



PLANWORX®

HIGH-EFFICIENT FACE-MILLING CUTTER WITH AN EXTREME SMOOTHNESS



 **pokoIm**
PREMIUMTOOLS. WE KNOW HOW.





... ACCURATELY PLANNED ... FOR CERTAIN

PLANWORX®, the face-milling cutter for medium and rough machining of steel, cast material and RSH material. Available in sizes from diam. 40 to 250 mm face diameter. Resonance vibrations are eliminated by using adapted uneven partitions. Extremely well suited to working conditions lacking stability with maximum chipping depths of up to 6.5 mm and for chamfer cutting angles up to approximately 45°. Feed holes for the internal supply of coolant are provided in all tools up to and including diam. 125 mm. The new tool has been designed for high-efficiency cutting with large cutting depths and an extreme smoothness. The coated and hardened base body offers longevity and a maximum of tooth stability even under extreme loads.

EIGHT cutting edges to each cutting insert, of 13 mm incircle and a special macro-geometry with face cutters of 2.4 mm length make the tool suitable for universal use in all areas. 5.4 mm effective plate thickness increases the enormously high process reliability and protects the support. Matching micro-geometries with polished chipping areas help keep temperatures in the cutting material at a minimum and ensure uniform disposal of chips.

Precision-made cutting inserts in grades: K10, P40 and M40 with adapted chip breakers and improved coatings provide extremely low-cost solutions in terms of the number of cutting edges and the service life.

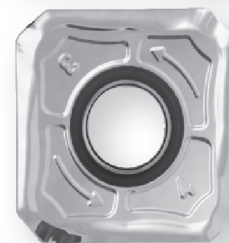
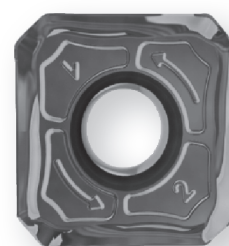




The benefits at a glance:

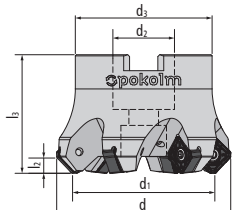
- ⊖ negative, and therefore extremely stable basic shape
- ⊖ all eight cutting edges can be used reliably
- ⊖ easy cutting with highly positive cutting plate geometry
- ⊖ uneven partition for lower vibration levels
- ⊖ coolant holes for media up to 125 mm diameter
- ⊖ low power consumption
- ⊖ outstandingly smooth running

Each cutting edge is marked for ease of orientation and enables a high speed of installation. Exactly manufactured insert mounts in combination with fastening screw with Torx Plus drive hold the insert exactly in its mounted position.








DIMENSIONS AND OPERATION DATA

The PLANWORX® „M“-Serie

MILLING CUTTER BODIES									
	Catalogue no.								Price in EUR
		d ₁	l ₂	l	l ₃	d ₂	d ₃	z	
Shell type milling cutter bodies									
	4 40 331	40	6.7	13	42	22	40	4	
	5 50 331	50	6.7	13	52	27	48	5	
	6 63 331	63	6.7	13	52	27	60	6	
	8 80 331	80	6.7	13	52	32	70	8	
	10 100 331	100	6.7	13	52	40	90	10	
	12 125 331	125	6.7	13	52	40	90	12	
	14 160 331	160	6.7	13	52	40	120	14	
	16 200 331	200	6.7	13	52	60	160	16	
	20 250 331	250	6.7	13	52	60	160	20	

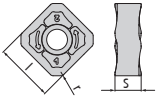
Accessories

	Catalogue no.	Description	Dimensions			Price in EUR
	40 505 P	Torx screw M 4.0	M 4.0	L 7.5	T 15P	
	15 500 P	Torx screwdriver T 15 P	T 15P			
	T 15 500 P	Torx interchangeable	T 15P	L 175	max. 5.5 Nm	
	T 15 502 P	Torx MagicSpring compatible bit f. Torque Vario®	T 15P	L 175	max. 5.5 Nm	
	TV 2-8	Screwdriver torque Vario®-S with window scale from Nm	from 2.0 Nm	up to 8.0 Nm	with scale	





Tightening torque torx screw 40 505 M₂: 5 Nm







PLANWORX®-Inserts Size "M", DIN-Identification: SNMX 135408 ER

INDEXABLE INSERTS		Catalogue No.	DIN- Identification	Carbide Grade	Coating	l	s	r	M	Price in EUR
		05 31 842	SNMX 135408 ER	P40	PVSR	13	5.4	0.8	4.0	
		05 31 862	SNMX 135408 ER	K10	PVTi	13	5.4	0.8	4.0	
		05 31 896	SNMX 135408 ER	M40	PVST	13	5.4	0.8	4.0	

Cutting Speeds V_c in m/min

MATERIAL		l	Kind of machining	P40 PVSR	K10 PVTi	M40 PVST	
Steel		13	Roughing Finishing	100 – 250 150 – 300			
Cast iron		13	Roughing Finishing		120 – 220 150 – 250		
Stainless Steel		13	Roughing Finishing		80 – 180 110 – 250		
High-temperature alloys		13	Roughing Finishing		40 – 180 60 – 120		

Application data (f_z/a_p)

MATERIAL		l	f_z/a_p	P40 PVSR	K10 PVTi	M40 PVST	
Steel		13	f_z (mm) a_p (mm)	0.08 – 0.55 0.1 – 6			
Cast iron		13	f_z (mm) a_p (mm)		0.1 – 0.55 0.1 – 6		
Stainless Steel		13	f_z (mm) a_p (mm)		0.08 – 0.3 0.1 – 4		
High-temperature alloys		13	f_z (mm) a_p (mm)		0.08 – 0.2 0.1 – 3		

EXTENDED OPERATION DATA

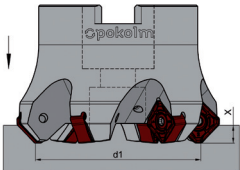
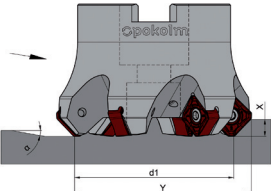
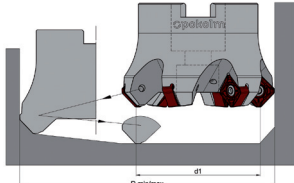



Classification of carbide material

Designation of main groups of chip removal and groups of application according to ISO 513

Designation		RANGE OF APPLICATION										MATERIAL TO BE MACHINED						
												P	M	K	N	S	H	
		1	5	10	15	20	25	30	35	40	45	50	Steel	Stainless	Cast-iron	Alloys	High-temperature	Hardened Steel
German standard designation	K10 PVTi																	
	HC-M15																	
	HC-K10																	
	P40 PVSR																	
	HC-P30																	
	HC-K25																	
	M40 PVST																	
	HC-P40																	
	HC-M40																	

● Major application ○ Minor application

Full colour circle symbols represent: Major applications for materials to be machined. Hollow colour circle symbols represent: Minor applications for materials to be machined. The upper point of the pentagon-symbol indicates major applications. Sloping sides to the right or left indicate minor applications.

axial plunging into solid block		ramping		circular milling into solid block			
							
							
Cutter diam. d_1 mm	x max. mm	Cutter diam. d_{1a} mm	a°	y mm	Cutter diam. d_{1a} mm	D_{min} mm	D_{max} mm
40	4	53.5	<11	29.5	53.5	89.5	93.5
50	4	63.5	<8	39.5	63.5	109.5	113.5
63	4	76.5	<6.5	52.5	76.5	135.5	139.5
80	4	93.5	<4	69.5	93.5	169.5	173.5
100	4	113.5	<3.5	89.5	113.5	209.5	213.5
125	4	138.5	<2.5	114.5	138.5	259.5	263.5

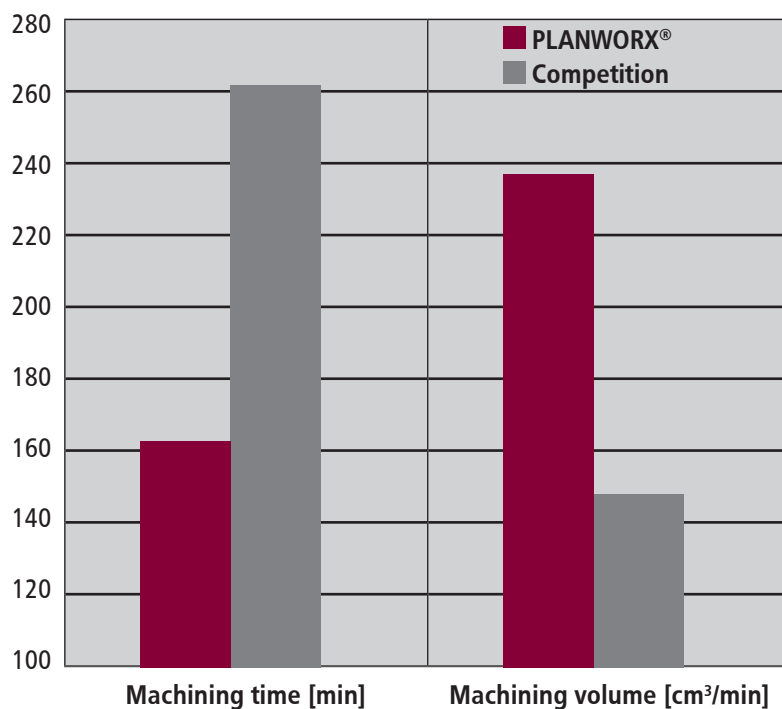
x maximum plunge depth
 f_z see operation data table but reduce value to 30 %
 Vertical dipping of tools with a bigger diameter than 125 mm is not recommended

y minimum travel
 x maximum travel
 a_p/f_z see operation data table
 d_{1a} outer diameter

a_p/f_z see operation data table
 D_{min} minimum bore diameter depending on cutter diameter
 D_{max} maximum bore diameter depending on cutter diameter
 d_{1a} outer diameter

FROM PRACTICE TO PRACTICE

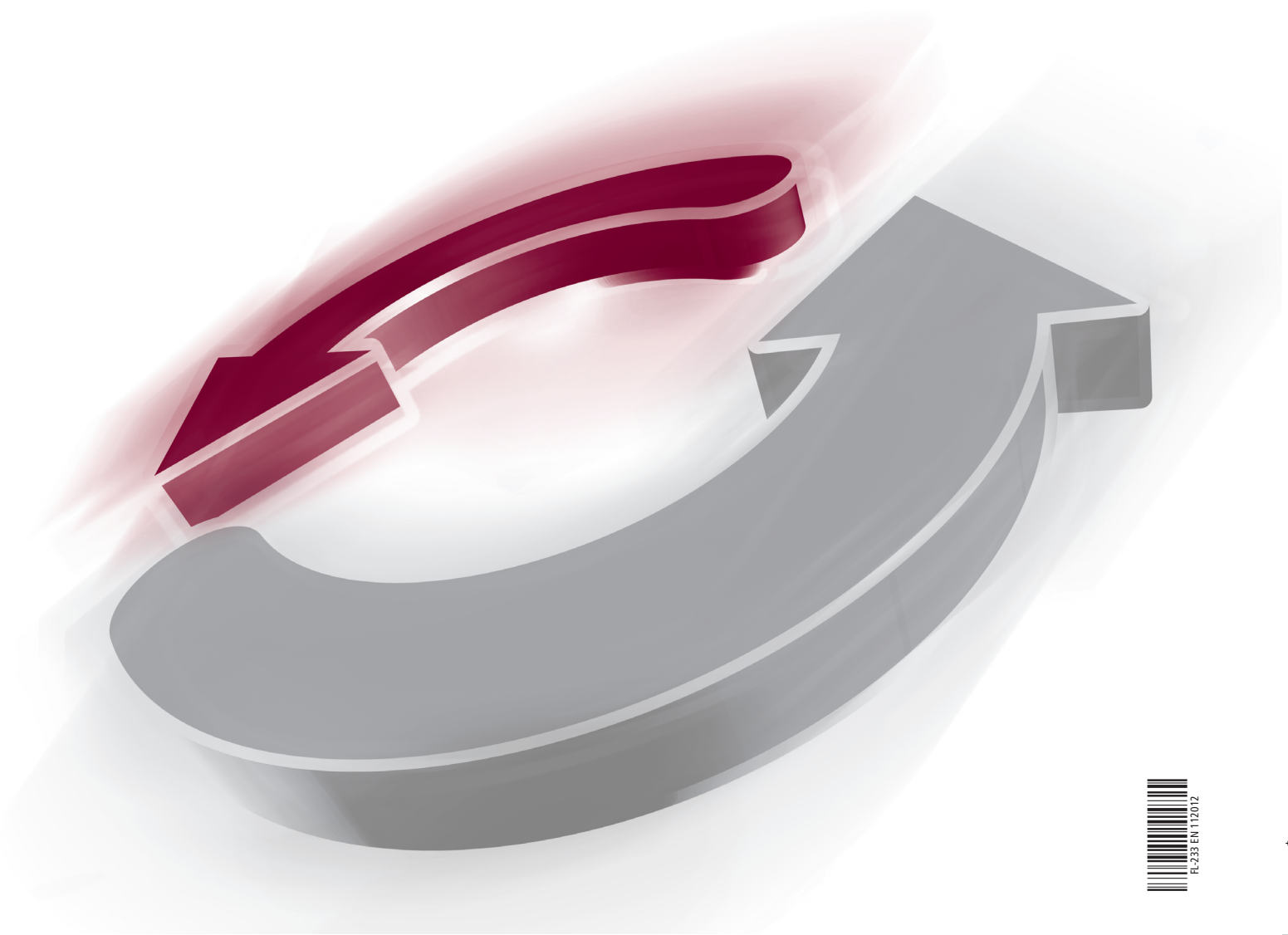
MASCHINE	MATERIAL	CONTROL
OKUMA Gantry	GG30	OKUMA - FANUC
PRACRICAL EXAMPLE	COMPETITION	PLANWORX®
Part	Clamping plate	
Material	GG 30	
Holder	BT 50	
Tool	diam. 63 z6	6 63 331 (diam. 63, z6)
Part clamping system	SNMX 1206	05 31 862
Coating	unknown	PVTi
Overhang	200 mm	200 mm
v_c (cutting speed)	220 m/min	261 m/min
v_f (total feed)	1.199 mm/min	1.920 mm/min
S (speed)	1.111 1/min	1.600 1/min
f_z (feed per tooth)	0,18 mm	0,2 mm
a_p (cutting depth)	3,25 mm	3,25 mm
a_e (cutting width)	37,8 mm	37,8 mm
Machinig volume	147,29 cm ³ /min	235,87 cm ³ /min
Machining time	264 min	165 min
Time saved	99 min	



Result:

The machining time of the whole part was reduced by 99 min. The complete clamping plate was machined without changing the insert holder. That means customers are able to save 37 % of the machining time, which can be used for other tasks.

A clear plus for the continued use of tools produced by Pokolm Frästechnik GmbH & Co. KG of Harsewinkel. The future course is clearly set with Pokolm premium tools.



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