



SuperF-UT

Solid Carbide End Mills
with unequal helix angle

Extended Standard Range
Edition 2012



Chip – by Chip – to the Top

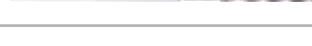
Solid carbide end mill with unequal helix angle

Overview

Type	Standard	Surface finish	Helix angle	No. of teeth	Shank form		Catalogue no.	Diameter range (mm)
SuperF-UT N	DIN 6527 K	TiAlN	35°/38°	4	HB		64550	6.000 - 20.000
	DIN 6527 L	TiAlN	35°/38°	4	HA		54551	4.000 - 20.000
	DIN 6527 L	TiAlN	35°/38°	4	HB		64551	4.000 - 25.000
	Stock std.	TiAlN	35°/38°	4	HA		54562	6.000 - 20.000
	Stock std.	TiAlN	35°/38°	4	HB		54563	6.000 - 20.000
	Stock std.	TiAlN	35°/38°	4	HA		54552	10.000 - 25.000
SuperF-UT N-F	DIN 6527 L	TiAlN	30°/32°	4	HA		54566	6.000 - 25.000
	DIN 6527 L	TiAlN	30°/32°	4	HB		54567	6.000 - 25.000
SuperF-UT Ti	DIN 6527 L	AlTiN+	35°/38°	4	HA		54560	6.000 - 20.000
	DIN 6527 L	AlTiN+	35°/38°	4	HB		54561	6.000 - 20.000
SuperF-UT N-3	DIN 6527 L	TiAlN	41°/43°/45°	3	HA		54564	3.000 - 20.000
	DIN 6527 L	TiAlN	41°/43°/45°	3	HB		54565	3.000 - 20.000
SuperF-UT VA-X	DIN 6527 K	AlTiN nano	36°/38°	4	HB		54576	4.000 - 20.000
	DIN 6527 L	AlTiN nano	36°/38°	4	HA		54558	3.000 - 25.000
	DIN 6527 L	AlTiN nano	36°/38°	4	HB		54559	3.000 - 25.000
SuperF-UT VA-X IK	DIN 6527 L	AlTiN nano	36°/38°	4	HA		54574	6.000 - 25.000
	DIN 6527 L	AlTiN nano	36°/38°	4	HB		54575	6.000 - 25.000
SuperF-UT VA-XF	DIN 6527 L	AlTiN nano	36°/38°	4	HA		54568	6.000 - 25.000
	DIN 6527 L	AlTiN nano	36°/38°	4	HB		54569	6.000 - 25.000

Solid carbide end mill with unequal helix angle

Overview

Type	Standard	Surface finish	Helix angle	No. of teeth	Shank form		Catalogue no.	Diameter range (mm)
SuperF-UT AI	DIN 6527 L	bright	40°/42°	4	HA		74554	4.000 - 20.000
	DIN 6527 L	bright	40°/42°	4	HB		74555	4.000 - 20.000
SuperF-UT AI-F	~DIN 6527 L	bright	29°/30°/31°	3	HA		54570	6.000 - 25.000
	~DIN 6527 L	bright	29°/30°/31°	3	HB		54571	6.000 - 25.000
SuperF-UT AI-3	~DIN 6527 L	bright	39°/40°/41°	3	HA		74552	3.000 - 20.000
	~DIN 6527 L	bright	39°/40°/41°	3	HB		74553	3.000 - 20.000
SuperF-UT H	DIN 6527 L	AlTiN	40°/42°	4	HA		54572	6.000 - 20.000
	DIN 6527 L	AlTiN	40°/42°	4	HB		54573	6.000 - 20.000
SuperF-UT VA	DIN 6527 L	TiAlN	40°/42°	4	HA		54556	4.000 - 20.000
	DIN 6527 L	TiAlN	40°/42°	4	HB		64557	4.000 - 20.000
	DIN 6527 L	TiAlN	40°/42°	4	HB		64567	6.000 - 20.000
SuperF-UT FS	Stock std.	TiAlN	44°/45°/46°	6	HA		64558	8.000 - 20.000
	Stock std.	TiAlN	44°/45°/46°	6	HB		64559	8.000 - 20.000

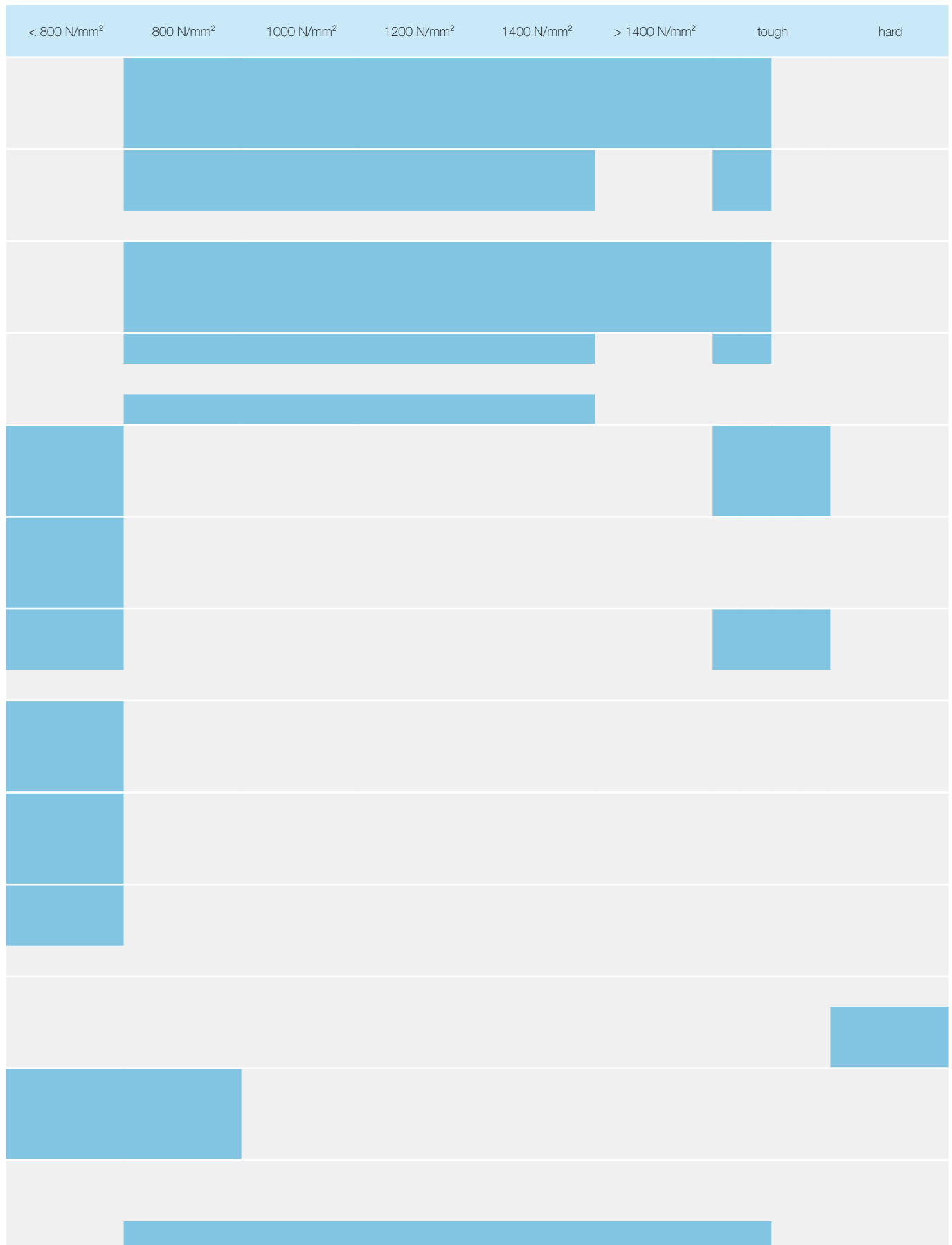
Application

by materials

Type	Catalogue no.	Application	Non-ferrous metals, Aluminium	Steels	Cast iron	Stainless and acid-resistant steels	Nickel, Ti-alloys	Hardened steels
SuperF-UT N	64550	Slot drilling						
	54551							
	64551	Roughing						
	54562							
	54563	Finishing						
SuperF-UT N-F	54566	Slot drilling						
	54567	Roughing						
	54567	Finishing						
SuperF-UT Ti	54560	Slot drilling						
	54561	Roughing						
	54561	Finishing						
SuperF-UT N-3	54564	Slot drilling						
	54565	Roughing						
	54565	Finishing						
SuperF-UT VA-X	54576	Slot drilling						
	54558	Roughing						
	54559	Finishing						
SuperF-UT VA-X IK	54574	Slot drilling						
	54575	Roughing						
	54575	Finishing						
SuperF-UT VA-XF	54568	Slot drilling						
	54569	Roughing						
	54569	Finishing						
SuperF-UT AI	74554	Slot drilling						
	74555	Roughing						
	74555	Finishing						
SuperF-UT AI-3	74552	Slot drilling						
	74553	Roughing						
	74553	Finishing						
SuperF-UT AI-F	54570	Slot drilling						
	54571	Roughing						
	54571	Finishing						
SuperF-UT H	54572	Slot drilling						
	54573	Roughing						
	54573	Finishing						
SuperF-UT VA	54556	Slot drilling						
	64557	Roughing						
	64567	Finishing						
SuperF-UT FS	64558	Slot drilling						
	64559	Roughing						
	64559	Fine finishing						

optimal well suited

by tensile strength



Solid carbide end mill with unequal helix angle

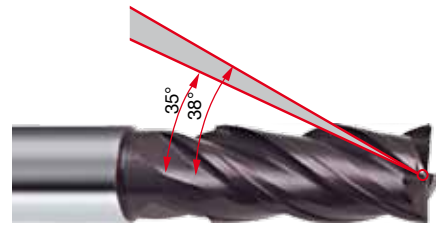
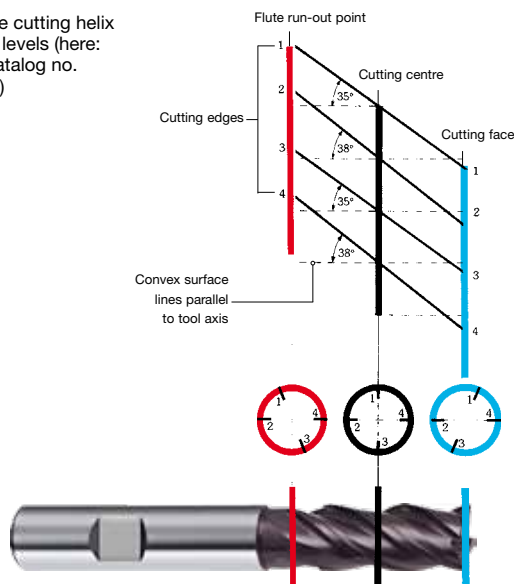
Advantages

Unequal helix angle for increased performance and quality

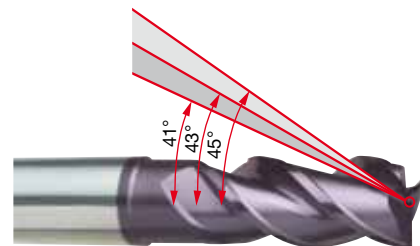
The SuperF-UT End Mill with unequal helix angle available from Stock will satisfy even the highest demands in milling operations. The advantages are:

- 60% higher feeds compared to conventional end mills with same helix angle
- no vibrations, chatterfree
- better surface quality
- longer tool life
- greater cutting depths
- much reduced run-out
- much increased application: for roughing and finishing

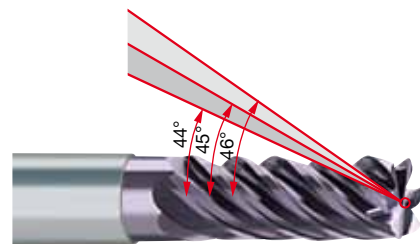
Description of the cutting helix at three different levels (here: F-UT End Mill, catalog no. 64551, Ø 18 mm)



SuperF-UT N



SuperF-UT N-3



SuperF-UT FS

Micro-corner protection for less wear

SuperF-UT solid carbide end mills have a special geometry with micro-corner protection. This design reduces the wear of the cutting edges considerably, allowing higher feed rates and longer tool life.



Reduced neck for increased cutting depths

The reduced neck of SuperF-UT solid carbide end mills increases the cutting depth and optimises the chip flow of large cutting depths. Therefore, SuperF-UT solid carbide end mills offer a wide application range.



Solid carbide end mill with unequal helix angle

Advantages

Defined corner radius

The STOCK SuperF-UT Ti end mill has different sized corner radii per diameter for increased wear protection and high form accuracy



New designed roughing profile

The SuperF-UT end mills type F are suitable for roughing and finishing operations, requiring less power due to less cutting forces by comparison to conventional end mills. They are the perfect solution for unstable conditions and less powerful machines, high feeds and speeds achieving good surface finished.



Solid carbide end mill with unequal helix angle

Types

SuperF-UT N



- 35°/38° helix angles
- 4-fluted
- slot drilling, roughing and finishing
- steel, high-alloyed steel and hardened steel up to 1600 N/mm² (48 HRC)
- 6 variants in different lengths with HA- or HB-shank

SuperF-UT N-F



- 30°/32° helix angles
- 4-fluted
- special roughing geometry
- slot drilling and roughing
- alloyed steel up to 1400 N/mm², hardened steel up to 48 HRC, Ni- und Ti-alloys
- especially for large cutting widths and depths under difficult machining conditions
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT Ti



- 35°/38° helix angles
- 4-fluted
- corner radius
- slot drilling, roughing and finishing
- Ni- and Ti-alloys
- application also a type N with corner radius
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT N-3



- 41°/43°/45° helix angles
- 3-fluted
- slot drilling, roughing and finishing
- especially for extrem cutting depths
- steel, high-alloyed steel and hardened steel up to 1400 N/mm² (44 HRC)
- 2 variants to DIN 6527 long with HA- or HB-shank

Solid carbide end mill with unequal helix angle

Types

SuperF-UT VA-X



- 36°/38° helix angles
- 4-fluted
- slot drilling, roughing and finishing
- VA-steels and stainless materials
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT VA-X IK

- with axial coolant ducts

SuperF-UT VA-XF



- 36°/38° helix angles
- 4-fluted
- special roughing geometry
- slot drilling and roughing
- steels up to 1200 N/mm², VA-steels and stainless materials, cast materials up to 240 HB 30 and non-ferrous metals
- recommended for difficult machining conditions as well as long reach applications
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT AL



- 40°/42° helix angles
- 4-fluted
- roughing, finishing and slotting
- Aluminium and Al-alloys > 3 % Si, long-chipping materials and non-ferrous metals
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT AL-F



- 29°/30°/31° helix angles
- 3-fluted
- special roughing geometry
- slot drilling and roughing
- Aluminium and Al-alloys
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT AI-3



- 39°/40°/41° helix angles
- 3-fluted
- slot drilling, roughing and finishing
- Aluminium and Al-alloys, long-chipping materials and non-ferrous metals
- 2 variants to Stock standard with HA- or HB-shank

SuperF-UT H



- 40°/42° helix angles
- 4-fluted
- with core stability
- roughing and finishing
- materials from 44 HRC up to 62 HRC
- 2 variants to DIN 6527 long with HA- or HB-shank

SuperF-UT VA



- 40°/42° helix angles
- 4-fluted
- slot drilling, finishing and roughing
- soft and tough steels, long-chipping materials up to 850 N/mm² (25 HRC)
- 3 variants to DIN 6527 long with HA- or HB-shank as well as with/without internal cooling

SuperF-UT FS



- 44°/45°/46° helix angles
- 6-fluted
- TiAlN-coating
- semi-roughing up to 0.3 x D, HPC roughing and HSC fine finishing
- standard steels, cast, non-ferrous metals and high-alloyed materials
- 2 variants to DIN 6527 long with HA- or HB-shank

General recommendations

Stock SuperF-UT end mills are designed for application under optimal machining conditions, i.e.:

- high machine performance
- sufficient coolant supply
- rigid workpiece and tool clamping

If these conditions are not available, we recommend the use of SuperF-UT end mills with new designed roughing and finishing profile.

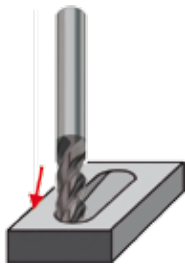
To machine steel materials (typically SuperF-UT type N) with a corner-radius end mill we recommend the SuperF-UT Ti, catalogue no. 54560 or 54561.

We recommend synchronous milling.

Ramping

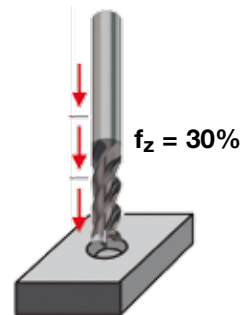
For ramping the feed rate ($v_f = \text{mm/min}$) should be reduced as illustrated.
This also applies to the transition to radial machining.

Ramping
 $\leq 15^\circ = f_z 100\%$
 $15^\circ - 30^\circ = f_z 70\%$



Axial ramping

For drilling the feed rate ($v_f = \text{mm/min}$) should be reduced as illustrated.
In addition, chip evacuation is required for larger milling depths in excess of $0,5 \times D$.
We recommend ramping.



Formulae:

Revolution per min. n

$$n = \frac{v_c \cdot 1000}{\pi \cdot D}$$

Feed per min. V_f

$$V_f = f_z \cdot n \cdot Z_c$$

f_z = feed per tooth
 n = revolution (U/min)
 Z_c = effective no. of teeth

Chip volume Q

$$Q = \frac{a_p \cdot a_e \cdot V_f}{1000}$$

Torque M_c

$$M_c = \frac{P_c \cdot 30 \cdot 10^3}{\eta \cdot n}$$

P_c = cutting force (kW)
 v_c = cutting speed

Application recommendations for End mills, type F-UT

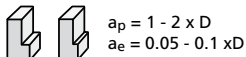
Feed column										
Code-letter	K	L	M	N	O	P	Q	R	S	
tool-Q mm	4.00	0.011	0.015	0.015	0.016	0.020	0.021	0.024	0.026	f (mm/tooth)
	6.00	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	
	8.00	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.052	
	10.00	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.066	
	12.00	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	
	16.00	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	
	20.00	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	



F-UT N-3		F-UT N		F-UT Ti		F-UT N-F	
HA	HB	HA	HB	HA	HB	HA	HB
54564	54565	54551	64551	54560	54561	54566	54567
		54562	54563				
		54552	64550				

Type
Shank form

Catalogue no.



Finishing

Material group	Tensile strength MPa (N/mm ²)	Hardness
Steel	< 850 N/mm ²	
Steel	850-1200 N/mm ²	
Steel	> 1200 N/mm ²	
Hardened steel		< 54 HRC
Hardened steel		54-60 HRC
Acid and stainless resistant steel	< 750 N/mm ²	
Acid and stainless resistant steel	700-900 N/mm ²	
Acid and stainless resistant steel	< 900 N/mm ²	
Nickel-base alloys	< 1300 N/mm ²	
Ti-alloys	< 1300 N/mm ²	
Cast iron		< 240 HB30
Cast iron		> 240 HB30
Al wrought alloys < 3% Si		
Al cast alloys > 3% Si		
Magnesium alloys		
Non-ferrous metal alloys	< 850 N/mm ²	

v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z
260	P	260	P	260	P		
210	P	210	P	210	P		
190	P	190	P	190	P		
		110	O				
		40	N	40	N		
		110	P	110	P		
200	Q	200	Q				
190	Q	190	Q				
		600	Q				
340	Q	340	Q				
380	P	380	P	380	P		



Roughing

Material group	Tensile strength MPa (N/mm ²)	Hardness
Steel	< 850 N/mm ²	
Steel	850-1200 N/mm ²	
Steel	> 1200 N/mm ²	
Hardened steel		< 54 HRC
Hardened steel		54-60 HRC
Acid and stainless resistant steel	< 750 N/mm ²	
Acid and stainless resistant steel	700-900 N/mm ²	
Acid and stainless resistant steel	< 900 N/mm ²	
Nickel-base alloys	< 1300 N/mm ²	
Ti-alloys	< 1300 N/mm ²	
Cast iron		< 240 HB30
Cast iron		> 240 HB30
Al wrought alloys < 3% Si		
Al cast alloys > 3% Si		
Magnesium alloys		
Non-ferrous metal alloys	< 850 N/mm ²	

v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z
200	S	200	S	200	S	200	M
180	S	180	S	180	S	180	M
160	R	160	R	160	R	160	L
110	M	110	M	110	M	110	K
140	Q						
120	P						
100	N						
35	L	35	L	35	L	35	K
90	P	90	P	90	P	90	K
180	S	180	S			180	O
160	S	160	S			160	M
280	S						
220	S						
300	O						



Slot drilling

Material group	Tensile strength MPa (N/mm ²)	Hardness
Steel	< 850 N/mm ²	
Steel	850-1200 N/mm ²	
Steel	> 1200 N/mm ²	
Hardened steel		< 54 HRC
Hardened steel		54-60 HRC
Acid and stainless resistant steel	< 750 N/mm ²	
Acid and stainless resistant steel	700-900 N/mm ²	
Acid and stainless resistant steel	< 900 N/mm ²	
Nickel-base alloys	< 1300 N/mm ²	
Ti-alloys	< 1300 N/mm ²	
Cast iron		< 240 HB30
Cast iron		> 240 HB30
Al wrought alloys < 3% Si		
Al cast alloys > 3% Si		
Magnesium alloys		
Non-ferrous metal alloys	< 850 N/mm ²	

v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z
180	Q	180	Q	180	Q	180	Q
160	Q	160	Q	160	Q	160	Q
135	P	135	P	135	P	135	Q
70	M	70	M	70	M	70	K
120	O						
80	N						
70	L						
30	K	30	K	30	K	30	K
60	N	60	N	60	K	60	K
160	R	160	R	160	R		
140	P	140	P	140	M		
230	O						
180	O						
250	N						



F-UT VA-X		F-UT VA-X		F-UT VA-XF		F-UT AL-3		F-UT AL		F-UT AL-F		F-UT VA			F-UT H		F-UT FS	
HA	HB	HA	HB	HA	HB	HA	HB	HA	HB	HA	HB	HA	HB	HB	HA	HB	HA	HB
54558	54559	54574	54575	54568	54569	74552	74553	74554	74555	54570	54571	54556	64557	64567	54572	54573	64558	64559
	54576	IK	IK											IK				

	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	f _z	v _c	f _z	v _c	f _z
											230	P	P			280	P
																220	P
																200	P
														100	K	150	O
	160	P	160	P												180	P
	120	O	120	O												140	O
	100	N	100	N							90	N				120	N
																45	N
																130	P
											180	Q				220	Q
																200	Q
						800	Q	800	Q							1000	Q
						330	P	330	P							350	Q
						260	Q	260	Q							280	Q
	380	P	380	P							340	P				400	P

	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	f _z	v _c	f _z	v _c	f _z
					200 180	M M					200 180	S S					
														70	K		
	140 120 100	Q P N	140 120 100	Q P N	140 120 100	N L K											
					180	O					180	S					
							600 280 220	S S S	600 280 220	S S S	600 280 220	Q O O					
	300	O	300	O	300	O					300	O					

	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	v _c	f _z	f _z	v _c	f _z	v _c	f _z
					180	Q					180	Q	Q				
											160	Q	Q				
	120	O	120	O	120	M											
	80	N	80	N	80	K											
	70	L	70	L	70	K					70		L				
	30	K	30	K	30	K					60		N				
											160		L				
							500	R	500	R	500	P					
							230	P	230	P	230	N		230		O	
	250	N			250	M	180	P	180	P	180	M					
							250	N	250	N							



Our Program

Products

- | Twist Drills
- | Taps
- | Milling Cutters
- | Reamers
- | Countersinks & -bores
- | Chamfering Tools
- | Special HSS and Carbide Tools
(to your specifications, or our solutions)

Services

- | Regrinding
- | Modifications
- | Recoating
- | Paid labour coating
- | Coating removal
- | Intelligent Tool Depot Systems
- | Technical assistance

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