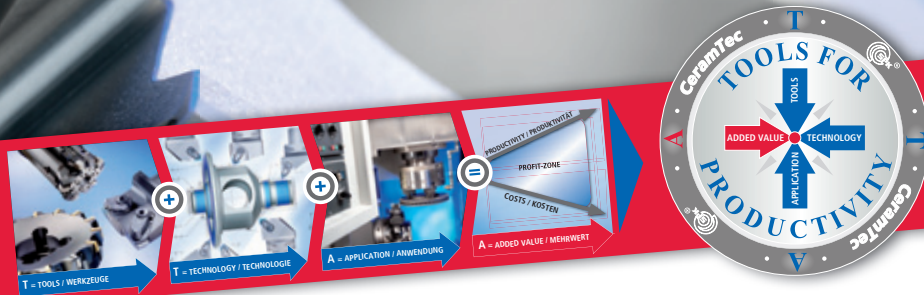




TOOLS

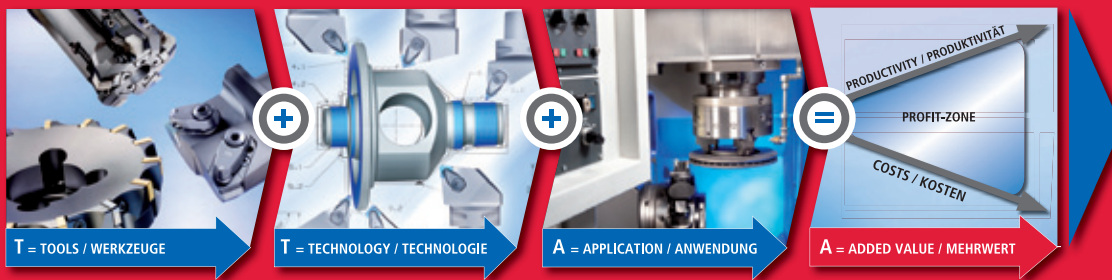
TECHNOLOGY

APPLICATION



SOFT-CUT

High-speed milling with minimal power consumption

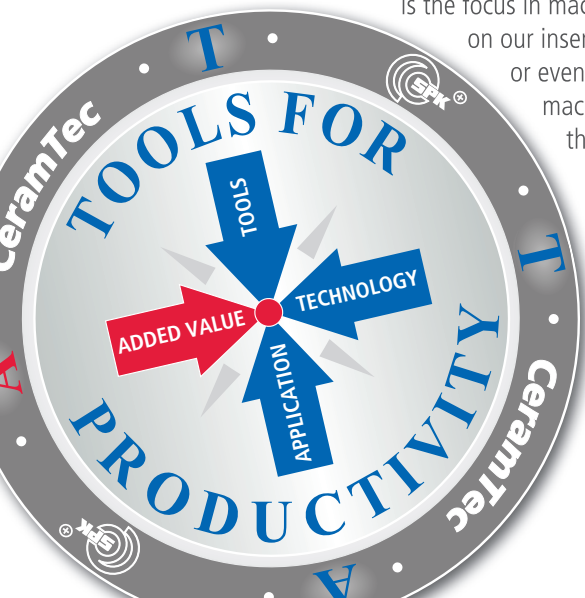


TOOLS FOR PRODUCTIVITY

Achieving the optimal machining of a workpiece is no longer solely dependent on the cutting process. Increasing technological and economical challenges require highly efficient machining processes. To this end, we have developed the programme “SPK+ - The Productivity Experts” with the formula: **tool + technology + application = increased productivity with lower costs**. It has already been shown that the formula means a boost in productivity for our customers in many specific applications. In the future, we will draw attention to this by placing a “productivity compass” on our products as a visible sign and seal of quality. The compass stands for our Tools for Productivity. Wherever you find our productivity compass, it will show you that the maximum contribution to productivity

is the focus in machining. Whether on our inserts, tool carriers or even on processing machines, whenever the machining process has been optimised by our

engineering on location. We work together with our customers from the beginning and provide them with highly specialised experts in the world’s most important markets. In this way, we can guarantee that using our **Tools for Productivity – tool + technology + application** – will guide you directly to your goal of perfected machining and maximum productivity. Our high performance cutting materials, precision tooling systems and our extensive range of services are perfectly tailored to meet the demands resulting from higher productivity. Our productivity compass is the productivity seal you can trust. More information can be found at www.tools-for-productivity.com



The Soft-Cut Milling System



HIGH-SPEED MILLING WITH MINIMAL POWER CONSUMPTION AND EXTREMELY QUIET OPERATION

The double positive Soft-Cut milling system is systematically designed for rough milling thin or unstable components at high feed rate speeds using ceramic cutting materials. What sets the Soft-Cut milling system apart



is its low cutting and passive forces, which are created by the axial and radial positive geometry.

The milling cutter is equipped with highly positive octagonal inserts. The eight-sided design of the inserts makes the Soft-Cut milling cutter series an extremely cost-efficient solution. The milling cutter series allows for reliable rough milling with a cutting depth of up to 4 mm at feed rate speeds of up to 10 m/min. These high cutting figures greatly reduce processing times while markedly increasing milling productivity. As a result, the processing costs per component sink and machine capacities are feed up and can be used for other work. The Soft-Cut milling system was designed

for high-performance rough milling and rough finishing of cast housing made of grey cast iron (GJL) and ductile cast iron (GJS) for general machinery construction as well as in the automotive and agricultural industries. The milling system is able to reliably process thin-walled or unstable components, but it can also perform rough milling tasks on cast iron workpieces with ceramic cutting materials at machining centres with very little available power. Furthermore, fewer forces are required for workpiece clamping.

The extremely soft cutting offers another advantage: The Soft-Cut series is able to greatly minimise the amount of noise produced during milling processes. In addition, burr formation on the workpiece has been significantly reduced. The milling cutters are characterised by their extremely quiet operation and the excellent surface quality they produce.

The Soft-Cut milling system PFL-OEHX is the perfect complement to the SPK Cutting Tools Division's line of milling products. The PFL-SP series of milling cutters, designed using positive geometries with screw clamping, and the PMK series of milling cutters with negative geometries and wedge clamping, are available with approach angles of $\alpha = 45^\circ$, 75° and 88° . The -OP and -OE milling cutters are the perfect addition for rough milling and finishing.

The SPK Cutting Tools Division provides an optimised line of milling products for the entire application spectrum for highly efficient and quick rough milling and finishing of cast iron.

Detailed information about CeramTec GmbH's SPK milling tools systems can be found at www.spk-tools.com/milling/

i Highly positive insert

Extremely low cutting forces for:

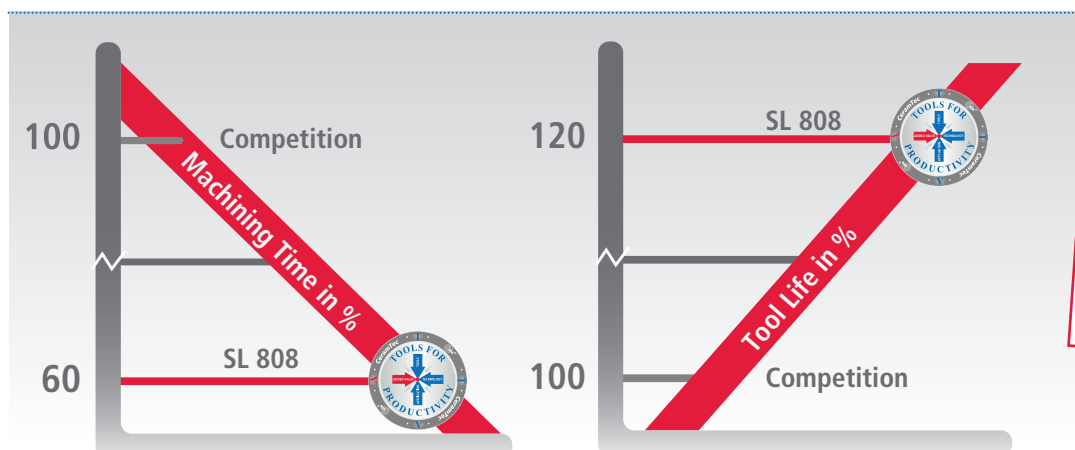
- Reduced power consumption
- Increased surface quality
- Minimal burr formation
- Extremely quiet operation



OEHX insert with 20° clearance angle



MACHINING TIME REDUCED BY 40% TOOL LIFE INCREASED BY 120 % WHEN ROUGH MILLING A HYDRAULIC BLOCK



REQUIREMENTS:

- REDUCE CUTTING FORCES
- SHORTEN PROCESSING TIMES
- REDUCE BURR FORMATION
- PROCESS RELIABILITY

CONDITIONS:

- DRY PROCESSING

SPK ENGINEERING FOR INCREASING EFFICIENCY THROUGH

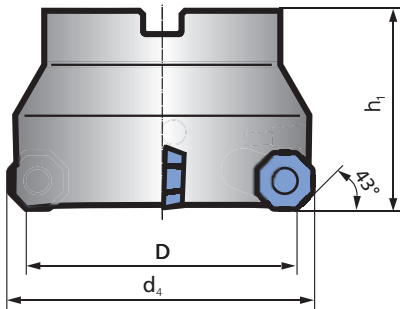
- RECOMMENDING A MILLING SYSTEM
- DEFINING THE MILLING STRATEGY
- DETERMINING THE CUTTING PARAMETERS

Rough milling a hydraulic block

	Competition	SPK Cutting Tools
Grade:	Carbide metal, coated	SL808
Milling cutter:	D=63, $\kappa=45^\circ$	PFL-063-050E06..
Insert:	ONHN 08 06 08	OEHX 08 06 08
Feed rate speed v_f :	1516 mm/min	3536 mm/min
Cutting speed v_c :	300 m/min	700 m/min
Feed rate f_z :	0.2 mm/z	0.2 mm/z
Depth of cut a_p :	2-3 mm	2-3 mm
Contact width a_e :	40 mm	40 mm
Machining time:	0.30 min	0.12 min
Tool life quantity:	100 %	120 %

Replacement criteria: Burr formation on the workpiece

Soft-Cut milling system, PFL-OEHX



Axial rake angle $\gamma_a + 14^\circ$

Radial rake angle $\gamma_r + 2^\circ$

Dimension table according to DIN 8030

i Recommended application

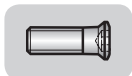
GJL (GG) GJS (GGG)

WORKPIECE
thin-walled ✓ unstable ✓

$f_z = 0,16 - 0,3$ mm/tooth

12.5/ ∇ • 6.3/ ∇ •

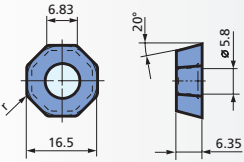
Type	SPK-Order-No.	Dimensions				
		D	Teeth z	h_1	d_4	n_{max} (min ⁻¹)
PFL-050-040E0643R-AM	771.00.005.24	50	4	40	60,2	18000
PFL-063-050E0643R-AM	771.00.005.34	63	5	40	73,2	13000
PFL-080-060E0643R-AM	771.00.005.44	80	6	50	90,2	10000
PFL-100-070E0643R-AM	771.00.005.54	100	7	50	110,2	8000
PFL-125-090E0643R-AM	771.00.005.64	125	9	63	135,2	8000
PFL-160-110E0643R-AM	771.00.005.74	160	11	63	170,2	6000
PFL-200-130E0643R-AM	771.00.005.84	200	13	63	210,2	4000
PFL-250-160E0643R-AM	771.00.005.94	250	16	63	260,2	3000



70.91.50.689.0



70.91.55.210.0

INSERT	ISO	GRADE	SPK-ORDER-NO.
<p>OEHX 06 06 16 T</p> 	OEHX 06 06 16 T 01020	SL 808	17.76.016.20.1

www.tools-for-productivity.com

CeramTec
THE CERAMIC EXPERTS

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