HARTNER

Precision Cutting Tools

NEW

TF 100 MULTI-MILL

the multifunctional end mill
for ramping, drilling, slotting,
roughing and finishing

- Ramping, drilling, slotting, roughing and finishing
- Plunging with up to 45°
- Milling with extreme metal removal rate
- Drilling without pilot drill up to 2xD possible
- High cutting parameters

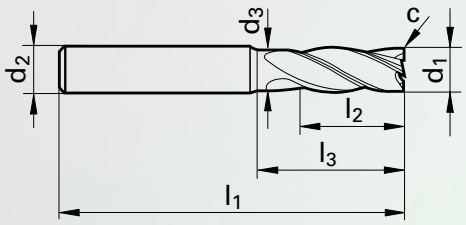
HARTNER

Precision Cutting Tools

TF 100 MULTI-MILL

Universal solid carbide end mill with four flutes for slotting, ramping, helical plunging and drilling operations as well as for roughing and finishing. The TF 100 MULTI-MILL is suitable for hard-to-machine materials due to the extremely hard and heat-resistant TiAlSiN-coating and the cutting edge preparation. Drilling is possible up to 2xD and ramping up to a plunge angle of 45 degrees. For creating precision slots in all tolerances more stable and for piloting on curved or oblique surfaces, there are also undersize dimensions in the programme. In finishing operations, a good surface quality is achieved.

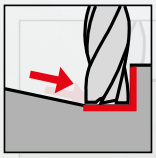
Order no.	84951	84950
Standard	DIN 6527 L	
Tool material	VHM	
Surface	TiAlSiN	
Type	N	
Shank form	HA	HB
Helix angle	36°/38°/37°	
Discount group	106	



Code no.	d1 (h10)	d2 (h6)	d3	l1	l2	l3	c	Z	Availability	
	mm	mm	mm	mm	mm	mm	mm x 45°			
4.000	4.000	6.000	3.800	57.000	11.000	21.000	0.040	4	•	•
5.000	5.000	6.000	4.800	57.000	13.000	21.000	0.050	4	•	•
5.700	5.700	6.000	5.500	57.000	13.000	21.000	0.060	4	•	•
6.000	6.000	6.000	5.700	57.000	13.000	21.000	0.060	4	•	•
7.700	7.700	8.000	7.400	63.000	19.000	27.000	0.080	4	•	•
8.000	8.000	8.000	7.700	63.000	19.000	27.000	0.080	4	•	•
9.700	9.700	10.000	9.400	72.000	22.000	32.000	0.100	4	•	•
10.000	10.000	10.000	9.500	72.000	22.000	32.000	0.100	4	•	•
11.700	11.700	12.000	11.200	83.000	26.000	38.000	0.120	4	•	•
12.000	12.000	12.000	11.500	83.000	26.000	38.000	0.120	4	•	•
13.700	13.700	14.000	13.200	83.000	26.000	38.000	0.140	4	•	•
14.000	14.000	14.000	13.500	83.000	26.000	38.000	0.140	4	•	•
15.600	15.600	16.000	15.100	92.000	32.000	44.000	0.160	4	•	•
16.000	16.000	16.000	15.500	92.000	32.000	44.000	0.160	4	•	•
19.500	19.500	20.000	19.000	104.000	38.000	54.000	0.200	4	•	•
20.000	20.000	20.000	19.500	104.000	38.000	54.000	0.200	4	•	•

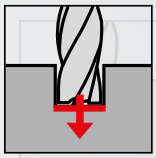
HARTNER

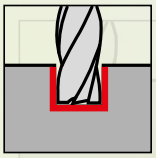
Precision Cutting Tools



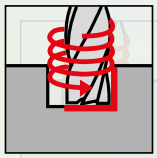
RAMPING

DRILLING

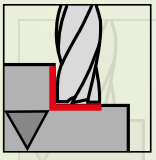




SLOTTING

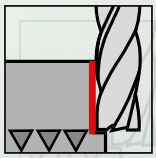


HELIX



ROUGHING

FINISHING



Plunging* and ramping*

Material/ISO material		Hardness	Ramping depth* (a_p max.)	Ramping* max. angle in °	Cutting speed (v_c)	fz (mm/z) with nom. Ø						
						4	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	up to 850 N/mm²	1xd	45°	270	0.015	0.020	0.030	0.040	0.045	0.050	0.060
	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850 - 1200 N/mm²	1xd	45°	240	0.012	0.015	0.020	0.035	0.040	0.045	0.050
	Alloyed heat-treatable, tool and high speed steels	850 - 1400 N/mm²	1xd	30°	200	0.008	0.010	0.015	0.025	0.030	0.035	0.040
M	Stainless steel - easy to machine / sulphured	up to 750 N/mm²	1xd	10°	60	0.008	0.010	0.015	0.025	0.030	0.035	0.040
	Stainless steel - moderately difficult to machine	over 750 - 950 N/mm²	0.5xd	5°	50	0.008	0.010	0.015	0.020	0.025	0.030	0.035
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	over 240 HB 30	1xd	45°	150	0.015	0.020	0.030	0.040	0.045	0.050	0.060
N	Aluminium, Al-wrought alloys, Al-alloys	up to 3% Si	1xd	30°	180	0.012	0.015	0.020	0.035	0.040	0.045	0.050
	Aluminium-cast alloys	over 3% Si	1xd	45°	140	0.015	0.020	0.030	0.040	0.045	0.050	0.060
S	Titanium, Titanium alloys	up to 1400 N/mm²	0.5xd	10°	45	0.008	0.010	0.015	0.020	0.025	0.030	0.035

* tool holders with peripherical cooling are recommended for optimal chip evacuation and tool life

Slotting*

Material/ISO material		Hardness	Cutting depth* (a_p)	Cutting width (a_e)	Cutting speed (v_c)	fz (mm/z) with nom. Ø						
						4	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	up to 850 N/mm²	1xd	1xd	270	0.018	0.025	0.035	0.050	0.060	0.080	0.100
	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850 - 1200 N/mm²	1xd	1xd	240	0.018	0.025	0.035	0.050	0.060	0.080	0.100
	Alloyed heat-treatable, tool and high speed steels	850 - 1400 N/mm²	1xd	1xd	200	0.018	0.025	0.030	0.045	0.050	0.070	0.085
M	Stainless steel - easy to machine / sulphured	up to 750 N/mm²	1xd	1xd	120	0.015	0.020	0.030	0.045	0.060	0.065	0.075
	Stainless steel - moderately difficult to machine	over 750 - 950 N/mm²	1xd	1xd	80	0.015	0.020	0.030	0.040	0.045	0.060	0.070
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	over 240 HB 30	1xd	1xd	160	0.018	0.025	0.035	0.050	0.060	0.080	0.100
N	Aluminium, Al-wrought alloys, Al-alloys	up to 3% Si	1xd	1xd	500	0.020	0.030	0.040	0.065	0.080	0.095	0.110
	Aluminium-cast alloys	over 3% Si	1xd	1xd	340	0.015	0.020	0.030	0.055	0.065	0.080	0.100
S	Titanium, Titanium alloys	up to 1400 N/mm²	1xd	1xd	60	0.015	0.020	0.030	0.040	0.045	0.060	0.070

* tool holders with peripherical cooling are recommended for optimal chip evacuation and tool life

HPC-Roughing* and HSC-Finishing**

Material/ISO material		Hardness	Cutting depth* (a_p)	Cutting width (a_e)	Cutting speed (v_c)	fz (mm/z) with nom. Ø						
						4	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	up to 850 N/mm²	1xd	1xd	270	0.020	0.030	0.045	0.060	0.075	0.090	0.110
	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850 - 1200 N/mm²	1xd	1xd	240	0.020	0.030	0.045	0.060	0.075	0.090	0.110
	Alloyed heat-treatable, tool and high speed steels	850 - 1400 N/mm²	1xd	1xd	200	0.018	0.025	0.030	0.055	0.070	0.085	0.100
M	Stainless steel - easy to machine / sulphured	up to 750 N/mm²	1xd	1xd	120	0.018	0.025	0.035	0.055	0.065	0.080	0.090
	Stainless steel - moderately difficult to machine	over 750 - 950 N/mm²	1xd	1xd	80	0.015	0.020	0.030	0.045	0.050	0.065	0.075
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	over 240 HB 30	1xd	1xd	160	0.015	0.030	0.045	0.060	0.075	0.090	0.110
N	Aluminium, Al-wrought alloys, Al-alloys	up to 3% Si	1xd	1xd	500	0.030	0.040	0.060	0.080	0.100	0.120	0.150
	Aluminium-cast alloys	over 3% Si	1xd	1xd	340	0.020	0.030	0.045	0.060	0.075	0.090	0.110
S	Titanium, Titanium alloys	up to 1400 N/mm²	1xd	1xd	60	0.015	0.020	0.030	0.045	0.050	0.065	0.075

* tool holders with peripherical cooling are recommended for optimal chip evacuation and tool life
** for HSC machining the cutting speed can be increased by 50%, feed rate f_z can be reduced depending on surface requirements.
*** for trochoidal milling and imachining with a_e = 0.1-0.2xd the cutting speed v_c and the feed rate can be increased by 50 %.

Drilling*

Material/ISO material		Hardness	Drilling depth** (a_p max.)	Cutting speed (v_c)	fz (mm/z) with nom. Ø						
					4	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	up to 850 N/mm²	2xd	270	0.015	0.020	0.030	0.040	0.045	0.050	0.060
	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850 - 1200 N/mm²	2xd	240	0.010	0.015	0.020	0.035	0.040	0.045	0.050
	Alloyed heat-treatable, tool and high speed steels	850 - 1400 N/mm²	1xd	200	0.008	0.010	0.015	0.025	0.030	0.035	0.040
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	over 240 HB 30	2xd	150	0.015	0.020	0.030	0.040	0.045	0.050	0.060
N	Aluminium, Al-wrought alloys, Al-alloys	up to 3% Si	1xd	180	0.010	0.015	0.020	0.035	0.040	0.045	0.050
	Aluminium-cast alloys	over 3% Si	1xd	140	0.015	0.020	0.030	0.040	0.045	0.050	0.060

* pecking recommended from drilling depth 1XD
** tool holders with peripherical cooling are recommended for optimal chip evacuation and tool life

Hartner GmbH
P.O. Box 10 04 27, D-72425 Albstadt
Tel. +49 74 31/1 25-0, Fax +49 74 31/1 25-21 547
www.hartner.de

148 844 • 2017