



# FOURWORX®

High Feed milling with more performance in cutting speed, feed and cutting depth

# 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  $\varnothing 16$  mm boasts three inserts. Together with this novelty, cutting depths up to ap 0.75 mm 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 feed-rates. 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.

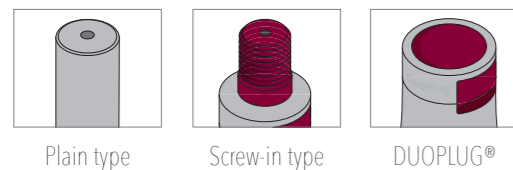
Even on less powerful machines, **FOURWORX®** offers ultimate performance. Similarly, the new milling system also proves its capabilities with fragile workpieces and in deep cavities, both in wet and dry machining. Four times more performance, which redefines the benchmark for economic efficiency.

## FOURWORX® - All features at a glance

- Four-fold benefits
- Completely redesigned overall geometry
- Maximum number of teeth on minimum diameter
- Very high removal rates and easy cutting
- All tools have an inner cooling by default
- Available from  $\varnothing 16$  to 42 mm
- Cutting depths up to ap 0.75 mm
- Maximum stability
- 3D chip pocket for optimum chip removal
- Corner radius 1 mm
- 4 cutting edges per insert, 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



### Type of connection



Practical-Video

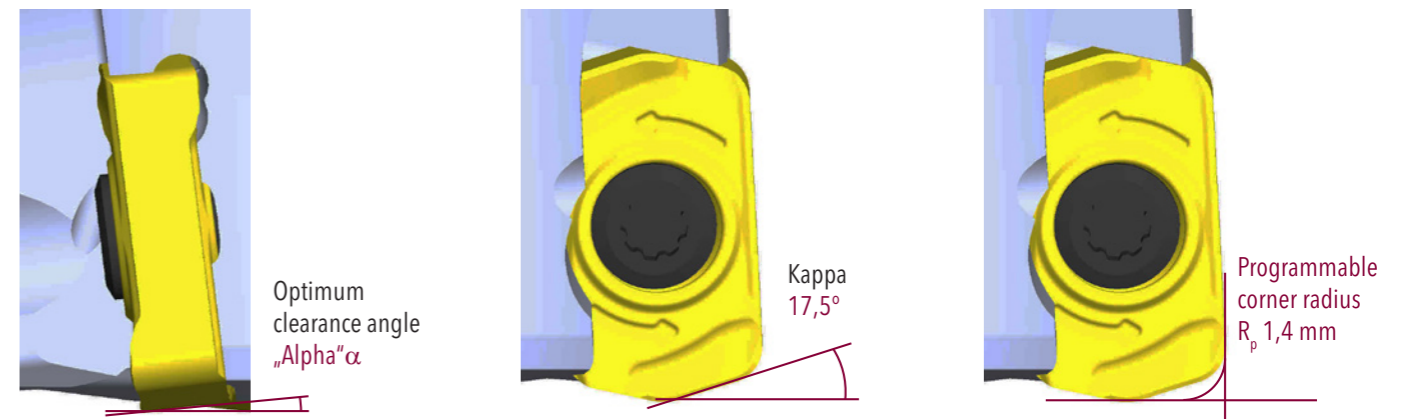
**FOURWORX®** in 1.2358

More Product-Videos available on:  
[youtube.com/pokolmknowhow](https://www.youtube.com/pokolmknowhow)

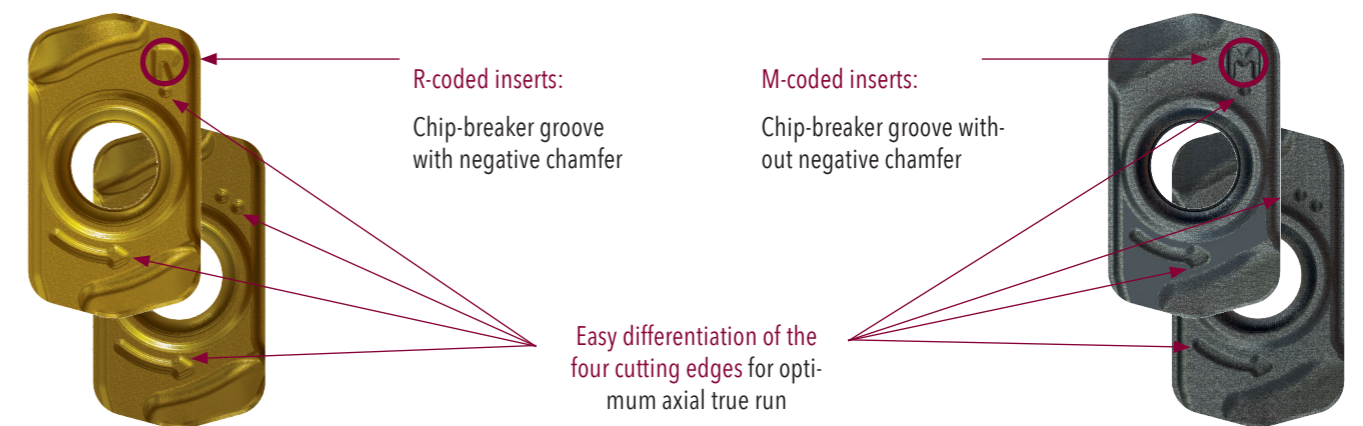


# FOURWORX® S in detail

Tool and insert geometry - guarantee for ultimate performance and efficiency



Inserts - cutting edges and chip-breaker grooves easily differentiated

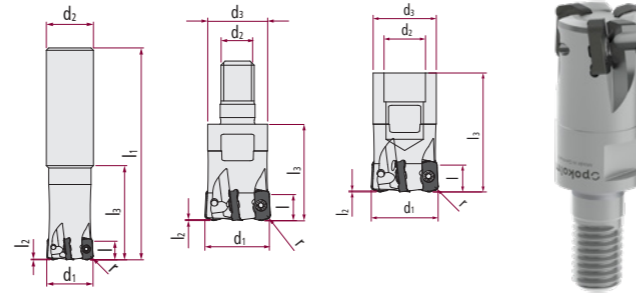


## FOURWORX® - Breakdown of order number

Tool	FR05-016-Z16-03-32	Inserts	FR05-8042-HF-R-P
Tool type FR - FOURWORX®		Inserts	
Insert size l/d mm		Tool type FR - FOURWORX®	
Nominal diameter $\varnothing$ mm [d.]		Insert size l/d mm	
Type of connection D - DUOPLUG® E - Threaded shank Z - Plain shank		Grade description High Feed Chip groove M - for medium roughing application R - heavy roughing application	
Connection size $\varnothing$ mm [d2]		Material P - steel M - stainless steel K - cast iron N - non-ferrous materials S - high-temperature alloys H - hardened steel	
No. of teeth			
Cylindrical usable length mm [L3]			

# FOURWORX®

Size S - Ø 16 - 42 mm



	Catalogue no.	d <sub>1</sub>	l/d	r <sub>p</sub>	l <sub>3</sub>	l <sub>2</sub>	l <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	z	Accessories	Features
DuoPlug®	FR05-016-D10-03	16	9	1,4*	35	0,35	-	M 10	15	3	A, B, C, D, E, F	
	FR05-020-D12-04	20	9	1,4*	35	0,4	-	M 12	18,6	4	A, B, C, D, E, F	
	FR05-025-D16-05	25	9	1,4*	40	0,45	-	M 16	23,5	5	A, B, C, D, E, F	
Screw-in type	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	1,4*	29	0,35	-	M 8	13,8	3	A, B, C, D, E, F	
	FR05-020-E10-04	20	9	1,4*	29	0,4	-	M 10	18	4	A, B, C, D, E, F	
	FR05-025-E12-05	25	9	1,4*	33	0,45	-	M 12	21	5	A, B, C, D, E, F	
	FR05-032-E16-05	32	9	1,4*	42	0,5	-	M 16	29	5	A, B, C, D, E, F	
	FR05-035-E16-06	35	9	1,4*	42	0,5	-	M 16	29	6	A, B, C, D, E, F	
Plain type	FR05-016-Z16-03-32	16	9	1,4*	32	0,35	80	16	13,8	3	A, B, C, D, E, F	
	FR05-020-Z20-04-40	20	9	1,4*	40	0,4	90	20	18	4	A, B, C, D, E, F	

Indexable inserts	Catalogue no.	DIN description	Carbide grade	Coating	l/d	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

Accessories	A	B	C	D	E
	 22 500 P	 07 500 P	 TV 04-1	 TV 500	 T7 500 P
	 T7 502 P				

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

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 <sub>z</sub> (mm) a <sub>p</sub> (mm)	0,25-1 0,05-0,7	-	0,2-0,95 0,05-0,6	-	-	-
M40 PPST	f <sub>z</sub> (mm) a <sub>p</sub> (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 <sub>z</sub> (mm) a <sub>p</sub> (mm)	0,3-1,2 0,1-0,75	-	0,25-1,1 0,1-0,7	-	-	-
P40 PPGO	f <sub>z</sub> (mm) a <sub>p</sub> (mm)	0,3-1,2 0,1-0,75	-	0,25-1,1 0,1-0,7	-	-	-
K10 PPTi	f <sub>z</sub> (mm) a <sub>p</sub> (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)

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	-	-	-
	semifinishing finishing	▽150 225 300 -	-	▽150 200 250 -	-	-	-
P40 PPGO	roughing	▽100 150 200	-	▽110 130 150	-	-	-
	semifinishing finishing	▽100 150 200 -	-	▽110 130 150 -	-	-	-
K10 PPTi	roughing	▽90 140 190	-	▽120 180 240	-	-	▽80 120 160
	semifinishing finishing	▽110 160 210 -	-	▽140 205 270 -	-	-	▽100 140 180 -
M40 PPST	roughing	▽80 140 200	▽80 130 180	-	-	▽30 55 80	-
	semifinishing finishing	▽100 150 200 -	▽100 155 210 -	-	-	▽40 65 90 -	-

\* For the CAD/CAM set-up please program 1,4 mm corner radius (r<sub>p</sub>). The remainder of the material is theoretically 0,342 mm (t). Please use „d<sub>p</sub>“ for tool length measurement.

## Extended operation data

Plunging			Ramping			Helix		
Cutter Ø d1	d <sub>p</sub>	X <sub>max</sub> mm	Cutter Ø d1	α°	y mm	Cutter Ø d1	D <sub>min</sub> mm	D <sub>max</sub> mm
16	10,78	0,35	16	<2,5	7	16	23	31
20	14,78	0,4	20	<1,9	11	20	31	39
25	19,78	0,45	25	<1,5	16	25	41	49
32	26,78	0,5	32	<1,2	23	32	55	63
35	29,78	0,5	35	<1,0	26	35	61	69
42	36,78	0,55	42	<0,9	33	42	75	83

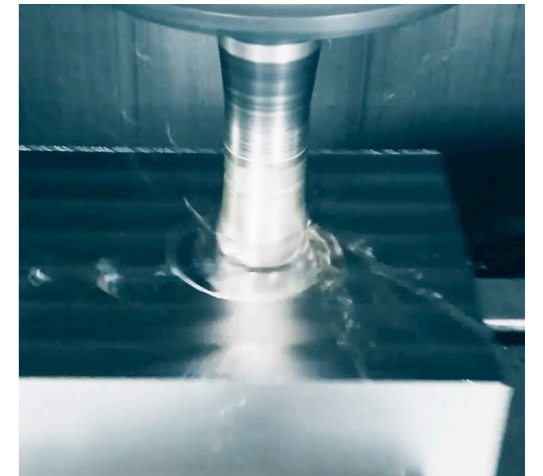
## Accessories

Accessories	Catalogue no.	Description				
<b>Torx® screws</b>						
	22 500 P	Torx® screw	M 2,2	L 5,2	T 7 Plus	0,65 Nm
<b>Torx wrench</b>						
	07 500 P	Torx® screwdriver (Torx®-Plus) T 7 IP	T 7 IP			
<b>Torque screwdriver</b>						
	TV 04-1	Torque screwdriver Vario®-S	von 0,4 Nm	bis 1,0 Nm	mit Skala, inkl. Setter	
<b>Torque Vario® setter adjusting tool</b>						
	TV 500	Torque Vario® - setter adjusting tool				
<b>Torx interchangeable blades, standard</b>						
	T7 500 P	Torx interchangeable blade for Torque Vario®	T 7 IP	L 175	max. 0,9 Nm	
<b>Torx interchangeable blades with retaining spring</b>						
	T7 502 P	Torx MagicSpring compatible bit f. Torque Vario®	T 7 IP	L 175	max. 0,9 Nm	

## FOURWORX® in field testing

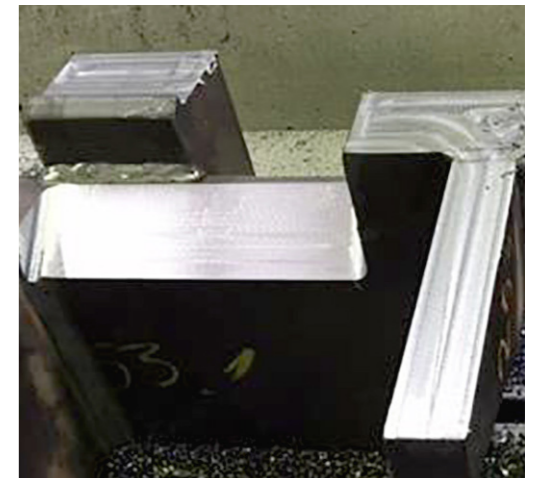
### Processing task in 1.2358, Cold working steel

Milling cutter:	FR05-025-E12-05
D <sub>c</sub> (nominal diameter):	25 mm
Arbor:	50 12 710
Overhang:	102,1 mm
Cooling:	Air
Indexable insert:	FR05-8042-HF-RP
V <sub>c</sub> (speed):	200 m/min
n (revolutions):	2547 min <sup>-1</sup>
f <sub>z</sub> (feed per tooth):	0,75 mm
V <sub>f</sub> (feed rate):	9551 mm/min
a <sub>p</sub> (depth of cut):	0,7 mm
a <sub>e</sub> (width of cut):	17 mm



### Processing task in ST52, Unalloyed constructional steel

Milling cutter:	FR05-025-E12-05
D <sub>c</sub> (nominal diameter):	25 mm
Arbor:	60 610, 50 3 710
Overhang:	162,1 mm
Cooling:	Air
Indexable insert:	FR05-8048-HF-RP
V <sub>c</sub> (speed):	196 m/min
n (revolutions):	2500 min <sup>-1</sup>
f <sub>z</sub> (feed per tooth):	0,64 mm
V <sub>f</sub> (feed rate):	8000 mm/min
a <sub>p</sub> (depth of cut):	0,3 mm
a <sub>e</sub> (width of cut):	2,0 mm



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