MACHINING SOLUTIONS FOR INDUSTRIAL SECTORS
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AUTOMOTIVE INDUSTRY

For over 50 years, precision tools from CeramTec have been an integral part of highly productive machining solutions for components from the automotive industry. With our tool solutions, the implementation of concrete cost savings and increased productivity is always a top priority. Component examples: brake components, fly wheels, clutch plates, brake drums, components, shafts, hydraulic elements, engine components.

AEROSPACE

The aerospace industry places extremely high demands on machining in terms of machining capacity and process safety due to the high-precision requirements and the exacting cutting materials together with our Micon Tool Technology tools are the optimal solution. Component examples: all engine components such as blisks.

MACHINERY AND PLANT ENGINEERING

Manufacturing complex components made of different materials with extreme precision and optimal surface quality in an economic way—that is the basic structure of requirements for which we work together with our customers to create innovative, cost-efficient machining solutions. Component examples: Gearboxes, housing, frames, guide rails, shafts, rollers.

AEROSPACE

The aerospace industry places extremely high demands on machining. In this field, machining capacity and process safety are the crucial parameters, and our CSA cutting materials together with our Monsoon Tool Technology tools are the optimal solution. Component examples: Jet engine components such as blisks.

WIND ENERGY

In the field of wind energy, components mostly require special machining solutions, since the components involved are often extremely heavy, subject to natural influences, and have a high level of surface quality performance, made of diverse materials and tools. By observing and analyzing the determining factors for machining, we are able to provide our customers with extremely efficient and cost-effective machining solutions. Component examples: Rotor flanges, blade connections, planetary gear components, gearbox housing, gear components.

GEAR TECHNOLOGY, DRIVE TECHNOLOGY AND BEARING INDUSTRY

Surface quality, tolerances and the tool life of the cutting materials are the standards for high machining. Our unique range of cutting materials of PcBN and ceramic, together with our perfectly matched tools, set the bar in this industry. In practice, this results in highly efficient and cost-effective machining. Component examples: Drive components, drive shafts, hydraulic elements, motor components.

BETTER INDUSTRY

For over 50 years, precision tools from CeramTec have been an integral part of highly productive machining solutions for components from the automotive industry. Component examples: Brake discs, brake drums, fly wheels, connecting rods, engine components.

TRANSPORT

Where machinery components for the transport industry are often required to ensure for the machining process to remain economic and efficient. Our tools and cutting materials make these kinds of solutions possible. Component examples: Wheel rims, shafts, bearings.

AUTOMOTIVE

For over 50 years, precision tools from CeramTec have been an integral part of highly productive machining solutions for components from the automotive industry. Component examples: Brake discs, brake drums, fly wheels, connecting rods, engine components.

AGRICULTURAL AND CONSTRUCTION MACHINERY

We offer highly efficient bearing solutions for components, agric. and construction machines. Our range of solutions are perfectly used for machining of soft steel as well as processing cast iron and hardened parts. Component examples: Drive components, drive shafts, hydraulic elements, motor components.

MOTOR INDUSTRY

The high-performance materials that are used in this industry require special solutions, which ensure an extremely high level of process reliability and component quality. In order to find the perfect solution, we consider the entire solution. Component examples: Connecting rods, pulley wheels, cylinder heads, cylinder liners.
We optimise machining productivity in your production processes

We optimise machining productivity in your production processes

by extremely high precision in limited tolerance

to manufacture products that are characterised

by extremely high precision in limited tolerance

for machining tasks. These tools make it possible

holder systems to create the optimal solutions

materials, coatings, insert geometries and tool

with a wide range of state-of-the-art cutting

SPK tools provide the manufacturing industry

becoming increasingly important. It brings to-

of practical knowledge regarding the use of our

mance of the machining tools and the amount

primarily influenced by two factors: the perfor-

Efficient implementation of these attributes is

ranges and perfectly matched surface qualities.

reliability.

create processes with increased productivity and

materials, components and the machine situation to
together cutting materials and tools with the ma-

machining and uses this know-how to create the

proven, reliable solutions with the highest possi-

high-performance cutting materials and modern high-performance cutting materials

Our engineering team is there for you around the globe!

for machining tools is solely on the purchase price. In practice, it has

As opposed to a comprehensive view of the machining process, the focus

Productivity

Defining tools

Designing cutting data

Consulting

Input engineering

Productivity gap

Our engineering team is there for you around the globe!

Productivity

A defines its values and objectives, it should be identified which additional resources which would optimise the process are

We tap into the potential of your machining processes

Handeng/Innovation

+50%

Engineering/Innovation

- Productivity

Setting up the optimal production costs per part

Productivity

Productivity

% of additional cost

% of additional value

output per unit of input


to manufacture products that are characterised

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In terms of scope and variety, CeramTec offers an internationally respected, one-of-a-kind range of ceramic cutting materials, PCBN, cermets and a large number of coatings for machining tasks such as hard turning, turning, grooving, milling and boring.

Silicon nitride ceramics
Silicon nitride ceramic inserts are ideal for machining cast iron parts with high cutting data and high machining speeds. They ensure reliable production in a wide range of applications. www.spk-tools.com/siliconnitrideceramics

α/β SiAlON ceramics
These gradient cutting materials are characterised by extreme hardness and wear-resistant surfaces, enabling continuous rough, cross-cutting. A vast range of possible applications when machining cast iron materials make them HPC specialists. www.spk-tools.com/sialonceramics

Mixed ceramics
These composite cutting materials feature exceptional wear resistance, edge stability and red hardness. They are used for processing hardened steels, hard machining of rolls, and finishing and medium machining of cast iron parts. www.spk-tools.com/mixedceramics

Cutting materials for hard turning
CeramTec has one of the largest selections of PCBN and ceramic cutting materials for turning and grooving components made of hardened steel. Our solid PCBN variants are particularly optimal for implementing machining strategies that reduce process times. www.spk-tools.com/hd-line

Cermets
This cutting material is ideal for rough finishing, finishing and fine finishing of steel, sintered metal and cast iron with both continuous and lightly interrupted cuts. We offer a wide range of chip breaker geometries for optimum, reliable chip formation and chip breaking. www.spk-tools.com/cermets

CSA cutting materials
This cutting material is ideal for turning and grooving of engine components. It has opened up new horizons for machining engine components in the aviation industry. www.spk-tools.com/CSA

Oxide ceramics
These traditional cutting materials for turning and grooving are ideal for use in machining processes with grey cast iron and ductile cast iron as well as parts made using organic bonding. www.spk-tools.com/oxideceramics

PCBN for machining cast iron
The unique and comprehensive range of PCBN high-performance cutting materials allows for reliable HPC machining of grey cast iron and chilled cast iron. From continuous to interrupted cuts, these materials feature exceptional behaviour reliability and set new standards for machining speeds, tool life and reliability. www.spk-tools.com/pcbn-castiron

Contents
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- α/β SiAlON ceramics
- Mixed ceramics
- Cuttings for hard turning
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- Cermets
- CSA cutting materials
- Oxide ceramics
- PCBN for machining cast iron
- Contents
The corresponding tool system, our Monsoon Tool Technology tool, uses integrated high-pressure cooling to ensure reliable chip breaking. The tool prevents the formation of problematic continuous chips and the CSA cutting materials can be used with high cutting data for the highest possible level of reliability.

We offer a complete package for engine construction in the aviation industry, consisting of our CSA cutting materials and the corresponding tool system, our Monsoon Tool Technology tool.

The CSA cutting materials were developed for high-performance machining of engine components in the aviation industry. CSA cutting materials combine extreme wear resistance and exceptionally high reliability. This makes it possible to significantly reduce machining times for turning.
TOOLS FOR TURNING

With our turning tools for external and internal machining, our cartridges and our tool changing systems, we offer a large number of turning solutions that increase productivity, optimise processes and reduce costs.

Cartridges
Our cartridges are designed in accordance with ISO standards. They can be adjusted axially and radially, which allows them to be used in a wide range of applications for external and internal machining.

Easy Change technology
This technology allows you to change the cutting material back and forth between ceramics and PCBN easily and simply and, with the S3 system, it ensures that the clamping element remains in the right position – even in overhead or sideways positions.

Heat protector
For the S3 system, the insert can be made of high-performance ceramics, which allows it to provide thermal insulation.

ODC force clamping technology
The S3 clamping technology ensures that the clamping force is optimally distributed so that the insert is reliably clamped as a result. Part of the clamping force is applied directly to the insert, fixing it reliably, creating a form-fit seal. Two thirds of the clamping force are applied in the insert seating.

Boring bars
Our boring bars are designed for optimal chip removal while ensuring a high level of stability against vibrations. Standard and special lengths, different diameters and a wide range of holder designs allow for reliable high-performance internal machining with our cutting materials.

System S3
S3 system standard and special turning tools can be equipped with extra features that significantly increase the reliability and the tool life of the tool holder. This allows the tool system to be flexibly adjusted on-location based on factory conditions. For example, clamping elements are available in carbide versions and tool holders are available in special materials.

Cartridges
Our cartridges are designed in accordance with ISO standards. They can be adjusted axially and radially, which allows them to be used in a wide range of applications for external and internal machining.

Tool holder
Our comprehensive range of standard and special tool holders are designed specifically for reliable high-performance machining with ceramic cutting materials, PCBN and ceramics. They can be used in a number of applications from heavy roughing to medium finishing tasks all the way to finishing and fine finishing. The range offers a wide spectrum of tool holder designs and insert types.

Modular tool changing systems
Precise machining of a part places great demands on the tool system, especially when changing tools. In order to meet the requirements for changing precision, handling and stability, our tools are available in all standard interface systems.

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TOOLS FOR HARD TURNING

We offer a variety of PCBN and ceramic cutting materials along with the matching tool holder systems for hard turning and finishing of gears, drive components and bearing components for individual, series or mass production. Our HD-Line cutting materials include a comprehensive selection of coated PCBN and ceramic high-performance grades for continuous cuts all the way to heavily interrupted cuts for hardened components with hardness up to 63 HRC. Our ceramic cutting materials for hard turning are an excellent technological and economical alternative for continuous cutting.

To supplement our multi-tipped and laminated inserts, we also offer solid versions made of PCBN, which allows you to implement alternative machining strategies. Our insert preparation expertise and the wide range of cutting materials available for hard turning allow us to implement even the most challenging hard turning applications in an economic and efficient way.

Hard turning with SPK tools
- Excellent surface quality
- Increased process reliability
- Shorter process chains
- High dimensional and shape accuracy
- High process flexibility
- Cutting materials for hard-soft transitions
- Continuous and interrupted cuts

Hard turning of a Gear

Inserts for Hard Turning
We offer a comprehensive range of standard and profiling tools for grooving and profiling. In our Engineering department, we design specially shaped grooving inserts and special holders, and manufacture them in our own in-house production facilities. When grooving with lateral movement, our RAG grooving system shows off its strength. The patented grooving insert's double prism clamping allows for high cutting values with extremely high reliability.
Face milling systems and their major areas of use

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<thead>
<tr>
<th>SPK milling type</th>
<th>PFK</th>
<th>PFL</th>
<th>BFL</th>
<th>PMK</th>
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- **Square shoulder milling and groove milling**: Our PFK milling system features exceptional performance for square shoulder and groove milling. High feed rates per tooth and effective chip removal along with moderate cutting forces come together with a variety of cutting materials to create a reliable and durable milling system with a wide range of possible applications.

- **High feed and helical milling**: The BFL milling system allows for maximum feed rates per tooth at high cutting speeds. Together with our corresponding standard inserts and standard cutting materials, it can show its high-feed qualities. The geometric design of the milling body allows for helical plunge milling into a workpiece in order to ensure the bearing seats are the right size.

- **Special tools and engineering**: When special milling tasks require special solutions, our Engineering department can show you their plans for how you can implement these milling tasks with standard or special milling tools efficiently and economically. The milling tools are then promptly manufactured exclusively in our own production facilities.

- **Working together with OEMs**: We offer support for original equipment projects based on our expertise and plans directly on location at machine manufacturers’ premises and in person with our customers.
We offer exceptionally powerful and flexible tool solutions for boring tasks: depending on the application, we can equip our boring tools with fixed insert seating or cartridges. For maximum efficiency, we design our boring tools with the optimum number of insert seats. In terms of the tool holder, we offer a comprehensive standard holder range – short taper, HSK taper or direct gripping.
Nowadays, optimal machining of a part is no longer solely dependent on paying attention to the cutting process. Continuously improving materials, continuously increasing qualitative requirements for components and growing environmental challenges mean that the entire machining process must be viewed holistically and optimised both in terms of technology and efficiency.

Our more than 50 years of machining experience makes it possible for us to design machining processes today that are highly efficient and low-cost thanks to our engineering services, coupled with our innovative high-performance cutting materials and our tool systems.

Our Engineering department plays a major role in this process. It answers questions of how a component can be machined optimally with our precision tools thanks to innovative and cost-optimised manufacturing strategies. They put together machining plans and perform time and cost studies in order to optimise machining processes.

In order to help our customers solve their machining challenges, we have made this process a standard as part of our programme SPK+ – The Productivity Experts with the engineering formula Tools + Technology + Application = more productivity at lower costs. A large number of specific applications have already shown that our engineering formula significantly increases productivity and lowers costs for our customers from a wide range of industries.

That is why we will be affixing a quality seal to our products in the future – our productivity compass, which is a sign of increased productivity for our engineered tools. Whenever you find our productivity compass, it will show you that the maximum contribution to productivity is the focus of our engineered machining solutions. Whether on our inserts, tool holders or even on processing machines, whenever the machining process has been optimised by our engineering on-location. Our productivity compass is the productivity seal you can trust.

www.tools-for-productivity.com