



FOURWORX®

Four-fold benefits - also with the smallest diameter in high-feed milling



 **pokolm**
PREMIUMTOOLS. WE KNOW HOW.

FOUR-FOLD BENEFITS: MORE SPEED, MORE FEED, MORE CUTTING DEPTH AND MORE PERFORMANCE

FOURWORX® is THE new high-performance milling system for rough and pre-finishing applications in the field of high-feed milling. With a multitude of revolutionary features, **FOURWORX®** advances into previously unattainable realms of performance. This is possible thanks to a completely redesigned overall geometry of the milling system. The significant outcome is that, for the first time, even the smallest tool diameter Ø16 mm boasts three inserts. With this novelty, cutting depths up to a_p 0.75 mm and feed rates up to f_z 1.2 mm/teeth can be achieved. And despite the small tool diameter, the innovative geometry guarantees maximum stability in use.

Similar attributes apply to the inserts. Despite the compact dimensions, a clearly visible and innovative reinforcing collar around the screw seat, together with a negative insert seat, provides for an enormously extended service life. At the same time, chamfered outer edges protect the inserts against spalling around the circumference. A 3D chip pocket guarantees optimum chip removal paired with maximum cutting performance; the corner radius of 1 mm stands for maximum stability at the outer tool diameter even at

high feedrates. The highly precise inserts possess four cutting edges. In four different grade/coating combinations and with two chip-breaker grooves, they allow the machining of a broad range of materials and are optimally suitable for the machining of steel, cast iron and SAH materials.

Overall, the innovative system design leads to a 50% reduction of the stress in the tool and to significantly enhanced stability.

Even on less powerful machines, **FOURWORX®** offers ultimate performance. Similarly, the new milling system also proves its capabilities with fragile workpieces and in deep cavities, both in wet and dry machining. Four times more performance, which redefines the benchmark for economic efficiency.



Practical video
FOURWORX®
in 1.2358

Connection types

All **FOURWORX®** tools are available as

- Plain shank end mill bodies,
- Threaded shank end mill bodies, and with the patented
- **DUOPLUG®** system for ultimate truth of running and maximum rigidity.

All tools possess internal coolant supply for maximum process reliability.



DUOPLUG®



Threaded shank



Plain shank

FOURWORX® S IN DETAIL

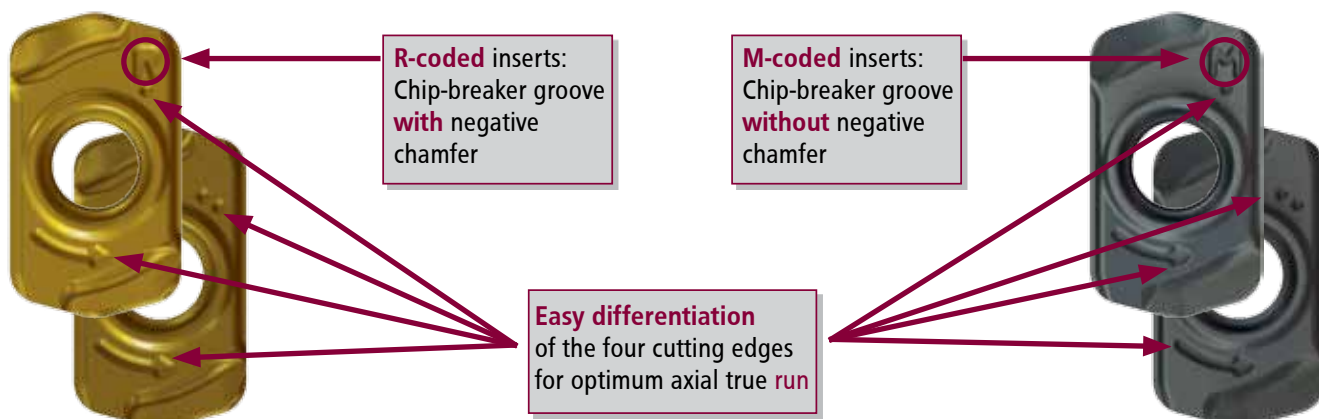
FOURWORX® - All features at a glance

- ➔ Four-fold benefits
- ➔ Completely redesigned overall geometry
- ➔ Maximum number of teeth on minimum diameter
- ➔ Available from Ø 16 to 42 mm
- ➔ Cutting depths up to ap 0.75 mm
- ➔ Feed rates up to fz 1.2 mm/tooth
- ➔ Maximum stability
- ➔ 3D chip pocket for optimum chip removal
- ➔ Corner radius 1 mm
- ➔ 4 cutting edges per insert
- ➔ 4 different inserts, 2 different chip-breaker grooves
- ➔ Machining of nearly all materials
- ➔ for ultimate performance even on less powerful machines
- ➔ Ideal for fragile workpieces and in deep cavities
- ➔ Wet and dry machining
- ➔ The new benchmark in terms of efficiency

Tool and insert geometry - guarantee for ultimate performance and efficiency



Inserts - cutting edges and chip-breaker grooves easily differentiated

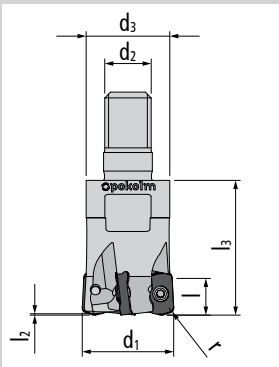


FOURWORX® M - BREAKDOWN OF ORDER NUMBER

Breakdown of order number for **MILLING CUTTER BODIES**

Example: **FR05-016-Z16-03-32**

- ⊕ System key
- ⊕ Insert size
mm [l]
- ⊕ Nominal diameter
Ø mm [d₁]
- ⊕ Connection types
E - Threaded shank
A - Shell type
Z - Plain shank
- ⊕ Connection size
Ø mm [d₂]
- ⊕ Number of teeth
- ⊕ Usable length
mm [l₃]



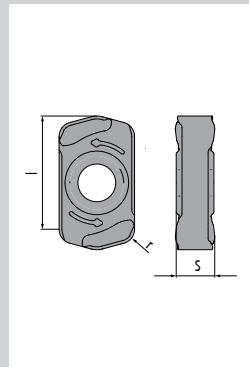
Breakdown of order number for **INSERTS**

Example: **FR05-8042-HF-RP**

- ⊕ System key
SQ - SQUAREWORX®
- ⊕ Insert size
mm [l]
- ⊕ Grade specification
- ⊕ Corner radius
- ⊕ Chip breaker
- ⊕ ISO Material group

M	for medium cutting
R	for heavy cutting

P	Steel
M	Stainles steel
K	Cast iron
N	Non-ferrous materials
S	High-temperature alloys
H	Hardened steel





FOURWORX®

Size S - Ø16 ... 42 mm

- Four cutting edges per indexable insert for ultimate efficiency
- Very high material removal rates and extremely easy cutting
- All tools possess internal coolant supply as standard.
- Extremely high feedrates up to fz 1.2 mm/teeth

Milling cutter bodies

Catalogue no.											Accessories	Features
	d ₁	l	r	l ₃	l ₂	l ₁	d ₂	d ₃	z			

DuoPlug®

	FR05-016-D10-03	16	9	1	35	0.35	-	M 10	15	3	A, B, C, D, E, F	
	FR05-020-D12-04	20	9	1	35	0.4	-	M 12	18.6	4	A, B, C, D, E, F	
	FR05-025-D16-05	25	9	1	40	0.45	-	M 16	23.5	5	A, B, C, D, E, F	

Threaded shank end mill bodies

	FR05-016-E08-02	16	9	1.4*	29	0.35	-	M 8	13.8	2	A, B, C, D, E, F	
	FR05-016-E08-03	16	9	1	29	0.35	-	M 8	13.8	3	A, B, C, D, E, F	
	FR05-020-E10-04	20	9	1	29	0.4	-	M 10	18	4	A, B, C, D, E, F	
	FR05-025-E12-05	25	9	1	33	0.45	-	M 12	21	5	A, B, C, D, E, F	
	FR05-032-E16-05	32	9	1	42	0.5	-	M 16	29	5	A, B, C, D, E, F	
	FR05-035-E16-06	35	9	1	42	0.5	-	M 16	29	6	A, B, C, D, E, F	
	FR05-042-E16-06	42	9	1	42	0.55	-	M 16	29	6	A, B, C, D, E, F	

Plain shank end mill bodies

	FR05-016-Z16-03-32	16	9	1	32	0.35	80	diam. 16	13.8	3	A, B, C, D, E, F	
	FR05-020-Z20-04-40	20	9	1	40	0.4	90	diam. 20	18	4	A, B, C, D, E, F	

* corner radius to be programmed

Accessories

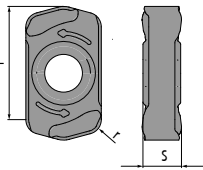
22 500 P Torx screw A > Page 7	07 500 P Torx-screwdriver (Torx-Plus) B > Page 7	TV 04-1 Screwdriver torque Vario®-S with window scale, C > Page 7	TV 500 Torque Vario® setter adjusting tool D > Page 7	T7 500 P Torx interchangeable bit for Torque Vario® E > Page 7	T7 502 P, Torx Magic- Spring compatible bit f. Torque Vario® F > Page 7
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latest items!

available as long as stock lasts

on request

stock item, subject to confirmation

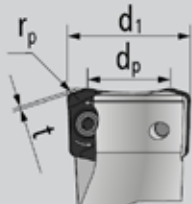
Indexable inserts	Catalogue no.	DIN Specification	Carbide Grade	Coating	l	s	r	M
	FR05-8042-HF-RP	LNKX 0925 ZSR	P40	PCSR	9	2.5	1	M 2.2
	FR05-8048-HF-RP	LNKX 0925 ZSR	P40	PPGO	9	2.5	1	M 2.2
	FR05-8062-HF-RK	LNKX 0925 ZSR	K10	PPTi	9	2.5	1	M 2.2
	FR05-8042-HF-MP	LNKX 0925 ZER	P40	PCSR	9	2.5	1	M 2.2
	FR05-8096-HF-MM	LNKX 0925 ZER	M40	PPST	9	2.5	1	M 2.2

Feed per tooth (fz) | d.o.c. (ap)

Material							
Carbide Grade Coating	Feed per tooth d.o.c.						
		steel	stainless steel	cast iron	non-ferrous materials	high-temperature alloys	hardened steel
Size S LNKX M							
P40 PCSR	f_z (mm) a_p (mm)	0,25-1 0,05-0,7	-	0,2-0,95 0,05-0,6	-	-	
M40 PPST	f_z (mm) a_p (mm)	0,25-1 0,05-0,6	0,25-1 0,05-0,6	-	-	0,15-0,75 0,05-0,6	-
Size S LNKX R							
P40 PCSR	f_z (mm) a_p (mm)	0,3-1,2 0,1-0,75	-	0,25-1,1 0,1-0,7	-	-	
P40 PPGO	f_z (mm) a_p (mm)	0,3-1,2 0,1-0,75	-	0,25-1,1 0,1-0,7	-	-	
K10 PPTi	f_z (mm) a_p (mm)	0,3-1,2 0,1-0,75	-	0,3-1,2 0,1-0,75	-	-	0,1-1 0,1-0,6

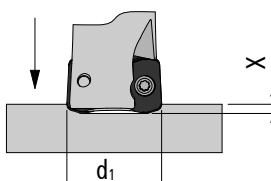
Cutting speed (Vc in m/min)

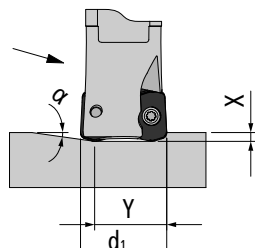
Material							
Carbide Grade Coating	Application						
		steel	stainless steel	cast iron	non-ferrous materials	high-temperature alloys	hardened steel
P40 PCSR	roughing	▽130 190 250	-	▽120 170 220	-	-	-
	pre finishing	▽150 225 300	-	▽150 200 250	-	-	-
P40 PPGO	roughing	▽100 150 200	-	▽110 130 150	-	-	-
	pre finishing	▽100 150 200	-	▽110 130 150	-	-	-
K10 PPTi	roughing	▽90 140 190	-	▽120 180 240	-	-	▽80 120 160
	pre finishing	▽110 160 210	-	▽140 205 270	-	-	▽100 140 180
M40 PPST	roughing	▽80 140 200	▽80 130 180	-	-	▽30 55 80	-
	pre finishing	▽100 150 200	▽100 155 210	-	-	▽40 65 90	-

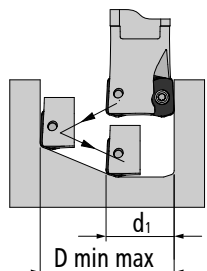


For the **CAD/CAM set-up** please program **1.4 mm** corner radius (r_p).
The remainder of the material is theoretically **0.342 mm** (t).
Please use „ d_p “ for tool length measurement.

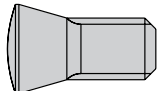
Extended operation data

Plunging	
	
Cutter diam. d1	X _{max}
16	0.35
20	0.4
25	0.45
32-35	0.5
42	0.55

Ramping		
		
Cutter diam. d1	α°	y
16	<2,5	7
20	<1,9	11
25	<1,5	16
32	<1,2	23
35	<1,0	26
42	<0,9	33

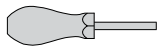
Helix		
		
Cutter diam. d1	D _{min}	D _{max}
16	23	31
20	31	39
25	41	49
32	55	63
35	61	69
42	75	83

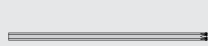
Accessories		Catalogue no.		Description	
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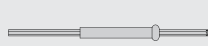
Torx@screws Torx@screws						
	22 500 P	Torx screw M 2.2 L 5.2 T 7 Plus 0.65 Nm	M 2.2	L 5.2	T 7 Plus	0.65 Nm

Spanners / screwdrivers Torx-screwdriver						
	07 500 P	Torx-screwdriver (Torx-Plus) T 7 Plus	T 7 Plus			

Torque screwdrivers and accessories Torque screwdrivers						
	TV 04-1	Screwdriver torque Vario®-S with window scale from Nm 0.4 up to 1.0 Nm with scale, inc setter				

Torque screwdrivers and accessories Torque Vario® setter adjusting tool						
	TV 500	Torque Vario® setter adjusting tool				

Torque screwdrivers and accessories Torx bits, standard						
	T7 500 P	Torx interchangeable bit for Torque Vario® T 7 IP L 175 max. 0.9 Nm	T 7 IP	L 175	max. 0.9 Nm	

Torque screwdrivers and accessories Torx bits with retaining spring						
	T7 502 P	Torx MagicSpring compatible bit f. Torque Vario® T 7 L 175 max. 0.9 Nm	T 7	L 175	max. 0.9 Nm	



Pokolm
Frästechnik GmbH & Co. KG

Adam-Opel-Straße 5
33428 Harsewinkel
Germany

Fon: +49 5247 9361-0
Fax: +49 5247 9361-99

info@pokolm.com
www.pokolm.com



www.pokolm.com