

# QUADWORX® „S“

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⊖ FOUR CUTTING EDGES OFFER HIGH EFFICIENCY

## ⊖ CONTACT

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## FOUR CUTTING EDGES OFFER HIGH EFFICIENCY

**Q**uadworx<sup>®</sup> „S“ - this new Pokolm development is suitable for universal application in high-feed-milling.

The new generation of Quadworx<sup>®</sup> „S“ milling cutters enables high feed rates when rough machining steel, cast iron and tempered steels; and NOW also when machining acid-resistant and corrosion-resistant materials, providing more efficiency and improved machine capacity. Quadworx<sup>®</sup> „S“ tools, diameter 14 to 25 mm, are available with threaded shank as well as with the DuoPlug<sup>®</sup>-system (patent held by Pokolm) for highest concentricity and maximum rigidity. All tools are provided with internal coolant supply to ensure maximum process reliability and secure chip removal when machining deep cavities.

Four cutting edges per insert and the special macro-geometry (large radius and wiper edge) enable universal application in the field of mould and die production. Adapted micro-geometries with polished rakes face help to minimise the temperature of the inserts while ensuring good chip evacuation. Maximum stability together with precision-manufactured inserts provide an excellent machining result. In addition, this combination also guarantees very high chip removal rates and consistently low cutting forces. Incorporated insert seats and increased tooth stability improve tool life, chip removal rate and productivity. The precision-manufactured

inserts in grades HSC05, P40 and the new grade M40 (which is provided with a chip groove and the recently developed PVST coating) are very economic regarding both the number of cutting edges and tool life. M40 and PVST represent the new characteristics for profitable machining of corrosion-resistant and acid-resistant materials. Extremely tough and temperature resistant carbide together with a specially modified AlTiN coating reduces built-up edge, increases heat resistance and simultaneously decreases frictional wear.

The contact faces for the inserts are in orthogonal position to each other, and the second clearance face ensures absolutely secure positioning of the insert in the tool. This results in maximum process security with maximum chip volume and low work piece costs.

As for all other tools with undefined corner radius the radius to be programmed has to be taken into account.  $R_p = 1.3 \text{ mm}$  must therefore be used for all tools. Extended application data and diameters can be found on the following pages.



02 47 896  
M40 PVST



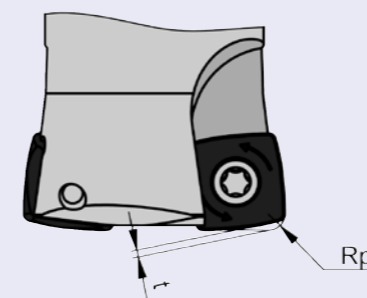
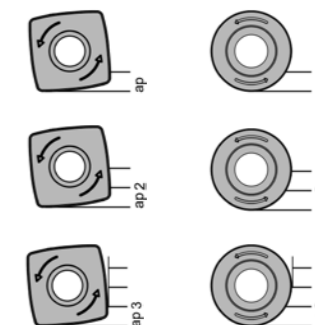
02 47 842  
P40 PVTi

## TECHNICAL INFORMATION

Due to the reduced arc of contact, when machining vertical moulds, less cutting forces influence milling cutters, inserts and machine spindle.

These following graphics explain the kind of geometry-influence to those cutting forces. One further element is the reduced power consumption of the machine, which allows more careful treatment of the machine.

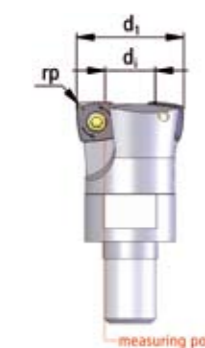
**C**omparing different arcs of contact for increasing cutting depths ( $a_p$  up to  $a_{p3}$ ) illustrate the reason of better running smoothness. As soon as the  $a_p$ -value has exceeded the size of our Quadworx-insert's minor cutting edge ( $a_{p3}$ ), the milling cutter gets a side clearance and thus it is cutting free and radial forces for milling cutter, inserts and machine spindle are decisively reduced.



Please take notice of the theoretical corner radius, which has to be programmed. The face milling cutter leaves a material stock not pre-determinable. When applying the tools listed please take the following value into account:

**This dimension "t" is 0.51 mm.**

Catalogue No.	$d_1$	$d_i$	Size of remaining stock t
2 16 247 SG	16	5,66	0,51
3 18 247 SG	18	7,72	0,51
3 20 247 SG	20	9,72	0,51
4 25 247 SG	25	14,78	0,51
2 14 247	14	3,7	0,51
2 16 247	16	5,66	0,51
3 18 247	18	7,72	0,51
3 20 247	20	9,72	0,51
4 25 247	25	14,78	0,51



**Definition of measuring point for Laser-linear-monitoring:**  
Please use diameter:  $d_i$

# DIMENSIONS AND OPERATION DATA



## The Quadworx® „S“-Range:

MILLING CUTTER BODIES		Catalogue No.								
		d <sub>1</sub>	l	r <sub>p</sub>	d <sub>2</sub>	d <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>	z	
	2 16 247 SG	16	7	1,3	M 10	15	1	38,5	2	
	3 18 247 SG	18	7	1,3	M 10	15	1	40	3	
	3 20 247 SG	20	7	1,3	M 12	18,5	1	40	3	
	4 25 247 SG	25	7	1,3	M 16	21,5	1	40	4	
	2 14 247	14	7	1,3	M 8	13,8	1	28,5	2	
	2 16 247	16	7	1,3	M 8	13,8	1	28,5	2	
	3 18 247	18	7	1,3	M 8	13,8	1	28,5	3	
	3 20 247	20	7	1,3	M 10	18	1	28,5	3	
	4 25 247	25	7	1,3	M 12	21	1	32,5	4	

## Indexable Inserts DIN-Identification: SDMX 07 02 05 SN

INDEXABLE INSERTS		Catalogue No.								
		DIN-Identification	l	s	r	M	Grade	Coating		
	02 47 837	SDMX 07 02 05 SN	7	2,38	0,5	M 2,5	HSC 05	PVTi		
	02 47 842	SDMX 07 02 05 SN	7	2,38	0,5	M 2,5	P40	PVTi		
	02 47 896	SDMT 07 02 05 SN	7	2,38	0,5	M 2,5	M40	PVST		

## Accessories

ACCESSORIES		Catalogue No.		Description		Dimensions	
	25 500	Torx screw		M 2,5	L 5,0	T 7	
	07 500	Torx screwdriver		T 7			

Starting torque for Torx® screw 25 500 M<sub>d</sub>: 1,28 Nm

## Application data (f<sub>z</sub>/a<sub>p</sub>)

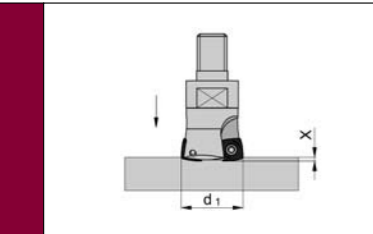
MATERIAL		CUTTING MATERIAL AND COATING				
		l	f <sub>z</sub> /a <sub>p</sub>	HSC05 PVTi	P40 PVTi	M40 PVST
Steel		7	f <sub>z</sub> (mm) a <sub>p</sub> (mm)		0,3 - 1,5 0,2 - 0,7	
Cast Iron		7	f <sub>z</sub> (mm) a <sub>p</sub> (mm)	0,3 - 1,5 0,2 - 0,7		
Hardened Steel		7	f <sub>z</sub> (mm) a <sub>p</sub> (mm)	0,3 - 1,0 0,2 - 0,5		
Stainless Steel		7	f <sub>z</sub> (mm) a <sub>p</sub> (mm)			0,2 - 1,0 0,1 - 0,5
High-temperature alloys		7	f <sub>z</sub> (mm) a <sub>p</sub> (mm)			0,2 - 0,8 0,1 - 0,5

## Cutting Speeds V<sub>c</sub> in m/min

MATERIAL		CUTTING SPEEDS				
		l	Application	HSC05 PVTi	P40 PVTi	M40 PVST
Steel		7	roughing finishing		100 - 200	
Cast Iron		7	roughing finishing	160 - 300		
Hardened Steel		7	roughing finishing	100 - 180		
Stainless Steel		7	roughing finishing			80 - 180 110 - 250
High-temperature alloys		7	roughing finishing			40 - 80 60 - 120

## EXTENDED OPERATION DATA

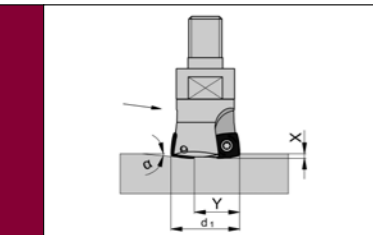
**axial plunging into solid block**



x maximum plunge depth  
 $f_z$  see operation data table, but reduce value to 30%

Cutter Diam. $\varnothing d_1$ , mm	x max. mm
14 – 25	1

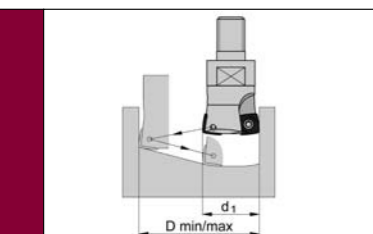
**incline plunge milling**



y minimum travel  
 x maximum plunge depth  
 $a_p/f_z$  see operation data table

Cutter Diam. $\varnothing d_1$ , mm	$\alpha^\circ$	y mm
14	< 13,5	4
16	< 8,8	6
18	< 6,6	8
20	< 5,2	10
25	< 3,3	15

**circular milling into solid block**



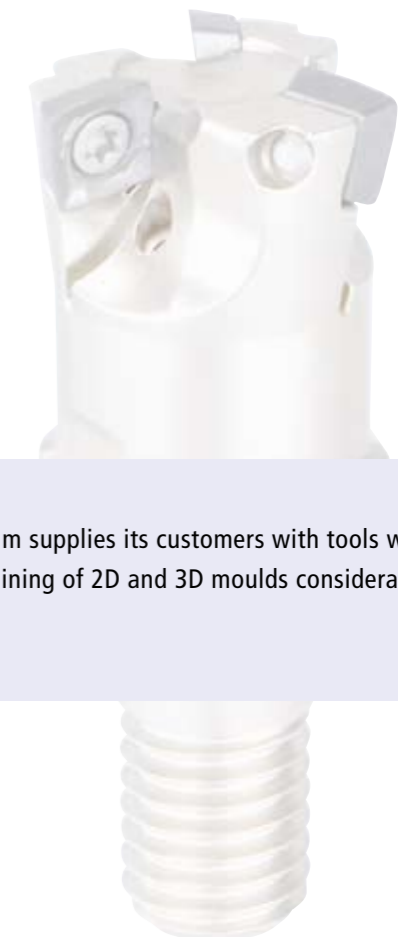
$a_p/f_z$  see operation data table

Cutter Diam. $\varnothing d_1$ , mm	$D_{min}$ mm	$D_{max}$ mm
14	18	28
16	22	32
18	26	36
20	30	40
25	40	50

$D_{min}$  minimum bore diameter depending on cutter diameter  
 $D_{max}$  maximum bore diameter depending on cutter diameter

## SUMMARY OF ADVANTAGES:

- ⊕ four cutting edges per insert for extremely economic applications
- ⊕ very high chip removal rates and very light cutting action
- ⊕ thanks to the insert position above the second clearance face and the 90° setting angle twisting of the insert is avoided
- ⊕ maximum process reliability specially by interrupted cutting through absolutely secure positioning of the insert



Thanks to continuous development of our production technologies, carbide grades and up-to-the-minute coatings which are specially tailored to the application,

Pokolm supplies its customers with tools which make machining of 2D and 3D moulds considerably easier.