051		0.058		0.059		0.071		0.057		0.055
12		0.064		0.064		0.078		0.079		0.092		0.076		0.072
16		0.080		0.082		0.095		0.096		0.115		0.089		0.085
20		0.094		0.093		0.108		0.109		0.135		0.096		0.091

FEATURES & BENEFITS

NiTiCo 30 DH (Without Oil Feed)



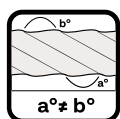
K50

1. 5 Flutes Design



Significantly increased feed rate
(25% higher than a 4-Flute design).

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Optimized Geometry with Chipbreakers



Efficiently shears work materials and shortens chips for improved chips removal.

4. Small Corner Radius



For less chipping of the cutting edges
and longer tool life.

5. Ideal Cutting Edge

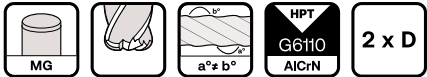


Provide edge protection to prolong
tool life.

6. Suitable for Material Groups:



NiTiCo 30 DH Endmill, with Chip Breaker, Recess and Weldon, 5 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
K50 0400 057 06	4	10	15	57	6	0.1	●
K50 0600 057 *	6	15	20	57	6	0.1	●
K50 0800 064	8	20	25	64	8	0.15	●
K50 1000 072 *	10	25	30	72	10	0.2	●
K50 1200 083 *	12	30	38	83	12	0.2	●
K50 1600 092 *	16	39	44	92	16	0.3	●
K50 2000 104 *	20	48	54	104	20	0.3	●

*- DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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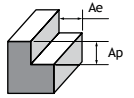
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

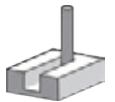


NiTiCo 30 DH Endmill, with Chip Breaker, Recess and Weldon, 5 Flutes – K50



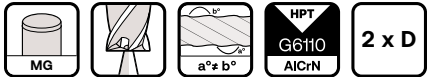
Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.25 × D		0.25 × D		0.20 × D		0.18 × D		0.15 × D		0.15 × D		0.15 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	265	0.017	295	0.017	240	0.018	135	0.017	90	0.022	45	0.022	35	0.021
5		0.021		0.022		0.024		0.022		0.028		0.028		0.027
6		0.026		0.027		0.029		0.027		0.034		0.034		0.032
8		0.036		0.037		0.040		0.037		0.047		0.047		0.045
10		0.047		0.047		0.052		0.047		0.060		0.060		0.057
12		0.057		0.057		0.065		0.057		0.074		0.074		0.070
16		0.074		0.073		0.082		0.072		0.093		0.093		0.088
20		0.085		0.089		0.097		0.085		0.111		0.111		0.105

NiTiCo 30 DH Endmill, with Chip Breaker, Recess and Weldon, 5 Flutes – K50



Trochoidal Milling	K		P			M		S						
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Proprietà	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.10 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	315	0.018	345	0.018	290	0.020	170	0.019	120	0.028	60	0.028	47	0.027
5		0.024		0.024		0.028		0.026		0.036		0.036		0.034
6		0.031		0.032		0.037		0.035		0.045		0.045		0.043
8		0.044		0.044		0.052		0.048		0.063		0.063		0.060
10		0.059		0.059		0.071		0.064		0.082		0.082		0.078
12		0.076		0.075		0.094		0.084		0.108		0.108		0.103
16		0.094		0.094		0.116		0.104		0.133		0.133		0.126
20		0.109		0.107		0.131		0.117		0.157		0.157		0.149

NiTiCo 30 DH Endmill, with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes



Order Number	D	I1	I2	L	d2 h6	R	Availability
K65 0400 057 06	4	10	15	57	6	0.1	●
K65 0600 057 *	6	15	20	57	6	0.1	●
K65 0800 064	8	20	25	64	8	0.15	●
K65 1000 072 *	10	25	30	72	10	0.2	●
K65 1200 083 *	12	30	38	83	12	0.2	●
K65 1600 092 *	16	39	44	92	16	0.3	●
K65 2000 104 *	20	48	54	104	20	0.3	●

*- DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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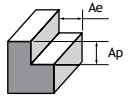
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

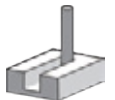


NiTiCo 30 DH Endmill, with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes – K65



Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.25 × D		0.25 × D		0.20 × D		0.18 × D		0.15 × D		0.15 × D		0.15 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	280	0.016	310	0.017	250	0.019	180	0.021	100	0.025	50	0.025	40	0.023
5		0.021		0.022		0.025		0.027		0.032		0.032		0.030
6		0.025		0.027		0.031		0.033		0.039		0.039		0.037
8		0.035		0.036		0.043		0.045		0.054		0.054		0.051
10		0.045		0.046		0.055		0.057		0.069		0.069		0.065
12		0.056		0.056		0.069		0.071		0.087		0.087		0.082
16		0.071		0.072		0.087		0.089		0.108		0.108		0.103
20		0.084		0.088		0.107		0.109		0.128		0.128		0.122

NiTiCo 30 DH Endmill, with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes – K65



Trochoidal Milling	K		P				M		S																																																												
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy																																																								
Proprietà	-		-		520 < Rm < 1200		High Machinability		-		-		-																																																								
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D																																																								
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D																																																								
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.10 × D		0.10 × D																																																								
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz																																																							
4															330	0.015	360	0.016	300	0.017	220	0.019	130	65	0.025	52	0.023																																										
5																												0.020	0.021	0.023	0.025	0.032	0.032	0.030																																			
6																																			0.026	0.027	0.031	0.033	0.040	0.040	0.038																												
8																																										0.037	0.037	0.044	0.046	0.055	0.055	0.052																					
10																																																	0.049	0.049	0.059	0.061	0.072	0.072	0.069														
12																																																								0.063	0.064	0.078	0.080	0.096	0.096	0.091							
16																																																															0.078	0.079	0.097	0.099	0.117	0.117	0.112
20																																																																					

NiTiCo 30 DH Long Endmill, 5 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
J92 0600 075	6	25		75	6	0.1	●
J92 0800 075	8			75	8	0.2	●
J92 1000 100	10	38		100	10	0.2	●
J92 1200 100	12	45		100	12	0.3	●
J92 1600 125	16	55		125	16	0.3	●
J92 2000 125	20	65		125	20	0.3	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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NiTiCo 30 DH Long Endmill with Weldon, 5 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
J93 0600 075	6	25		75	6	0.1	●
J93 0800 075	8			75	8	0.2	●
J93 1000 100	10	38		100	10	0.2	●
J93 1200 100	12	45		100	12	0.3	●
J93 1600 125	16	55		125	16	0.3	●
J93 2000 125	20	65		125	20	0.3	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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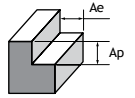
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

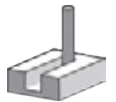


NiTiCo 30 DH Long Endmill, 5 Flutes – J92, J93



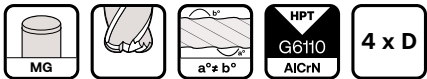
Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.00 × D		1.00 × D		1.00 × D	
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.15 × D		0.10 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	230	0.014	260	0.015	210	0.016	140	0.017	75	0.023	50	0.020	40	0.019
5		0.019		0.019		0.020		0.021		0.029		0.026		0.024
6		0.024		0.023		0.025		0.027		0.036		0.033		0.031
8		0.031		0.032		0.035		0.037		0.049		0.046		0.043
10		0.041		0.041		0.046		0.048		0.063		0.060		0.057
12		0.053		0.050		0.057		0.060		0.078		0.075		0.071
16		0.066		0.062		0.071		0.074		0.099		0.093		0.088
20		0.078		0.073		0.080		0.085		0.119		0.108		0.103

NiTiCo 30 DH Long Endmill, 5 Flutes – J92, J93



Trochoidal Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	2.00 × D		2.00 × D		2.00 × D		2.00 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.12 × D		0.12 × D		0.10 × D		0.08 × D		0.10 × D		0.08 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	270	0.014	300	0.014	260	0.014	170	0.016	95	0.021	60	0.015	50	0.014
5		0.018		0.018		0.020		0.022		0.027		0.021		0.020
6		0.023		0.025		0.027		0.029		0.035		0.027		0.026
8		0.034		0.035		0.040		0.042		0.049		0.039		0.037
10		0.047		0.046		0.054		0.056		0.065		0.053		0.050
12		0.061		0.059		0.070		0.071		0.083		0.068		0.065
16		0.068		0.068		0.089		0.090		0.106		0.082		0.078
20		0.080		0.078		0.101		0.103		0.126		0.090		0.085

NiTiCo 30 DH Long Endmill with Chip Breaker, Recess & Weldon, 5 Flutes



Order Number	D	l1	l2	L	d2 h6	R	Availability
K51 0600 075	6	26	32	75	6	0.1	●
K51 0800 075 *	8	32	38	75	8	0.2	●
K51 1000 100	10	42	52	100	10	0.2	●
K51 1200 100 *	12		54	100	12	0.2	●
K51 1600 125	16	60	68	125	16	0.3	●
K51 2000 125 *	20	67	75	125	20	0.3	●

*- DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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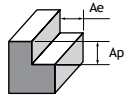
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

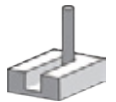


NiTiCo 30 DH Long Endmill with Chip Breaker, Recess & Weldon, 5 Flutes – K51



Side Milling	K		P		M		S							
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.10 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	240	0.014	270	0.015	220	0.017	120	0.017	80	0.019	40	0.019	30	0.018
5		0.019		0.019		0.022		0.020		0.024		0.024		0.023
6		0.023		0.024		0.027		0.025		0.030		0.030		0.029
8		0.031		0.032		0.037		0.034		0.043		0.043		0.041
10		0.041		0.041		0.048		0.043		0.055		0.055		0.052
12		0.053		0.052		0.060		0.054		0.070		0.070		0.067
16		0.067		0.066		0.077		0.069		0.089		0.089		0.085
20		0.079		0.078		0.090		0.080		0.106		0.106		0.101

NiTiCo 30 DH Long Endmill with Chip Breaker, Recess & Weldon, 5 Flutes – K51



Trochoidal Milling	K		P				M		S					
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Proprietà	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D	
Ae (mm)	0.12 × D		0.12 × D		0.10 × D		0.08 × D		0.08 × D		0.08 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	285	0.013	315	0.014	270	0.014	150	0.014	105	0.018	53	0.018	39	0.017
5		0.018		0.019		0.021		0.019		0.024		0.024		0.023
6		0.024		0.025		0.028		0.026		0.030		0.030		0.029
8		0.034		0.035		0.040		0.036		0.042		0.042		0.040
10		0.046		0.046		0.055		0.049		0.056		0.056		0.053
12		0.060		0.060		0.071		0.063		0.074		0.074		0.070
16		0.070		0.071		0.089		0.077		0.091		0.091		0.086
20		0.080		0.080		0.100		0.088		0.107		0.107		0.102

FEATURES & BENEFITS

NiTiCo 30 DH (With Oil Feed)



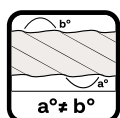
K67

1. 5 Flutes Design



Significantly increased feed rate
(25% higher than a 4-Flute design).

2. Differential Helix (DH)



Reduces the cutting force:

- Allows high speed machining, increasing productivity.
- Improves surface finishing.

3. Optimized Geometry with Chipbreakers



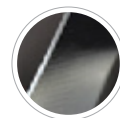
Efficiently shears work materials and shortens chips for improved chips removal.

4. Small Corner Radius



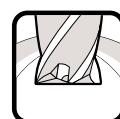
For less chipping of the cutting edges and longer tool life.

5. Ideal Cutting Edge



Provide edge protection to prolong tool life.

6. Oil Hole for High Performance Milling

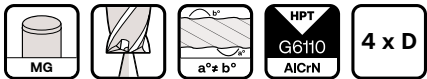


- Improves welding resistance.
- Enables a wide range of machining processes.
- Especially beneficial for difficult to cut materials, offering stable machining.

7. Suitable for Material Groups:



NiTiCo 30 DH Long Endmill with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes



Order Number		D	l1	l2	L	d2 h6	R	Availability
K67 0600 075	*	6	26	32	75	6	0.1	●
K67 0800 075		8	32	38	75	8	0.15	●
K67 1000 100	*	10	42	52	100	10	0.2	●
K67 1200 100		12		54	100	12	0.2	●
K67 1600 125	*	16	60	68	125	16	0.3	●
K67 2000 125		20	67	75	125	20	0.3	●

*- DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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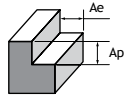
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

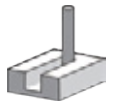


NiTiCo 30 DH Long Endmill with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes – K67



Side Milling	K		P				M		S					
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Ap (mm)	1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D		1.50 × D	
Ae (mm)	0.15 × D		0.15 × D		0.12 × D		0.10 × D		0.10 × D		0.10 × D		0.10 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	250	0.014	280	0.014	230	0.018	160	0.020	85	0.020	45	0.020	35	0.019
5		0.019		0.019		0.023		0.025		0.027		0.027		0.026
6		0.023		0.024		0.029		0.031		0.035		0.035		0.033
8		0.031		0.032		0.039		0.041		0.050		0.050		0.047
10		0.041		0.041		0.050		0.052		0.066		0.066		0.062
12		0.053		0.054		0.063		0.065		0.084		0.084		0.080
16		0.068		0.069		0.082		0.084		0.107		0.107		0.101
20		0.080		0.083		0.099		0.101		0.126		0.126		0.120

NiTiCo 30 DH Long Endmill with Internal Oil Hole, Chip Breaker, Recess & Weldon, 5 Flutes – K67



Trochoidal Milling	K		P				M		S					
Working Material	Grey Cast Iron		Carbon Steel		Alloy Steel		Stainless Steel		Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Proprietà	-		-		520 < Rm < 1200		High Machinability		-		-		-	
Maximum Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D	
Ae (mm)	0.12 × D		0.12 × D		0.10 × D		0.08 × D		0.08 × D		0.08 × D		0.08 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	300	0.013	330	0.014	280	0.014	200	0.016	115	0.021	61	0.021	47	0.020
5		0.018		0.019		0.021		0.023		0.028		0.028		0.026
6		0.024		0.025		0.028		0.030		0.035		0.035		0.034
8		0.034		0.035		0.040		0.042		0.049		0.049		0.046
10		0.045		0.046		0.055		0.057		0.066		0.066		0.062
12		0.059		0.060		0.072		0.074		0.089		0.089		0.084
16		0.072		0.074		0.088		0.090		0.107		0.107		0.101
20		0.081		0.082		0.099		0.101		0.123		0.123		0.117

FEATURES & BENEFITS

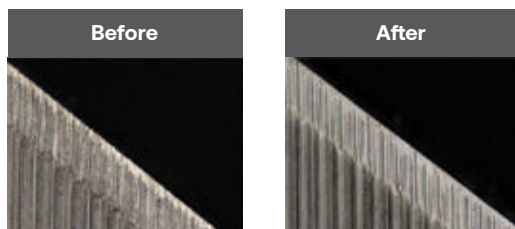
NiTiCo 30 DP MULTIFLUTE



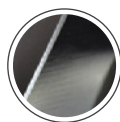
M01

1. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



2. Ideal Cutting Edge



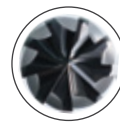
Provides edge protection to prolong tool life.

3. Optimized Geometry with Chipbreakers



Efficiently shears work materials and shortens chips for improved chips removal.

4. High Flute Count



- Allows faster feed rates with stable load per tooth, reducing cycle time and increasing material removal.
- More flutes increase tool rigidity, reducing vibration and deflection for consistent, reliable machining.
- Wear is shared across more cutting edges, lowering stress per edge and extending tool life.
- Reduced step-over and tighter scallop heights deliver a smoother, high-quality surface with minimal post-processing.

5. Suitable for Material Groups:



NiTiCo 30 DP Multiflute Torus with Recess, 9 Flutes



Order Number	D1	l1	l2	l4	L	d1	l1xØ	R	d2 h6	Availability
M01 1000 072 1000 050	10	27	32	40	72	9.8	2.7	0.5	10	●
M01 1200 083 1200 050	12	30	37	46	83	11.7	2.5	0.5	12	●
M01 1600 100 1600 100	16	40	51	49	100	15.7	2.5	1	16	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

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O01

O02

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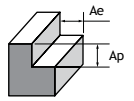
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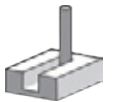
Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



NiTiCo 30 DP Multiflute Torus with Recess, 9 Flutes – M01

Side Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		1.00 × D	
Ae (mm)	0.05 × D		0.05 × D		0.04 × D		0.05 × D		0.04 × D		0.05 × D		0.05 × D		0.04 × D		0.03 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	280	0.090	230	0.084	190	0.081	140	0.073	100	0.062	250	0.105	140	0.096	70	0.058	40	0.054
12		0.104		0.097		0.094		0.092		0.078		0.132		0.120		0.076		0.067
16		0.126		0.118		0.114		0.112		0.095		0.173		0.158		0.090		0.080



NiTiCo 30 DP Multiflute Torus with Recess, 9 Flutes – M01

Trochoidal Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Min. Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		2.00 × D		1.00 × D	
Ae (mm)	0.05 × D		0.05 × D		0.04 × D		0.05 × D		0.04 × D		0.05 × D		0.05 × D		0.04 × D		0.03 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	300	0.100	250	0.093	210	0.090	160	0.082	120	0.069	270	0.117	160	0.107	120	0.065	45	0.061
12		0.115		0.107		0.104		0.103		0.087		0.147		0.134		0.085		0.075
16		0.140		0.131		0.126		0.125		0.106		0.193		0.176		0.100		0.089

NiTiCo 30 Long DP Multiflute Torus with Chip Breaker and Recess, 9 Flutes



Order Number	D1	l1	l2	l4	L	d1	l1xØ	R	d2 h6	Availability
M02 1000 100 1000 050 042	10	42	52	48	100	9.8	4.2	0.5	10	●
M02 1200 100 1200 050	12	48	54	46	100	11.7	4.0	0.5	12	●
M02 1600 125 1600 100	16	64	76	49	125	15.7	4.0	1	16	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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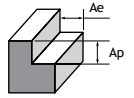
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

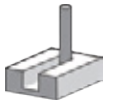


NiTiCo 30 Long DP Multiflute Torus with Chip Breaker and Recess, 9 Flutes - M02



Side Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		1.00 × D	
Ae (mm)	0.05 × D		0.05 × D		0.04 × D		0.05 × D		0.04 × D		0.05 × D		0.05 × D		0.04 × D		0.03 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	250	0.086	200	0.080	160	0.077	120	0.070	90	0.059	220	0.100	120	0.092	65	0.056	35	0.052
12		0.099		0.093		0.090		0.088		0.075		0.126		0.114		0.073		0.064
16		0.120		0.113		0.109		0.107		0.091		0.165		0.151		0.086		0.076

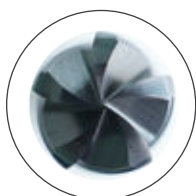
NiTiCo 30 Long DP Multiflute Torus with Chip Breaker and Recess, 9 Flutes - M02



Trochoidal Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Min. Slot Width	1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D		1.25 × D	
Ap (mm)	3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		3.00 × D		1.00 × D	
Ae (mm)	0.05 × D		0.05 × D		0.04 × D		0.05 × D		0.04 × D		0.05 × D		0.05 × D		0.04 × D		0.03 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	270	0.095	220	0.089	180	0.086	140	0.078	110	0.066	240	0.112	140	0.102	90	0.062	40	0.058
12		0.110		0.102		0.099		0.098		0.083		0.140		0.128		0.081		0.072
16		0.133		0.125		0.120		0.119		0.101		0.184		0.168		0.095		0.085

FEATURES & BENEFITS

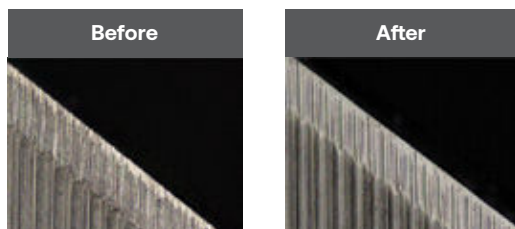
NiTiCo 30 HIGH FEED



M14

1. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



2. Superior Coating

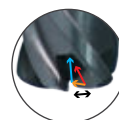


Enhances heat resistance to prolong tool life.

3. High Feed Profile

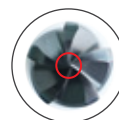


Enables high-feed machining with thin-chip formation for higher MRR and improved chip evacuation.



Axial Cutting Force Design:

- Directs most cutting forces along the spindle axis, minimizing tool deflection.
- Enhances stability during high-feed machining, even in long overhang setups.



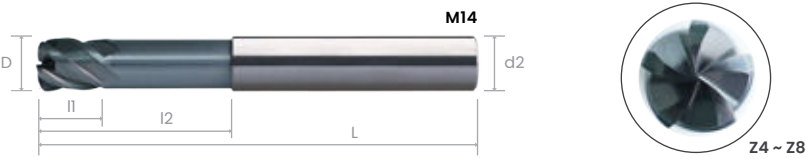
Central Coolant Hole:

- Enhances chip evacuation and thermal control, especially effective in deep cavity or blind hole applications.

4. Suitable for Material Groups:



NiTiCo 30 High Feed Endmill with Recess, 4 - 8 Flutes



Order Number	Lenght	D	l1	l2	L	d2 h6	Z	Availability
M14 0600 060 06	Standard	6	6	24	60	6	5	●
M14 0800 064 08		8	8	28	64	8	5	●
M14 1000 070 10		10	10	30	70	10	6	●
M14 1000 100 10	Long			60	100	10	6	●
M14 1000 125 10	Extra-Long			85	125	10	6	●
M14 1200 075 12	Standard	12	12	30	75	12	6	●
M14 1200 100 12	Long			55	100	12	6	●
M14 1200 125 12	Extra-Long			80	125	12	6	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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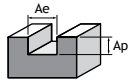
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

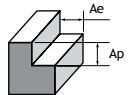


NiTiCo 30 High Feed Endmill with Recess, 4 – 8 Flutes, Standard Length – M14



Slotting	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	0.06 × D		0.06 × D		0.04 × D		0.05 × D		0.04 × D		0.06 × D		0.04 × D		0.03 × D		0.03 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	230	0.224	160	0.208	150	0.200	120	0.176	70	0.144	180	0.216	120	0.208	100	0.144	40	0.120
8		0.288		0.272		0.256		0.240		0.200		0.272		0.264		0.200		0.168
10		0.350		0.320		0.310		0.300		0.250		0.330		0.320		0.250		0.210
12		0.440		0.410		0.390		0.360		0.310		0.420		0.400		0.310		0.260

NiTiCo 30 High Feed Endmill with Recess, 4 – 8 Flutes, Standard Length – M14



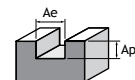
Side Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	0.06 × D		0.06 × D		0.04 × D		0.05 × D		0.04 × D		0.06 × D		0.04 × D		0.03 × D		0.03 × D	
Ae (mm)	0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.40 × D		0.40 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
6	230	0.280	160	0.260	150	0.250	120	0.220	70	0.180	180	0.270	120	0.260	100	0.180	40	0.150
8		0.360		0.340		0.320		0.300		0.250		0.340		0.330		0.250		0.210
10		0.440		0.410		0.390		0.380		0.320		0.420		0.400		0.320		0.270
12		0.550		0.520		0.490		0.460		0.390		0.530		0.510		0.390		0.330

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

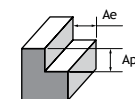


NiTiCo 30 High Feed Endmill with Recess, 4 – 8 Flutes, Long Length – M14



Slotting	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	0.04 × D		0.04 × D		0.03 × D		0.04 × D		0.03 × D		0.04 × D		0.03 × D		0.02 × D		0.02 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	160	0.280	110	0.260	100	0.240	80	0.240	50	0.200	130	0.260	90	0.250	70	0.200	30	0.160
12		0.350		0.320		0.310		0.280		0.240		0.330		0.320		0.240		0.200

NiTiCo 30 High Feed Endmills with Recess, 4 – 8 Flutes, Long Length – M14



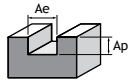
Side Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
Ap (mm)	0.04 × D		0.04 × D		0.03 × D		0.04 × D		0.03 × D		0.04 × D		0.03 × D		0.02 × D		0.02 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	160	0.350	110	0.330	100	0.310	80	0.300	50	0.250	130	0.330	90	0.320	70	0.250	30	0.210
12		0.440		0.410		0.390		0.360		0.300		0.420		0.400		0.300		0.250

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

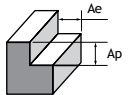


NiTiCo 30 High Feed Endmill with Recess, 4 – 8 Flutes, Extra-Long Length – M14



Slotting	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	–		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		–		–		–		–	
Ap (mm)	0.03 × D		0.03 × D		0.02 × D		0.03 × D		0.02 × D		0.03 × D		0.02 × D		0.01 × D		0.01 × D	
Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	120	0.170	80	0.160	75	0.150	60	0.150	40	0.120	90	0.160	60	0.160	50	0.120	25	0.100
12		0.210		0.200		0.190		0.180		0.150		0.200		0.200		0.150		0.120

NiTiCo 30 High Feed Endmill with Recess, 4 – 8 Flutes, Extra-Long Length – M14



Side Milling	P						M				K				S			
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	–		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		–		–		–		–	
Ap (mm)	0.03 × D		0.03 × D		0.02 × D		0.03 × D		0.02 × D		0.03 × D		0.02 × D		0.01 × D		0.01 × D	
Ae (mm)	0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.45 × D		0.40 × D		0.40 × D	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
10	120	0.220	80	0.200	75	0.190	60	0.190	40	0.160	90	0.210	60	0.200	50	0.160	25	0.130
12		0.270		0.250		0.240		0.230		0.190		0.260		0.250		0.190		0.160



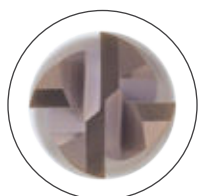
ENDMILLS

for Mould & Die
and hard milling

For High Alloy Steels
50 – 70 HRC

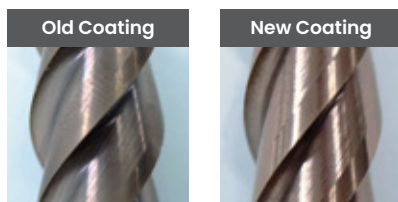
FEATURES & BENEFITS

DM70X



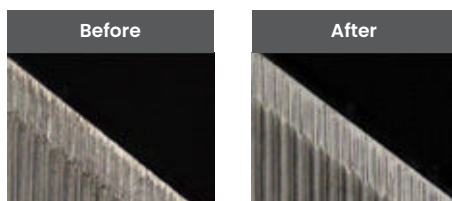
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Supreme Edge Technology

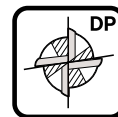
- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



A6M



3. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

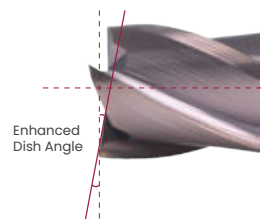
4. Enhanced Gash Land



- Reinforces corner strength to resist chipping and premature wear.
- Increases mechanical strength for better performance under high cutting forces.
- Improves cutting stability for longer tool life and reliable machining.

5. Enhanced Dish Angle

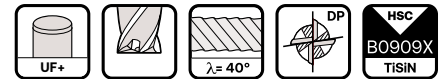
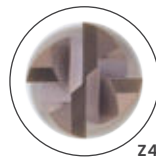
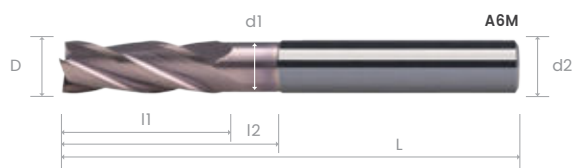
Minimizes irregular tool movement to reduce wear, ensuring longer tool life.



6. Suitable for Material Groups:

H

DM70X DP Endmill with Recess, 4 Flutes



Order Number	D	I1	I2	L	d1	d2 h5	Availability
A6M 0100 050 04	1	2.5	4	50	0.95	4	●
A6M 0100 050 06			6	50	0.95	6	●
A6M 0150 050 04	1.5	4	6	50	1.45	4	●
A6M 0150 050 06			9	50	1.45	6	●
A6M 0200 050 04	2	6	8	50	1.94	4	●
A6M 0200 050 06			12	50	1.94	6	●
A6M 0250 050 04	2.5	8	10	50	2.4	4	●
A6M 0250 050 06			15	50	2.4	6	●
A6M 0300 050 04	3		12	50	2.85	4	●
A6M 0300 050 06			15	50	2.85	6	●
A6M 0400 050 04	4	11	16	50	3.8	4	●
A6M 0400 050 06			20	50	3.8	6	●
A6M 0400 075 04		15	20	75	3.8	4	●
A6M 0500 060 06	5	13	20	60	4.8	6	●
A6M 0600 060 06 13	6		22	60	5.8	6	●
A6M 0600 060 06 20		20	24	60	5.8	6	●
A6M 0600 075 06		15	20	75	5.8	6	●
A6M 0600 100 06		20	24	100	5.8	6	●
A6M 0800 075 08	8		25	75	7.8	8	●
A6M 0800 100 08		25	30	100	7.8	8	●
A6M 1000 075 10	10	22	30	75	9.8	10	●
A6M 1000 100 10 25		25	30	100	9.8	10	●
A6M 1000 100 10 30		30	35	100	9.8	10	●
A6M 1000 125 10			35	125	9.8	10	●
A6M 1000 150 10			35	150	9.8	10	●
A6M 1200 075 12	12	25	35	75	11.7	12	●
A6M 1200 100 12 30		30	35	100	11.7	12	●
A6M 1200 100 12 35		35	40	100	11.7	12	●
A6M 1200 150 12			40	150	11.7	12	●
A6M 2000 100 20 40	20	40	60	100	19	20	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

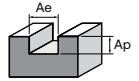
Diameter (mm)	Tolerance
<1	+0 ~ -0.005
1 ≤ D ≤ 2.5	+0 ~ -0.010
2.5 ≤ D ≤ 6	+0 ~ -0.015
6 < D ≤ 10	-0.005 ~ -0.020
>10	-0.010 ~ -0.025

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

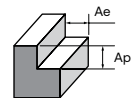


DM70X Endmill with Recess, 4 Flutes – A6M



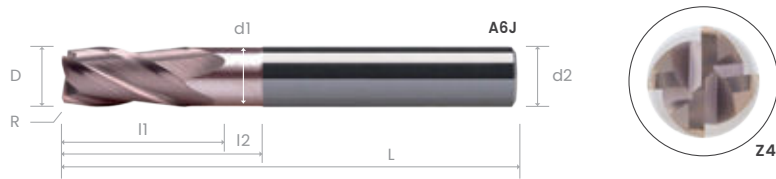
Slotting	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 < HRC ≤ 65		65 < HRC ≤ 70	
Ap (mm)	0.02 x D		0.01 x D		0.01 x D	
Ae (mm)	0.40 x D		0.40 x D		0.40 x D	
D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	70	0.035	60	0.015	50	0.014
1.5		0.058		0.024		0.022
2		0.080		0.032		0.030
2.5		0.108		0.043		0.040
3		0.135		0.053		0.050
4		0.190		0.076		0.072
5		0.243		0.097		0.092
6		0.300		0.121		0.115
8		0.402		0.160		0.152
10		0.480		0.198		0.188
12		0.560		0.230		0.219
20		0.660		0.255		0.250

DM70X Endmill with Recess, 4 Flutes – A6M



Side Milling	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 < HRC ≤ 65		65 < HRC ≤ 70	
Ap (mm)	1.00 - 1.50 x D		1.00 - 1.50 x D		1.00 - 1.50 x D	
Ae (mm)	0.030 x D		0.020 x D		0.015 x D	
D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	200	0.006	150	0.006	100	0.005
2		0.014		0.012		0.011
3		0.022		0.020		0.019
4		0.031		0.029		0.026
5		0.047		0.045		0.040
6		0.073		0.064		0.058
8		0.094		0.085		0.078
10		0.113		0.103		0.092
12		0.125		0.114		0.103
20		0.188		0.171		0.155

DM70X DP Torus Endmill with Recess, 4 Flutes



Order Number	D	l1	l2	L	d1	R	d2 h5	Availability
A6J 0200 050 0400 020	2	6	12	50	1.94	0.2	4	●
A6J 0200 050 0400 030			12	50	1.94	0.3	4	●
A6J 0300 050 0400 050	3	8	12	50	2.85	0.5	4	●
A6J 0300 060 0600 050			15	60	2.85	0.5	6	●
A6J 0400 060 0400 050	4	9	16	60	3.8	0.5	4	●
A6J 0400 075 0600 050		10	20	75	3.8	0.5	6	●
A6J 0600 060 0600 050	6	11	24	60	5.8	0.5	6	●
A6J 0600 060 0600 100			24	60	5.8	1	6	●
A6J 0600 060 0600 150			24	60	5.8	1.5	6	●
A6J 0600 075 0600 020		13	30	75	5.8	0.2	6	●
A6J 0600 075 0600 050			30	75	5.8	0.5	6	●
A6J 0600 075 0600 050 20		20	30	75	5.8	0.5	6	●
A6J 0800 075 0800 020		8	16	26	75	7.8	0.2	8
A6J 0800 075 0800 050 16	26			75	7.8	0.5	8	●
A6J 0800 075 0800 100	26			75	7.8	1	8	●
A6J 0800 075 0800 200	26			75	7.8	2	8	●
A6J 0800 100 0800 050	19		32	100	7.8	0.5	8	●
A6J 0800 100 0800 200			32	100	7.8	2	8	●
A6J 1000 075 1000 200	10		22	30	75	9.8	2	10
A6J 1000 100 1000 050 22		40		100	9.8	0.5	10	●
A6J 1000 100 1000 100	40	100		9.8	1	10	●	
A6J 1200 075 1200 100	12	35		75	11.7	1	12	●
A6J 1200 075 1200 300		35		75	11.7	3	12	●

Stock Availability

● Ex Stock (Germany)

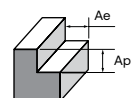
Diameter (mm)	Radius Tolerance	Diameter (mm)	Tolerance
D ≤ 2.5	±0.005	<1	+0 ~ -0.005
3 < D ≤ 6	±0.010	1 ≤ D ≤ 2.5	+0 ~ -0.010
D > 6	±0.015	2.5 ≤ D ≤ 6	+0 ~ -0.015

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DM70X DP Torus Endmill, 4 Flutes – A6J

Side Milling	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 < HRC ≤ 65		65 < HRC ≤ 70	
Ap (mm)	0.18 x R		0.12 x R		0.09 x R	
Ae (mm)	(D/2)-R		(D/2)-R		(D/2)-R	
D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
2	80	0.080	70	0.032	60	0.030
3		0.135		0.053		0.050
4		0.190		0.076		0.072
6		0.300		0.121		0.115
8		0.402		0.160		0.152
10		0.480		0.198		0.188
12		0.560		0.230		0.219

1. Suitable to use in down cutting or contour lines. Reduce the feed rate between 60% and 70% when cutting at an incline (incline angle: 1°) in Z direction.
2. It is recommended to reduce the speed for corners be set. The speed reduction is approximately 1/2 of the diameter tool, and the feed rate need to be reduced between 50% and 60%.
3. R = Corner Radius, D = Cutter Diameter.

DM70X Miniature Endmill with Long Neck, 2 Flutes



Order Number	D	l1	l2	L	d1	d2 h5	Availability
A6D 0050 050 0400 0200	0.5	0.4	2	50	0.46	4	●
A6D 0050 050 0400 0400			4	50	0.46	4	●
A6D 0060 050 0400 0200	0.6	0.5	2	50	0.56	4	●
A6D 0070 050 0400	0.7	0.55	-	50	-	4	●
A6D 0070 050 0400 0600			6	50	0.66	4	●
A6D 0080 050 0400 0400	0.8	0.65	4	50	0.76	4	●
A6D 0100 050 0400 0500	1	0.8	5	50	0.95	4	●
A6D 0100 050 0400 0600			6	50	0.95	4	●
A6D 0100 050 0400 0800			8	50	0.95	4	●
A6D 0100 050 0400 1000			10	50	0.95	4	●
A6D 0140 050 0400	1.4	1.1	-	50	-	4	●
A6D 0150 050 0400	1.5	1.2	-	50	-	4	●
A6D 0150 050 0400 0600			6	50	1.45	4	●
A6D 0150 050 0400 0800			8	50	1.45	4	●
A6D 0150 050 0400 1000			10	50	1.45	4	●
A6D 0150 050 0400 1200	2	1.6	12	50	1.45	4	●
A6D 0200 050 0400 0800			8	50	1.94	4	●
A6D 0200 050 0400 1000			10	50	1.94	4	●
A6D 0200 050 0400 1400			14	50	1.94	4	●
A6D 0200 050 0400 1600			16	50	1.94	4	●
A6D 0200 060 0400 2000			20	60	1.94	4	●
A6D 0200 075 0400 2500	2.5	2	25	75	1.94	4	●
A6D 0250 050 0400			-	50	-	4	●
A6D 0250 050 0400 1200			12	50	2.4	4	●
A6D 0250 100 0400 4000	3	4.5	40	100	2.4	4	●
A6D 0300 075 0600 3000			30	75	2.85	6	●

Stock Availability

● Ex Stock (Germany)

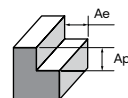
Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

Diameter (mm)	Tolerance
<1	+0 ~ -0.005
1 ≤ D ≤ 2.5	+0 ~ -0.010
2.5 ≤ D ≤ 6	+0 ~ -0.015

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DM70X Miniature Endmill with Long Neck, 2 Flutes – A6D

Profiling		H							
Working Material		Hardened Steel							
Properties		45 ≤ HRC < 52				52 ≤ HRC < 68			
D	Effective Length	Ap	Ae	Vc	Vf	Ap	Ae	Vc	Vf
0.5	2	0.010	0.250	43	420	0.007	0.250	36	380
	4	0.005	0.250	43	290	0.003	0.250	36	220
0.6	2	0.010	0.300	52	500	0.007	0.300	43	360
0.7	-	0.020	0.350	60	770	0.014	0.350	51	650
	6	0.014	0.350	58	540	0.009	0.350	47	425
0.8	4	0.025	0.400	69	700	0.015	0.400	58	600
1	5	0.030	0.030	63	800	0.020	0.500	50	700
	6	0.020	0.500	57	700	0.010	0.500	44	600
	8	0.020	0.500	50	600	0.010	0.500	38	500
	10	0.010	0.500	44	500	0.007	0.500	31	400
1.4	6	0.040	0.700	88	800	0.030	0.700	79	700
1.5	-	0.050	0.750	94	900	0.040	0.750	85	800
	6	0.040	0.750	94	800	0.030	0.750	85	700
	8	0.030	0.750	85	600	0.030	0.750	66	600
	10	0.030	0.750	75	500	0.020	0.750	66	500
	12	0.020	0.750	66	500	0.020	0.750	57	430
2	8	0.050	1.000	101	800	0.040	1.000	75	600
	10	0.050	1.000	88	700	0.040	1.000	75	500
	12	0.040	1.000	75	600	0.030	1.000	63	500
	14	0.030	1.000	75	600	0.020	1.000	63	430
	16	0.030	1.000	63	500	0.020	1.000	58	400
	20	0.020	1.000	58	380	0.010	1.000	53	340
	25	0.015	1.000	53	330	0.008	1.000	50	300
2.5	-	0.070	1.250	110	800	0.050	1.250	79	700
	12	0.060	1.250	94	700	0.040	1.250	75	600
	40	0.012	1.250	43	200	0.010	1.250	39	180
3	30	0.030	1.500	66	600	0.020	1.500	61	500

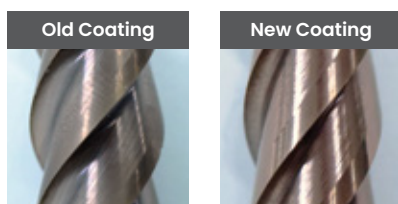
FEATURES & BENEFITS

DM70X



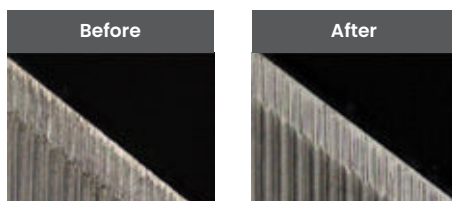
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Supreme Edge Technology

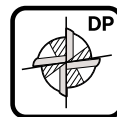
- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



A6E



3. Differential Pitch (DP)



Reduces chatter to provide excellent surface finishing.

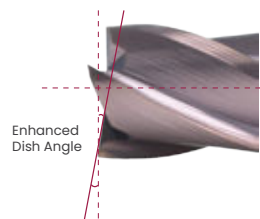
4. Enhanced Gash Land



- Reinforces corner strength to resist chipping and premature wear.
- Increases mechanical strength for better performance under high cutting forces.
- Improves cutting stability for longer tool life and reliable machining.

5. Enhanced Dish Angle

Minimizes irregular tool movement to reduce wear, ensuring longer tool life.



6. Suitable for Material Groups:



DM70X Miniature DP Endmill with Long Neck, 4 Flutes



Order Number	D	l1	l2	L	d1	d2 h5	Availability
A6E 0180 050 0400 160	1.8	1.4	16	50	1.74	4	●
A6E 0200 050 0400 060	2	1.6	6	50	1.94	4	●
A6E 0200 050 0400 160			16	50	1.94	4	●
A6E 0250 050 0400	2.5	2	-	50	-	4	●
A6E 0250 050 0400 080			8	50	2.4	4	●
A6E 0400 100 0600 400	4	6	40	100	3.8	6	●
A6E 0600 060 0600 200	6	9	20	60	5.8	6	●

Stock Availability

● Ex Stock (Germany)

Diameter (mm)	Tolerance
<1	+0 ~ -0.005
1 ≤ D ≤ 2.5	+0 ~ -0.010
2.5 ≤ D ≤ 6	+0 ~ -0.015

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

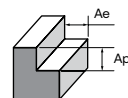
O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



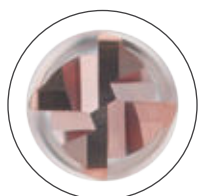
DM70X Miniature DP Endmill with Long Neck, 4 Flutes – A6E



Profiling		H							
Working Material		Hardened Steel							
Properties		45 ≤ HRC < 52				52 ≤ HRC < 68			
D	Effective Length	Ap	Ae	Vc	Vf	Ap	Ae	Vc	Vf
1.8	16	0.02	0.9	62	1000	0.01	0.9	52	800
2	6	0.06	1	124	1800	0.05	1	94	1500
	16	0.03	1	69	1000	0.02	1	58	850
2.5	-	0.07	1.25	121	2000	0.05	1.25	79	1750
	8	0.07	1.25	121	1600	0.05	1.25	79	1400
4	40	0.03	2	50	720	0.01	2	38	600
6	20	0.18	3	135	1600	0.08	3	85	1400

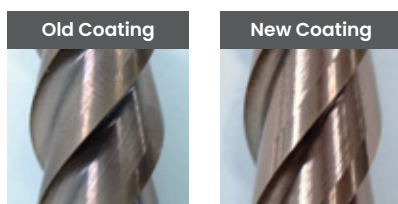
FEATURES & BENEFITS

DM70X



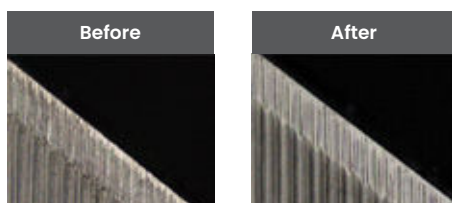
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



3. Differential Pitch (DP)



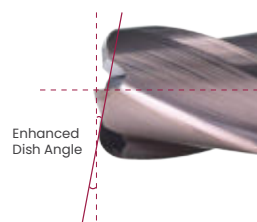
Reduces chatter to provide excellent surface finishing.

A6G



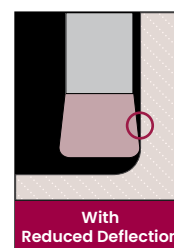
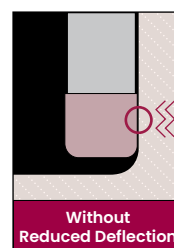
4. Enhanced Dish Angle

Minimizes irregular tool movement to reduce wear, ensuring longer tool life.



5. Back Taper Optimization (<Ø 4mm)

- Prevents unwanted contact between micro tools ($\leq \varnothing 4$ mm) and the workpiece in deep or narrow cavities, reducing vibration and ensuring better surface finishing by maintaining a safe clearance gap.
- Reduces tool deflection for tight tolerance and dimensional accuracy.
- Minimizes vibration for superior surface finishing.



6. Suitable for Material Groups:

H

DM70X Miniature Torus Endmill with Long Neck, 4 Flutes



Order Number	D	l1	l2	L	d1	R	d2 h5	Availability
A6G 0100 050 0400 040 R010	1	0.8	4	50	0.95	0.1	4	●
A6G 0100 050 0400 060 R010			6	50	0.95	0.1	4	●
A6G 0100 050 0400 060 R020			6	50	0.95	0.2	4	●
A6G 0100 050 0400 080 R010			8	50	0.95	0.1	4	●
A6G 0100 050 0400 100 R010			10	50	0.95	0.1	4	●
A6G 0120 050 0400 R010	1.2	1	-	50	-	0.1	4	●
A6G 0120 050 0400 050 R010	1.5	1.2	5	50	1.14	0.1	4	●
A6G 0150 050 0400 080 R010			8	50	1.43	0.1	4	●
A6G 0150 050 0400 080 R020			8	50	1.43	0.2	4	●
A6G 0200 050 0400 060 R010	2	1.6	6	50	1.91	0.1	4	●
A6G 0200 050 0400 080 R020			8	50	1.91	0.2	4	●
A6G 0200 050 0400 100 R020			10	50	1.91	0.2	4	●
A6G 0200 050 0400 120 R010			12	50	1.91	0.1	4	●
A6G 0200 050 0400 120 R020			12	50	1.91	0.2	4	●
A6G 0200 050 0400 120 R050			12	50	1.91	0.5	4	●
A6G 0200 060 0400 160 R020			16	60	1.91	0.2	4	●
A6G 0200 060 0400 200 R020			20	60	1.91	0.2	4	●
A6G 0300 050 0600 100 R020	3	2.5	10	50	2.85	0.2	6	●
A6G 0300 060 0600 160 R020			16	60	2.85	0.2	6	●
A6G 0300 060 0600 160 R030			16	60	2.85	0.3	6	●
A6G 0300 060 0600 160 R050			16	60	2.85	0.5	6	●
A6G 0300 060 0600 160 R100			16	60	2.85	1	6	●
A6G 0300 060 0600 200 R020			20	60	2.85	0.2	6	●
A6G 0300 075 0600 250 R030			25	75	2.85	0.3	6	●
A6G 0300 075 0600 300 R050			30	75	2.85	0.5	6	●
A6G 0300 075 0600 300 R100			30	75	2.85	1	6	●
A6G 0400 050 0600 080 R020	4	3.2	8	50	3.8	0.2	6	●
A6G 0400 050 0600 120 R020			12	50	3.8	0.2	6	●
A6G 0400 060 0600 160 R020			16	60	3.8	0.2	6	●
A6G 0400 060 0600 160 R030			16	60	3.8	0.3	6	●
A6G 0400 060 0600 160 R050			16	60	3.8	0.5	6	●
A6G 0400 075 0600 240 R020			24	75	3.8	0.2	6	●
A6G 0400 075 0600 320 R020			32	75	3.8	0.2	6	●
A6G 0400 075 0600 320 R050			32	75	3.8	0.5	6	●
A6G 0500 060 0600 150 R050	5	4	15	60	4.75	0.5	6	●
A6G 0500 100 0600 400 R010			40	100	4.75	0.1	6	●
A6G 0500 100 0600 400 R100			40	100	4.75	1	6	●
A6G 0600 075 0600 180 R050	6	5	18	75	5.7	0.5	6	●
A6G 0600 075 0600 240 R030			24	75	5.7	0.3	6	●
A6G 0600 075 0600 240 R050			24	75	5.7	0.5	6	●
A6G 0600 100 0600 480 R050			48	100	5.7	0.5	6	●
A6G 0600 100 0600 480 R100			48	100	5.7	1	6	●

Stock Availability

● Ex Stock (Germany)

Diameter (mm)	Radius Tolerance	Diameter (mm)	Tolerance
D ≤ 2.5	±0.005	<1	+0 ~ -0.005
3 < D ≤ 6	±0.010	1 ≤ D ≤ 2.5	+0 ~ -0.010
D > 6	±0.015	2.5 ≤ D ≤ 6	+0 ~ -0.015

Material Group

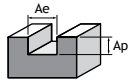
N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DM70X Miniature Torus Endmill with Long Neck, 4 Flutes - A6G



Slotting		H1			H2		
Working Material		Hardened Steel			Hardened Steel		
Properties		45 ≤ HRC < 52			52 ≤ HRC < 68		
D	Effective Length	Ap	Vc	Vf	Ap	Vc	Vf
1	4	0.040	66	1748	0.030	57	1584
	6	0.020	50	1512	0.010	44	1288
	8	0.020	47	1216	0.008	41	1056
	10	0.010	41	952	0.006	35	800
1.2	-	0.030	63	1800	0.030	53	1512
	5	0.030	63	1368	0.030	53	1176
	10	0.020	41	960	0.010	35	840
1.5	8	0.040	50	1368	0.025	44	1176
2	6	0.060	57	1800	0.050	47	1500
	8	0.050	50	1600	0.040	44	1344
	10	0.050	46	1450	0.035	39	1250
	12	0.040	41	1344	0.030	35	1120
	16	0.030	35	1040	0.020	30	883
	20	0.020	25	736	0.010	22	680
3	10	0.090	35	1728	0.065	30	1509
	16	0.070	31	1560	0.050	27	1360
	20	0.070	25	1440	0.040	22	1248
	25	0.060	24	1312	0.020	20	1120
	30	0.030	20	1176	0.020	17	988
4	8	0.150	31	1945	0.080	27	1792
	12	0.150	31	1738	0.080	27	1600
	16	0.100	25	1530	0.060	22	1400
	24	0.100	20	1115	0.050	17	980
	32	0.100	17	700	0.020	14	588
5	15	0.120	20	1792	0.080	22	1584
	40	0.05	13	890	0.020	11	798
6	18	0.180	17	1586	0.080	14	1386
	24	0.100	16	1404	0.070	13	1212
	48	0.050	8	700	0.030	6	496

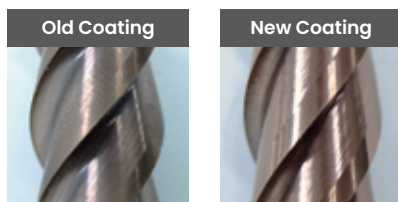
FEATURES & BENEFITS

DM70X



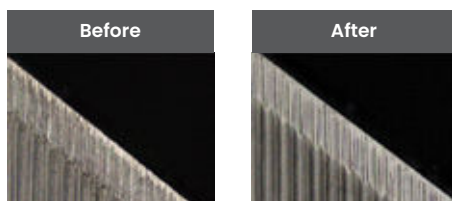
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.

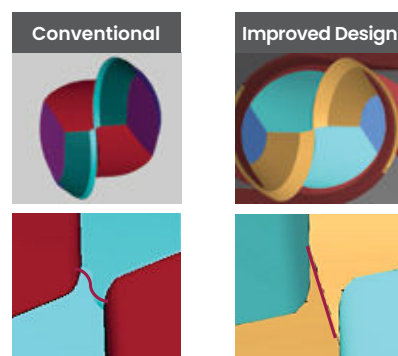


A6Q



3. Optimized Chisel Angle Design

- Smoother cutting action for superior surface finishing.
- Improved wear resistance on the cutting face for longer tool life.
- Stable cutting behavior for high precision and machining consistency in semi-finishing and finishing operations.



4. Suitable for Material Groups:

H

DM70X Ballnose Cutters, 2 Flutes



Order Number	D	l1	R	l2	L	d1	d2 h5	Availability
A6Q 0100 050 04	1	1	0.5		50		4	●
A6Q 0100 050 06					50		6	●
A6Q 0150 050 04	1.5	1.5	0.75		50		4	●
A6Q 0150 050 06					50		6	●
A6Q 0200 050 04	2	2	1		50		4	●
A6Q 0200 050 06					50		6	●
A6Q 0250 050 04	2.5	2.5	1.25		50		4	●
A6Q 0300 050 04					50		4	●
A6Q 0300 050 06	3	3	1.5		50		6	●
A6Q 0400 050 04					50		4	●
A6Q 0400 060 06	4	4	2		60		6	●
A6Q 0500 060 06					60		6	●
A6Q 0600 060	6	6	3		60		6	●
A6Q 0600 075					75		6	●
A6Q 0600 100					100		6	●
A6Q 0800 075	8	8	4		75		8	●
A6Q 0800 100					100		8	●
A6Q 1000 075					75		10	●
A6Q 1000 100	10	10	5		100		10	●
A6Q 1000 125					125		10	●
A6Q 1000 150					150		10	●
A6Q 1200 075	12	12	6		75		12	●
A6Q 1200 100					100		12	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

DM70X Ballnose Cutters with Recess, 2 Flutes



Order Number	D	l1	R	l2	L	d1	d2 h5	Availability
A6R 0800 075	8	8	4	24	50	7.8	8	●
A6R 0800 100				24	50	7.8	8	●

Stock Availability

● Ex Stock (Germany)

Material Group

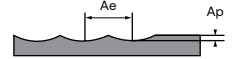
- N01
- N02
- N03
- K01
- K02
- P01
- P02
- P03
- M01
- M02
- S01
- S02
- S03
- H01
- H02
- O01
- O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

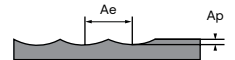


DM70X Ballnose Cutters, 2 Flutes – A6Q, A6R



Roughing	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 < HRC ≤ 65		65 < HRC ≤ 70	
Ap (mm)	0.08 x D		0.05 x D		0.05 x D	
Ae (mm)	0.24 x D		0.15 x D		0.15 x D	
D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	240	0.014	180	0.012	120	0.012
1.5		0.019		0.018		0.017
2		0.025		0.023		0.023
2.5		0.032		0.029		0.030
3		0.039		0.036		0.037
4		0.054		0.049		0.052
5		0.068		0.061		0.064
6		0.084		0.075		0.074
8		0.116		0.099		0.100
10		0.136		0.124		0.124
12		0.146		0.132		0.134

DM70X Ballnose Cutters, 2 Flutes – A6Q, A6R



Finishing	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 < HRC ≤ 65		65 < HRC ≤ 70	
Ap (mm)	0.05 - 0.10		0.05 - 0.10		0.05 - 0.10	
Ae (mm)	0.02 x D		0.02 x D		0.02 x D	
D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	250	0.038	200	0.024	150	0.024
2		0.038		0.043		0.043
3		0.052		0.056		0.057
4		0.076		0.072		0.072
5		0.089		0.086		0.085
6		0.097		0.099		0.095
8		0.111		0.104		0.104
10		0.119		0.114		0.114
12		0.123		0.119		0.119

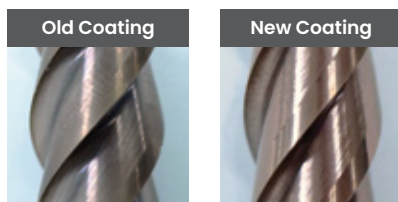
FEATURES & BENEFITS

DM70X



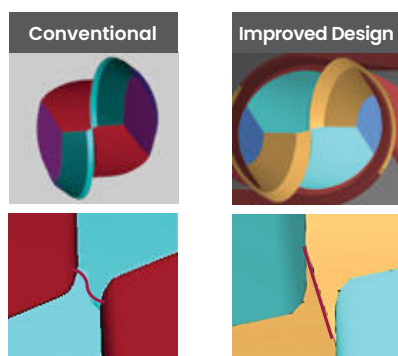
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Optimized Chisel Angle Design

- Smoother cutting action for superior surface finishing.
- Improved wear resistance on the cutting face for longer tool life.
- Stable cutting behavior for high precision and machining consistency in semi-finishing and finishing operations.

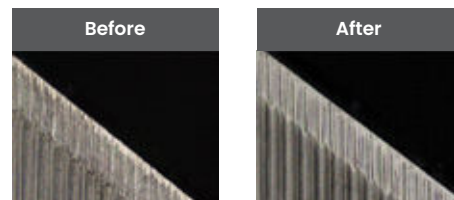


A6S



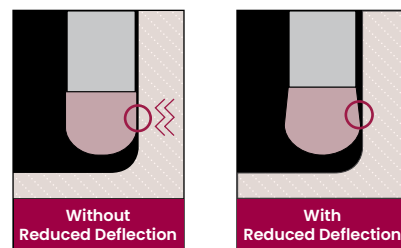
3. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



4. Back Taper Optimization ($< \varnothing 4\text{mm}$)

- Prevents unwanted contact between micro tools ($\leq \varnothing 4\text{mm}$) and the workpiece in deep or narrow cavities, reducing vibration and ensuring better surface finishing by maintaining a safe clearance gap.
- Reduces tool deflection for tight tolerance and dimensional accuracy.
- Minimizes vibration for superior surface finishing.



5. Suitable for Material Groups:

H

DM70X Miniature Ballnose Cutters with Long Neck, 2 Flutes



Order Number	D	l1	R	l2	L	d1	d2 h5	Availability
A6S 0040 050 0400 0200	0.4	0.3	0.2	2	50	0.37	4	●
A6S 0040 050 0400 0300				3	50	0.37	4	●
A6S 0040 050 0400 0400				4	50	0.37	4	●
A6S 0060 050 0400 0300	0.6	0.45	0.3	3	50	0.56	4	●
A6S 0060 050 0400 0400				4	50	0.56	4	●
A6S 0060 050 0400 0600				6	50	0.56	4	●
A6S 0060 050 0400 0800	0.8	0.6	0.4	8	50	0.56	4	●
A6S 0080 050 0400 0200				2	50	0.76	4	●
A6S 0080 050 0400 0400				4	50	0.76	4	●
A6S 0080 050 0400 0600	1	0.75	0.5	6	50	0.76	4	●
A6S 0080 050 0400 0800				8	50	0.76	4	●
A6S 0100 050 0400 0300				3	50	0.95	4	●
A6S 0100 050 0400 0400	1.5	1.1	0.75	4	50	0.95	4	●
A6S 0100 050 0400 0500				5	50	0.95	4	●
A6S 0100 050 0400 0600				6	50	0.95	4	●
A6S 0100 050 0400 0800	2	1.5	1	8	50	0.95	4	●
A6S 0100 050 0400 1000				10	50	0.95	4	●
A6S 0100 050 0400 1200				12	50	0.95	4	●
A6S 0100 050 0400 1600	3	2.5	1.5	16	50	0.95	4	●
A6S 0150 050 0400 0300				3	50	1.45	4	●
A6S 0150 050 0400 0600				6	50	1.45	4	●
A6S 0150 050 0400 0800	6	8	10	8	50	1.45	4	●
A6S 0150 050 0400 1000				10	50	1.45	4	●
A6S 0150 050 0400 1200				12	50	1.45	4	●
A6S 0200 050 0400 0600	6	8	10	6	50	1.94	4	●
A6S 0200 050 0400 0800				8	50	1.94	4	●
A6S 0200 050 0400 1000				10	50	1.94	4	●
A6S 0200 050 0400 1200	6	8	10	12	50	1.94	4	●
A6S 0200 050 0400 1600				16	50	1.94	4	●
A6S 0200 050 0600 0400				4	50	1.94	6	●
A6S 0200 050 0600 0600	6	8	10	6	50	1.94	6	●
A6S 0200 060 0400 2000				20	60	1.94	4	●
A6S 0300 060 0600 0600				6	60	2.85	6	●
A6S 0300 060 0600 0800	6	8	10	8	60	2.85	6	●
A6S 0300 060 0600 1000				10	60	2.85	6	●
A6S 0300 060 0600 1200				12	60	2.85	6	●
A6S 0300 060 0600 1600	6	8	10	16	60	2.85	6	●
A6S 0300 060 0600 2000				20	60	2.85	6	●
A6S 0300 075 0600 2500				25	75	2.85	6	●
A6S 0300 075 0600 3000	6	8	10	30	75	2.85	6	●

cont'd ►

 Stock Availability
 ● Ex Stock (Germany)

Diameter (mm)	Radius Tolerance	Diameter (mm)	Tolerance
D ≤ 2.5	±0.005	<1	+0 ~ -0.005
3 < D ≤ 6	±0.010	1 ≤ D ≤ 2.5	+0 ~ -0.010
D > 6	±0.015	2.5 ≤ D ≤ 6	+0 ~ -0.015

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

DM70X Miniature Ballnose Cutters with Long Neck, 2 Flutes



Order Number	D	l1	R	l2	L	d1	d2 h5	Availability
A6S 0400 060 0400 0800	4	3	2	8	60	3.8	4	●
A6S 0400 060 0600 0800				8	60	3.8	6	●
A6S 0400 060 0600 1000				10	60	3.8	6	●
A6S 0400 060 0600 1200				12	60	3.8	6	●
A6S 0400 060 0600 1400				14	60	3.8	6	●
A6S 0400 060 0600 1600				16	60	3.8	6	●
A6S 0400 060 0600 2000				20	60	3.8	6	●
A6S 0400 075 0600 2500				25	75	3.8	6	●
A6S 0400 075 0600 3000				30	75	3.8	6	●
A6S 0500 075 0600 2500	5	3.5	2.5	25	75	4.8	6	●
A6S 0600 060 0600 1500	6	6	3	15	60	5.7	6	●
A6S 0600 060 0600 2000				20	60	5.7	6	●
A6S 0600 075 0600 3000				30	75	5.7	6	●

Stock Availability
● Ex Stock (Germany)

Diameter (mm)	Radius Tolerance	Diameter (mm)	Tolerance
D ≤ 2.5	±0.005	<1	+0 ~ -0.005
3 < D ≤ 6	±0.010	1 ≤ D ≤ 2.5	+0 ~ -0.010
D > 6	±0.015	2.5 ≤ D ≤ 6	+0 ~ -0.015

Material Group

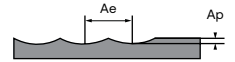
N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DM70X Miniature Ballnose Cutters with Long Neck, 2 Flutes - A6S



Profiling		H							
Working Material		Hardened Steel							
Properties		45 ≤ HRC < 52				52 ≤ HRC < 68			
D	Effective Length	Ap	Ae	Vc	Vf	Ap	Ae	Vc	Vf
0.4	2	0.010	0.020	50	595	0.005	0.020	50	430
	3	0.007	0.020	50	459	0.003	0.020	50	330
	4	0.005	0.020	38	323	0.002	0.020	38	230
0.6	3	0.030	0.030	75	1160	0.020	0.030	57	598
	4	0.020	0.030	75	1040	0.010	0.030	57	537
	6	0.007	0.030	57	800	0.004	0.030	57	415
0.8	8	0.003	0.030	47	560	0.002	0.030	38	294
	2	0.100	0.040	101	2000	0.050	0.040	75	1200
	4	0.050	0.040	101	1664	0.030	0.040	75	1000
1	6	0.030	0.040	75	1328	0.010	0.040	63	800
	8	0.010	0.040	75	992	0.005	0.040	63	600
	3	0.100	0.050	126	2378	0.080	0.050	79	1332
1.5	4	0.100	0.050	126	2255	0.050	0.050	79	1264
	5	0.050	0.050	94	2133	0.030	0.050	63	1195
	6	0.050	0.050	94	2010	0.020	0.050	63	1127
2	8	0.040	0.050	94	1765	0.020	0.050	63	991
	10	0.030	0.050	79	1520	0.010	0.050	57	854
	12	0.010	0.050	63	1275	0.005	0.050	50	718
3	16	0.005	0.050	57	785	0.002	0.050	44	445
	18	0.003	0.050	57	540	0.002	0.050	44	308
	3	0.150	0.075	141	3000	0.100	0.075	118	2000
1.5	6	0.150	0.075	141	2676	0.100	0.075	118	1782
	8	0.100	0.075	118	2459	0.050	0.075	94	1637
	10	0.100	0.075	118	2243	0.050	0.075	94	1492
2	12	0.050	0.075	94	2027	0.020	0.075	85	1347
	4	0.200	0.100	157	2922	0.150	0.100	126	1947
	6	0.200	0.100	157	2765	0.150	0.100	126	1842
3	8	0.200	0.100	126	2608	0.100	0.100	101	1736
	10	0.100	0.100	113	2451	0.100	0.100	88	1631
	12	0.100	0.100	101	2295	0.050	0.100	75	1526
1.5	16	0.070	0.100	101	1981	0.030	0.100	75	1315
	20	0.050	0.100	88	1668	0.020	0.100	63	1104
	6	0.200	0.150	3000	0.200	0.200	0.150	132	2000
2	8	0.200	0.150	2850	0.200	0.200	0.150	132	1898
	10	0.200	0.150	2700	0.100	0.100	0.150	132	1795
	12	0.200	0.150	2550	0.100	0.100	0.150	132	1693
3	16	0.100	0.150	2250	0.100	0.100	0.150	113	1488
	20	0.100	0.150	1950	0.100	0.100	0.150	113	1284
	25	0.100	0.150	1575	0.050	0.050	0.150	94	1028
1.5	30	0.070	0.150	1200	0.030	0.030	0.150	81	772

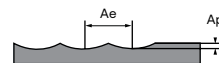
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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DM70X Miniature Ballnose Cutters with Long Neck, 2 Flutes – A6S



Profiling		H							
Working Material		Hardened Steel							
Properties		45 ≤ HRC < 52				52 ≤ HRC < 68			
D	Effective Length	Ap	Ae	Vc	Vf	Ap	Ae	Vc	Vf
4	8	0.300	0.200	251	3000	0.200	0.200	151	2000
	10	0.300	0.200	251	2883	0.200	0.200	151	1925
	12	0.300	0.200	251	2767	0.200	0.200	151	1850
	14	0.300	0.200	251	2650	0.200	0.200	151	1774
	16	0.200	0.200	201	2533	0.100	0.200	126	1699
	20	0.200	0.200	201	2300	0.100	0.200	126	1549
	25	0.200	0.200	201	2008	0.100	0.200	126	1360
	30	0.100	0.200	176	1717	0.050	0.200	103	1172
5	25	0.200	0.250	236	2100	0.100	0.250	113	1325
6	15	0.300	0.300	302	2760	0.200	0.300	132	1830
	20	0.300	0.300	302	2520	0.200	0.300	132	1660
	30	0.200	0.300	264	2040	0.150	0.300	123	1320

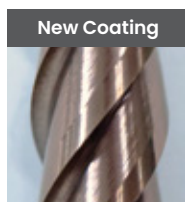
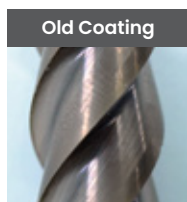
FEATURES & BENEFITS

DM70X HIGH FEED



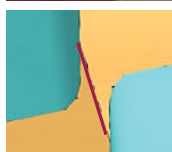
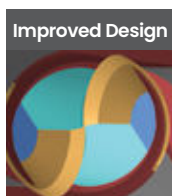
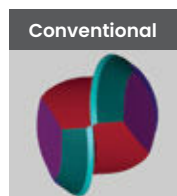
1. New B0909X Coating with Higher Silicon Content

- High heat and wear resistance for longer tool life when machining hardened steels.
- Maintains performance under high-speed conditions for stable machining.



2. Optimized Chisel Angle Design

- Smoother cutting action for superior surface finishing.
- Improved wear resistance on the cutting face for longer tool life.
- Stable cutting behavior for high precision and machining consistency in semi-finishing and finishing operations.

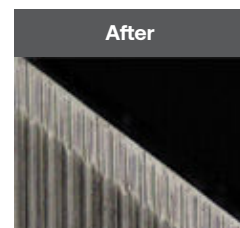
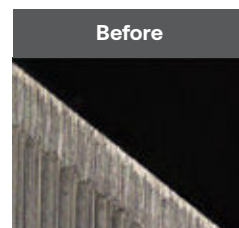


M17



3. Supreme Edge Technology

- Uniform cutting edges ensure consistent machining.
- Smooth edge surface enhances coating adhesion and chip flow for superior surface finishing.
- Reduced friction and abrasion resistance contribute to longer tool life.



4. High Feed Profile



Enables high-feed machining with thin-chip formation for higher MRR and improved chip evacuation.



Axial Cutting Force Design:

- Directs most cutting forces along the spindle axis, minimizing tool deflection.
- Enhances stability during high-feed machining, even in long overhang setups.

5. Proven Tough PVD Silicon Based Coating

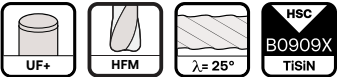
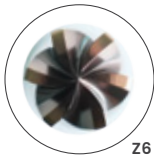
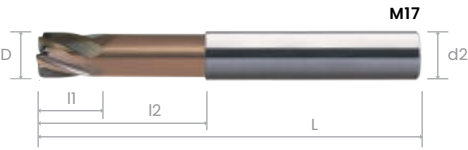


- Prolong the tool life.
- Increases hardness and higher abrasive wear resistance.
- Smoother chip evacuation.

6. Suitable for Material Groups:



DM70X High Feed Endmill with Recess, 6 Flutes



Order Number	Length	D	l1	l2	L	d2 h6	Rtheo	Z	Max Ae	Availability
M17 0600 060 06	Standard	6	5	24	60	6	0.67	6	2.4	●
M17 0800 064 08		8	7	28	64	8	0.85	6	3.2	●
M17 1000 070 10		10	8	30	70	10	0.97	6	4	●
M17 1000 100 10	Long			60	100	10	0.97	6	4	●
M17 1000 125 10	Etran-Long			85	125	10	0.97	6	4	●
M17 1200 075 12	Standard	12	10	30	75	12	1.09	6	4.8	●
M17 1200 100 12	Long			55	100	12	1.09	6	4.8	●
M17 1200 125 12	Extra-Long			80	125	12	1.09	6	4.8	●

Stock Availability

● Ex Stock (Germany)

Material Group

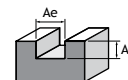
- N01
- N02
- N03
- K01
- K02
- P01
- P02
- P03
- M01
- M02
- S01
- S02
- S03
- H01
- H02
- O01
- O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

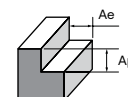


DM70X High Feed Endmill with Recess, Standard Length, 6 Flutes – M17



Slotting	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.03 x D		0.02 x D		0.01 x D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
6	90	0.160	80	0.144	70	0.128
8		0.208		0.184		0.160
10		0.240		0.210		0.180
12		0.300		0.280		0.250

DM70X High Feed Endmill with Recess, Standard Length, 6 Flutes– M17



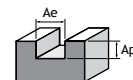
Side Milling	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.03 x D		0.02 x D		0.01 x D	
Ae (mm)	0.40 x D		0.40 x D		0.40 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
6	90	0.200	80	0.180	70	0.160
8		0.260		0.230		0.200
10		0.320		0.280		0.250
12		0.400		0.360		0.320

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

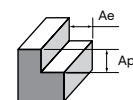


DM70X High Feed Endmill with Recess, Long Length, 6 Flutes - M17



Slotting	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.02 x D		0.02 x D		0.01 x D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
10	70	0.180	60	0.160	50	0.150
12		0.240		0.210		0.180

DM70X High Feed Endmill with Recess, Long Length, 6 Flutes - M17



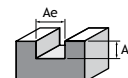
Side Milling	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.02 x D		0.02 x D		0.01 x D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
10	70	0.250	60	0.220	50	0.200
12		0.320		0.280		0.250

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

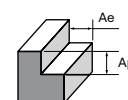


DM70X High Feed Endmill with Recess, Extra-Long Length, 6 Flutes - M17



Slotting	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.01 x D		0.01 x D		0.01 x D	
Ae (mm)	1.00 x D		1.00 x D		1.00 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
10	50	0.120	40	0.110	30	0.100
12		0.150		0.140		0.130

DM70X High Feed Endmill with Recess, Extra-Long Length, 6 Flutes - M17



Side Milling	H					
Working Material	Hardened Steel					
Properties	50 ≤ HRC ≤ 55		55 ≤ HRC ≤ 65		65 ≤ HRC < 70	
Ap (mm)	0.01 x D		0.01 x D		0.01 x D	
Ae (mm)	0.40 x D		0.40 x D		0.40 x D	
D	Vc	Fz	Vc	Fz	Vc	Fz
10	50	0.160	40	0.150	30	0.140
12		0.200		0.190		0.180



DRILLS

for High performance
applications up to 68 HRC

NC Spotting Drill, 90° Point Angle



Order Number	D	I1	I2	L	d2 h6	Availability
955 0400 050	4	8		50	4	●
955 0400 075				75	4	●
955 0400 100				100	4	●
955 0500 050	5	12		50	5	●
955 0500 075				75	5	●
955 0500 100				100	5	●
955 0600 050	6	16		50	6	●
955 0600 075				75	6	●
955 0600 100				100	6	●
955 0800 064	8	20		64	8	●
955 0800 100				100	8	●
955 1000 070	10	25		70	10	●
955 1000 100				100	10	●
955 1000 125				125	10	●
955 1000 150			150	10	●	
955 1200 075	12			75	12	●
955 1200 100				100	12	●
955 1200 125				125	12	●
955 1200 150				150	12	●
955 1600 090	16	26		90	16	●
955 1600 125				125	16	●
955 1600 150				150	16	●

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●			○	○

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



NC Spot Drill, 90° Point Angle - 955

Spotting	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	220	0.075	150	0.073	140	0.071	110	0.071	60	0.052	40	0.045
5		0.097		0.095		0.092		0.090		0.066		0.060
6		0.120		0.118		0.112		0.110		0.082		0.074
8		0.164		0.162		0.152		0.150		0.115		0.105
10		0.210		0.208		0.192		0.185		0.142		0.135
12		0.280		0.274		0.235		0.233		0.190		0.175
16		0.345		0.342		0.312		0.305		0.245		0.235

NC Spot Drill, 90° Point Angle - 955

Slotting	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Titanium Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-	
D	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz	Vc	Fz
4	120	0.074	100	0.064	85	0.062	70	0.056	50	0.050	30	0.040
5		0.094		0.084		0.080		0.073		0.064		0.054
6		0.115		0.101		0.096		0.088		0.080		0.065
8		0.155		0.140		0.134		0.125		0.110		0.085
10		0.193		0.176		0.166		0.155		0.140		0.120
12		0.248		0.220		0.215		0.200		0.180		0.170
16		0.320		0.288		0.280		0.258		0.242		0.215

FEATURES & BENEFITS

FLAT DRILL



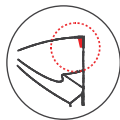
W15

1. 180° Point Angle Design



- Revolutionary drilling strategy.
- Maximise the use of the pilot hole.

2. Unique Edge Protection Design



- Enhance resistance to chipping.
- Controlled burr formation on workpiece.

3. Highly Treated Gash Surface



- Reduce friction during machining operation.
- Lower machining load.
- Reduce build up edge on tool.

4. Optimized Flute Design



- High performance with excellent chip evacuation.
- Resistance to chip blockage in the flute.
- Low vibration machining.

5. Superior Coating to Reduce Friction

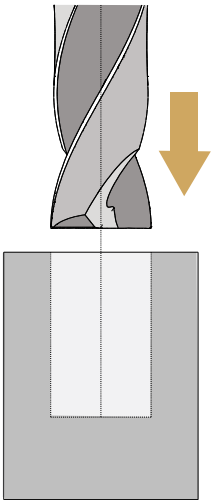
- Increase hardness and abrasive wear resistance.
- Higher thermal resistance.
- Smoother chip evacuation.

6. Suitable for Material Groups:

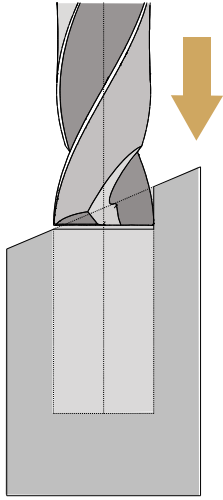


Flat Drill Application

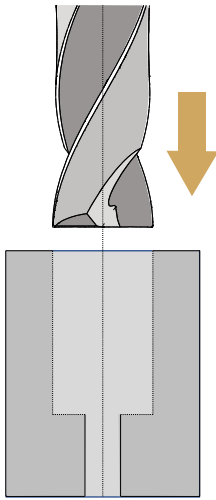
**FLAT BOTTOM
DRILLING**



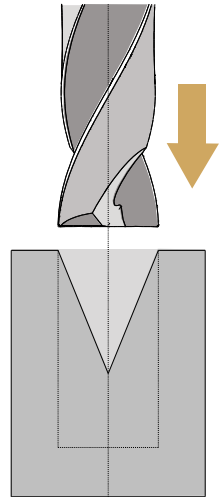
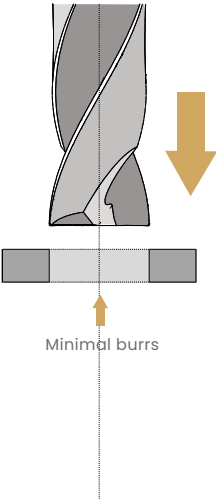
**COUNTER BORING
ON INCLINED PLANE**



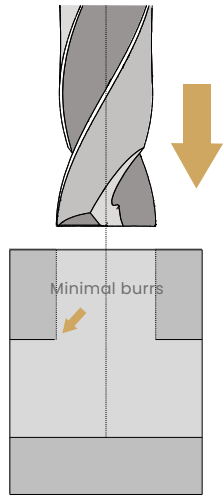
**COUNTER
BORING**



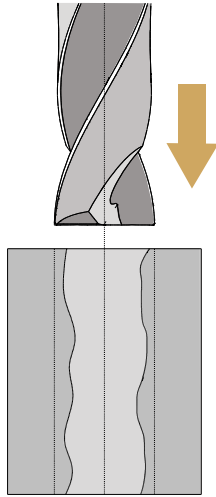
**DRILLING
THIN PLATE**



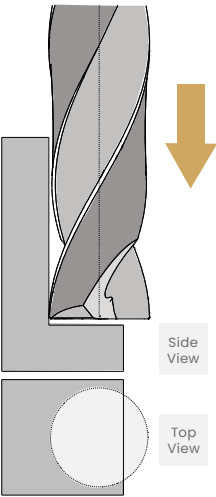
**BLIND
TAPPED HOLES**



**INTERSECTING
HOLES**

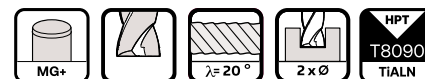


**CORRECTING
ECCENTRIC HOLE**



**HALF-MOON
DRILLING**

Flat Drill 180° Point Angle – 2 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W15 0200 *	2	9	10		50	3	●
W15 0220 *	2.2	11	12		50	4	●
W15 0250 *	2.5	12	13		50	4	●
W15 0260 *	2.6		13		50	4	●
W15 0270 *	2.7		13		50	4	●
W15 0300 *	3	16	18		60	6	●
W15 0330 *	3.3		18		60	6	●
W15 0340 *	3.4		18		60	6	●
W15 0380 *	3.8		18		60	6	●
W15 0400 *	4	18	20		60	6	●
W15 0410 *	4.1	21	23		60	6	●
W15 0420 *	4.2		23		60	6	●
W15 0450 *	4.5		23		60	6	●
W15 0500 *	5	24	26		60	6	●
W15 0520 *	5.2		26		60	6	●
W15 0530 *	5.3		26		60	6	●
W15 0550 *	5.5		26		60	6	●
W15 0590 *	5.9		26		60	6	●
W15 0600 *	6	27	30		60	6	●
W15 0620 *	6.2	30	33		75	8	●
W15 0630 *	6.3		33		75	8	●
W15 0650 *	6.5		33		75	8	●
W15 0670 *	6.7		33		75	8	●
W15 0700 *	7	33	36		75	8	●
W15 0800 *	8	37	40		75	8	●
W15 0850 *	8.5	40	43		90	10	●
W15 0900 *	9		43		90	10	●
W15 0950 *	9.5		43		90	10	●
W15 1000 *	10	45	48		90	10	●
W15 1050 *	10.5	48	51		100	12	●
W15 1100 *	11	50	53		100	12	●
W15 1400 *	14	63	70		125	14	●
W15 1500 *	15	72	80		125	16	●
W15 1600 *	16		80		125	16	●

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●		●	●	●	●	●	●								

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



Flat Drill 180° Point Angle, 2 x Ø, 2 Flutes – W15

Drilling	P						M	K				N				
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Wrought Aluminium		Cast Aluminium	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		-		-		Si < 9%		Si ≥ 9%	
D	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn
1	55	0.016	45	0.015	27	0.012	22	0.006	45	0.013	20	0.010	110	0.019	80	0.017
2	63	0.034	55	0.035	32	0.030	26	0.012	55	0.027	23	0.025	130	0.038	90	0.033

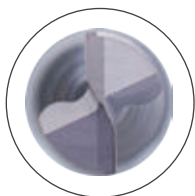
Drilling	P						M	K				N				
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Grey Cast Iron		Ductile Cast Iron		Wrought Aluminium		Cast Aluminium	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		-		-		Si < 9%		Si ≥ 9%	
D	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn	Vc	Fn
3	68	0.056	58	0.054	32	0.047	30	0.022	60	0.048	25	0.044	145	0.063	100	0.055
4		0.074		0.072		0.062		0.029		0.064		0.060		0.086		0.072
5		0.091		0.089		0.080		0.035		0.079		0.075		0.108		0.090
6		0.111		0.106		0.094		0.044		0.094		0.086		0.126		0.107
8		0.148		0.142		0.123		0.058		0.125		0.120		0.167		0.144
10		0.182		0.179		0.160		0.070		0.158		0.150		0.211		0.177
12		0.222		0.213		0.178		0.088		0.188		0.171		0.249		0.214
16		0.286		0.283		0.229		0.117		0.250		0.240		0.334		0.282
20		0.364		0.340		0.320		0.140		0.300		0.300		0.422		0.344

Footnote

- Modify recommended machining cutting parameter based on machine clamping conditions and rigidity of machine.
- Recommend drilling depth not more than 2 x Ø.
- Reduce spindle speed and cutting speed by 20% when using non water soluble cutting fluid.
- When drilling with inclined angle less than 30°, the feed rate reduces 50%.
- When drilling with inclined angle more than 30°, the feed rate reduces 70% or less and the cutting speed reduces 30% or less depending on the machining condition.
- Recommend to remove hard surface of the workpiece before using the flat drill.
- When drilling Stainless Steel or Aluminium, adjust the machining cutting parameter according to machining condition.
- This cutting tool is a drilling tool, not a milling tool.

FEATURES & BENEFITS

DR-S



W08

1. Wider Chip Pocket



Enhances and smoother chip evacuation.

2. Straight Edge Profile



Shorter chip and reinforced cutting edge.

3. Bigger K-Value



Suitable for higher feed rate and enhances tool durability.

4. Corner Chamfer Edge

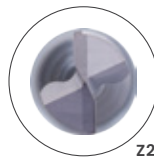


Low friction, high wear resistance.

5. Suitable for Material Groups:



DR-S Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W08 0100 *	1	4	7	33	45	3	●
W08 0110 *	1.1		7	33	45	3	●
W08 0120 *	1.2		7	33	45	3	●
W08 0130 *	1.3		7	33	45	3	●
W08 0140 *	1.4		7	33	45	3	●
W08 0150 *	1.5	10	13	35	50	3	●
W08 0160 *	1.6		13	35	50	3	●
W08 0170 *	1.7		13	35	50	3	●
W08 0180 *	1.8		13	35	50	3	●
W08 0190 *	1.9		13	35	50	3	●
W08 0200 *	2	14	17	36	55	3	●
W08 0210 *	2.1		17	36	55	3	●
W08 0220 *	2.2		17	36	55	3	●
W08 0230 *	2.3		17	36	55	3	●
W08 0240 *	2.4		17	36	55	3	●
W08 0250 *	2.5		17	36	55	3	●
W08 0260 *	2.6		17	36	55	3	●
W08 0270 *	2.7		17	36	55	3	●
W08 0280 *	2.8		17	36	55	3	●
W08 0290 *	2.9		17	36	55	3	●
W08 0300 *	3		20	36	62	6	●
W08 0310 *	3.1		20	36	62	6	●
W08 0320 *	3.2		20	36	62	6	●
W08 0330 *	3.3		20	36	62	6	●
W08 0340 *	3.4		20	36	62	6	●
W08 0350 *	3.5		20	36	62	6	●
W08 0360 *	3.6		20	36	62	6	●
W08 0370 *	3.7		20	36	62	6	●
W08 0380 *	3.8	17	24	36	66	6	●
W08 0390 *	3.9		24	36	66	6	●
W08 0400 *	4		24	36	66	6	●
W08 0410 *	4.1		24	36	66	6	●
W08 0420 *	4.2		24	36	66	6	●
W08 0430 *	4.3		24	36	66	6	●
W08 0440 *	4.4		24	36	66	6	●
W08 0450 *	4.5		24	36	66	6	●
W08 0460 *	4.6		24	36	66	6	●
W08 0470 *	4.7		24	36	66	6	●

cont'd ▶

* - DIN 6535

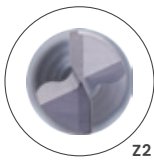
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●							

DR-S Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W08 0480 *	4.8	20	28	36	66	6	●
W08 0490 *	4.9		28	36	66	6	●
W08 0500 *	5		28	36	66	6	●
W08 0510 *	5.1		28	36	66	6	●
W08 0520 *	5.2		28	36	66	6	●
W08 0530 *	5.3		28	36	66	6	●
W08 0540 *	5.4		28	36	66	6	●
W08 0550 *	5.5		28	36	66	6	●
W08 0560 *	5.6		28	36	66	6	●
W08 0570 *	5.7		28	36	66	6	●
W08 0580 *	5.8	24	28	36	66	6	●
W08 0590 *	5.9		28	36	66	6	●
W08 0600 *	6		28	36	66	6	●
W08 0610 *	6.1		34	36	79	8	●
W08 0620 *	6.2		34	36	79	8	●
W08 0630 *	6.3		34	36	79	8	●
W08 0640 *	6.4		34	36	79	8	●
W08 0650 *	6.5		34	36	79	8	●
W08 0660 *	6.6		34	36	79	8	●
W08 0670 *	6.7		34	36	79	8	●
W08 0680 *	6.8	29	34	36	79	8	●
W08 0690 *	6.9		34	36	79	8	●
W08 0700 *	7		34	36	79	8	●
W08 0710 *	7.1		41	36	79	8	●
W08 0720 *	7.2		41	36	79	8	●
W08 0730 *	7.3		41	36	79	8	●
W08 0740 *	7.4		41	36	79	8	●
W08 0750 *	7.5		41	36	79	8	●
W08 0760 *	7.6		41	36	79	8	●
W08 0770 *	7.7		41	36	79	8	●
W08 0780 *	7.8		41	36	79	8	●
W08 0790 *	7.9		41	36	79	8	●
W08 0800 *	8		41	36	79	8	●

cont'd ▶

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

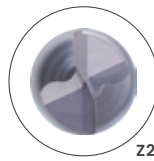
H02

O01

O02

●●●●●●●●●●

DR-S Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W08 0810 *	8.1	35	47	40	89	10	●
W08 0820 *	8.2		47	40	89	10	●
W08 0830 *	8.3		47	40	89	10	●
W08 0840 *	8.4		47	40	89	10	●
W08 0850 *	8.5		47	40	89	10	●
W08 0860 *	8.6		47	40	89	10	●
W08 0870 *	8.7		47	40	89	10	●
W08 0880 *	8.8		47	40	89	10	●
W08 0890 *	8.9		47	40	89	10	●
W08 0900 *	9		47	40	89	10	●
W08 0910 *	9.1		47	40	89	10	●
W08 0920 *	9.2		47	40	89	10	●
W08 0930 *	9.3		47	40	89	10	●
W08 0940 *	9.4		47	40	89	10	●
W08 0950 *	9.5		47	40	89	10	●
W08 0960 *	9.6		47	40	89	10	●
W08 0970 *	9.7		47	40	89	10	●
W08 0980 *	9.8		47	40	89	10	●
W08 0990 *	9.9		47	40	89	10	●
W08 1000 *	10		47	40	89	10	●
W08 1010 *	10.1	40	55	45	102	12	●
W08 1020 *	10.2		55	45	102	12	●
W08 1030 *	10.3		55	45	102	12	●
W08 1040 *	10.4		55	45	102	12	●
W08 1050 *	10.5		55	45	102	12	●
W08 1060 *	10.6		55	45	102	12	●
W08 1070 *	10.7		55	45	102	12	●
W08 1080 *	10.8		55	45	102	12	●
W08 1090 *	10.9		55	45	102	12	●
W08 1100 *	11		55	45	102	12	●
W08 1110 *	11.1		55	45	102	12	●
W08 1120 *	11.2		55	45	102	12	●
W08 1140 *	11.4		55	45	102	12	●
W08 1150 *	11.5		55	45	102	12	●
W08 1160 *	11.6		55	45	102	12	●
W08 1170 *	11.7		55	45	102	12	●
W08 1180 *	11.8		55	45	102	12	●
W08 1190 *	11.9		55	45	102	12	●
W08 1200 *	12		55	45	102	12	●

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* - DIN 6535

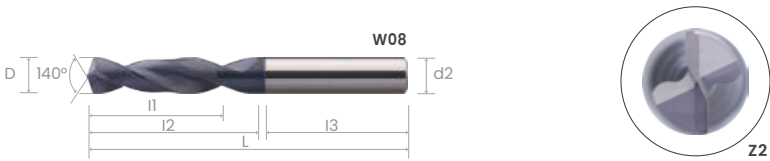
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●							

DR-S Twist Drill – 3 x Ø, 2 Flutes



Order Number		D	l1	l2	l3	L	d2 h6	Availability
W08 1250	*	12.5	43	60	45	107	14	●
W08 1270	*	12.7		60	45	107	14	●
W08 1300	*	13		60	45	107	14	●
W08 1350	*	13.5		60	45	107	14	●
W08 1370	*	13.7		60	45	107	14	●
W08 1380	*	13.8		60	45	107	14	●
W08 1400	*	14		60	45	107	14	●
W08 1450	*	14.5	45	65	48	115	16	●
W08 1500	*	15		65	48	115	16	●
W08 1550	*	15.5		65	48	115	16	●
W08 1600	*	16		65	48	115	16	●
W08 1650	*	16.5	51	73	48	123	18	●
W08 1700	*	17		73	48	123	18	●
W08 1750	*	17.5		73	48	123	18	●
W08 1800	*	18		73	48	123	18	●
W08 1900	*	19	55	79	50	131	20	●
W08 2000	*	20		79	50	131	20	●

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

●

●

●

●

●

●

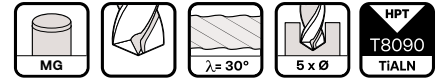
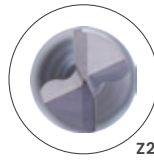
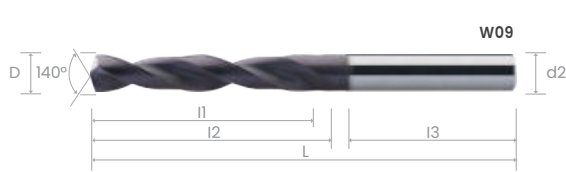
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DR-S Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W09 0100 *	1	5	8	33	55	3	●
W09 0110 *	1.1	9	12	33	55	3	●
W09 0120 *	1.2		12	33	55	3	●
W09 0130 *	1.3		12	33	55	3	●
W09 0140 *	1.4		12	33	55	3	●
W09 0150 *	1.5	13	16	35	55	3	●
W09 0160 *	1.6		16	35	55	3	●
W09 0170 *	1.7		16	35	55	3	●
W09 0180 *	1.8		16	35	55	3	●
W09 0190 *	1.9		16	35	55	3	●
W09 0200 *	2	16	19	36	57	3	●
W09 0210 *	2.1		19	36	57	3	●
W09 0220 *	2.2		19	36	57	3	●
W09 0230 *	2.3		19	36	57	3	●
W09 0240 *	2.4		19	36	57	3	●
W09 0250 *	2.5		19	36	57	3	●
W09 0260 *	2.6		19	36	57	3	●
W09 0270 *	2.7		19	36	57	3	●
W09 0280 *	2.8		19	36	57	3	●
W09 0290 *	2.9		19	36	57	3	●
W09 0300 *	3	23	28	36	66	6	●
W09 0310 *	3.1		28	36	66	6	●
W09 0320 *	3.2		28	36	66	6	●
W09 0330 *	3.3		28	36	66	6	●
W09 0340 *	3.4		28	36	66	6	●
W09 0350 *	3.5		28	36	66	6	●
W09 0360 *	3.6		28	36	66	6	●
W09 0370 *	3.7		28	36	66	6	●
W09 0380 *	3.8	29	36	36	74	6	●
W09 0390 *	3.9		36	36	74	6	●
W09 0400 *	4		36	36	74	6	●
W09 0410 *	4.1		36	36	74	6	●
W09 0420 *	4.2		36	36	74	6	●
W09 0430 *	4.3		36	36	74	6	●
W09 0440 *	4.4		36	36	74	6	●
W09 0450 *	4.5		36	36	74	6	●
W09 0460 *	4.6		36	36	74	6	●
W09 0470 *	4.7		36	36	74	6	●

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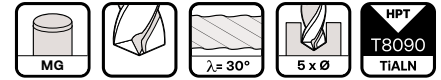
* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●							

DR-S Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W09 0480 *	4.8	35	44	36	82	6	●
W09 0490 *	4.9		44	36	82	6	●
W09 0500 *	5		44	36	82	6	●
W09 0510 *	5.1		44	36	82	6	●
W09 0520 *	5.2		44	36	82	6	●
W09 0530 *	5.3		44	36	82	6	●
W09 0540 *	5.4		44	36	82	6	●
W09 0550 *	5.5		44	36	82	6	●
W09 0560 *	5.6		44	36	82	6	●
W09 0570 *	5.7		44	36	82	6	●
W09 0580 *	5.8		44	36	82	6	●
W09 0590 *	5.9		44	36	82	6	●
W09 0600 *	6	43	44	36	82	6	●
W09 0610 *	6.1		53	36	91	8	●
W09 0620 *	6.2		53	36	91	8	●
W09 0630 *	6.3		53	36	91	8	●
W09 0640 *	6.4		53	36	91	8	●
W09 0650 *	6.5		53	36	91	8	●
W09 0660 *	6.6		53	36	91	8	●
W09 0670 *	6.7		53	36	91	8	●
W09 0680 *	6.8		53	36	91	8	●
W09 0690 *	6.9		53	36	91	8	●
W09 0700 *	7		53	36	91	8	●
W09 0710 *	7.1		53	36	91	8	●
W09 0720 *	7.2		53	36	91	8	●
W09 0730 *	7.3		53	36	91	8	●
W09 0740 *	7.4		53	36	91	8	●
W09 0750 *	7.5		53	36	91	8	●
W09 0760 *	7.6		53	36	91	8	●
W09 0770 *	7.7		53	36	91	8	●
W09 0780 *	7.8		53	36	91	8	●
W09 0790 *	7.9		53	36	91	8	●
W09 0800 *	8		53	36	91	8	●

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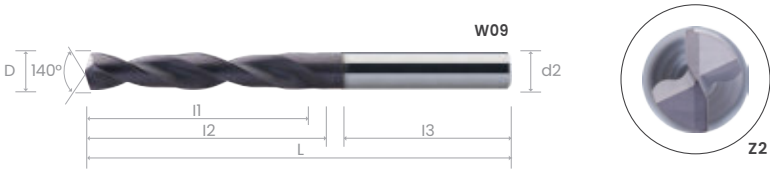
* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●							

DR-S Twist Drills - 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W09 0810 *	8.1	49	61	40	103	10	●
W09 0820 *	8.2		61	40	103	10	●
W09 0830 *	8.3		61	40	103	10	●
W09 0840 *	8.4		61	40	103	10	●
W09 0850 *	8.5		61	40	103	10	●
W09 0860 *	8.6		61	40	103	10	●
W09 0870 *	8.7		61	40	103	10	●
W09 0880 *	8.8		61	40	103	10	●
W09 0890 *	8.9		61	40	103	10	●
W09 0900 *	9		61	40	103	10	●
W09 0910 *	9.1		61	40	103	10	●
W09 0920 *	9.2		61	40	103	10	●
W09 0930 *	9.3		61	40	103	10	●
W09 0940 *	9.4		61	40	103	10	●
W09 0950 *	9.5		61	40	103	10	●
W09 0960 *	9.6		61	40	103	10	●
W09 0970 *	9.7		61	40	103	10	●
W09 0980 *	9.8		61	40	103	10	●
W09 0990 *	9.9		61	40	103	10	●
W09 1000 *	10		61	40	103	10	●
W09 1020 *	10.2	56	71	45	118	12	●
W09 1030 *	10.3		71	45	118	12	●
W09 1050 *	10.5		71	45	118	12	●
W09 1080 *	10.8		71	45	118	12	●
W09 1100 *	11		71	45	118	12	●
W09 1120 *	11.2		71	45	118	12	●
W09 1130 *	11.3		71	45	118	12	●
W09 1150 *	11.5		71	45	118	12	●
W09 1180 *	11.8		71	45	118	12	●
W09 1200 *	12		71	45	118	12	●

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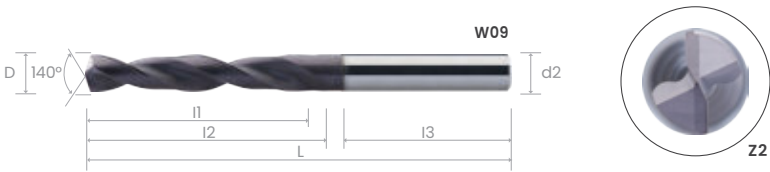
* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●							

DR-S Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W09 1220 *	12.2	60	77	45	124	14	●
W09 1250 *	12.5		77	45	124	14	●
W09 1270 *	12.7		77	45	124	14	●
W09 1280 *	12.8		77	45	124	14	●
W09 1300 *	13		77	45	124	14	●
W09 1330 *	13.3		77	45	124	14	●
W09 1350 *	13.5		77	45	124	14	●
W09 1370 *	13.7		77	45	124	14	●
W09 1380 *	13.8		77	45	124	14	●
W09 1400 *	14		77	45	124	14	●
W09 1450 *	14.5	63	83	48	133	16	●
W09 1500 *	15		83	48	133	16	●
W09 1550 *	15.5		83	48	133	16	●
W09 1600 *	16		83	48	133	16	●
W09 1700 *	17	71	93	48	143	18	●
W09 1750 *	17.5		93	48	143	18	●
W09 1800 *	18		93	48	143	18	●
W09 1900 *	19	77	101	50	153	20	●
W09 1950 *	19.5		101	50	153	20	●

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Twist Drill, 3 x Ø & 5 x Ø External Coolant, 2 Flutes - W08, W09

Aggressive	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.058		0.063		0.062		0.070		0.052		0.037
4		0.081		0.087		0.085		0.095		0.073		0.055
5		0.104		0.111		0.110		0.120		0.096		0.069
6		0.128		0.138		0.136		0.145		0.119		0.086
7		0.155		0.164		0.165		0.170		0.144		0.100
8		0.183		0.194		0.194		0.200		0.171		0.130
9		0.211		0.222		0.224		0.226		0.200		0.144
10		0.241		0.254		0.257		0.252		0.230		0.175
11		0.272		0.287		0.290		0.282		0.263		0.175
12	200	0.300	165	0.321	140	0.318	95	0.308	70	0.296	25	0.200
13		0.322		0.339		0.339		0.333		0.314		0.200
14		0.335		0.357		0.361		0.359		0.332		0.233
15		0.349		0.368		0.378		0.371		0.348		0.233
16		0.365		0.391		0.393		0.405		0.365		0.260
17		0.374		0.409		0.399		0.428		0.379		0.260
18		0.383		0.412		0.418		0.447		0.393		0.260
19		0.394		0.429		0.426		0.469		0.406		0.260
20		0.406		0.432		0.430		0.463		0.417		0.300



DR-S Twist Drill, 3 x Ø & 5 x Ø External Coolant, 2 Flutes - W08, W09

Aggressive	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.072		0.061		0.060		0.049		0.042		0.036
4		0.100		0.085		0.083		0.069		0.061		0.056
5		0.128		0.111		0.107		0.088		0.074		0.069
6		0.157		0.138		0.132		0.109		0.095		0.082
7		0.188		0.166		0.157		0.132		0.113		0.090
8		0.221		0.197		0.184		0.156		0.136		0.125
9		0.250		0.230		0.212		0.173		0.146		0.125
10		0.285		0.264		0.241		0.208		0.167		0.143
11		0.319		0.300		0.272		0.233		0.182		0.167
12	105	0.361	80	0.338	50	0.303	40	0.255	35	0.200	20	0.167
13		0.385		0.357		0.323		0.280		0.222		0.200
14		0.413		0.375		0.342		0.270		0.250		0.200
15		0.422		0.391		0.360		0.300		0.238		0.200
16		0.457		0.406		0.377		0.325		0.271		0.250
17		0.475		0.419		0.394		0.313		0.271		0.250
18		0.489		0.431		0.409		0.313		0.257		0.250
19		0.511		0.442		0.423		0.343		0.300		0.250
20		0.529		0.452		0.437		0.329		0.283		0.225

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Twist Drill, 3 x Ø & 5 x Ø External Coolant, 2 Flutes – W08, W09

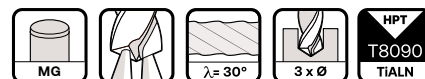
Conventional	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	150	0.055	130	0.062	100	0.060	75	0.061	70	0.039	20	0.032
4		0.077		0.085		0.082		0.083		0.055		0.050
5		0.100		0.109		0.106		0.104		0.072		0.062
6		0.124		0.135		0.131		0.126		0.089		0.073
7		0.149		0.161		0.158		0.149		0.108		0.090
8		0.177		0.190		0.187		0.174		0.128		0.113
9		0.204		0.218		0.215		0.197		0.150		0.113
10		0.235		0.249		0.246		0.219		0.172		0.143
11		0.266		0.281		0.278		0.246		0.196		0.167
12		0.300		0.314		0.306		0.268		0.221		0.167
13		0.319		0.332		0.326		0.290		0.235		0.200
14		0.329		0.350		0.347		0.313		0.248		0.200
15		0.350		0.360		0.363		0.324		0.261		0.200
16		0.363		0.383		0.377		0.353		0.273		0.250
17		0.369		0.401		0.383		0.373		0.284		0.250
18		0.385		0.403		0.401		0.389		0.294		0.250
19		0.388		0.421		0.409		0.408		0.304		0.250
20		0.408		0.423		0.413		0.403		0.313		0.225



DR-S Twist Drill, 3 x Ø & 5 x Ø External Coolant, 2 Flutes – W08, W09

Conventional	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	80	0.060	60	0.055	40	0.040	30	0.044	25	0.041	12	0.023
4		0.084		0.076		0.055		0.063		0.060		0.040
5		0.110		0.099		0.071		0.075		0.075		0.050
6		0.135		0.124		0.088		0.100		0.093		0.057
7		0.162		0.149		0.105		0.114		0.108		0.083
8		0.194		0.177		0.123		0.142		0.140		0.100
9		0.221		0.206		0.142		0.155		0.156		0.100
10		0.254		0.237		0.161		0.180		0.188		0.150
11		0.283		0.269		0.182		0.200		0.188		0.150
12		0.318		0.303		0.203		0.225		0.214		0.150
13		0.345		0.320		0.216		0.225		0.214		0.200
14		0.358		0.336		0.229		0.257		0.250		0.200
15		0.394		0.351		0.240		0.243		0.233		0.200
16		0.406		0.364		0.252		0.283		0.280		0.167
17		0.427		0.376		0.263		0.283		0.280		0.167
18		0.420		0.387		0.274		0.267		0.260		0.167
19		0.443		0.397		0.283		0.267		0.260		0.167
20		0.462		0.406		0.292		0.300		0.300		0.200

DR-S Oil Feed Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W10 0100 *	1	4	7	33	45	3	●
W10 0110 *	1.1		7	33	45	3	●
W10 0120 *	1.2		7	33	45	3	●
W10 0130 *	1.3		7	33	45	3	●
W10 0140 *	1.4		7	33	45	3	●
W10 0150 *	1.5	10	13	35	50	3	●
W10 0160 *	1.6		13	35	50	3	●
W10 0170 *	1.7		13	35	50	3	●
W10 0180 *	1.8		13	35	50	3	●
W10 0190 *	1.9		13	35	50	3	●
W10 0200 *	2	14	17	36	55	3	●
W10 0210 *	2.1		17	36	55	3	●
W10 0220 *	2.2		17	36	55	3	●
W10 0230 *	2.3		17	36	55	3	●
W10 0240 *	2.4		17	36	55	3	●
W10 0250 *	2.5		17	36	55	3	●
W10 0260 *	2.6		17	36	55	3	●
W10 0270 *	2.7		17	36	55	3	●
W10 0280 *	2.8		17	36	55	3	●
W10 0290 *	2.9		17	36	55	3	●
W10 0300 *	3		20	36	62	6	●
W10 0310 *	3.1		20	36	62	6	●
W10 0320 *	3.2		20	36	62	6	●
W10 0330 *	3.3		20	36	62	6	●
W10 0340 *	3.4		20	36	62	6	●
W10 0350 *	3.5		20	36	62	6	●
W10 0360 *	3.6		20	36	62	6	●
W10 0370 *	3.7		20	36	62	6	●
W10 0380 *	3.8	17	24	36	66	6	●
W10 0390 *	3.9		24	36	66	6	●
W10 0400 *	4		24	36	66	6	●
W10 0410 *	4.1		24	36	66	6	●
W10 0420 *	4.2		24	36	66	6	●
W10 0430 *	4.3		24	36	66	6	●
W10 0440 *	4.4		24	36	66	6	●
W10 0450 *	4.5		24	36	66	6	●
W10 0460 *	4.6		24	36	66	6	●
W10 0470 *	4.7		24	36	66	6	●

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* - DIN 6535

Stock Availability

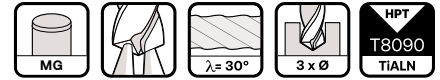
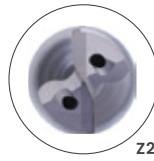
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
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DR-S Oil Feed Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W10 0480 *	4.8	20	28	36	66	6	●
W10 0490 *	4.9		28	36	66	6	●
W10 0500 *	5		28	36	66	6	●
W10 0510 *	5.1		28	36	66	6	●
W10 0520 *	5.2		28	36	66	6	●
W10 0530 *	5.3		28	36	66	6	●
W10 0540 *	5.4		28	36	66	6	●
W10 0550 *	5.5		28	36	66	6	●
W10 0560 *	5.6		28	36	66	6	●
W10 0570 *	5.7		28	36	66	6	●
W10 0580 *	5.8		28	36	66	6	●
W10 0590 *	5.9		28	36	66	6	●
W10 0600 *	6		28	36	66	6	●
W10 0610 *	6.1	24	34	36	79	8	●
W10 0620 *	6.2		34	36	79	8	●
W10 0630 *	6.3		34	36	79	8	●
W10 0640 *	6.4		34	36	79	8	●
W10 0650 *	6.5		34	36	79	8	●
W10 0660 *	6.6		34	36	79	8	●
W10 0670 *	6.7		34	36	79	8	●
W10 0680 *	6.8		34	36	79	8	●
W10 0690 *	6.9		34	36	79	8	●
W10 0700 *	7		34	36	79	8	●
W10 0710 *	7.1	29	41	36	79	8	●
W10 0720 *	7.2		41	36	79	8	●
W10 0730 *	7.3		41	36	79	8	●
W10 0740 *	7.4		41	36	79	8	●
W10 0750 *	7.5		41	36	79	8	●
W10 0760 *	7.6		41	36	79	8	●
W10 0770 *	7.7		41	36	79	8	●
W10 0780 *	7.8		41	36	79	8	●
W10 0790 *	7.9		41	36	79	8	●
W10 0800 *	8		41	36	79	8	●

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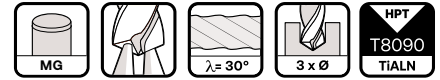
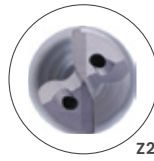
* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

DR-S Oil Feed Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W10 0810 *	8.1	47	47	40	89	10	●
W10 0820 *	8.2		47	40	89	10	●
W10 0830 *	8.3		47	40	89	10	●
W10 0840 *	8.4		47	40	89	10	●
W10 0850 *	8.5		47	40	89	10	●
W10 0860 *	8.6		47	40	89	10	●
W10 0870 *	8.7		47	40	89	10	●
W10 0880 *	8.8		47	40	89	10	●
W10 0890 *	8.9		47	40	89	10	●
W10 0900 *	9		47	40	89	10	●
W10 0910 *	9.1		47	40	89	10	●
W10 0920 *	9.2		47	40	89	10	●
W10 0930 *	9.3		47	40	89	10	●
W10 0940 *	9.4		47	40	89	10	●
W10 0950 *	9.5		47	40	89	10	●
W10 0960 *	9.6		47	40	89	10	●
W10 0970 *	9.7		47	40	89	10	●
W10 0980 *	9.8		47	40	89	10	●
W10 0990 *	9.9		47	40	89	10	●
W10 1000 *	10		47	40	89	10	●
W10 1020 *	10.2	55	55	45	102	12	●
W10 1030 *	10.3		55	45	102	12	●
W10 1050 *	10.5		55	45	102	12	●
W10 1080 *	10.8		55	45	102	12	●
W10 1100 *	11		55	45	102	12	●
W10 1120 *	11.2		55	45	102	12	●
W10 1130 *	11.3		55	45	102	12	●
W10 1150 *	11.5		55	45	102	12	●
W10 1180 *	11.8		55	45	102	12	●
W10 1200 *	12		55	45	102	12	●

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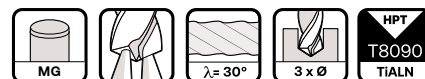
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Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

DR-S Oil Feed Twist Drill – 3 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W10 1220 *	12.2	43	60	45	107	14	●
W10 1250 *	12.5		60	45	107	14	●
W10 1270 *	12.7		60	45	107	14	●
W10 1280 *	12.8		60	45	107	14	●
W10 1300 *	13		60	45	107	14	●
W10 1330 *	13.3		60	45	107	14	●
W10 1350 *	13.5		60	45	107	14	●
W10 1370 *	13.7		60	45	107	14	●
W10 1380 *	13.8		60	45	107	14	●
W10 1400 *	14		60	45	107	14	●
W10 1450 *	14.5	45	65	48	115	16	●
W10 1500 *	15		65	48	115	16	●
W10 1530 *	15.3		65	48	115	16	●
W10 1550 *	15.5		65	48	115	16	●
W10 1580 *	15.8		65	48	115	16	●
W10 1600 *	16		65	48	115	16	●
W10 1650 *	16.5	51	73	48	123	18	●
W10 1700 *	17		73	48	123	18	●
W10 1750 *	17.5		73	48	123	18	●
W10 1800 *	18		73	48	123	18	●
W10 1850 *	18.5	51	79	50	131	20	●
W10 1900 *	19		79	50	131	20	●
W10 2000 *	20		79	50	131	20	●

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Stock Availability

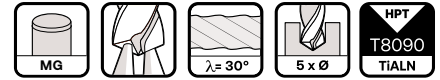
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
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DR-S Oil Feed Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W11 0100 *	1	5	8	33	55	3	●
W11 0110 *	1.1	9	12	33	55	3	●
W11 0120 *	1.2		12	33	55	3	●
W11 0130 *	1.3		12	33	55	3	●
W11 0140 *	1.4		12	33	55	3	●
W11 0150 *	1.5	13	16	35	55	3	●
W11 0160 *	1.6		16	35	55	3	●
W11 0170 *	1.7		16	35	55	3	●
W11 0180 *	1.8		16	35	55	3	●
W11 0190 *	1.9		16	35	55	3	●
W11 0200 *	2	16	19	36	57	3	●
W11 0210 *	2.1		19	36	57	3	●
W11 0220 *	2.2		19	36	57	3	●
W11 0230 *	2.3		19	36	57	3	●
W11 0240 *	2.4		19	36	57	3	●
W11 0250 *	2.5		19	36	57	3	●
W11 0260 *	2.6		19	36	57	3	●
W11 0270 *	2.7		19	36	57	3	●
W11 0280 *	2.8		19	36	57	3	●
W11 0290 *	2.9		19	36	57	3	●
W11 0300 *	3	23	28	36	66	6	●
W11 0310 *	3.1		28	36	66	6	●
W11 0320 *	3.2		28	36	66	6	●
W11 0330 *	3.3		28	36	66	6	●
W11 0340 *	3.4		28	36	66	6	●
W11 0350 *	3.5		28	36	66	6	●
W11 0360 *	3.6		28	36	66	6	●
W11 0370 *	3.7		28	36	66	6	●
W11 0380 *	3.8	29	36	36	74	6	●
W11 0390 *	3.9		36	36	74	6	●
W11 0400 *	4		36	36	74	6	●
W11 0410 *	4.1		36	36	74	6	●
W11 0420 *	4.2		36	36	74	6	●
W11 0430 *	4.3		36	36	74	6	●
W11 0440 *	4.4		36	36	74	6	●
W11 0450 *	4.5		36	36	74	6	●
W11 0460 *	4.6		36	36	74	6	●
W11 0470 *	4.7		36	36	74	6	●

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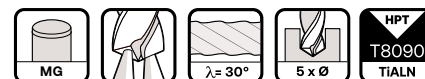
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	●	●	●	●	●				

DR-S Oil Feed Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W11 0480 *	4.8	35	44	36	82	6	●
W11 0490 *	4.9		44	36	82	6	●
W11 0500 *	5		44	36	82	6	●
W11 0510 *	5.1		44	36	82	6	●
W11 0520 *	5.2		44	36	82	6	●
W11 0530 *	5.3		44	36	82	6	●
W11 0540 *	5.4		44	36	82	6	●
W11 0550 *	5.5		44	36	82	6	●
W11 0560 *	5.6		44	36	82	6	●
W11 0570 *	5.7		44	36	82	6	●
W11 0580 *	5.8		44	36	82	6	●
W11 0590 *	5.9		44	36	82	6	●
W11 0600 *	6		44	36	82	6	●
W11 0610 *	6.1	43	53	36	91	8	●
W11 0620 *	6.2		53	36	91	8	●
W11 0630 *	6.3		53	36	91	8	●
W11 0640 *	6.4		53	36	91	8	●
W11 0650 *	6.5		53	36	91	8	●
W11 0660 *	6.6		53	36	91	8	●
W11 0670 *	6.7		53	36	91	8	●
W11 0680 *	6.8		53	36	91	8	●
W11 0690 *	6.9		53	36	91	8	●
W11 0700 *	7		53	36	91	8	●
W11 0710 *	7.1		53	36	91	8	●
W11 0720 *	7.2		53	36	91	8	●
W11 0730 *	7.3		53	36	91	8	●
W11 0740 *	7.4		53	36	91	8	●
W11 0750 *	7.5		53	36	91	8	●
W11 0760 *	7.6		53	36	91	8	●
W11 0770 *	7.7		53	36	91	8	●
W11 0780 *	7.8		53	36	91	8	●
W11 0790 *	7.9		53	36	91	8	●
W11 0800 *	8		53	36	91	8	●

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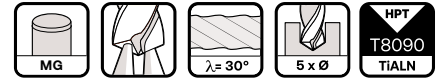
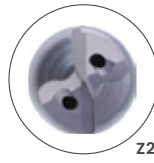
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	●	●	●	●	●				

DR-S Oil Feed Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W11 0810 *	8.1	49	61	40	103	10	●
W11 0820 *	8.2		61	40	103	10	●
W11 0830 *	8.3		61	40	103	10	●
W11 0840 *	8.4		61	40	103	10	●
W11 0850 *	8.5		61	40	103	10	●
W11 0860 *	8.6		61	40	103	10	●
W11 0870 *	8.7		61	40	103	10	●
W11 0880 *	8.8		61	40	103	10	●
W11 0890 *	8.9		61	40	103	10	●
W11 0900 *	9		61	40	103	10	●
W11 0910 *	9.1		61	40	103	10	●
W11 0920 *	9.2		61	40	103	10	●
W11 0930 *	9.3		61	40	103	10	●
W11 0940 *	9.4		61	40	103	10	●
W11 0950 *	9.5		61	40	103	10	●
W11 0960 *	9.6		61	40	103	10	●
W11 0970 *	9.7		61	40	103	10	●
W11 0980 *	9.8		61	40	103	10	●
W11 0990 *	9.9		61	40	103	10	●
W11 1000 *	10		61	40	103	10	●
W11 1010 *	10.1	56	71	45	118	12	●
W11 1020 *	10.2		71	45	118	12	●
W11 1030 *	10.3		71	45	118	12	●
W11 1040 *	10.4		71	45	118	12	●
W11 1050 *	10.5		71	45	118	12	●
W11 1060 *	10.6		71	45	118	12	●
W11 1070 *	10.7		71	45	118	12	●
W11 1080 *	10.8		71	45	118	12	●
W11 1090 *	10.9		71	45	118	12	●
W11 1100 *	11		71	45	118	12	●
W11 1110 *	11.1		71	45	118	12	●
W11 1120 *	11.2		71	45	118	12	●
W11 1130 *	11.3		71	45	118	12	●
W11 1140 *	11.4		71	45	118	12	●
W11 1150 *	11.5		71	45	118	12	●
W11 1160 *	11.6		71	45	118	12	●
W11 1170 *	11.7		71	45	118	12	●
W11 1180 *	11.8		71	45	118	12	●
W11 1190 *	11.9		71	45	118	12	●
W11 1200 *	12		71	45	118	12	●

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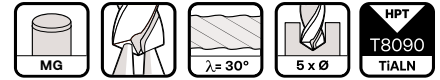
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Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	●	●	●	●	●				

DR-S Oil Feed Twist Drill – 5 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W11 1210 *	12.1	60	77	45	124	14	●
W11 1220 *	12.2		77	45	124	14	●
W11 1230 *	12.3		77	45	124	14	●
W11 1240 *	12.4		77	45	124	14	●
W11 1250 *	12.5		77	45	124	14	●
W11 1260 *	12.6		77	45	124	14	●
W11 1270 *	12.7		77	45	124	14	●
W11 1280 *	12.8		77	45	124	14	●
W11 1290 *	12.9		77	45	124	14	●
W11 1300 *	13		77	45	124	14	●
W11 1320 *	13.2		77	45	124	14	●
W11 1330 *	13.3		77	45	124	14	●
W11 1350 *	13.5		77	45	124	14	●
W11 1360 *	13.5		77	45	124	14	●
W11 1370 *	13.7		77	45	124	14	●
W11 1380 *	13.8		77	45	124	14	●
W11 1390 *	13.7		77	45	124	14	●
W11 1400 *	14		77	45	124	14	●
W11 1420 *	14.2	63	83	48	133	16	●
W11 1450 *	14.5		83	48	133	16	●
W11 1500 *	15		83	48	133	16	●
W11 1520 *	15.2		83	48	133	16	●
W11 1530 *	15.3		83	48	133	16	●
W11 1550 *	15.5		83	48	133	16	●
W11 1580 *	15.8		83	48	133	16	●
W11 1600 *	16		83	48	133	16	●
W11 1650 *	16.5	71	93	48	143	18	●
W11 1700 *	17		93	48	143	18	●
W11 1750 *	17.5		93	48	143	18	●
W11 1800 *	18		93	48	143	18	●
W11 1850 *	18.5	77	101	50	153	20	●
W11 1900 *	19		101	50	153	20	●
W11 1950 *	19.5		101	50	153	20	●
W11 2000 *	20		101	50	153	20	●

* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	●	●	●	●	●				

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Oil Feed Twist Drill, 3 x Ø & 5 x Ø Internal Coolant, 2 Flutes - W10, W11

Aggressive	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	310	0.076	220	0.073	190	0.077	140	0.073	105	0.071	40	0.047
4		0.107		0.102		0.107		0.104		0.099		0.066
5		0.140		0.134		0.139		0.136		0.128		0.085
6		0.176		0.169		0.172		0.172		0.160		0.105
7		0.216		0.204		0.206		0.211		0.194		0.126
8		0.256		0.244		0.245		0.252		0.230		0.156
9		0.301		0.287		0.281		0.297		0.268		0.173
10		0.347		0.327		0.324		0.344		0.308		0.208
11		0.397		0.377		0.369		0.394		0.351		0.233
12		0.446		0.424		0.408		0.447		0.395		0.255
13		0.471		0.450		0.434		0.472		0.415		0.280
14		0.486		0.461		0.452		0.495		0.433		0.270
15		0.505		0.483		0.472		0.517		0.449		0.289
16		0.516		0.500		0.499		0.537		0.463		0.313
17		0.522		0.505		0.513		0.554		0.475		0.313
18		0.536		0.526		0.531		0.570		0.485		0.300
19		0.544		0.532		0.548		0.585		0.494		0.329
20		0.540		0.525		0.549		0.597		0.500		0.314



DR-S Oil Feed Twist Drill, 3 x Ø & 5 x Ø Internal Coolant, 2 Flutes - W10, W11

Aggressive	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	175	0.063	120	0.068	65	0.080	60	0.048	50	0.054	35	0.026
4		0.090		0.098		0.110		0.067		0.075		0.039
5		0.119		0.132		0.143		0.085		0.094		0.048
6		0.151		0.171		0.178		0.106		0.115		0.058
7		0.185		0.214		0.215		0.125		0.135		0.075
8		0.222		0.261		0.253		0.150		0.160		0.086
9		0.262		0.312		0.294		0.168		0.178		0.092
10		0.304		0.368		0.337		0.190		0.206		0.108
11		0.349		0.427		0.382		0.217		0.220		0.118
12		0.396		0.491		0.429		0.250		0.236		0.130
13		0.417		0.503		0.457		0.267		0.254		0.133
14		0.437		0.511		0.484		0.279		0.275		0.150
15		0.454		0.515		0.509		0.292		0.291		0.150
16		0.470		0.514		0.534		0.317		0.320		0.157
17		0.484		0.509		0.557		0.308		0.320		0.157
18		0.496		0.499		0.578		0.336		0.344		0.157
19		0.506		0.485		0.599		0.327		0.344		0.183
20		0.514		0.466		0.618		0.350		0.375		0.183

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Oil Feed Twist Drill, 3 x Ø & 5 x Ø Internal Coolant, 2 Flutes - W10, W11

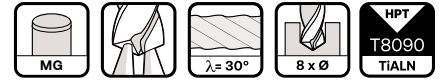
Conventional	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.069		0.065		0.079		0.077		0.070		0.046
4		0.097		0.091		0.109		0.109		0.097		0.067
5		0.127		0.120		0.141		0.143		0.125		0.080
6		0.159		0.150		0.176		0.181		0.157		0.108
7		0.195		0.184		0.212		0.222		0.190		0.118
8		0.232		0.216		0.250		0.265		0.225		0.156
9		0.273		0.254		0.290		0.312		0.263		0.175
10		0.314		0.292		0.332		0.361		0.302		0.188
11		0.359		0.334		0.376		0.414		0.344		0.214
12	240	0.406	200	0.370	160	0.422	85	0.469	65	0.387	22	0.250
13		0.431		0.400		0.446		0.496		0.407		0.250
14		0.451		0.417		0.469		0.520		0.424		0.250
15		0.475		0.437		0.491		0.543		0.440		0.300
16		0.492		0.460		0.510		0.564		0.454		0.280
17		0.511		0.474		0.529		0.582		0.466		0.280
18		0.521		0.489		0.545		0.599		0.475		0.350
19		0.532		0.506		0.560		0.614		0.484		0.350
20		0.541		0.522		0.573		0.627		0.490		0.325



DR-S Oil Feed Twist Drill, 3 x Ø & 5 x Ø Internal Coolant, 2 Flutes - W10, W11

Conventional	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.069		0.065		0.073		0.039		0.044		0.038
4		0.099		0.095		0.100		0.057		0.067		0.058
5		0.131		0.128		0.130		0.074		0.080		0.070
6		0.166		0.166		0.162		0.089		0.100		0.088
7		0.204		0.208		0.196		0.113		0.121		0.100
8		0.244		0.253		0.230		0.129		0.142		0.133
9		0.288		0.303		0.268		0.146		0.164		0.133
10		0.334		0.357		0.307		0.158		0.180		0.160
11		0.384		0.414		0.348		0.182		0.211		0.160
12	110	0.436	80	0.476	40	0.390	35	0.200	30	0.225	15	0.200
13		0.459		0.488		0.416		0.222		0.225		0.200
14		0.481		0.496		0.440		0.250		0.257		0.200
15		0.499		0.499		0.463		0.238		0.243		0.200
16		0.517		0.498		0.486		0.271		0.283		0.267
17		0.532		0.493		0.507		0.271		0.283		0.267
18		0.546		0.484		0.526		0.257		0.267		0.267
19		0.557		0.471		0.545		0.300		0.267		0.267
20		0.565		0.452		0.562		0.283		0.300		0.233

DR-S Oil Feed Twist Drill – 8 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W12 0300 *	3	32	40	36	85	6	●
W12 0310 *	3.1		40	36	85	6	●
W12 0320 *	3.2		40	36	85	6	●
W12 0330 *	3.3		40	36	85	6	●
W12 0340 *	3.4		40	36	85	6	●
W12 0350 *	3.5		40	36	85	6	●
W12 0360 *	3.6	36	40	36	85	6	●
W12 0370 *	3.7		40	36	85	6	●
W12 0380 *	3.8		40	36	85	6	●
W12 0390 *	3.9		40	36	85	6	●
W12 0400 *	4	38	46	36	85	6	●
W12 0410 *	4.1		46	36	85	6	●
W12 0420 *	4.2		46	36	85	6	●
W12 0430 *	4.3	40	46	36	97	6	●
W12 0440 *	4.4		46	36	97	6	●
W12 0450 *	4.5	44	46	36	97	6	●
W12 0460 *	4.6		46	36	97	6	●
W12 0470 *	4.7		46	36	97	6	●
W12 0480 *	4.8		46	36	97	6	●
W12 0490 *	4.9		46	36	97	6	●
W12 0500 *	5	48	57	36	97	6	●
W12 0510 *	5.1		57	36	97	6	●
W12 0520 *	5.2		57	36	97	6	●
W12 0530 *	5.3		57	36	97	6	●
W12 0540 *	5.4		57	36	97	6	●
W12 0550 *	5.5		57	36	97	6	●
W12 0560 *	5.6		57	36	97	6	●
W12 0570 *	5.7		57	36	97	6	●
W12 0580 *	5.8		57	36	97	6	●
W12 0590 *	5.9		57	36	97	6	●
W12 0600 *	6		57	36	97	6	●

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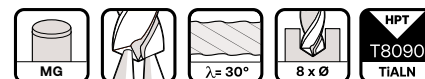
* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	○	○	●	●	●				

DR-S Oil Feed Twist Drill – 8 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W12 0610 *	6.1	64	76	36	116	8	●
W12 0620 *	6.2		76	36	116	8	●
W12 0630 *	6.3		76	36	116	8	●
W12 0640 *	6.4		76	36	116	8	●
W12 0650 *	6.5		76	36	116	8	●
W12 0660 *	6.6		76	36	116	8	●
W12 0670 *	6.7		76	36	116	8	●
W12 0680 *	6.8		76	36	116	8	●
W12 0690 *	6.9		76	36	116	8	●
W12 0700 *	7		76	36	116	8	●
W12 0710 *	7.1		76	36	116	8	●
W12 0720 *	7.2		76	36	116	8	●
W12 0730 *	7.3		76	36	116	8	●
W12 0740 *	7.4		76	36	116	8	●
W12 0750 *	7.5		76	36	116	8	●
W12 0760 *	7.6		76	36	116	8	●
W12 0770 *	7.7		76	36	116	8	●
W12 0780 *	7.8		76	36	116	8	●
W12 0790 *	7.9		76	36	116	8	●
W12 0800 *	8	80	76	36	116	8	●
W12 0810 *	8.1		95	40	142	10	●
W12 0820 *	8.2		95	40	142	10	●
W12 0830 *	8.3		95	40	142	10	●
W12 0840 *	8.4		95	40	142	10	●
W12 0850 *	8.5		95	40	142	10	●
W12 0860 *	8.6		95	40	142	10	●
W12 0870 *	8.7		95	40	142	10	●
W12 0880 *	8.8		95	40	142	10	●
W12 0890 *	8.9		95	40	142	10	●
W12 0900 *	9		95	40	142	10	●
W12 0910 *	9.1		95	40	142	10	●
W12 0920 *	9.2		95	40	142	10	●
W12 0930 *	9.3		95	40	142	10	●
W12 0940 *	9.4		95	40	142	10	●
W12 0950 *	9.5		95	40	142	10	●
W12 0960 *	9.6		95	40	142	10	●
W12 0970 *	9.7		95	40	142	10	●
W12 0980 *	9.8		95	40	142	10	●
W12 0990 *	9.9		95	40	142	10	●
W12 1000 *	10		95	40	142	10	●

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* - DIN 6535

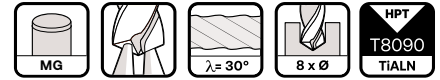
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	○	○	●	●	●				

DR-S Oil Feed Twist Drill – 8 x Ø, 2 Flutes



Order Number	D	l1	l2	l3	L	d2 h6	Availability
W12 1020 *	10.2	96	114	45	163	12	●
W12 1030 *	10.3		114	45	163	12	●
W12 1050 *	10.5		114	45	163	12	●
W12 1080 *	10.8		114	45	163	12	●
W12 1100 *	11		114	45	163	12	●
W12 1120 *	11.2		114	45	163	12	●
W12 1130 *	11.3		114	45	163	12	●
W12 1150 *	11.5		114	45	163	12	●
W12 1180 *	11.8		114	45	163	12	●
W12 1200 *	12		114	45	163	12	●
W12 1220 *	12.2	112	133	45	182	14	●
W12 1250 *	12.5		133	45	182	14	●
W12 1270 *	12.7		133	45	182	14	●
W12 1280 *	12.8		133	45	182	14	●
W12 1300 *	13		133	45	182	14	●
W12 1330 *	13.3		133	45	182	14	●
W12 1350 *	13.5		133	45	182	14	●
W12 1370 *	13.7		133	45	182	14	●
W12 1380 *	13.8		133	45	182	14	●
W12 1400 *	14		133	45	182	14	●
W12 1600 *	16	128	152	48	204	16	●
W12 1700 *	17	144	171	48	222	18	●

* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
○	○	○	●	●	●	●	●	○	○	●	●	●				

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Oil Feed Twist Drill, 8 x Ø Internal Coolant, 2 Flutes - W12

Aggressive	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.064		0.059		0.064		0.059		0.058		0.037
4		0.090		0.083		0.089		0.084		0.082		0.054
5		0.117		0.109		0.116		0.110		0.103		0.065
6		0.148		0.138		0.145		0.141		0.131		0.084
7		0.179		0.166		0.173		0.173		0.161		0.106
8		0.214		0.199		0.203		0.206		0.189		0.129
9		0.252		0.231		0.235		0.242		0.222		0.138
10		0.290		0.266		0.273		0.277		0.255		0.158
11		0.329		0.307		0.302		0.320		0.281		0.182
12	260	0.375	190	0.343	160	0.340	120	0.366	90	0.325	35	0.200
13		0.392		0.362		0.360		0.377		0.330		0.222
14		0.403		0.375		0.376		0.396		0.348		0.238
15		0.416		0.388		0.400		0.419		0.365		0.225
16		0.431		0.405		0.416		0.438		0.383		0.257
17		0.441		0.411		0.433		0.443		0.394		0.257
18		0.450		0.424		0.438		0.450		0.406		0.243
19		0.450		0.431		0.456		0.462		0.388		0.267
20		0.450		0.426		0.462		0.470		0.400		0.250



DR-S Oil Feed Twist Drill, 8 x Ø Internal Coolant, 2 Flutes - W12

Aggressive	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3		0.051		0.056		0.066		0.041		0.047		0.022
4		0.073		0.083		0.091		0.055		0.066		0.033
5		0.097		0.111		0.117		0.072		0.081		0.040
6		0.124		0.141		0.143		0.089		0.100		0.050
7		0.151		0.178		0.173		0.109		0.116		0.057
8		0.182		0.220		0.209		0.125		0.138		0.067
9		0.211		0.258		0.240		0.144		0.147		0.073
10		0.248		0.309		0.272		0.169		0.177		0.090
11		0.282		0.359		0.319		0.180		0.192		0.100
12	150	0.325	100	0.407	55	0.353	50	0.200	40	0.209	30	0.113
13		0.338		0.416		0.371		0.215		0.230		0.100
14		0.349		0.426		0.385		0.225		0.230		0.114
15		0.369		0.418		0.417		0.245		0.244		0.114
16		0.387		0.430		0.445		0.270		0.275		0.133
17		0.383		0.426		0.436		0.260		0.275		0.133
18		0.400		0.417		0.470		0.289		0.275		0.133
19		0.400		0.406		0.460		0.278		0.314		0.133
20		0.421		0.394		0.511		0.313		0.300		0.160

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-S Oil Feed Twist Drill, 8 x Ø Internal Coolant, 2 Flutes - W12

Conventional	N						K				S	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-		-		-		-	
	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
D												
3		0.060		0.053		0.066		0.062		0.058		0.041
4		0.084		0.075		0.090		0.087		0.084		0.056
5		0.110		0.097		0.117		0.115		0.105		0.069
6		0.138		0.125		0.146		0.148		0.130		0.082
7		0.170		0.150		0.175		0.181		0.163		0.100
8		0.201		0.180		0.207		0.214		0.192		0.138
9		0.237		0.211		0.241		0.256		0.226		0.138
10		0.272		0.241		0.277		0.293		0.256		0.157
11		0.312		0.275		0.306		0.330		0.288		0.200
12	200	0.346	175	0.309	135	0.350	75	0.382	55	0.329	20	0.200
13		0.369		0.328		0.360		0.397		0.341		0.240
14		0.380		0.340		0.386		0.415		0.357		0.240
15		0.391		0.347		0.403		0.438		0.385		0.220
16		0.408		0.363		0.423		0.453		0.382		0.275
17		0.424		0.382		0.428		0.439		0.363		0.245
18		0.436		0.397		0.452		0.455		0.385		0.245
19		0.449		0.401		0.460		0.474		0.371		0.245
20		0.462		0.418		0.468		0.502		0.397		0.228



DR-S Oil Feed Twist Drill, 8 x Ø Internal Coolant, 2 Flutes - W12

Conventional	P						M				S	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Nickel Alloy	
Properties	-		520 < Rm < 1200		-		High Machinability		Low Machinability		-	
	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
D												
3		0.057		0.052		0.059		0.038		0.044		0.038
4		0.081		0.079		0.086		0.050		0.060		0.050
5		0.109		0.105		0.112		0.065		0.075		0.060
6		0.139		0.134		0.134		0.081		0.086		0.075
7		0.169		0.169		0.163		0.100		0.108		0.086
8		0.204		0.208		0.186		0.108		0.130		0.100
9		0.235		0.246		0.226		0.127		0.144		0.100
10		0.277		0.291		0.250		0.150		0.163		0.120
11		0.316		0.340		0.294		0.156		0.163		0.120
12	95	0.361	70	0.387	35	0.323	30	0.188	25	0.186	15	0.175
13		0.378		0.395		0.349		0.188		0.186		0.150
14		0.398		0.400		0.363		0.200		0.217		0.150
15		0.411		0.403		0.387		0.200		0.200		0.150
16		0.434		0.400		0.400		0.233		0.240		0.200
17		0.428		0.370		0.390		0.222		0.238		0.187
18		0.441		0.372		0.380		0.210		0.224		0.187
19		0.451		0.373		0.443		0.210		0.224		0.187
20		0.438		0.338		0.420		0.238		0.263		0.163

FEATURES & BENEFITS

DR MINI MICRO DRILLS



1. Split Point Design



Provides self centering ability and reduced thrust.

2. X-Thinning



Better self-centering on initial cutting.

3. Straight Edge Profile



Shorter chip and reinforced cutting edge.

H03



4. Polished Flute



Ensures fast and effective chip evacuation and drastically reduces built-up edge.

5. Suitable for Material Groups:



DR Mini Oil Feed Twist Drills – 5 x Ø, 8 x Ø, 12 x Ø, 15 x Ø, 20 x Ø, 25 x Ø, 30 x Ø



Order Number	Hole Depth l2/D	D h7	l1	l2	L	d2 h6	Availability
H03 0100 5	5 x D	1	6.5	8	50	3	●
H03 0100 8	8 x D		9.5	11	50	3	●
H03 0100 12	12 x D		13.5	15	55	3	●
H03 0110 5	5 x D	1.1	7.2	8.7	50	3	●
H03 0110 8	8 x D		10.5	12	50	3	●
H03 0120 5	5 x D	1.2	7.8	9.3	50	3	●
H03 0120 8	8 x D		11.4	12.9	50	3	●
H03 0130 5	5 x D	1.3	8.5	10	50	3	●
H03 0130 8	8 x D		12.4	13.9	50	3	●
H03 0140 5	5 x D	1.4	9.1	10.6	50	3	●
H03 0150 5	5 x D		9.8	11.3	50	3	●
H03 0150 8	8 x D	1.5	14.3	15.8	50	3	●
H03 0150 12	12 x D		20.3	21.8	55	3	●
H03 0160 5	5 x D	1.6	10.4	11.9	50	3	●
H03 0160 8	8 x D		15.2	16.7	50	3	●
H03 0170 5	5 x D	1.7	11.1	12.6	55	3	●
H03 0170 8	8 x D		16.2	17.7	60	3	●
H03 0170 12	12 x D		23	24.5	65	3	●
H03 0180 5	5 x D	1.8	11.7	13.2	55	3	●
H03 0180 8	8 x D		17.1	18.6	60	3	●
H03 0180 12	12 x D		24.3	25.8	65	3	●
H03 0190 5	5 x D	1.8	12.4	13.9	55	3	●
H03 0190 12	12 x D		25.7	27.2	65	3	●
H03 0200 5	5 x D	2	13	16	55	3	●
H03 0200 8	8 x D		19	22	60	3	●
H03 0200 12	12 x D		27	30	65	3	●
H03 0210 5	5 x D	2.1	13.7	16.85	55	3	●
H03 0210 8	8 x D		20	23.15	60	3	●
H03 0210 12	12 x D		28.4	31.55	65	3	●
H03 0220 5	5 x D	2.2	14.3	17.6	55	3	●
H03 0220 8	8 x D		20.9	24.2	60	3	●
H03 0230 5	5 x D	2.3	15	18.45	55	3	●
H03 0230 8	8 x D		21.9	25.35	60	3	●
H03 0230 12	12 x D		31.1	34.55	65	3	●
H03 0240 5	5 x D	2.4	15.6	19.2	55	3	●
H03 0240 12	12 x D		32.4	36	75	3	●
H03 0250 5	5 x D	2.5	16.3	20.05	55	3	●
H03 0250 8	8 x D		23.8	27.55	60	3	●
H03 0250 12	12 x D		33.8	37.55	75	3	●

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Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

DR Mini Oil Feed Twist Drills – 5 x Ø, 8 x Ø, 12 x Ø, 15 x Ø, 20 x Ø, 25 x Ø, 30 x Ø



Order Number	Hole Depth l2/D	D h7	l1	l2	L	d2 h6	Availability
H03 0260 5	5 x D	2.6	16.9	20.8	55	3	●
H03 0260 8	8 x D		24.7	28.6	60	3	●
H03 0260 12	12 x D		35.1	39	75	3	●
H03 0270 5	5 x D	2.7	17.6	21.65	55	3	●
H03 0270 8	8 x D		25.7	29.75	60	3	●
H03 0280 5	5 x D	2.8	18.2	22.4	55	3	●
H03 0280 8	8 x D		26.6	30.8	60	3	●
H03 0290 5	5 x D	2.9	18.9	23.25	55	3	●
H03 0290 8	8 x D		27.6	31.95	60	3	●
H03 0300 5	5 x D	3	19.5	24	55	3	●
H03 0300 8	8 x D		28.5	33	60	3	●
H03 0300 12	12 x D		40.5	45	75	3	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR Mini Oil Feed Twist Drill, 5 x Ø, 8 x Ø, 2 Flutes – H03

Working Material	N						K				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	120 ~ 170	0.017	105 ~ 150	0.018	90 ~ 140	0.016	85	0.018	65	0.016	30	0.013
1.5		0.026		0.026		0.024		0.027		0.024		0.019
2		0.035		0.035		0.032		0.035		0.032		0.025
2.5		0.043		0.044		0.040		0.044		0.040		0.031
3		0.052		0.053		0.049		0.053		0.048		0.038

Working Material	P						M				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Nickel Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	90	0.017	80	0.016	65	0.014	60	0.015	40	0.014	20	0.009
1.5		0.026		0.024		0.022		0.022		0.021		0.016
2		0.035		0.031		0.029		0.029		0.028		0.025
2.5		0.043		0.039		0.036		0.036		0.035		0.035
3		0.052		0.047		0.043		0.044		0.042		0.045



DR Mini Oil Feed Twist Drill, 12 x Ø, 20 x Ø, 2 Flutes – H03

Working Material	N						K				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	130	0.016	115	0.016	105	0.015	80	0.014	55	0.014	30	0.010
1.5		0.025		0.024		0.022		0.021		0.021		0.016
2		0.033		0.032		0.029		0.028		0.028		0.021
2.5		0.041		0.039		0.037		0.035		0.035		0.026
3		0.049		0.047		0.044		0.042		0.042		0.031

Working Material	P						M				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Nickel Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	85	0.014	65	0.014	55	0.010	50	0.010	40	0.009	15	0.010
1.5		0.021		0.020		0.015		0.015		0.014		0.016
2		0.028		0.027		0.020		0.020		0.019		0.025
2.5		0.035		0.034		0.025		0.025		0.024		0.035
3		0.042		0.041		0.031		0.030		0.028		0.044

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Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR Mini Oil Feed Twist Drill, 25 x Ø, 30 x Ø, 2 Flutes – H03

Working Material	N						K				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	125	0.014	105	0.014	95	0.012	75	0.010	50	0.013	30	0.006
1.5		0.021		0.021		0.018		0.015		0.019		0.009
2		0.028		0.027		0.024		0.020		0.025		0.013
2.5		0.035		0.034		0.030		0.025		0.031		0.015
3		0.042		0.041		0.036		0.030		0.037		0.019

Working Material	P						M				S	
	Wrought Aluminium		Cast Aluminium		Copper Alloy		Grey Cast Iron		Ductile Cast Iron		Nickel Alloy	
Properties	Si < 9%		Si ≥ 9%		–		–		–		–	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn	Vc	fn
1	80	0.010	60	0.011	50	0.008	45	0.007	35	0.007	15	0.008
1.5		0.015		0.016		0.011		0.010		0.011		0.013
2		0.020		0.022		0.015		0.014		0.014		0.021
2.5		0.025		0.027		0.019		0.017		0.018		0.030
3		0.031		0.033		0.022		0.021		0.021		0.038

FEATURES & BENEFITS

DR-LX



1. Polished Flute



Ensures fast and effective chip evacuation and drastically reduces built-up edge.

2. Versatile Machining Condition

Able to drill reliably with various coolant pressure and cutting data.

3. Flexible Drilling

Able to drill reliably in continuous and peck drilling.

4. T8090 Tip Coating

Low friction, high wear resistance.

W05



5. State-of-the-Art-Geometry



For prolonged durability and excellent quality.

Wider Flute Shape:

- Better chip evacuation.

Tougher Core Diameter

- Ensures smooth chip evacuation and core rigidity.

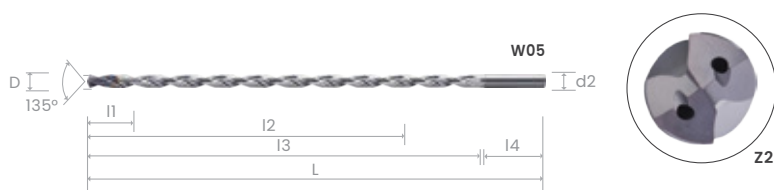
GG Point Geometry

- Protect & Reduce Chipping.

6. Suitable for Material Groups:



DR-LX SB Spiral Burnishing Oil Feed Twist Drill – 12 x Ø, 15 x Ø, 20 x Ø, 25 x Ø, 30 x Ø



Order Number	*l2/D	D h7	l1	l2	l3	l4	L	d2 h6	Availability
W05 0300 20	20 x D	3	15.5	64	69	32	105	3	●
W05 0310 12	12 x D	3.1	15.5	45	32	50	85	4	●
W05 0320 12		3.2	16	45	32	50	85	4	●
W05 0350 12		3.5	17.5	48	32	54	90	4	●
W05 0380 12		3.8	19	57	32	64	100	4	●
W05 0390 12		3.9	19.5	57	32	64	100	4	●
W05 0400 12		15 x D	4	20	57	32	64	100	4
W05 0400 15	62				32	68	105	4	●
W05 0400 20	82				32	88	125	4	●
W05 0400 25	101				32	107	140	4	●
W05 0400 30	30 x D			121	32	127	160	4	●
W05 0420 12	12 x D	4.2	21	57	34	64	100	5	●
W05 0450 12		4.5	22.5	57	34	64	100	5	●
W05 0480 12		4.8	24	67	34	74	110	5	●
W05 0500 12	15 x D	5	25	72	34	81	120	5	●
W05 0500 15				77	34	85	120	5	●
W05 0500 20				102	34	110	145	5	●
W05 0500 25				126	34	134	170	5	●
W05 0500 30	30 x D			151	34	159	195	5	●
W05 0520 12 *	12 x D	5.2	26	72	36	81	120	6	●
W05 0550 30 *	30 x D	5.5	27.5	166	36	174	215	6	●
W05 0560 12 *	12 x D	5.6	28	72	36	81	120	6	●
W05 0580 12 *		5.8	29	72	36	81	120	6	●
W05 0600 12 *	15 x D	6	30	72	36	81	120	6	●
W05 0600 15 *				92	36	101	140	6	●
W05 0600 20 *				122	36	131	170	6	●
W05 0600 25 *				151	36	160	200	6	●
W05 0600 30 *	30 x D			181	36	190	230	6	●
W05 0680 12 *	12 x D	6.8	34	96	36	108	145	8	●
W05 0700 12 *		7	35	96	36	108	145	8	●
W05 0700 15 *	107			38	118	160	8	●	
W05 0700 20 *	142			38	153	195	8	●	
W05 0700 25 *	176			38	187	230	8	●	
W05 0750 30 *	30 x D	7.5	37.5	226	38	237	280	8	●
W05 0800 12 *	12 x D	8	40	96	36	108	145	8	●
W05 0800 15	15 x D			122	40	134	175	8	●
W05 0800 20	20 x D			162	40	174	215	8	●
W05 0800 25	25 x D			201	40	213	255	8	●
W05 0800 30	30 x D			241	40	253	295	8	●

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* - DIN 6535

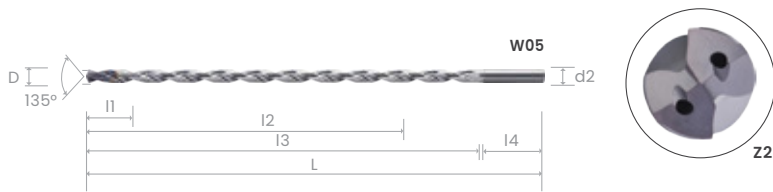
Stock Availability

● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

DR-LX SB Spiral Burnishing Oil Feed Twist Drill – 12 x Ø, 15 x Ø, 20 x Ø, 25 x Ø, 30 x Ø



Order Number	*I2/D	D h7	I1	I2	I3	I4	L	d2 h6	Availability
W05 0850 12 *	12 x D	8.5	42.5	120	40	135	180	10	●
W05 0850 20 *	20 x D			172	40	185	230	10	●
W05 0900 12 *	12 x D	9	45	120	40	135	180	10	●
W05 0900 15 *	15 x D			137	40	151	195	10	●
W05 0900 20 *	20 x D			182	40	196	240	10	●
W05 0900 25 *	25 x D			226	40	240	285	10	●
W05 1000 12 *	12 x D	10	50	120	40	135	180	10	●
W05 1000 15 *	15 x D			152	40	167	210	10	●
W05 1000 20 *	20 x D			202	40	217	260	10	●
W05 1000 25 *	25 x D			252	40	267	310	10	●

* - DIN 6535

Stock Availability
● Ex Stock (Germany)

Material Group

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
●	●	●	●	●	●	●	●	●	●	●	●	●				

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-LX SB Spiral Burnishing Oil Feed Twist Drill, 12 x Ø, 2 Flutes – W05

Working Material	N					
	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
D	Vc	fn	Vc	fn	Vc	fn
3	120 - 170	0.084	105 - 150	0.083	90 - 140	0.081
4		0.120		0.119		0.116
5		0.161		0.160		0.155
6		0.209		0.203		0.196
7		0.259		0.253		0.245
8		0.311		0.305		0.298
9		0.332		0.323		0.321
10		0.351		0.350		0.340
12		0.381		0.371		0.365

Working Material	P					
	Carbon Steel		Alloy Steel		Prehardened Steel	
Properties	-		520 < Rm < 1200		35±HRC<45	
D	Vc	fn	Vc	fn	Vc	fn
3	80 - 120	0.066	65 - 110	0.064	55 - 80	0.063
4		0.095		0.092		0.088
5		0.126		0.123		0.120
6		0.164		0.153		0.153
7		0.202		0.189		0.192
8		0.245		0.232		0.231
9		0.272		0.246		0.249
10		0.294		0.263		0.266
12		0.339		0.287		0.280

Working Material	K				M			
	Grey Cast Iron		Ductile Cast Iron		Stainless Steel		Stainless Steel	
Properties	-		-		High Machinability		Low Machinability	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	70 - 110	0.067	55 - 80	0.067	50 - 75	0.066	35 - 50	0.062
4		0.097		0.094		0.094		0.088
5		0.130		0.126		0.122		0.113
6		0.164		0.160		0.158		0.147
7		0.209		0.200		0.190		0.176
8		0.251		0.242		0.234		0.218
9		0.262		0.262		0.248		0.224
10		0.280		0.273		0.259		0.248
12		0.304		0.288		0.298		0.267

Working Material	S					
	Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		-	
D	Vc	fn	Vc	fn	Vc	fn
3	25 - 35	0.062	20 - 30	0.052	20 - 30	0.040
4		0.088		0.077		0.050
5		0.112		0.097		0.050
6		0.158		0.120		0.063
7		0.190		0.140		0.063
8		0.234		0.182		0.080
9		0.242		0.202		0.080
10		0.252		0.210		0.100
12		0.280		0.220		0.100

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-LX SB Spiral Burnishing Oil Feed Twist Drill, 15 x Ø, 20 x Ø, 2 Flutes – W05

Working Material	N					
	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
D	Vc	fn	Vc	fn	Vc	fn
3	100 - 130	0.110	105 - 150	0.083	85 - 115	0.104
4		0.150		0.119		0.143
5		0.209		0.160		0.199
6		0.259		0.203		0.242
7		0.309		0.253		0.295
8		0.373		0.305		0.359
9		0.402		0.323		0.383
10		0.445		0.350		0.423
12		0.493		0.371		0.466

Working Material	P					
	Carbon Steel		Alloy Steel		Prehardened Steel	
Properties	-		520 < Rm < 1200		35±HRC<45	
D	Vc	fn	Vc	fn	Vc	fn
3	60 - 85	0.085	45 - 70	0.083	35 - 40	0.082
4		0.117		0.114		0.111
5		0.162		0.158		0.156
6		0.200		0.191		0.191
7		0.238		0.228		0.231
8		0.291		0.281		0.283
9		0.314		0.301		0.300
10		0.354		0.333		0.333
12		0.408		0.369		0.364

Working Material	K				M			
	Grey Cast Iron		Ductile Cast Iron		Stainless Steel		Stainless Steel	
Properties	-		-		High Machinability		Low Machinability	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	50 - 75	0.088	35 - 45	0.088	30 - 40	0.082	20 - 30	0.073
4		0.120		0.118		0.113		0.101
5		0.168		0.165		0.155		0.137
6		0.204		0.201		0.191		0.169
7		0.248		0.242		0.228		0.197
8		0.300		0.297		0.279		0.245
9		0.313		0.316		0.298		0.250
10		0.351		0.346		0.324		0.287
12		0.392		0.381		0.370		0.320

Working Material	S					
	Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		-	
D	Vc	fn	Vc	fn	Vc	fn
3	20 - 30	0.078	15 - 25	0.049	25	0.032
4		0.102		0.063		0.040
5		0.150		0.091		0.040
6		0.174		0.109		0.050
7		0.190		0.116		0.050
8		0.234		0.154		0.063
9		0.242		0.171		0.063
10		0.294		0.196		0.080
12		0.347		0.218		0.080

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition



DR-LX SB Spiral Burnishing Oil Feed Twist Drill, 25 x Ø, 30 x Ø, 2 Flutes – W05

Working Material	N					
	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
D	Vc	fn	Vc	fn	Vc	fn
3	100 - 130	0.110	105 - 150	0.083	85 - 115	0.104
4		0.150		0.119		0.143
5		0.209		0.160		0.199
6		0.259		0.203		0.242
7		0.309		0.253		0.295
8		0.373		0.305		0.359
9		0.402		0.323		0.383
10		0.445		0.350		0.423
12		0.493		0.371		0.466

Working Material	P					
	Carbon Steel		Alloy Steel		Prehardened Steel	
Properties	-		520 < Rm < 1200		35±HRC<45	
D	Vc	fn	Vc	fn	Vc	fn
3	60 - 85	0.085	45 - 70	0.083	35 - 45	0.082
4		0.117		0.114		0.111
5		0.162		0.158		0.156
6		0.200		0.191		0.191
7		0.238		0.228		0.231
8		0.291		0.281		0.283
9		0.314		0.301		0.300
10		0.354		0.333		0.333
12		0.408		0.369		0.364

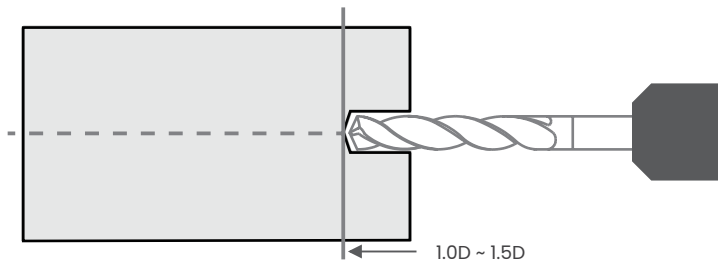
Working Material	K				M			
	Grey Cast Iron		Ductile Cast Iron		Stainless Steel		Stainless Steel	
Properties	-		-		High Machinability		Low Machinability	
D	Vc	fn	Vc	fn	Vc	fn	Vc	fn
3	50 - 75	0.088	35 - 45	0.088	30 - 40	0.082	20 - 30	0.073
4		0.120		0.118		0.113		0.101
5		0.168		0.165		0.155		0.137
6		0.204		0.201		0.191		0.169
7		0.248		0.242		0.228		0.197
8		0.300		0.297		0.279		0.245
9		0.313		0.316		0.298		0.250
10		0.351		0.346		0.324		0.287
12		0.392		0.381		0.370		0.320

Working Material	S					
	Titanium Alloy		Nickel Alloy		Cobalt Alloy	
Properties	-		-		-	
D	Vc	fn	Vc	fn	Vc	fn
3	15 - 25	0.082	15 - 20	0.061	25	0.026
4		0.113		0.085		0.032
5		0.153		0.113		0.032
6		0.198		0.139		0.040
7		0.228		0.156		0.040
8		0.281		0.204		0.050
9		0.291		0.227		0.050
10		0.323		0.245		0.064
12		0.370		0.263		0.064

DR-LX LONG DRILL TECHNICAL INFO (APPLICATION)

Drilling on Standard Through Hole

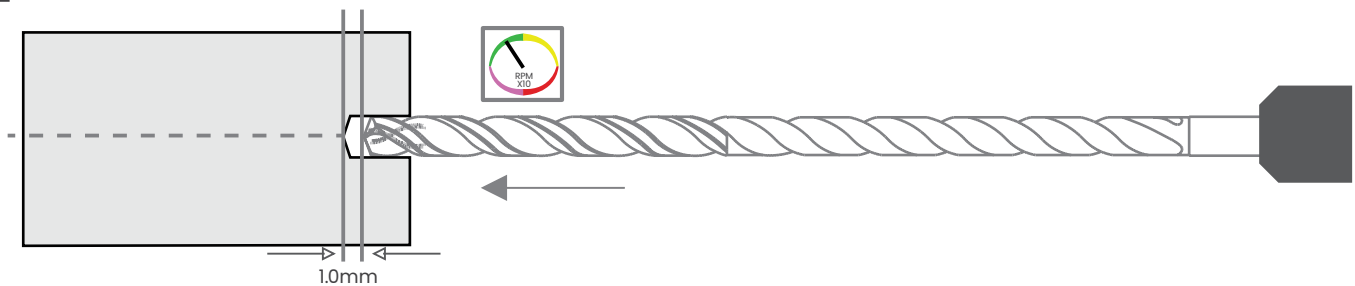
1



Develop pilot bore

- Using a 3xD pilot drill (DR-S) with point angle 140° and tolerance m7 (4 - 25 micron > Ø deep hole drill)
- Drilling pilot bore depth with minimum of 1 to 1.5D

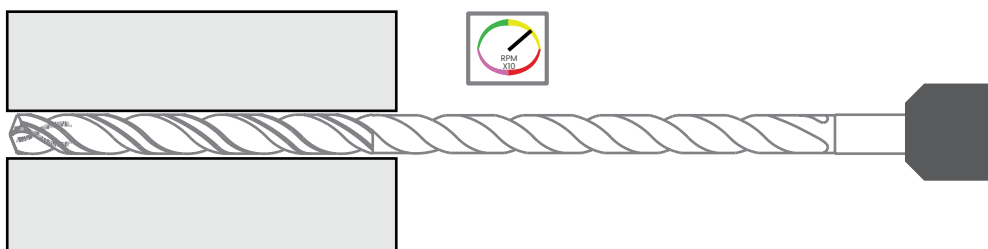
2



Enter according to pilot bore

- Enter without coolant until approximately 1mm before the end of pilot bore
- Approximately 300 rpm and feed rate of 500 mm/min
- Then start high pressure coolant

3



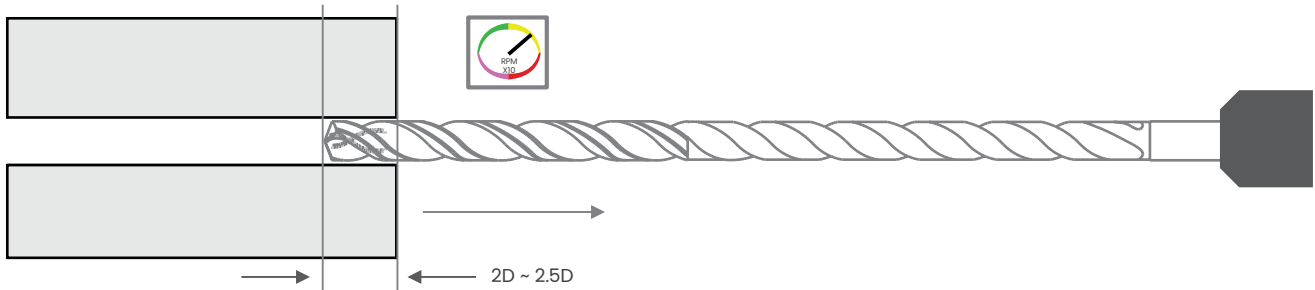
Deep drilling process

- Load higher spindle speed (V_c) and feed rate (f) as recommended
- Drill continuously to the full hole depth without chip-removal / peck-drilling cycles
- For through holes, reduce the feed rate by 30% approximately 1mm before completing the hole

DR-LX LONG DRILL TECHNICAL INFO (APPLICATION)

Drilling on Standard Through Hole

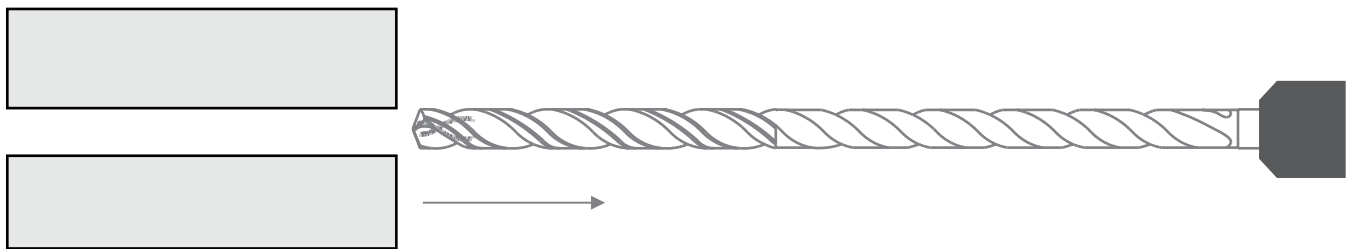
4



Withdrawal

- Switch off the coolant supply
- Withdraw the long drills after drilling to the full hole depth
- Maintain the existing spindle (V_c) and double the feed rate (f)
- Withdraw to approximately $2 - 2.5 \times D$ into the pilot bore

5

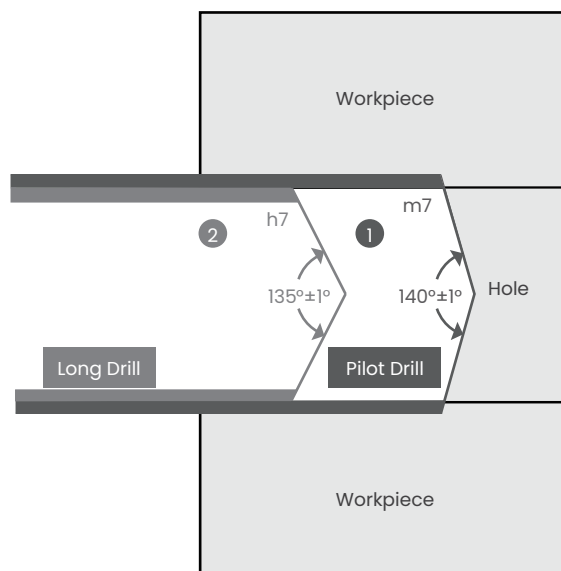


Discharge from the bore

- Retract at a low, constant speed for the

DR-LX LONG DRILL TECHNICAL INFO (APPLICATION)

Drilling on Standard Through Hole



1. Pilot Bore

Please use the corresponding drill with internal coolant supply and the same nominal diameter for the pilot bore.
Pilot Drill Series I **DR-S (140° I D(m7))**

Tolerance consideration for m7 in μm

Diameter	Tolerance, μm
$\leq \varnothing 3$	+2 ~ +12
$\varnothing 4 - \varnothing 6$	+4 ~ +16
$\varnothing 7 - \varnothing 10$	+6 ~ +21

2. Deep Hole Bore (12xD – 30xD)

Please use the corresponding drill with internal coolant supply and the same nominal diameter for the deep hole bore.
Long Drill Series I **DR-LX (135° I D(h7))**

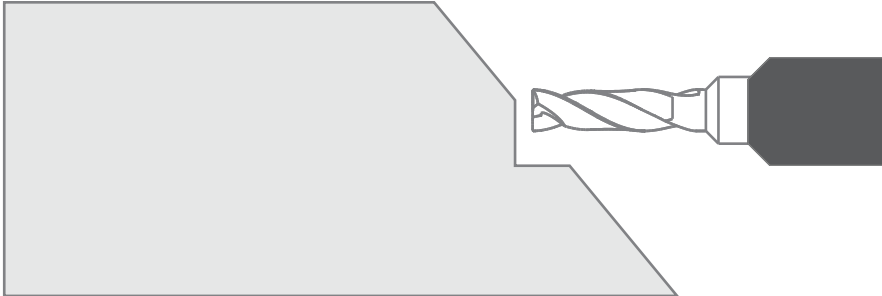
Tolerance consideration for h7 in μm

Diameter	Tolerance, μm
$\leq \varnothing 3$	0 ~ -10
$\varnothing 4 - \varnothing 6$	0 ~ -12
$\varnothing 7 - \varnothing 10$	0 ~ -15

DR-LX LONG DRILL TECHNICAL INFO (APPLICATION)

Drilling On Irregular Faces or Angles

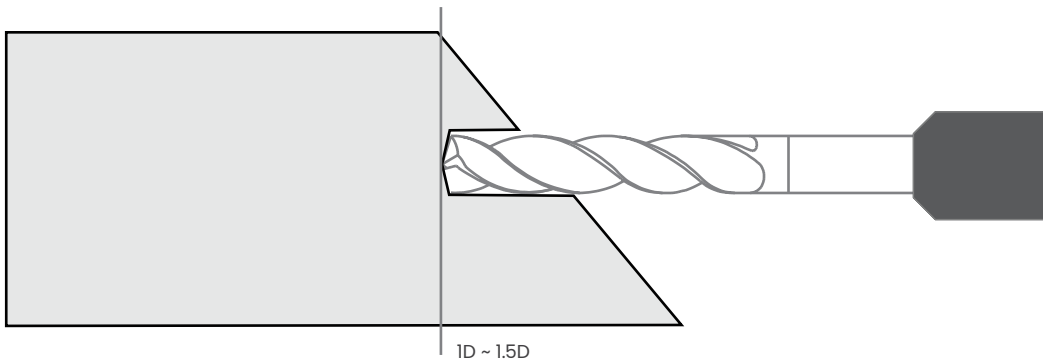
1



Spot Facing

- Create a flat surface on the irregular faces/angles using the **Flat Drill (W15)**
- Machine the spot face to the same width as the required deep hole diameter

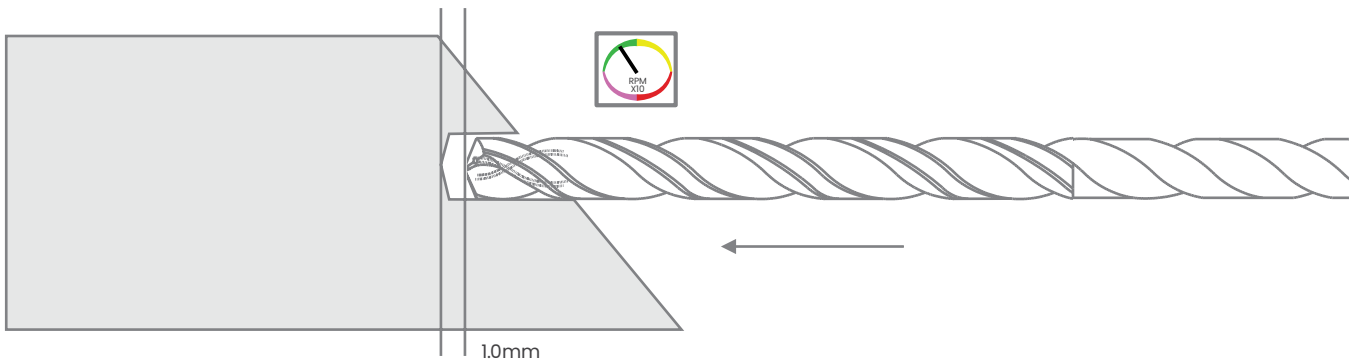
2



Develop pilot bore

- Using a 3xD pilot drill (DR-S) with point angle 140° & tolerance m7 (4 - 25 micron > Ø deep hole drill)
- Drill the pilot bore to a depth of at least 1 - 1.5 x D

3



Enter according to pilot bore

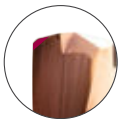
- Enter without coolant until approximately 1mm before the end of pilot bore
- Approximately 300 rpm and feed rate of 500 mm/min
- Then start high pressure coolant

FEATURES & BENEFITS

DR 60



1. Corner Chamfer Edge



Low friction, high wear resistance.

2. Thinning

Special Thinning for hardened material.

3. Bigger Web Thickness

Increases the tool rigidity.

823



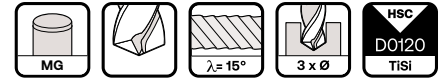
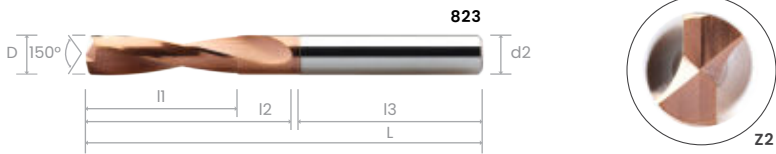
4. Tough PVD Silicon Based Coating

- Prolong the tool life.
- Enables higher cutting speeds.
- Increases heat resistance.

5. Suitable for Material Groups:

H

DR 60 Twist Drill, 2 Flutes – 3 X Ø



Order Number	D	l1	l2	l3	L	d2 h6	Availability
823 0300 *	3	14	20	36	62	6	●
823 0380 *	3.8	17	24	36	66	6	●
823 0420 *	4.2		24	36	66	6	●
823 0500 *	5	20	28	36	66	6	●
823 0580 *	5.8		28	36	66	6	●
823 0600 *	6		28	36	66	6	●
823 0680 *	6.8	29	41	36	79	8	●
823 0700 *	7		41	36	79	8	●
823 0800 *	8		41	36	79	8	●
823 0850 *	8.5	35	47	40	89	10	●
823 0900 *	9		47	40	89	10	●
823 1000 *	10		47	40	89	10	●
823 1100 *	11	40	55	45	102	12	●
823 1200 *	12		55	45	102	12	●

* - DIN 6535

Stock Availability

● Ex Stock (Germany)

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

Recommended Cutting Data

Note: These recommended cutting data indicators are just for reference. They should be adjusted according to the different cutting condition

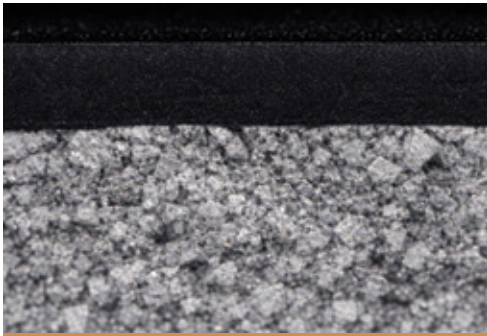


DR 60 Twist Drill, 3 x Ø, 2 Flutes – 823

Working Material	H			
	Hardened Steel			
Properties	45 ≤ HRC < 52		52 ≤ HRC < 68	
D	Vc	Fn	Vc	Fn
3	30	0.024	20	0.018
4		0.050		0.025
5		0.065		0.029
6		0.080		0.032
7		0.090		0.036
8		0.100		0.039
9		0.110		0.043
10		0.120		0.046
11		0.130		0.050
12		0.140		0.053
13		0.150		0.059

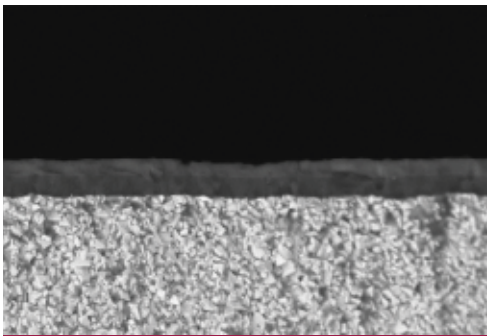


INDEXABLE MILLING



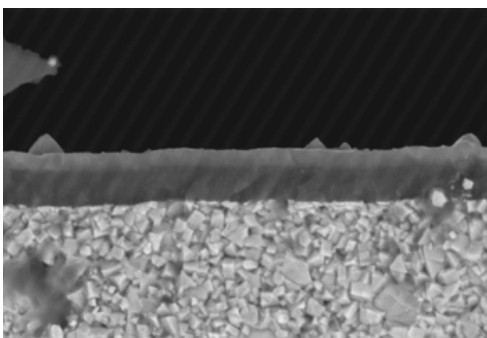
HPU2500: THE ALL ROUND UNIVERSAL CUTTING

A fine-grain carbide substrate paired with AlTiN coating for reliable, all-round performance. Handles chip adhesion well and holds up across a wide range of steels and cast materials. The safe, go-to choice when you need one grade that performs consistently across varying jobs.



HPS2500: BEST FOR HEAT RESISTANT CUTTING

Built for the heat that stainless steel and superalloys generate at the cutting edge. A specially formulated substrate combined with AlTiSiN coating resists high thermal stress, keeping the edge sharp and stable even as temperatures climb. The right choice whenever heat, not wear, is what's wearing your tools out.



HPH1500: BUILT FOR HIGH HARDNESS CUTTING

Designed for roughing operations on hardened steels and high-hardness alloys, where the repeated impact loading of each pass puts extra stress on the cutting edge. A tough, cobalt-enriched substrate resists chipping under that loading, while a multi-layer coating protects against heat buildup from heavy chip loads. Built to survive aggressive roughing passes on hard material without breaking down.

Geometry	F	M
Shoulder Milling Insert		
Edge Profile		
Application	Optimized for finishing applications. First choice for M, S and N material groups.	Suitable for roughing applications. First choice for P, K and H material groups.

FEATURES & BENEFITS

INDEXABLE SHOULDER MILLING

1. True 90° Shoulder Accuracy

Delivers precise vertical walls and flat shoulders, reducing the need for secondary finishing.

2. Excellent Ramp-Down Capability

Optimized geometry allows smooth ramping and helical entry for flexible machining strategies.

3. Secure Insert Clamping

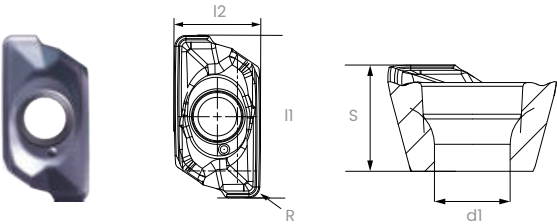
Rigid pocket and secure clamping provide stable, vibration-resistant cutting.

4. Reliable Cutting Performance

Consistent tool life and surface finishing across a wide range of materials and machining conditions.



Optimum Shoulder Milling



Order Number	l1	l2	S	d1	R	Ap Max	HPU2500
XDKX 12T308-F PDSR HPU2500	12.18	6.4	4	2.9	0.8	9	●
XDKX 12T308-M PDSR HPU2500	12.18	6.4	4	2.9	0.8	9	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

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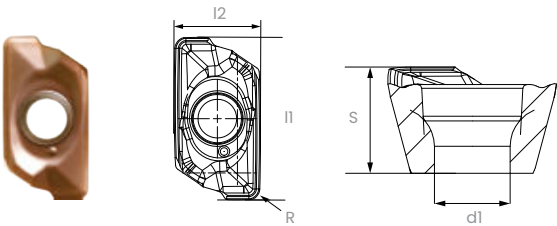
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NiTiCo 45 Shoulder Milling



Order Number	l1	l2	S	d1	R	Ap Max	HPS2500
XDKX 12T308-F PDSR HPS2500	12.18	6.4	4	2.9	0.8	9	●
XDKX 12T308-M PDSR HPS2500	12.18	6.4	4	2.9	0.8	9	●

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

O02

Recommended Cutting Data

Note: The cutting data shown are guide values. Adjust them to suit the machine, the setup rigidity and the workpiece condition.



Shoulder Milling Insert M PDSR HPU2500, HPS2500

Material Group	P			M		K	
Working Material	Carbon Steel	Alloy Steel	Prehardened Steel	Stainless Steel	Stainless Steel	Grey Cast Iron	Ductile Cast Iron
Properties	-	520 < Rm < 1200	35 ≤ HRC < 45	High Machinability	Low Machinability	-	-
Coolant	Dry Preferred			Wet Preferred		Dry Preferred	
Ap (mm)	3	3	3	3	3	3	3
Ae (mm)	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D
Vc	270	170	120	220	160	240	200
Fz	0.17	0.15	0.13	0.15	0.12	0.17	0.15

Material Group	N			S			H	
Working Material	Wrought Aluminium	Cast Aluminium	Copper Alloy	Titanium Alloy	Nickel Alloy	Cobalt Alloy	Hardened Steel	Hardened Steel
Properties	Si < 9%	Si ≥ 9%	-	-	-	-	45 ≤ HRC < 52	52 ≤ HRC < 68
Coolant	Wet Preferred			Wet Preferred			Dry Preferred	
Ap (mm)	3	3	3	3	3	3	2	2
Ae (mm)	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D
Vc	400	400	400	55	40	40	50	40
Fz	0.18	0.18	0.18	0.12	0.12	0.12	0.08	0.08

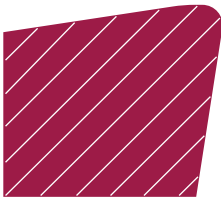
Note: For extended tool life, reduce the recommended cutting speed by 30%

Shoulder Milling Insert F PDSR HPU2500, HPS2500

Material Group	P			M		K	
Working Material	Carbon Steel	Alloy Steel	Prehardened Steel	Stainless Steel	Stainless Steel	Grey Cast Iron	Ductile Cast Iron
Properties	-	520 < Rm < 1200	35 ≤ HRC < 45	High Machinability	Low Machinability	-	-
Coolant	Dry Preferred			Wet Preferred		Dry Preferred	
Ap (mm)	3	3	3	3	3	3	3
Ae (mm)	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D
Vc	270	170	120	220	160	240	200
Fz	0.14	0.12	0.10	0.12	0.10	0.14	0.12

Material Group	N			S			H	
Working Material	Wrought Aluminium	Cast Aluminium	Copper Alloy	Titanium Alloy	Nickel Alloy	Cobalt Alloy	Hardened Steel	Hardened Steel
Properties	Si < 9%	Si ≥ 9%	-	-	-	-	45 ≤ HRC < 52	52 ≤ HRC < 68
Coolant	Wet Preferred			Wet Preferred			Dry Preferred	
Ap (mm)	3	3	3	3	3	3	2	2
Ae (mm)	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D	0.80 × D
Vc	400	400	400	55	40	40	50	40
Fz	0.16	0.16	0.16	0.10	0.10	0.10	0.06	0.06

Note: For extended tool life, reduce the recommended cutting speed by 30%

Geometry	M	R
High Feed Milling Insert		
Edge Profile		
Explanation	Suitable for soft material machining. First choice for P, M,S and N material groups.	Suitable for high-alloy steels and hardened steels from 40–65 HRC. First choice for H and K material groups

FEATURES & BENEFITS

INDEXABLE HIGH FEED MILLING

1. High Feed Geometry for Maximum Productivity

A small entering angle thins the chip, so feed per tooth can run far above conventional milling at the same cutting load.

2. Excellent Ramp-Down Capability

Optimized geometry allows smooth ramping and helical entry for flexible machining strategies.

3. Large Insert Seating Contact Area

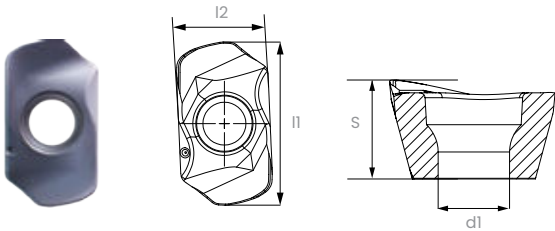
Robust seating surface provides high stability under extreme feed rates and cutting loads.

4. Axial Cutting Force for Long Reach

The shallow entering angle directs load into the spindle rather than against the tool, so deep cavities can be machined at long overhang with less deflection.



Optimum High Feed Milling



Order Number	I1	I2	S	d1	RP	UTCN	Ap Max	HPU2500
XDKX 12T3HF-M ZDSR HPU2500	11.03	6.1	3.8	2.9	1.74	0.35	1.5	●

* RP (Programming Radius)
* UTCN (Uncut Thickness)

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

H01

H02

O01

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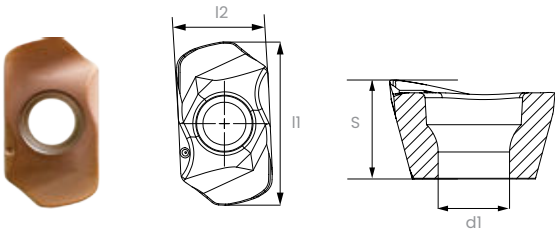
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NiTiCo 45 High Feed Milling



Order Number	I1	I2	S	d1	RP	UTCN	Ap Max	HPS2500
XDKX 12T3HF-M ZDSR HPS2500	11.03	6.1	3.8	2.9	1.74	0.35	1.5	●

* RP (Programming Radius)
* UTCN (Uncut Thickness)

Stock Availability

● Ex Stock (Germany)

Material Group

N01

N02

N03

K01

K02

P01

P02

P03

M01

M02

S01

S02

S03

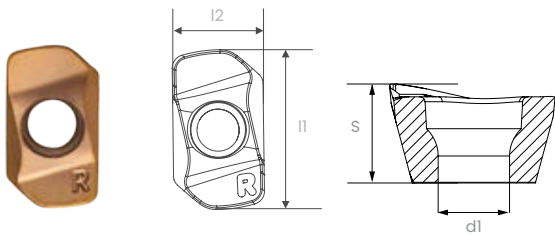
H01

H02

O01

O02

DM70X High Feed Milling



Order Number	I1	I2	S	d1	RP	UTCN	Ap Max	HPH1500
XDKX 12T3HF-R ZDSR HPH1500	11.03	6.1	3.8	2.9	1.30	0.28	0.5	●

* RP (Programming Radius)
* UTCN (Uncut Thickness)

Stock Availability

● Ex Stock (Germany)

Material Group

- N01
- N02
- N03
- K01
- K02
- P01
- P02
- P03
- M01
- M02
- S01
- S02
- S03
- H01
- H02
- O01
- O02

Recommended Cutting Data

Note: The cutting data shown are guide values. Adjust them to suit the machine, the setup rigidity and the workpiece condition.



High Feed Milling Insert M ZDSR HPU2500, HPS2500

Material Group	P			M		K	
Working Material	Carbon Steel	Alloy Steel	Prehardened Steel	Stainless Steel	Stainless Steel	Grey Cast Iron	Ductile Cast Iron
Properties	-	520 < Rm < 1200	35 ≤ HRC < 45	High Machinability	Low Machinability	-	-
Coolant	Dry Preferred			Wet Preferred		Dry Preferred	
Ap (mm)	1	0.8	0.6	0.8	0.6	0.8	0.8
Ae (mm)	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D
Vc	270	170	120	220	160	240	200
Fz	1.50	1.30	1.10	0.70	0.60	1.30	1.10

Material Group	N			S			H	
Working Material	Wrought Aluminium	Cast Aluminium	Copper Alloy	Titanium Alloy	Nickel Alloy	Cobalt Alloy	Hardened Steel	Hardened Steel
Properties	Si < 9%	Si ≥ 9%	-	-	-	-	45 ≤ HRC < 52	52 ≤ HRC < 68
Coolant	Wet Preferred			Wet Preferred			Dry Preferred	
Ap (mm)	1	1	1	1	0.8	0.8	0.5	0.4
Ae (mm)	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D
Vc	400	400	400	55	40	40	50	40
Fz	1.00	1.00	1.00	0.70	0.60	0.60	0.60	0.50

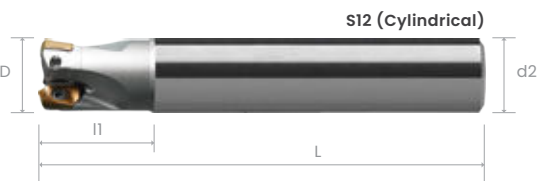
Note: For extended tool life, reduce the recommended cutting speed by 30%

High Feed Milling Insert R ZDSR HPH1500

Material Group	P		K		H	
Working Material	Alloy Steel	Prehardened Steel	Grey Cast Iron	Ductile Cast Iron	Hardened Steel	Hardened Steel
Properties	520 < Rm < 1200	35 ≤ HRC < 45	-	-	45 ≤ HRC < 52	52 ≤ HRC < 68
Coolant	Dry Preferred		Dry Preferred		Dry Preferred	
Ap (mm)	0.5	0.5	0.5	0.5	0.5	0.4
Ae (mm)	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D	0.60 × D
Vc	170	120	240	200	50	40
Fz	1.50	1.30	1.50	1.30	1.00	0.70

Note: For extended tool life, reduce the recommended cutting speed by 30%

Cutter Bodies – Cylindrical Shank



Screw	Screwdriver
H2506-TX08	HFD-TX08

Order Number	D	I1	L	d2	Z	Availability	Insert
S12 1600 090 Z2	16	32	90	16	2	●	XDKX I2T
S12 1600 160 Z2		48	160	16	2	●	
S12 1700 160 Z2	17		160	17	2	●	
S12 2000 100 Z3	20	40	100	20	3	●	
S12 2000 200 Z3		60	200	20	3	●	
S12 2100 200 Z3	21		200	21	3	●	
S12 2500 110 Z4	25	50	110	25	4	●	
S12 2500 200 Z4		75	200	25	4	●	
S12 3200 130 Z5	32	64	130	32	5	●	
S12 3200 200 Z5		96	200	32	5	●	

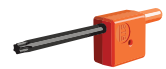
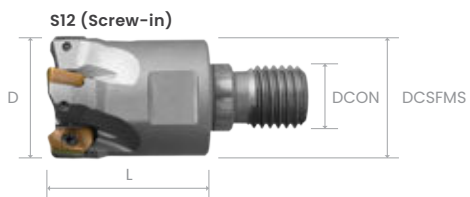
Stock Availability

● Ex Stock (Germany)

Material Group

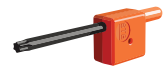
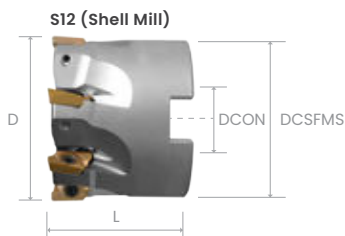
- N01
- N02
- N03
- K01
- K02
- P01
- P02
- P03
- M01
- M02
- S01
- S02
- S03
- H01
- H02
- O01
- O02

Cutter Bodies – Screw-in and Shell Mill



Screw	Screwdriver
H2506-TX08	HFD-TX08

Order Number	D	DCON	TDZ	L	DCSFMS	Z	Availability	Insert
S12 1600 M08 Z2	16	8.5	M08	23	14	2	●	XDKX I2T
S12 2000 M10 Z3	20	10.5	M10	28	18	3	●	
S12 2500 M12 Z4	25	12.5	M12	30	21	4	●	
S12 3200 M16 Z5	32	17	M16	40	30	5	●	
S12 4000 M16 Z6	40		M16	40	35	6	●	



Screw	Screwdriver
H2506-TX08	HFD-TX08

Order Number	D	DCON	L	DCSFMS	Z	Availability	Insert
S12 4000 16 Z6	40	16	40	35	6	●	XDKX I2T
S12 5000 22 Z7	50	22	40	47	7	●	
S12 6300 22 Z8	63		40	50	8	●	

Stock Availability

● Ex Stock (Germany)

Material Group

N01 N02 N03 K01 K02 P01 P02 P03 M01 M02 S01 S02 S03 H01 H02 O01 O02

Description of the Icons

1 Tool Material (Tungsten Carbide)														
		Micro Grain Carbide 90% WC 6% Co 91.5 HRA 0.7 micron Grain Size ISO Grade K10/K30					Micro Grain Carbide 90% WC 10% Co 92.0±0.5 HRA 0.8 micron Grain Size ISO Grade K10/K30					Micro Grain Carbide 93.5% WC 6% Co 93.5 HRA 0.6 micron Grain Size ISO Grade K05/K10		
		Ultra Fine Carbide 86.5% WC 12% Co 93.0±0.5 HRA 0.5 micron Grain Size ISO Grade K10/K40					Ultra Fine Carbide 91% WC 9% Co 93.9 HRA 0.2 micron Grain Size ISO Grade K05/K10							
2 Corner Form														
		Sharp Corner Edge					Corner Edge Radius Tolerance of the Radius					Full Radius Tolerance of the Radius		
		Chamfer												
3 Cutting Geometry														
		Display Helix Angle of Flute					Taper Angle					No Vibration		
												No Vibration		
4 Shank Design														
		HA = Plain shank HB = Weldon Shank												
5 DR														
		Without Oil Hole					Internal Oil Hole					Drilling Depth		
		180° Point Angle Design					Unique Edge Protection Design					Highly Treated Gash Surface		
												Optimized Flute Design		
6 Tolerance														
Ø mm	Tol. µm													
	HPMT	h5	h6	h7	h9	m7	H7							
≤ 3.0	0 / -20	0 / -4	0 / -6	0 / -6	0 / -25	+12 / -12	+10 / 0							
3.0~6.0	0 / -25	0 / -5	0 / -8	0 / -12	0 / -30	+16 / +4	+12 / 0							
6.0~10.0	0 / -30	0 / -6	0 / -9	0 / -15	0 / -36	+21 / +6	+15 / 0							
10.0~18.0		0 / -8	0 / -11	0 / -18	0 / -43	+25 / +7	+18 / 0							
18.0~30.0		0 / -9	0 / -13	0 / -21	0 / -52	+29 / +8	+21 / 0							
7 Recess														
Ø (mm)	3	4	5	6	8	10	12	14	16	18	20			
Recess Ø (mm)	2.8	3.7	4.6	5.5	7.4	9.2	11	13	15	17	19			

Description of the Icons

8 Coatings							
Type of Coating	Coating Material	Hardness	Oxidation Resistance Temperature	Coefficient of Friction	Standard Thickness	Application Area	Coating Colour
	Uncoated	-/-	-/-	-/-	-/-	-/-	-/-
	AITIN (Monolayer)	3,300	≥ 900°C ≤ 1,000°C	0.3	3 µm	Suitable for medium and high speed, wet and dry machining and good for machining steel with hardness up to HRC 52.	 Blue-Black
	TiSi Based (Multilayer)	3,600	≤ 1,200°C	0.3	2.5 – 3.5 µm	Suitable for high speed (dry) and hard machining for difficult materials above HRC 52. Suitable for high speed machining with hardened steels above HRC 60.	 Copper
	AlTiSiN (Multilayer)	3,800	≤ 1,200°C	0.4 – 0.5	1 – 4 µm	Suitable for high speed (dry) and hard machining for difficult material above HRC 50. Suitable for high speed machining with hardened steels above HRC60. Vc & Vf = +30%.	 Copper to Brown
	AlCrN (Monolayer)	3,200	≤ 1,100°C	0.35	2.5 – 3.5 µm	Suitable for low to medium speed, wet and dry machining and good for machining steel with hardness and high temperature alloy up to HRC 52.	 Blue-Grey
	ta-C	(GPA) >65	>500°C	0.3	0.3 µm	Specialized for machining and forming non-ferrous materials and polymers, offers excellent adhesion resistance and edge retention for high-precision applications	 Rainbow
	Diamond (Monolayer)	(GPA) 40 – 90	≤ 600°C	0.15 – 0.2	1.2 µm	Suitable for machining graphite and composite reinforced plastic fiber glass (CRP) (e.g. graphite electrodes, crucibles, boats).	 Dark Grey
	Alu	2,600	600°C	0.35	1 – 3 µm	Suitable for aluminium.	 Barley
	TiSi Based (Multilayer)	3,600	≤ 1,200°C	0.3	2 – 3 µm	Suitable for high performance drilling in difficult machining material.	 Copper
	TiAlN (Multilayer)	3,300	≤ 900°C	0.3–0.35	3 µm	Suitable for low and medium cutting speed under wet machining.	 Blue-Black

*HSC = High Speed Cutting
*HPT = High Performance Tools

Material Appendix

Material	HPMT	Description	Properties	W. Nr.	DIN	UNI	AFNOR	AISI/SAE/ASTM	JIS	Common Name
Aluminum Wrought Alloy, Si < 9%	N01	Aluminium alloys	Si < 9%	3.0255	Al99.5		A-5/1050A		(Al050)	
				3.0515	AlMn1					
				3.0517	AlMn1Cu		A-M1/3003		A3003	
				3.1255	AlCuSiMn		A-U4SG/2014			
				3.1655	AlCuBiPb		A-U5PbBi/2011		A2011	
				3.2161	G-AlSi8Cu3			A380		
				3.2341	G-AlSi5Mg	3599	A-S7G	B26	AC 4C	
				3.3206	AlMgSi0.5		A-GS/6060			
				3.3210	AlMgSi0.7		A-GSUC/6061		(A6063)	
				3.3315	AlMgI		A-G0.6			
				3.4335	AlZn4.5MgI		A-Z5G/7020			
				3.4365	AlZnMgCu1.5		A-Z5GU/7075		A7075	
				3.5103	G-MgSe3Zn2ZrI		ZREI	AMS 4442		
Aluminum Cast Alloy, Si ≥ 9%	N02	Aluminium alloys	9% < Si < 16%	3.5612	G-MgAl6Zn		G-A6-ZI	AZ61A		
				3.5812	G-MgAl8Zn		(G-A7-ZI)	AZ80A		
				3.2315	AlMgSiI		A-SGM0.7/6082			
Copper Alloy	N03	Copper alloys	Si > 16%	3.2381	G-AlSi10Mg		A-S10G	B85		
				3.2382	GD-AlSiI2			A413.2		
								B390.0	ADC14	
				2.0940.01	CuAlI0Fe		CuAlI0Fe	CA952		
				2.0975.01	CuAlI0Ni		CuAlI0Ni5Fe5	CA955		
				2.0872	CuNiI0FeIMn		CuNiI0FeIMn			
					CuNiI0Zn45					
				2.0790	CuNiI8Zn19Pb		CuNiI8Zn19PbI			
				2.1176	CuPbI0Sn		CuSnI0PbI0	CA937		
				2.1050.01	CuSnI0		CuSnI0			
				2.1087	CuSnI0Zn					
				2.1020	CuSn6		CuSn6		C5191	
				2.0240	CuZnI5		CuZnI5		C2300	
Grey Cast Iron	K01	Grey cast irons (GCI)		2.0470	CuZn28SnI		CuZn29SnI			
				2.0321	CuZn37		CuZn37			
				2.0530	CuZn38SnI					
				2.0401	CuZn39Pb3		CuZn39Pb3			
				2.0402	CuZn40Pb2		CuZn39Pb2			
Ductile Cast Iron	K02	Ductile Cast Iron		2.0410	CuZn44Pb2					
				0.6150	GG-15	G15	Ft 15 D	A48 25 B	FC 150	
				0.6200	GG-20	G20	Ft 20 D	A48 30 B	FC 200	
					GG-220 HB			G 3500		
				0.6250	GG-25	G25	Ft 25 D	A48 35 B	FC 250	
				0.6300	GG-30	G30	Ft 30 D	A48 45 B	FC 300	
				0.6350	GG-35	G35	Ft 35 D	A48 50 B	FC 350	
				0.7033	GGG-35.3		FGS 370-17		FCD 350-22L	
Carbon Steel	P01	Free-Cutting Steels	360 < Rm < 880	0.7040	GGG-40	GS 400-12	FGS 400-12	60-40-18	FCD 400-18L	
				0.7043	GGG-40.3	GSO 42/17	FGS-370-17	60-40-18		
				0.7050	GGG-50	GS 500-7	FGS 500-7	A536 80-55-6	FCD 500-7	
				0.7060	GGG-60	GS 600-3	FGS 600-3	A476 80-60-03	FCD 600-3	
				0.7070	GGG-70	GS 700-2	FGS 700-2	A536 100-70-03	FCD 700-2	
				1.0715	9 SMn 28	CF 9 SMn 28	S 250	1213	SUM 22	
				1.0718	9 SMnPb 28	CF 9 SMnPb 28	S 250 Pb	12 L 13	SUM 22 L	
				1.0721	10 S 20	CF 10 S 20	10 F 1	1108		
				1.0722	10 SPb 20	CF 10 SPb 20	10 PbF 2	11 L 08		
				1.0723	15 S 20				SUM 32	
				1.0726	35 S 20		35 MF 4	1140		
				1.0727	46 S 20		45 MF 4	1146		
				1.0736	9 SMn 36	CF 9 SMn 36	S 300	1215		
Carbon Steel	P01	"Low alloy ferritic steels, C < 0.25%wt Low alloy weldable general structural steels"	320 < Rm < 600	1.0737	9 SMnPb 36	CF 9 SMnPb 36	S 300 Pb	12 L 14		
				1.0037	St 37-2	Fe 360 B	E 24-2		STKM 12 C	
				1.0116	St 37-3	Fe 360 D FF	E 24-3, E 24-4	A 573 Gr. 58		
				1.0144	St 44-3 N	Fe 430 D FF	E 28-3, E 28-4	A 573 Gr. 70	SM 41 C	
				1.0301	C 10	C 10	AF 34 C 10, XC 10	1010	S 10 C	
				1.0401	C 15	C 15, C 16	AF 37 C 12, XC 18	1015		
				1.0402	C 22	C 20, C 21	C 20	1023		
				1.0570	St 52-3	Fe 510 B	E 36-3, E 36-4		SM 50 YA	
				1.1141	Ck 15	C 15, C 16	XC 15, XC 18	1015	S 15 C, S 15 CK	
				1.1158	Ck 25	C 25	XC 25	1025	S 25 C	
				1.2162	21 MnCr 5		20 NC 5		SCR 420 H	
				1.5415	15 Mo 3	16 Mo 3	15 D 3	A 204 Gr. A		
				1.5423	16 Mo 5	16 Mo 5		4520	SB 450 M	
Carbon Steel	P01	"Ferritic & ferritic/pearlitic steels, C < 0.25%wt Weldable general structural steels Case hardening steels"	430 < Rm < 610	1.5752	14 NiCr 14		12 NC 15	3310, 9314	SNC 815 (H)	
				1.5919	15 CrNi 6	16 CrNi4	16 NC 6	4320		
				1.6587	18 CrNiMo 7 6	18 NiCrMo 7	18 NCD 6			
				1.7131	16 MnCr 5	16 MnCr 5	16 MC 5	5115	SCR 415	
				1.7139	16 MnCrS 5					
				1.7147	20 MnCr 5	20 MnCr 5	20 MC 5	5120	SMnC 420 (H)	
				1.7149	20 MnCrS 5		20 MnCrS 5	5120 H	SMnC 21 H	
				1.7335	13 CrMo 4 4	14 CrMo 4 5	15 CD 3.5	A 182-F11, F12		
				1.7337	16 CrMo 4 4	14 CrMo 4 5	15 CD 4.5	A 387 Gr. 12 Cl. 2		
				1.7380	10 CrMo 9 10	12 CrMo 9 10	10 CD 9.10	A 182-F22		

Material	HPMT	Description	Properties	W. Nr.	DIN	UNI	AFNOR	AISI/SAE/ASTM	JIS	Common Name
Alloy Steel	P02	"Low alloy general structural steels, 0.25% < C < 0.67%wt Low alloy Quench & Temper steels"	520 < Rm < 1200	1.0501	C 35	C 35	AF 55 C 35	1035		
				1.0503	C 45	C 45	AF 65 C 45	1045	S 45 C	
				1.0511	C 40	C 40	AF 60 C 40	1040	S 40 C	
				1.0535	St 70-2	Fe 690	A 70-2	1055		
				1.0601	C 60	C 60	CC 55	1060		
				1.1157	40 Mn 4		35 M 5	1039		
				1.1165	30 Mn 5			1330	SMn 1 H, SCMn 2	
				1.1167	36 Mn 5		40 M 5	1335	SMn 438 (H), SCMn 3	
				1.1181	Ck 35	C 35	XC 38 H1	1035	S 35 C	
				1.1191	Ck 45	C 45	XC 42	1045	S 45 C	
				1.1221	Ck 60	C 60	XC 60	1064	S 58 C	
				1.1740	C 60 W		Y3 55	1060	SK 7	
		"Structural steels, 0.25% < C < 0.67%wt Quench & Temper steels"	550 < Rm < 1200	1.0904	55 Si 7	55 Si 8	55 S 7	9255		
				1.1201	42 CrMo 4	42 CrMo 4	42 CD 4	4142, 4140	SCM 440 (H)	
				1.2330	35 CrMo 4	35 CrMo 4	34 CD 4	4135		
				1.2542	45 WCrV 7	45 WCrV 8 KU		S1		
				1.2714	56 NiCrMoV 7	56 NiCrMoV7-KU		L6	SKT 4	
				1.5121	46 MnSi 4			5045		
				1.5710	36 NiCr 6		35 NC 6	3135	SNC 236	
				1.5736	36 NiCr 10	35 NiCr 9	35 NC 11	3435	SNC 631 (H)	
				1.6511	36 CrNiMo 4	38 NiCrMo 4 (KB)	40 NCD 3	9840		
				1.6582	36 CrNiMo 6	35 NiCrMo 6 (KW)	35 NCD 6	4340	SNCM 447	
				1.7033	34 Cr 4	34 Cr 4 (KB)	32 C 4	5132	SCr 430 (H)	
				1.7035	41 Cr 4	41 Cr 4	42 C 4	5140	SCr 440 (H)	
				1.7218	25 CrMo 4	25 CrMo 4 (KB)	25 CD 4 S	4130	SCM 425	
				1.7361	32 CrMo 12	32 CrMo 12	30 CD 12			
				1.8159	50 CrV 4	51 CrV 4	50 CV 4	6150	SUP 10	
				1.8509	41 CrAlMo 7	41 CrAlMo 7	40 CAD 6.12	A 355 Cl. A	SACM 645	
Prehardened Steel	P03	"Low alloy through hardening steels, C > 0.67%wt Low alloy spring and bearing steels"	35 ≤ HRC < 45	1.1231	Ck 67	C 70	XC 68	1070		
				1.1274	Ck 101			1095	SUP 4	
				1.1545	C 105 W1	C 100 KU	Y1 105	W1		
				1.1645	C 105 W2	C 100 KU	Y1 105		SK 3	
				1.1663	C 125 W	C 120 KU	Y2 120	W1	SK 2	
		"Through hardening steels, C > 0.67%wt Spring and bearing steels"	35 ≤ HRC < 45	1.2210	115 CrV 3	107 CrV 3 KU	100 C 3	L2		
				1.2311	40 CrMnMo 7	40 CrMnMo 7 KU	40 CMD 8 S	P20		
				1.2510	100 MnCrW 4	95 MnWCr 5 KU	90 MWCV 5	O1	SKS 3	
				1.2842	90 MnCrV 8	90 MnVCr 8 KU	90 MV 8	O2		
				1.3505	100 Cr 6	100 Cr 6	100 C 6	52100	SUJ 2	
		"Tool steels High speed steels (HSS)"	35 ≤ HRC < 45	1.2080	X 210 Cr 12	X 210 Cr 13 KU	Z 200 C 12	D3	SKD 1	
				1.3243	X 38 CrMoV 5 1	X 37 CrMoV 5 1 KU	Z 38 CDV 5	H11	SKD 6	
				1.2344	X 40 CrMoV 5 1	X 40 CrMo 5 1 1 KU	Z 40 CDV 5	H13	SKD 61	
				1.2363	X 100 CrMoV 5 1	X 100 CrMoV 5 1 KU	Z 100 CDV 5	A2	SKD 12	
				1.2365	X 32 CrMoV 3 3	30 CrMoV 12 27 KU	32 DCV 28	H10	SKD 7	
				1.2436	X 210 CrW 12	X 215 CrW 12 1 KU		D6	SKD 2	
				1.2601	X 165 CrMoV 12	X 165 CrMoW 12 KU				
				1.2713	55 NiCrMoV 6		55 NCDV 7	L6	SKT 4	
				1.3243	S 6-5-2-5	HS 6-5-2-5	Z 85 WDKCV 06-05-05-04-02	M35	SKH 55	
				1.3247	S 2-10-1-8	HS 2-10-1-8	Z 110 DKCVV 09-08-04	M42	SKH 51	
				1.3255	S 18-1-2-5	HS 18-1-2-5	Z 80 WDKCV 18-05-04-01	T4	SKH 3	
				1.3343	S 6-5-2	HS 6-5-2	Z 85 WDCV 06-05-04-02	M2	SKH 9, SKH 5	
				1.3348	S 2-9-2	HS 2-9-2	Z 100 DCWV 09-04-02-02	M7	SKH 58	
				1.3355	S 18-0-1	HS 18-0-1	Z 80 WCV 18-04-01	T1	SKH 2	

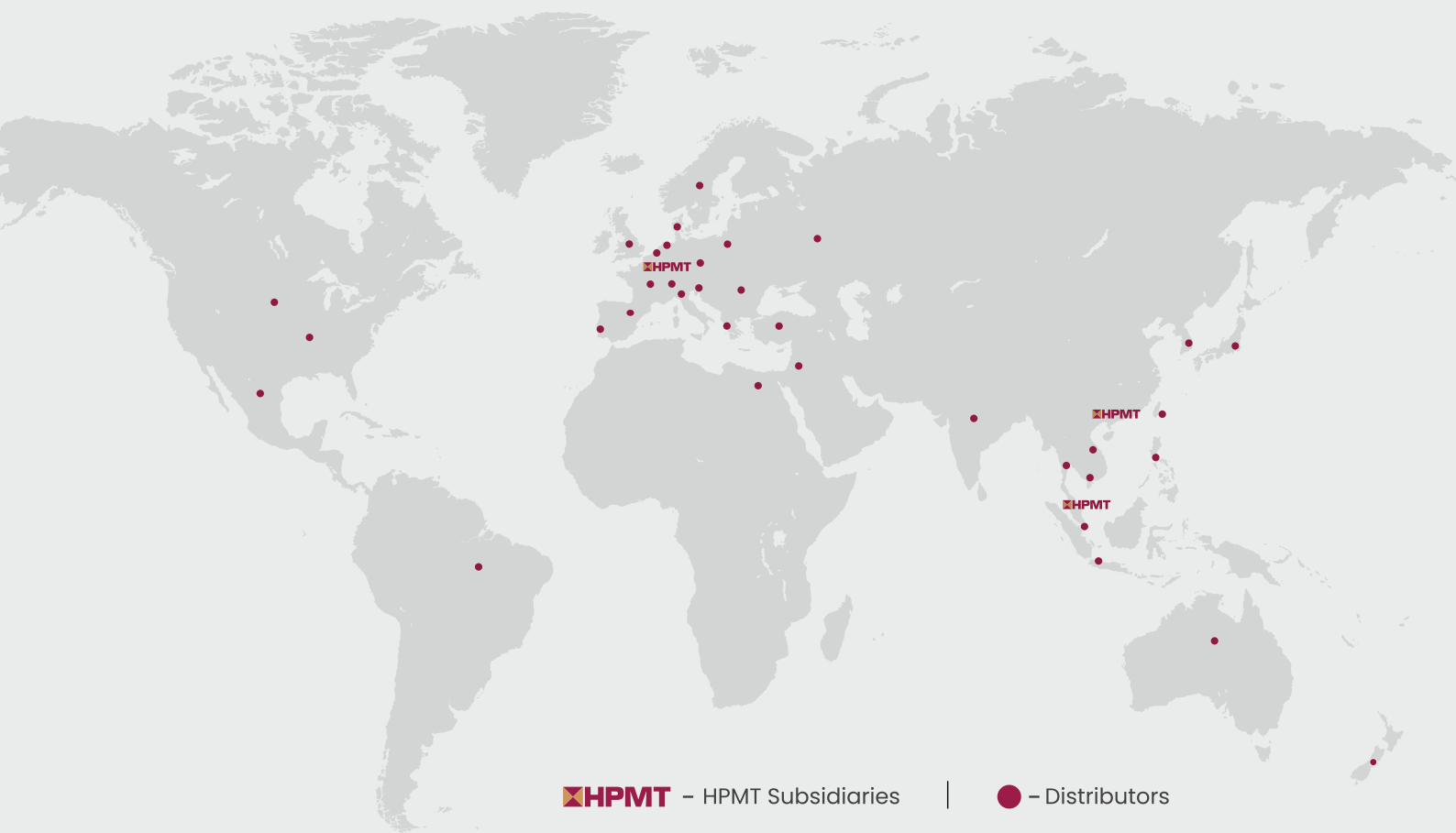
Material Appendix

Material	HPMT	Description	Properties	W. Nr.	DIN	UNI	AFNOR	AISI/SAE/ASTM	JIS	Common Name
Stainless steel, High Machinability	M01	Free-cutting austenitic stainless steel		1.4305	X 10 CrNiS 18 9	X 10 CrNi 18 09	Z 10 CNF 18.09	303	SUS 303	
		Low alloy austenitic stainless steels		1.4300	X 12 CrNi 18 8		Z 12 CN 18	302	SUS 302	
				1.4301	X 6 CrNi 18 10	X 5 CrNi 18 11	Z 6 CN 18.09	304	SUS 304	
				1.4306	X 2 CrNi 19 11	X 3 Cr Ni 18 11	Z 2 CN 18.10	304 L	SUS 304 L	
				1.4310	X 12 CrNi 17 7	X 12 CrNi 17.07	Z 12 CN 17.07	301	SUS 301	
				1.4401	X 5 CrNiMo 17 12 2	X 5 CrNiMo 17 12	Z 3 CND 17.11.1	316	s	
				1.4550	X 6 CrNiNb 18 10	X 6 CrNiNb 18 11	Z 6 CNNb 18.10	347	SUS 347	
		Medium alloy austenitic stainless steels		1.4311	X 2 CrNiN 19 11	X 2 CrNiN 18 11	Z 2 CN 18.10 Az	304 LN	SUS 304 LN	
				1.4335	X 12 CrNi 25 21	X 6 CrNi 26 20	Z 12 CN 25.20	310 S	SUH 310, SUS 310 S	
				1.4429	X 2 CrNiMoN 17 13 3	X 2 CrNiMoN 17 13 3	Z 2 CND 17.13 Az	316 LN	SUS 316 LN	
				1.4435	X 2 CrNiMo 18 14 3	X 2 CrNiMo 17 13 2	Z 2 CND 17.13	316L	SCS 16, SUS 316L	
				1.4466	X 5 CrNi 18 15	X 5 CrNi 18 15		317	SUS 317	
				1.4893	X 9 CrNiSiN 21 11 2					252 MA
Stainless Steel, Low Machinability	M02	Ferritic & martensitic stainless steels		1.4000	X 6 Cr 13	X 6 Cr 13	Z 6 C 12	403	SUS 403	
				1.4006	X 10 Cr 13	X 12 Cr 13	Z 10 C 13	410, CA-15	SUS 410	
				1.4016	X 6 Cr 17	X 8 Cr 17	Z 8 C 17	430	SUS 430	
				1.4021	X 20 Cr 13	X 20 Cr 13	Z 20 C 13	420	SUS 420 J 1	
				1.4031	X 40 Cr 13	X 40 Cr 14	Z 40 C 14	420	SUS 420	
				1.4109	X 65 CrMo 14		Z 70 D 14	440 A	SUS 440 A	
				1.4112	X 90 CrMoV 18	X CrTi 12	Z 2 CND 18.05	440 B	SUS 440 B	
				1.4125	X 105 CrMo 17	X 105 CrMo 17	Z 100 CD 17	440 C	SUS 440 C	
				1.4313	X 5 CrNi 13 4	X 6 CrNi 13 04	Z 5 CN 13.4		SCS 5	
				1.4749	X 18 CrN 28		Z 18 C 25	446		
		High alloy austenitic and duplex stainless steels		1.4417	X 2 CrNiMoSi 19 5		Z 2 CND 18.05.03			3RE60
				1.4460	X 4 CrNiMo 27 5 2	X 3 CrNiMo 27 5 2	Z 3 CND 25.7 Az	329	SUS 329 J 1	
				1.4462	X 2 CrNiMoN 22 5	X 2 CrNiMoN 22 5	Z 2 CND 22.05 Az	329 LN		SAF 2205
				1.4539	X 2 NiCrMoCu 25 20 5		Z 2 NCDU 25 20	904L		
		Difficult high alloy austenitic and duplex stainless steels		1.4410	X 2 CrNiMoN 25 7 4	X 2 CrNiMoN 25 7 4	Z 3 CND 25.07 Az	F 53		SAF 2507
				1.4529	X 1 CrNiMoN 20 18 7	X 1 CrNiMoN 20 18 7	Z 1 CNDU 20.18.05 Az			254 SMO
				1.4534	X 3 CrNiMoAl 13 8 2			XM-13		PH13-8Mo
				1.4540	X 4 CrNiCuNb 16 4		Z 4 CNUNb 16.4 M	XM-12		15-5-PH
				1.4568	X 7 CrNiAl 17 7	X 7 CrNiAl 17 7	Z 9 CAN 17.7	AMS 5528	SUS 631	17-7-PH
				1.4652	X 2 CrNiMoN 25 22 7					654 SMO
				1.4876	X 10 NiCrAlTi 32 20		Z 10 NC 32.21		NCF 800	Alloy 800
				1.4943	X 4 NiCrTi 25 15		Z 6 NCTDV 25.15	660	SUH 660	A286
Titanium Alloy	S01	Titanium, low alloyed, (α)		3.7024						Ti
		Titanium, medium alloyed (α+β)						AMS 4919		Ti 6-2-4-2
								AMS 4943		Ti 3Al-2.5V (grade 9)
		Titanium, high alloyed		3.7164	TiV10Fe2Al3			AMS 4920, Grade 5		Ti 6Al-4V
Nickel Alloy	S02	Nickel based superalloys		2.4810				AMS 4986		Ti 10V-2Fe-3Al
				2.4819						Hastelloy C
										Hastelloy C-276
										IN 100
				2.4668						Inconel 718
				2.4669						Inconel X-750
				2.4631						Nimonic 80A
Cobalt Alloy	S03	Cobalt based superalloys								René 41
				2.4654						Udimet 500
										Waspalloy
										Haynes 25
										Stellite 21
										Stellite 31

Material	HPMT	Description	Properties	W. Nr.	DIN	UNI	AFNOR	AISI/SAE/ASTM	JIS	Common Name
Hardened Steel	H01 & H02	Case hardened steels	58 < HRC < 62	1.7131	16 MnCr 5	16 MnCr 5	16 MC 5	5115	SCR 415	
		Quenched & Tempered steels	38 < HRC < 56	1.1201	42 CrMo 4	42 CrMo 4	42 CD 4	4142, 4140	SCM 440 (H)	
				1.1231	Ck 67	C 70	XC 68	1070		
				1.1248	Ck 75	C 75	XC 75	1078, 1080		
				1.1274	Ck 101			1095	SUP 4	
				1.1545	C 105 W1	C 100 KU	Y1 105	W 1		
				1.2550	60 WCrV 7	55 WCrV 8 KU	55 WC 20	S1		
		Quenched & Tempered steels Bearing Steels	56 < HRC < 64	1.7176	55 Cr 3	55 Cr 3	55 C 3	5155	SUP 9 (A)	
				1.2210	115 CrV 3	107 CrV 3 KU	100 C 3	L2		
				1.2311	40 CrMnMo 7	40 CrMnMo 7 KU	40 CMD 8 S	P20		
				1.2510	100 MnCrW 4	95 MnWCr 5 KU	90 MWCV 5	O1	SKS 3	
				1.2842	90 MnCrV 8	90 MnVCr 8 KU	90 MV 8	O2		
				1.3505	100 Cr 6	100 Cr 6	100 C 6	52100	SUJ 2	
		"Tool steels High Speed Steels"	38 < HRC < 64	1.2344	X 40 CrMoV 5 1	X 40 CrMo 5 1 1 KU	Z 40 CDV 5	H13	SKD 61	
				1.2363	X 100 CrMoV 5 1	X 100 CrMoV 5 1 KU	Z 100 CDV 5	A2	SKD 12	
				1.2379	X 155 CrVMo 12 1	X 155 CrVMo 12 1 KU	Z 160 CDV 12	D2	SKD 11	
				1.2436	X 210 CrW 12	X 215 CrW 12 1 KU			SKD 2	
				1.2601	X 165 CrMoV 12	X 165 CrMoW 12 KU	55 NCDV 7	L6	SKT 4	
				1.2713	55 CNiCrMoV6					
				1.3243	S 6-5-2-5	HS 6-5-2-5	Z 85 WDKCV 06-05-05-04-02	M35	SKH 55	
				1.3247	S 2-10-1-8	HS 2-9-1-8	Z 110 DKCWV 09-08-04	M42	SKH 51	
				1.3343	S 6-5-2	HS 6-5-2	Z 85 WDCV 06-05-04-0	M2	SKH 9, SKH 51	
				1.3355	S 18-0-1	HS 18-0-1	Z 80 WCV 18-04-01	T1	SKH 2	
		Martensitic stainless steels	38 < HRC < 50	1.4021	X 20 Cr 13	X 20 Cr 13	Z 20 C 13	420	SUS 420 J 1	
				1.4109	X 65 CrMo 14		Z 70 D 14	440 A	SUS 440 A	
				1.4112	X 90 CrMoV 18	X CrTi 12	Z 2 CND 18 05	440 B	SUS 440 B	
				1.4125	X 105 CrMo 17	X 105 CrMo 17	Z 100 CD 17	440 C	SUS 440 C	
				1.4534	X 3 CrNiMoAl 13 8 2			XM-13		PH13-8Mo
		Precipitation hardened stainless steels	33 < HRC < 50	1.4542	X 5 CrNiCuNb 17 4		Z 6 CNU 17.4	630	SCS 24, SUS 630	17-4-PH
				1.4568	X 7 CrNiAl 17 7	X 7 CrNiAl 17 7	Z 9 CAN 17.4	AMS 5528	SUS 631	17-7-PH
				1.4943	X 4 NiCrTi 25 15		Z 6 NCTDV 25.15	660	SUH 660	A286
				1.3401	X 120 Mn 12		Z 120 M 12	A128 Grade A	SC MnH 1	
		Manganese steels	23 < HRC < 64	G-X330 NiCr 4 2	FB Ni4 Cr2 BC		Grade 2 A	A532 IB (NiCr-LC)		Ni-Hard 2
		White Cast Irons	50 < HRC < 64	G-X260 NiCr4	FB Ni4 Cr2 HC		Grade 2 B	A532 IA (NiCr-HC)		Ni-Hard 1
				G-X300 CrNiSi 9 5 2	FB Cr9 Ni5		Grade 2 C, D, E	A532 ID (Ni-HiCr)		Ni-Hard 4
Thermoplastics	O1									
Graphite	O2									

Hardness Conversion Chart

Tensile Strength Rm in N/mm ²	Brinell Hardness HB	Rockwell Hardness HRC	Vickers Hardness HV	PSI
150	50		50	22
200	60		60	29
250	80		80	37
300	90		95	43
350	100		110	50
400	120		125	58
450	130		140	66
500	150		155	73
550	165		170	79
600	175		185	85
650	190		200	92
700	200		220	98
750	215		235	105
800	230	22	250	112
850	250	25	265	120
900	270	27	280	128
950	280	29	295	135
1000	300	31	310	143
1050	310	33	325	150
1100	320	34	340	158
1150	340	36	360	164
1200	350	38	375	170
1250	370	40	390	177
1300	380	41	405	185
1350	400	43	420	192
1400	410	44	435	200
1450	430	45	450	207
1500	440	46	465	214
1550	450	48	480	221
1600	470	49	495	228
		51	530	247
		53	560	265
		55	595	283
		57	635	301
		59	680	320
		61	720	339
		63	770	358
		64	800	377
		65	830	396
		66	870	415
		67	900	434
		68	940	453
		69	980	472



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