



# HARTNER

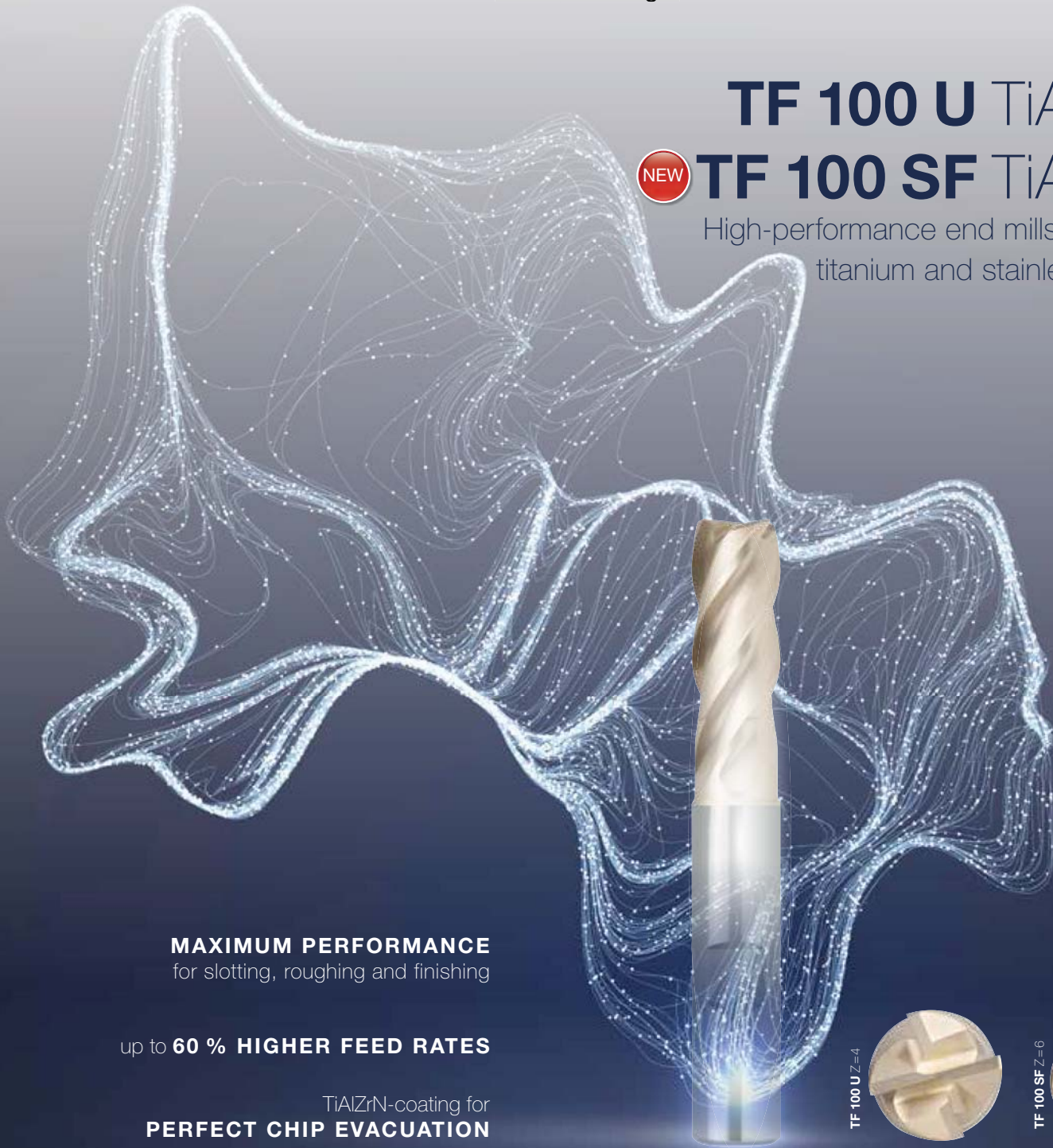
Precision Cutting Tools

## TF 100 U TiAlZrN

NEW

## TF 100 SF TiAlZrN

High-performance end mills for steel, titanium and stainless steels



**MAXIMUM PERFORMANCE**  
for slotting, roughing and finishing

up to **60 % HIGHER FEED RATES**

TiAlZrN-coating for  
**PERFECT CHIP EVACUATION**

TF 100 U Z=4



TF 100 SF Z=6



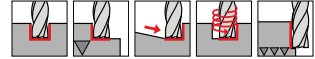
## TiAlZrN-COATING

TiAlZrN-coating relies on a proven TiN and TiAlN multi-layer structure combined with a ZrN based cover coating. The multi-layer structure guarantees good values of hardness and toughness and the zirconium-based top layer minimises the chemical reaction between the coating and the material to be machined thereby reducing the development of edge build-up and the adhesion of the material to the cutting edge as much as possible.

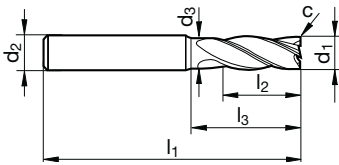
## Article no. 84981



<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>	<b>H</b>
•	○			•	



centre cutting • with neck clearance • for materials up to 48 HRC



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code no.
6.00	6.00	5.70	57.00	13.00	20.00	0.15	4	6.000
8.00	8.00	7.70	63.00	19.00	26.00	0.15	4	8.000
10.00	10.00	9.50	72.00	22.00	30.00	0.20	4	10.000
12.00	12.00	11.50	83.00	26.00	36.00	0.20	4	12.000
16.00	16.00	15.50	92.00	32.00	42.00	0.35	4	16.000
20.00	20.00	19.50	104.00	38.00	52.00	0.45	4	20.000

	Hardness	Cutting depth $a_p$	Cutting width $a_e$	Cutting speed $v_c$	fz (mm/z) with nom. Ø						
					3	6	8	10	12	16	20
<b>P</b>	≤ 850 N/mm <sup>2</sup>	2 x d	0.3 x d	200	0.02	0.04	0.055	0.07	0.085	0.1	0.12
<b>M</b>	≤ 750 N/mm <sup>2</sup>	2 x d	0.3 x d	140	0.018	0.035	0.045	0.06	0.07	0.09	0.1
	≥ 750 N/mm <sup>2</sup>	2 x d	0.3 x d	120	0.016	0.03	0.04	0.055	0.065	0.08	0.095
<b>S</b>	≤ 1300 N/mm <sup>2</sup>	2 x d	0.2 x d	130	0.02	0.03	0.04	0.06	0.07	0.08	0.09

Peripheral cooling is recommended for optimal cooling and tool life.

Application	$v_c$ factor	$f_z$ factor	Feed width ( $a_e$ )	Feed depth ( $a_p$ )
Slotting	1	1 (0.7 for $a_p = 2xd$ )	1xd	0.5 up to 1xd
Roughing	1	1 (0.7 for $a_p = 2xd$ )	0.4 up to 0.9xd	0.5 up to 1xd
Finishing	1	1	0.01 up to 0.1xd	1 up to 2xd
HPC-roughing	1.3	1.5	0.15 up to 0.4xd	1 up to 2xd
HSC-roughing	1.5	2	0.05 up to 0.15xd	1 up to 2xd

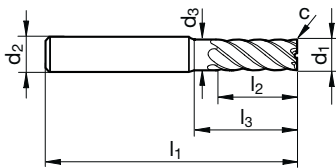
## Article no. 84984



<b>P</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>	<b>H</b>
•	•		•	•	



centre cutting • with neck clearance • for materials up to 48 HRC



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code no.
8.00	8.00	7.70	63.00	19.00	26.00	0.10	6	8.000
10.00	10.00	9.50	72.00	22.00	30.00	0.10	6	10.000
12.00	12.00	11.50	83.00	26.00	36.00	0.10	6	12.000
16.00	16.00	15.50	92.00	32.00	42.00	0.15	6	16.000
20.00	20.00	19.50	104.00	38.00	52.00	0.15	6	20.000

	Hardness	Cutting depth* $a_p$	Cutting width** $a_e$	Cutting speed $v_c$	fz (mm/z) with nom. Ø							
					3	6	8	10	12	16	20	25
<b>P</b>	≤ 850 N/mm <sup>2</sup>	2xd	0.3xd	280	0.016	0.03	0.04	0.055	0.065	0.08	0.095	0.14
	850 - 1400 N/mm <sup>2</sup>	2xd	0.2xd	220	0.015	0.025	0.035	0.045	0.05	0.065	0.08	0.12
<b>M</b>	≤ 750 N/mm <sup>2</sup>	2xd	0.2xd	180	0.015	0.025	0.035	0.045	0.05	0.065	0.08	0.12
	≥ 750 N/mm <sup>2</sup>	2xd	0.2xd	120	0.015	0.025	0.035	0.045	0.05	0.065	0.08	0.12
<b>N</b>	≤ 7% Si	2xd	0.2xd	1000	0.018	0.035	0.045	0.05	0.065	0.08	0.12	0.15
<b>S</b>	up to 1300 N/mm <sup>2</sup>	2xd	0.15xd	130	0.01	0.03	0.04	0.05	0.05	0.063	0.081	0.11

\* Peripheral cooling is recommended for optimal cooling and tool life.

\*\* With trochoidal milling and machining with  $a_e = 0.1-0.2xd$  the cutting speed  $v_c$  and the feed rate can each be increased by 50%.

Application	$v_c$ factor	$f_z$ factor	Feed width ( $a_e$ )	Feed depth ( $a_p$ )
Slotting	1	1 (0.7 for $a_p = 2xd$ )	1xd	0.5 up to 1xd
Roughing	1	1 (0.7 for $a_p = 2xd$ )	0.4 up to 0.9xd	0.5 up to 1xd
Finishing	1	1	0.01 up to 0.1xd	1 up to 2xd
HPC-roughing	1.3	1.5	0.15 up to 0.4xd	1 up to 2xd
HSC-roughing	1.5	2	0.05 up to 0.15xd	1 up to 2xd

# THE HARTNER PROGRAMME



▼ FU 500 / FN 500



▼ GUN DRILLS



▼ INOX DRILLS



▼ MICRO PRECISION DRILLS



▼ THREADING TOOLS



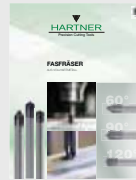
▼ TS-DRILLS



▼ TF 100 MULTI-MILL



▼ SOLID CARBIDE  
MILLING CUTTERS



▼ CHAMFERING  
MILLING CUTTERS



▼ MULTIPLEX



▼ MULTIPLEX HPC



▼ TM VENDING MACHINES

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Printed in Germany | 2019

