NEW

Member IMC Group
Ingersoll
Cutting Tools

SFEEDUP
HIGH SPEED & FEED

HIPOSSFEED V

CUTTERS AND INSERTS OF FNKT05 LINE
FOR MINIATURE MACHINING

MINI SIZED 90° END MILL AND HIGH FEED MILL WITH STRONG V-SHAPED INSERT

- *Minimum tool diameter: Ø8 (Z=2)*
- *Strong insert clamping*
- *Increased productivity*
- *Excellent chip evacuation*
- *Improved tool live*
- *Wide range of applications*

No. 191 E / 9-2020 V.4

Product Overview

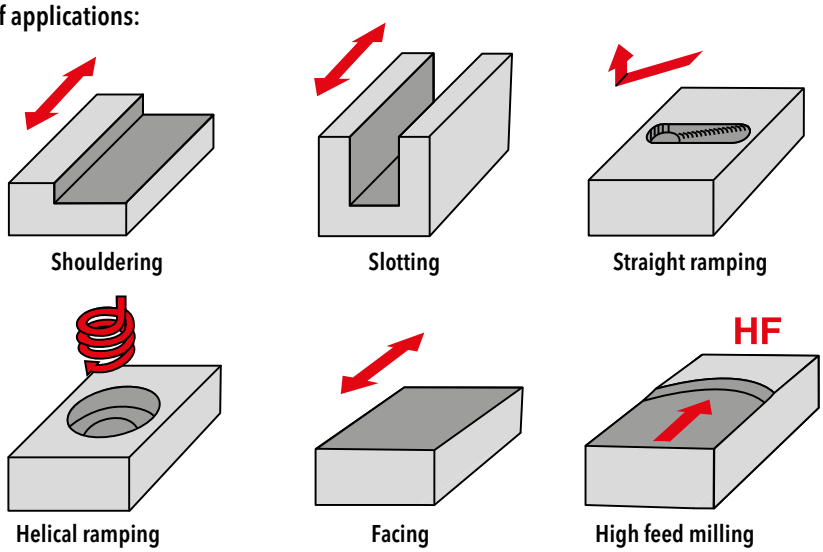
Ingersoll has released a new line of cutters and inserts for miniature machining in the Ø8 - Ø14 mm diameter range – the HiPosSFeed^{V} line.

The new **HiPosSFeed^{V}** family is ideal for small parts and the miniature industry. It is also designed to replace the machining range of solid carbide end mills from Ø8 (Z = 2). This family of cutters and inserts improves productivity and reduces costs due to the advantages of exchangeable inserts compared to solid carbide end mills.

Application Range

Designed for various applications, it is equipped with the pressed type FNKT05 insert for general applications, side ground type FNHT05 insert for finishing with low cutting force and the high feed UNKT05 insert for shallow depth of cut but high feed per tooth.

Covers a wide variety of applications:



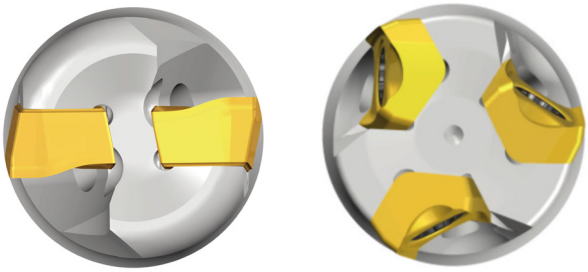
Shouldering | Slotting | Straight ramping

Helical ramping | Facing | High feed milling

Technical Features & Advantages

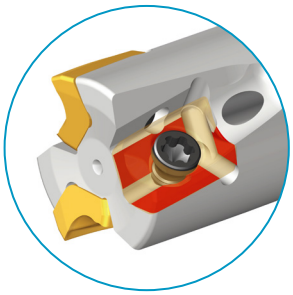
- Minimum tool diameter: Ø8 (Z=2)

- Finer pitch cutter maximizes productivity compared to the competition

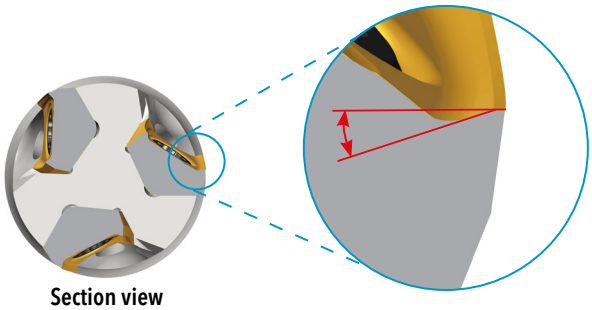


Competition (Ø10, Z=2) | Ingersoll (Ø10, Z=3)

- Unique V shape insert bottom design
  - Increased insert rigidity
  - Improved self-positioning for strong insert clamping

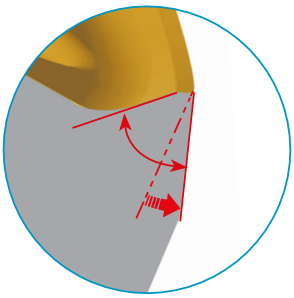


- High-rake angle design reduces cutting loads, which results in excellent chip evacuation

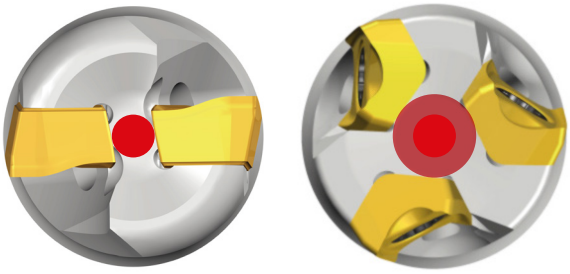


Section view

- Enhanced cutting edge design improves tool life and productivity



- Higher-stiffness core diameter over the competitor's cutter



Competition (Ø10, Z=2) | Ingersoll (Ø10, Z=3)

- Increased productivity due to high ramping angle
- Covers a wide variety of applications

FNKT05_


Insert:	FNKT0502_R-M	FNHT0502_R-L
average chip thickness:	hm = 0,04 mm	hm = 0,03 mm
max. cutting depth:	ap = 5,0 mm	ap = 5,0 mm

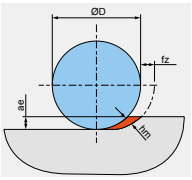
Recommended cutting data:

ISO	material	cutting speed Vc [m/min]				feed per tooth fz [mm]
		1st choice dry machining resp. wear resistant carbide		1st choice wet machining resp. rough carbide		
P	unalloyed steel	IN2505	250 – 290	IN2530	200 – 240	0,04 – 0,08
P	alloyed steel 800 N/mm²	IN2505	210 – 250	IN2530	160 – 200	0,04 – 0,06
P	alloyed steel 1100 N/mm²	IN2505	160 – 180	IN2530	110 – 130	0,03
M	stainless steel	IN2505	120 – 180	IN2530	80 – 130	0,04 – 0,06
K	gray cast iron	IN2505	180 – 250	IN2530	150 – 200	0,04 – 0,08
K	nodular cast iron	IN2505	140 – 210	IN2530	110 – 160	0,04 – 0,06
N	aluminum	–	–	–	–	–
S	high temperature alloys	IN2505	110 – 125	IN2530	60 – 80	0,04
S	titanium alloys	IN2505	40 – 50	IN2530	30 – 40	0,04
H	hard machining < 54 HRC	–	–	–	–	–
H	hard machining < 63 HRC	–	–	–	–	–

Tips:

- The worse the material machinability, the smaller the tool engagement should be choosen.
- The smaller the cutting tool diameter, the higher the cutting speed can be.
- If tool engagement is less than 1/3 of cutting tool diameter, the feed per tooth should be calculated with the following formula:

$$fz = hm \times \sqrt{\frac{D}{ae}}$$



Ramping data and circular interpolation:

tool diameter [mm]	max. ramp. angle [°]	min. bore dia. uneven ground [mm]	max. ap/rev. [mm]	min. bore dia. even ground [mm]	max. ap/rev. [mm]	max. bore dia. even ground [mm]	max. ap/rev. [mm]
8	1,90	12,0	0,4	14,9	0,7	15,5	0,7
9	1,70	13,8	0,4	16,9	0,7	17,5	0,7
10	1,50	15,7	0,4	18,9	0,7	19,5	0,7
11	1,20	17,7	0,4	20,9	0,6	21,5	0,6
12	1,10	19,6	0,4	22,9	0,6	23,5	0,6
13	1,00	21,6	0,4	24,9	0,6	25,5	0,6
14	1,00	23,5	0,5	26,9	0,7	27,5	0,7
15	0,80	25,4	0,4	28,9	0,6	29,5	0,6
16	0,75	27,4	0,4	30,9	0,6	31,5	0,6
20	0,60	35,4	0,5	38,9	0,6	39,5	0,6

General information:

Insert screw size 436: **SM18-033-00** Torque: **0,5 Nm**
Torque wrench: **DTN005S with bit DS-TP06TB**

UNKT05

Insert:	UNKT0502TR-HF
average chip thickness:	hm = 0,2 mm
max. cutting depth:	ap = 0,5 mm

Recommended cutting data:

ISO	material	cutting speed Vc [m/min]				feed per tooth fz [mm]
		1st choice dry machining resp. wear resistant carbide		1st choice wet machining resp. rough carbide		
P	unalloyed steel	IN2505	250 – 290	IN2530	200 – 240	0,2 – 0,4
P	alloyed steel 800 N/mm²	IN2505	210 – 250	IN2530	160 – 200	0,2 – 0,3
P	alloyed steel 1100 N/mm²	IN2505	160 – 180	IN2530	110 – 130	0,2
M	stainless steel	IN2505	120 – 180	IN2530	80 – 130	0,2 – 0,3
K	gray cast iron	IN2505	180 – 250	IN2530	150 – 200	0,2 – 0,4
K	nodular cast iron	IN2505	140 – 210	IN2530	110 – 160	0,2 – 0,3
N	aluminum	–	–	–	–	–
S	high temperature alloys	IN2505	110 – 125	IN2530	60 – 80	0,2
S	titanium alloys	IN2505	40 – 50	IN2530	30 – 40	0,2
H	hard machining < 54 HRC	–	–	–	–	–
H	hard machining < 63 HRC	–	–	–	–	–

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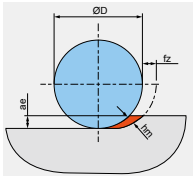
- The worse the material machinability, the smaller the tool engagement should be choosen.
- The smaller the cutting tool diameter, the higher the cutting speed can be.
- If tool engagement is less than 1/3 of cutting tool diameter, the feed per tooth should be calculated with the following formula:

$$fz = hm \times \sqrt{\frac{D}{ae}}$$



Ramping data and circular interpolation:

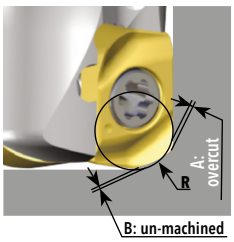
tool diameter [mm]	max. ramp. angle [°]	min. bore dia. [mm]	max. ap/rev. [mm]	max. bore dia. [mm]	max. ap/rev. [mm]
8	0,45	10,5	0,1	16	0,2
9	0,55	12,5	0,1	18	0,2
10	0,30	14,5	0,1	20	0,1
11	0,35	16,5	0,1	22	0,2
12	0,70	18,5	0,2	24	0,4
13	0,75	20,5	0,3	26	0,5
14	0,85	22,5	0,3	28	0,5
15	0,65	24,5	0,4	30	0,5
16	0,65	26,5	0,4	32	0,5
20	0,50	34,5	0,4	40	0,5

Programming Tips:

Please use a corner radius of 0.8 up to 1 mm in your NC-program when machining 3D-contours.
Refer to the following table for max. allowance resp. over cut:

	R program	A over cut	B un-machined
UNKT0502TR-HF	0,8	0	0,21
	0,9	0	0,18
	1,0	0,02	0,14

Recommended program 'R'

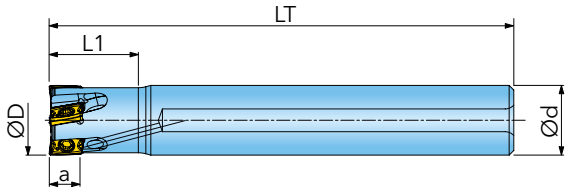


General information:

Insert screw: **SM18-033-00** Torque: **0,5 Nm** Torque wrench: **DTN005S with bit DS-TP06TB**

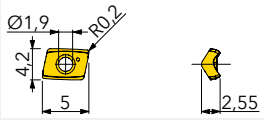
HIPOSSFEED V END MILL 12J1A...T

ADAPTION ACC. TO DIN 1835 A

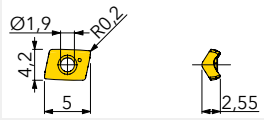


Designation	D	d	LT	L1	a	Z		IK	kg
12J1A008012T0R00	8	8	80	12	5	2	1,9	✓	0,03
12J1A009012T0R00	9	8	80	12	5	2	1,7	✓	0,03
12J1A010015T1R00	10	10	80	15	5	3	1,5	✓	0,04
12J1A011012T1R00	11	10	80	12	5	3	1,2	✓	0,04
12J1A012015T2R00	12	12	80	15	5	4	1,1	✓	0,06
12J1A013012T2R00	13	12	80	12	5	4	1,0	✓	0,06
12J1A014012T2R00	14	12	80	12	5	4	1,0	✓	0,06

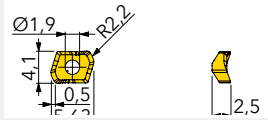
FNKT050202R-M



FNHT050202R-L



UNKT0502TR-HF



Designation	fz(min/max)	Design	Grade	IN2005	IN2504	IN2505	IN2530
FNKT050202R-M	0,04/0,08	positive geometry R0,2				●	●
FNHT050202R-L	0,03/0,07	sharp geometry R0,2		●		●	●
UNKT0502TR-HF[1)]	0,30/0,50	positive high feed geometry			●	●	●

[1)] Cutter body has to be modified

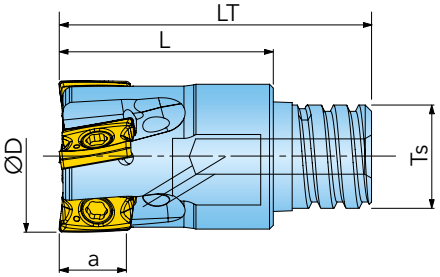
● = P ● = M ● = K ● = N ● = S ○ = H

SPARE PARTS

	SM18-033-00 (0,5Nm)	TXPLUS06x90-B

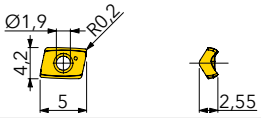
① = Insert screw ② = Torx-bit

FOR EXCHANGEABLE HEAD SYSTEM

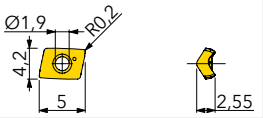


Designation	D	LT	L	a	Ts	Z		IK	kg
12J1A008010TQR00	8	16,8	10	5	T5	2	1,9	✓	0,01
12J1A010016T6R00	10	22,8	16	5	T6	3	1,5	✓	0,01
12J1A012017T8R00	12	24,8	17	5	T8	4	1,1	✓	0,01

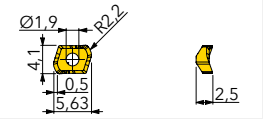
FNKT050202R-M



FNHT050202R-L



UNKT0502TR-HF

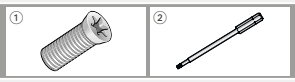


Designation	fz(min/max)	Design	Grade	IN2005	IN2504	IN2505	IN2530				
FNKT050202R-M	0,04/0,08	positive geometry R0,2				●	●				
FNHT050202R-L	0,03/0,07	sharp geometry R0,2		●		●	●				
UNKT0502TR-HF [1]	0,30/0,50	positive high feed geometry			●	●	●				

[1] Cutter body has to be modified

● = P ● = M ● = K ● = N ● = S ○ = H

SPARE PARTS

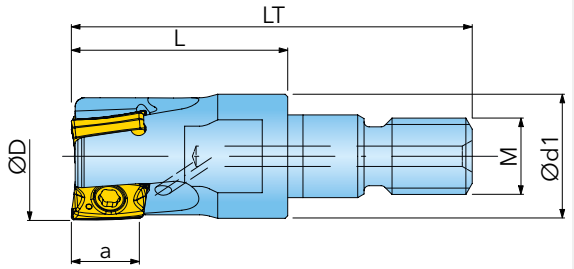


	SM18-033-00 (0,5Nm)	TXPLUS06x90-B

① = Insert screw ② = Torx-bit

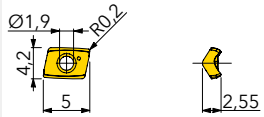
HIPOSSFEED V END MILL 12J1A...X

SCREW-IN TYPE ADAPTION



Designation	D	d1	LT	L	a	M	Z		IK	kg
12J1A010017X4R00	10	9,8	31,5	17	5	M6	3	1,50	✓	0,01
12J1A012017X4R00	12	11,8	31,5	17	5	M6	4	1,10	✓	0,01
12J1A015023X5R00	15	12,8	40,8	23	5	M8	5	0,80	✓	0,03
12J1A016023X5R00	16	12,8	40,8	23	5	M8	5	0,75	✓	0,03
12J1A020030X6R00	20	17,8	49,8	30	5	M10	6	0,60	✓	0,07

FNKT050202R-M



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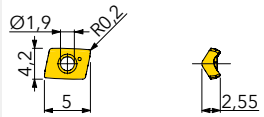
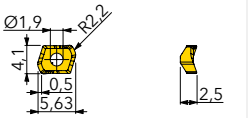


UNKT0502TR-HF

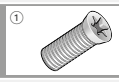


Designation	fz(min/max)	Design	Grade	IN2005	IN2504	IN2505	IN2530				
FNKT050202R-M	0,04/0,08	positive geometry R0,2				●	●				
FNHT050202R-L	0,03/0,07	sharp geometry R0,2		●		●	●				
UNKT0502TR-HF [1)]	0,30/0,50	positive high feed geometry			●	●	●				

[1)] Cutter body has to be modified.

● = P ● = M ● = K ● = N ● = S ○ = H

SPARE PARTS



	SM18-033-00 (0,5Nm)	TXPLUS06x90-B

① = insert screw ② = Torx bit

Ingersoll Werkzeuge GmbH

Main Office: Kalteiche-Ring 21–25 • D-35708 Haiger
Fon: +49 2773 742-0 • Fax: +49 2773 742-812
Email: info@ingersoll-imc.de

Office South: Florianstraße 13–17 • D-71665 Vaihingen-Horrheim
Fon: +49 7042 8316-0 • Fax: +49 7042 8316-26
Email: horrheim@ingersoll-imc.de