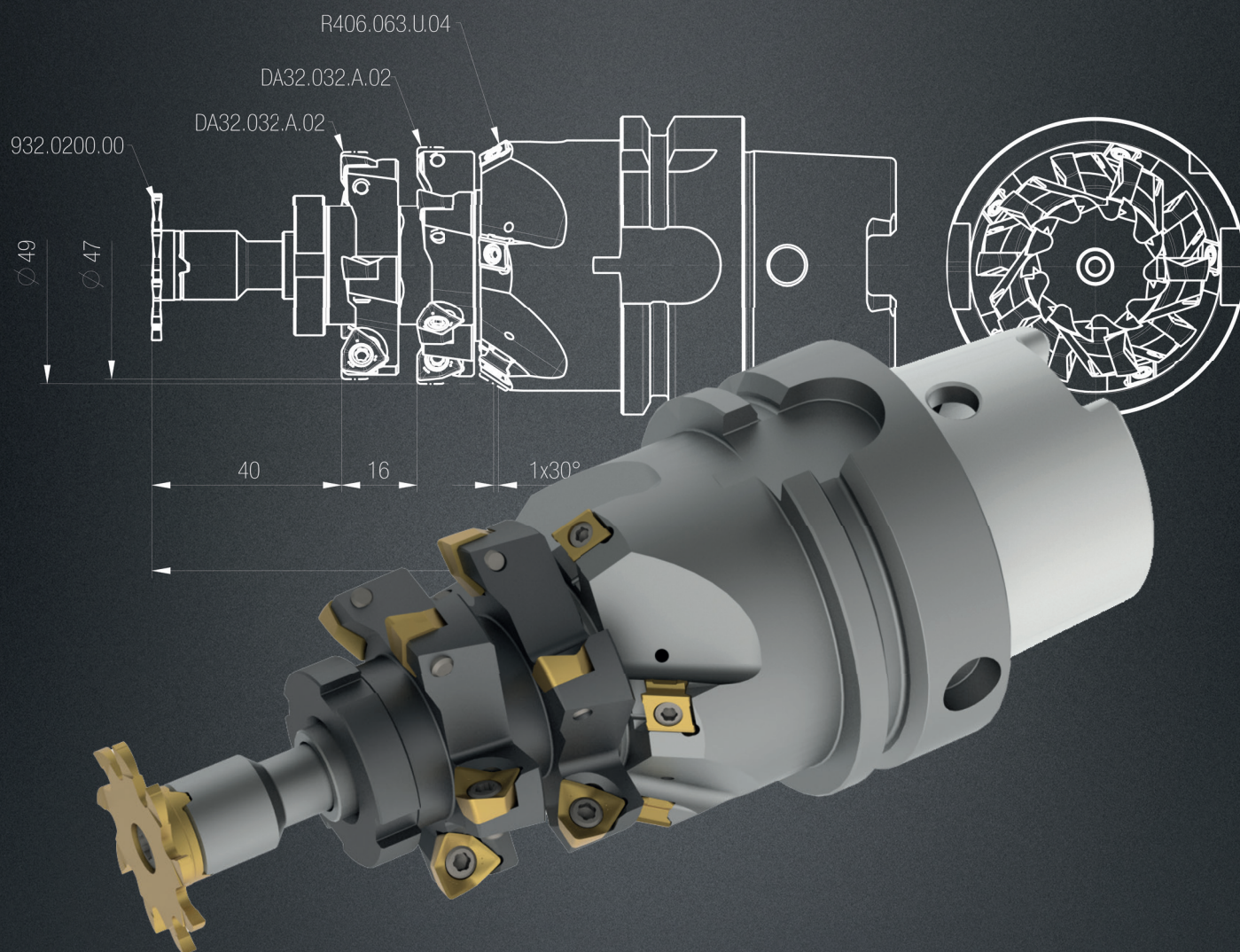


# SPECIAL AND COMBI TOOLS



- REQUIREMENTS
- TASKS
- SOLUTIONS
- ADVANTAGES



# DEAR READER,



Tool manufacturers are concentrating more and more on standard solutions. In many cases this is understandable, as the cost of developing special and combination tools is often very high. We take a different approach and give special and combination tools a lot of attention at our company. In addition, we have integrated processes that enable production of customised tools and with which we offer fast delivery times. In order to do this as effectively as possible with small quantities of special inserts and tool holder, we developed the „Greenline“ system. The description of this production control system is:

To deliver all orders for up to fifty inserts, including coating, within five<sup>(1)</sup> working days after approval of the drawing by the customer. For up to five tool holders ordered, the target is ten<sup>(1)</sup> working days.

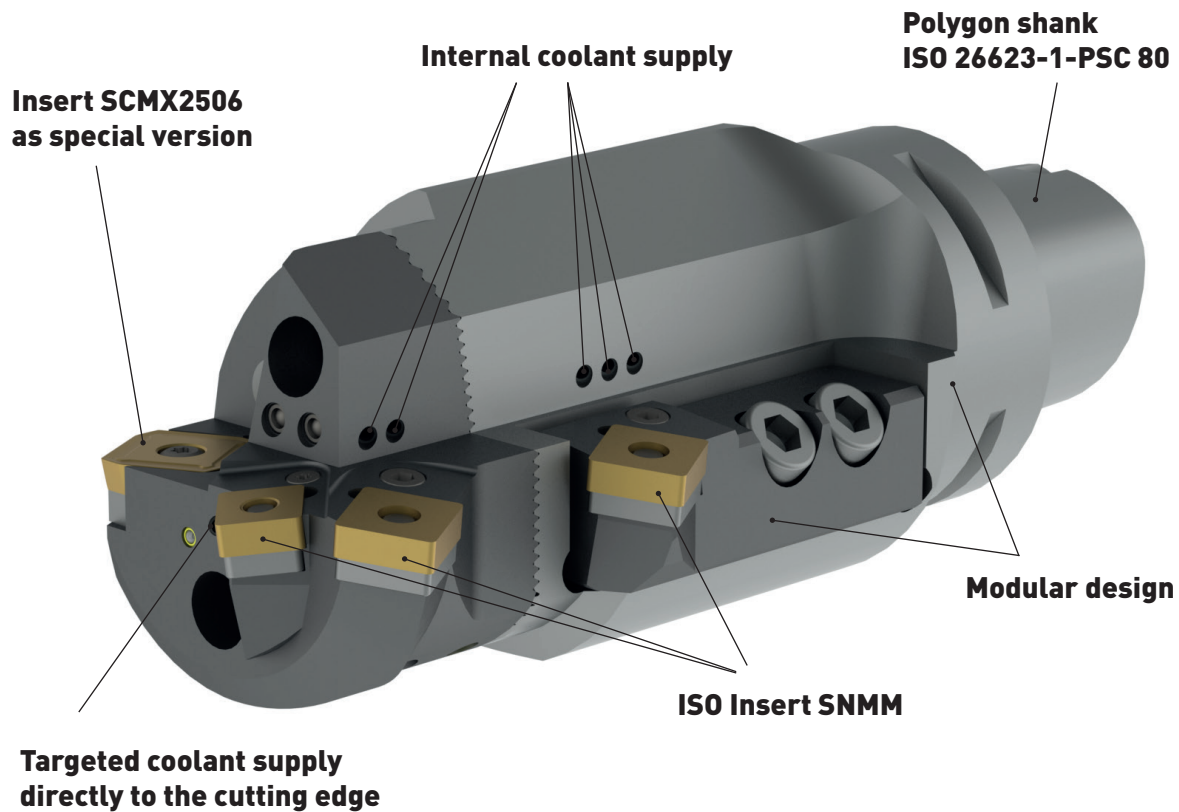
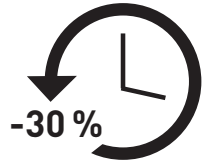
In addition to 25,000 permanently available standard tools, we have delivered over 150,000 special solutions to our customers. Currently, special and combination tools account about half of our production. On the following pages you will find examples that we have produced. If you are interested in a consultation, our sales engineers will be happy to assist you at any time.

A handwritten signature in black ink, appearing to read 'M. Rommel', with a stylized flourish at the end.

Matthias Rommel, CEO Paul Horn GmbH

<sup>(1)</sup> Please note that delivery times may be longer for orders placed from outside Germany.

# TWO INSERTS FOR HIGHER PERFORMANCE



## REQUIREMENT

Reduction in the time required for pre-machining API and Premium fittings.

## TASK FOR HORN

Design of a tool to save tool change times.

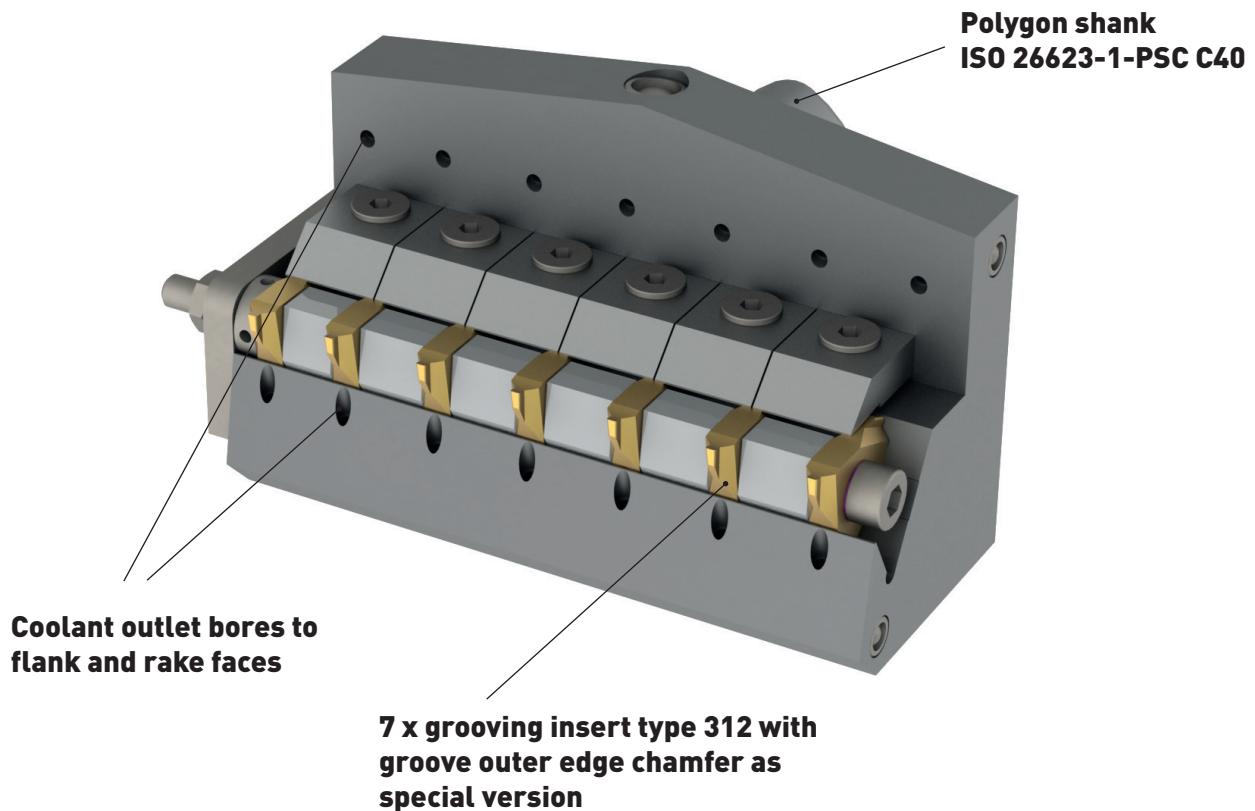
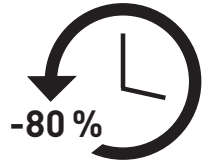
## TOOL SOLUTION

Modular combination tool with internal coolant supply for face turning. Internal turning with two ISO inserts arranged one behind the other and high-feed turning of the outer diameter with insert SCMX2506.

## ADVANTAGE

**Longer tool life for internal turning and 30% reduction in machining time due to the simultaneous use of two ISO inserts.**

# MORE EFFICIENCY THROUGH MULTIPLE GROOVING TOOLS



## REQUIREMENT

The machining of shafts with different varieties of grooves.

## TASK FOR HORN

Design of a tool with the required flexibility to makes it possible to produce a shaft with five, six or seven grooves in a given cycle time.

## TOOL SOLUTION

A multiple grooving tool based on our grooving system 312 in a polygon shank design with cooling directly to the cutting edge.

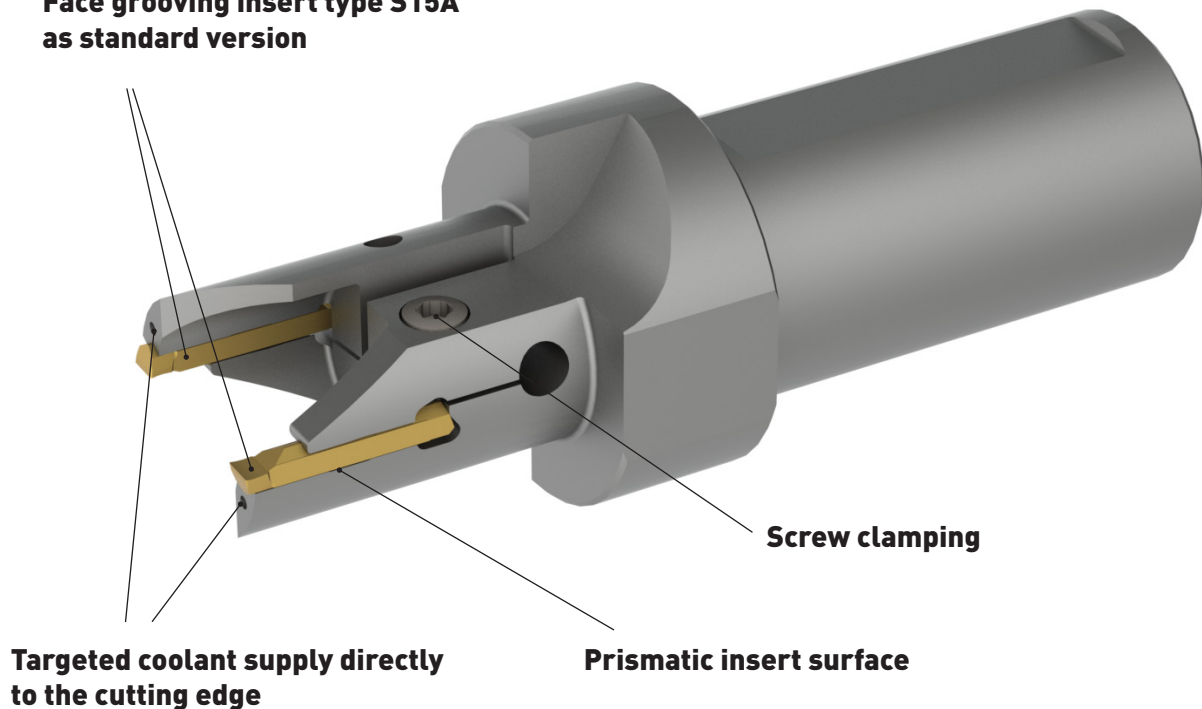
## ADVANTAGE

**Increased tool life through the use of multiple inserts, quick changeover and shorter cycles. Reduction of machining time by 80 %.**

# DOUBLE THE FORCE FOR AXIAL GROOVING



Face grooving insert type S15A  
as standard version



## REQUIREMENT

Fast, reliable production of an axial groove with a depth of 40 mm and a width of 5.65 mm.

## TASK FOR HORN

Design of a tool that allows the groove to be machined as efficiently as possible.

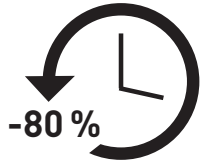
## TOOL SOLUTION

A special tool based on our axial parting system 15A/25A with two offset inserts and targeted coolant supply directly to the cutting edges.

## ADVANTAGE

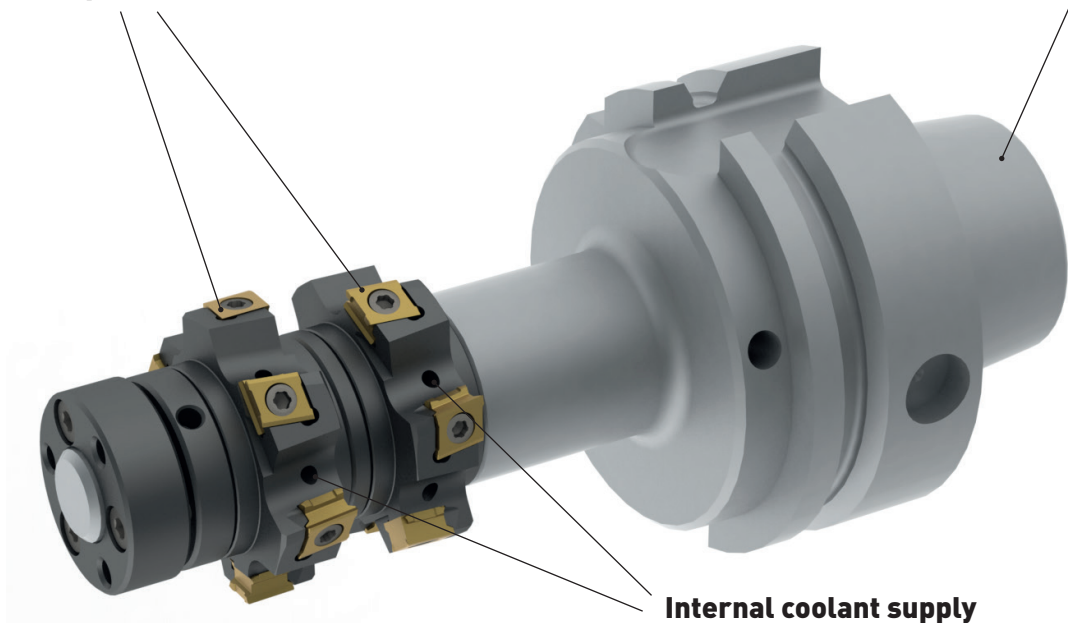
**Efficient chip removal due to chipbreaker geometry and offset cutting edge, low cycle time due to high metal removal rate. Reduction of machining time by 50 %.**

# SUCCESS WITH DOUBLE THE MILLING POWER



**Milling inserts type 406 with tangential screw as special version**

**HSK B-63**



**Internal coolant supply**

## **REQUIREMENT**

Reliable production of two grooves (11 mm) by turn-milling in one pass.

## **TASK FOR HORN**

The design of a milling tool on which pre-assembled inserts can be changed.

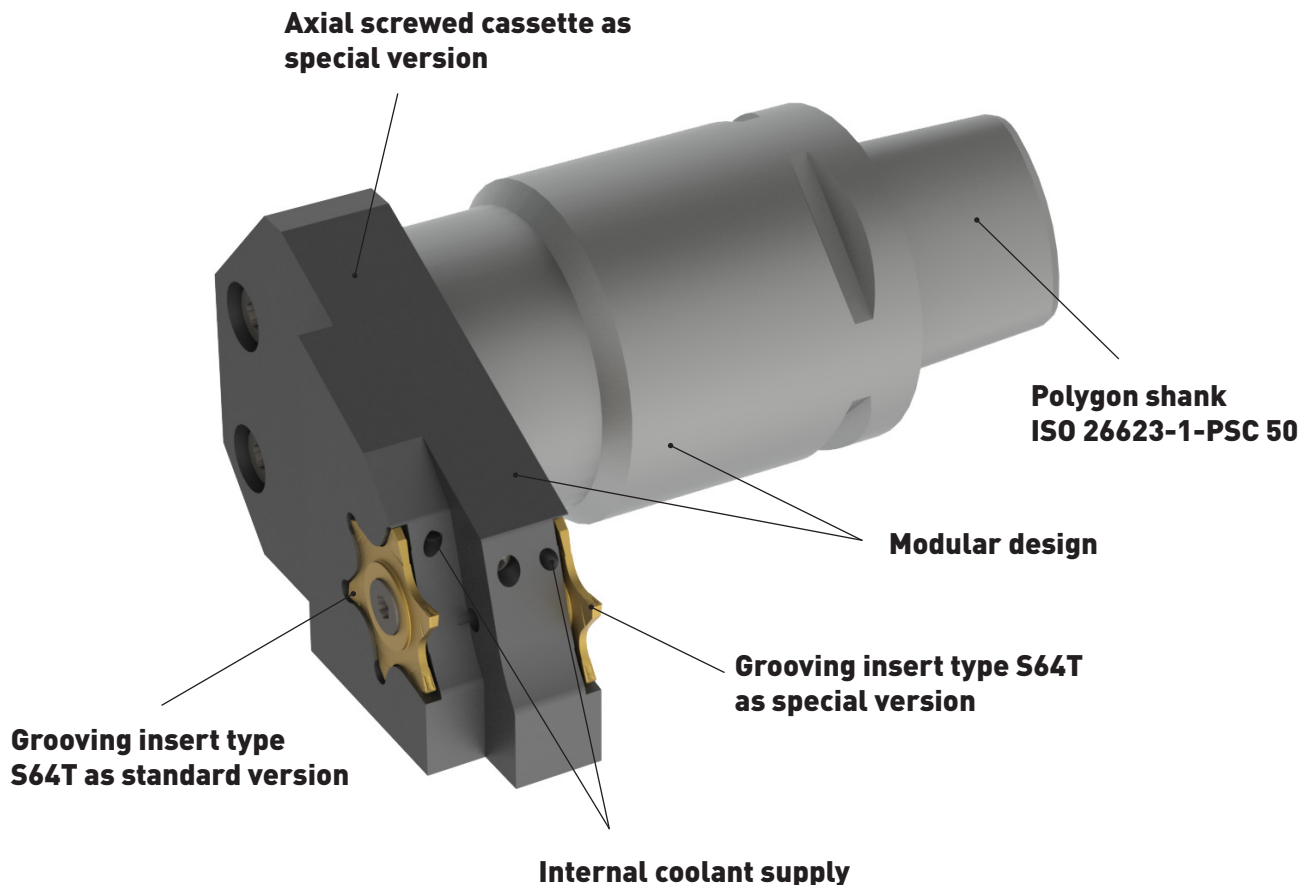
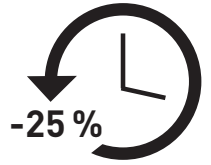
## **TOOL SOLUTION**

A modular combination milling tool with HSK B-63 interface based on tangentially screwed milling inserts type 406 as special version.

## **ADVANTAGE**

**Process reliability is guaranteed and set-up times have been reduced by 80 %.**

# FRONT AND BACK IN ONE CLAMPING



## REQUIREMENT

Production of two grooves without tool change. The special feature here is that one groove lies behind a collar that represents an interference contour.

## TASK FOR HORN

The design of a modular tool with which it is possible to machine the front and back in one clamping.

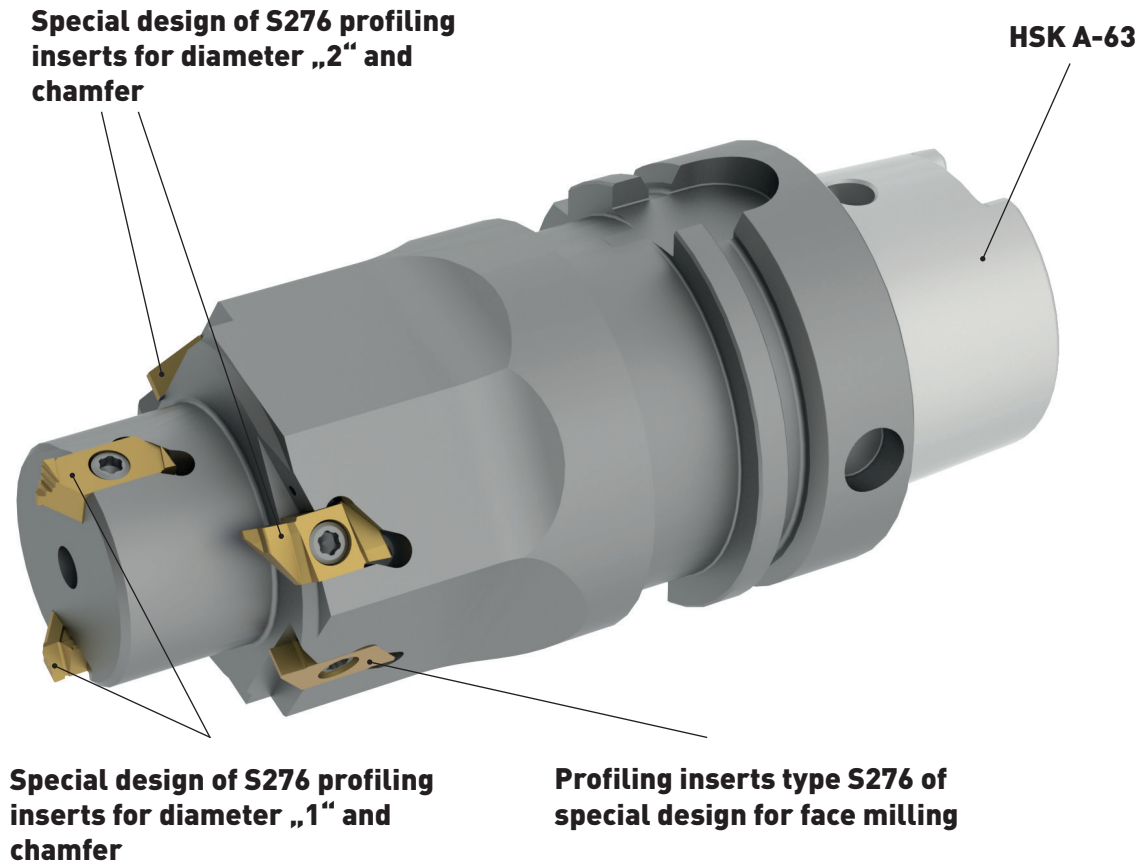
## TOOL SOLUTION

A multi-part combination parting tool based on polygon shank PSC50 with long extension to bypass the interference contour.

## ADVANTAGE

**Both grooves are machined with this combination tool without changing tools. Thanks to the targeted coolant supply directly to the cutting edge, the grooves can be produced efficiently and reliably. Reduction of machining time by 25 %.**

# SINKING AND CHAMFERING IN ONE PASS



## REQUIREMENT

Production of two diameters including the chamfers.

## TASK FOR HORN

The design of a tool with interchangeable cutting edges. The required tolerance on the work-piece must be maintained.

## TOOL SOLUTION

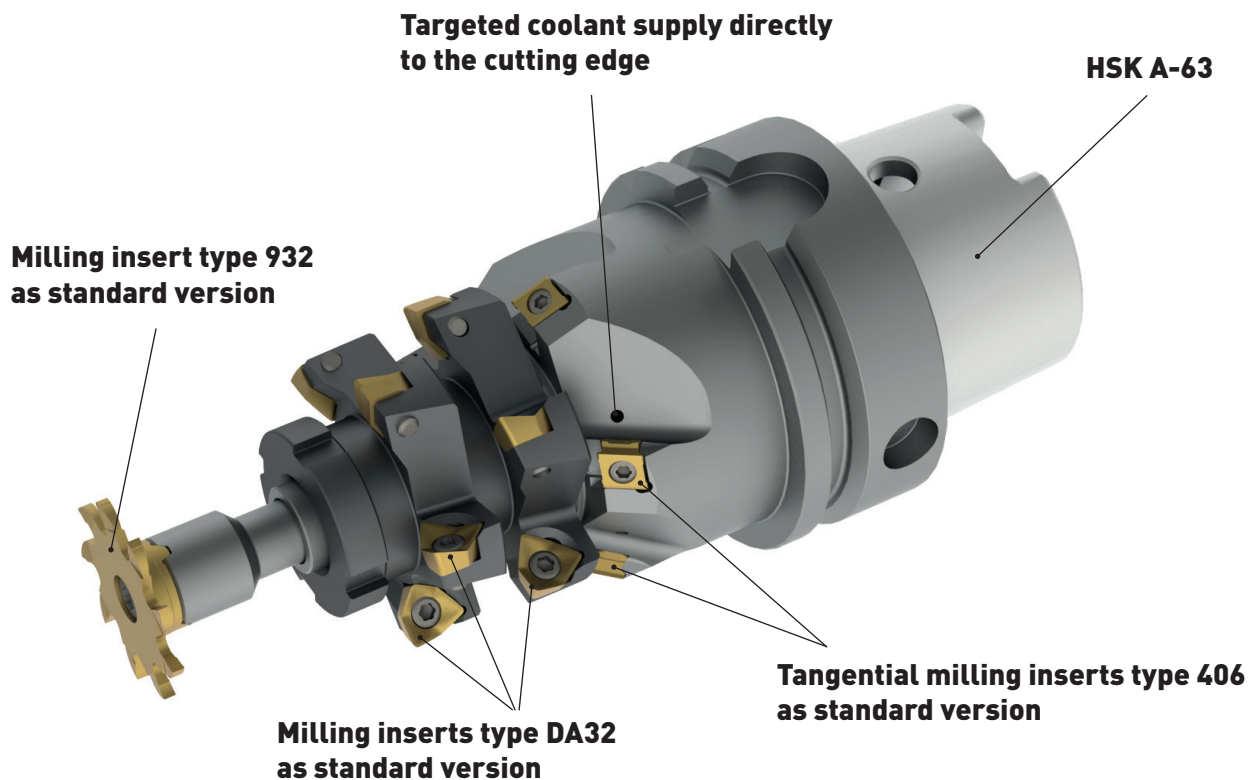
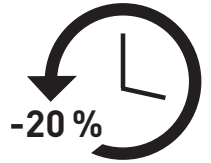
A monobloc tool based on HSK A-63 with tangentially screwed profiling inserts type S276 of special design. Due to the precise design of the inserts and the cutter body, there is no need to adjust the inserts after they are changed.

## ADVANTAGE

**The use of the combination tool eliminates tool change and the setting up of the machine is much more convenient, as tools do not have to be matched to each other. Reduction of machining time by 35 %.**



# GROOVE AND STEPPED BORE MILLING IN COMBINATION TOOL



## REQUIREMENT

Produce a stepped bore and an undercut.

## TASK FOR HORN

The stepped bore including the chamfers and a groove need to be machined with one tool.

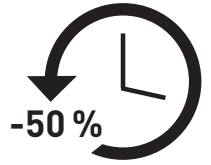
## TOOL SOLUTION

A combination tool based on HSK A-63. The tool has a modular design. Due to the mounting position of the inserts, standard versions can be used.

## ADVANTAGE

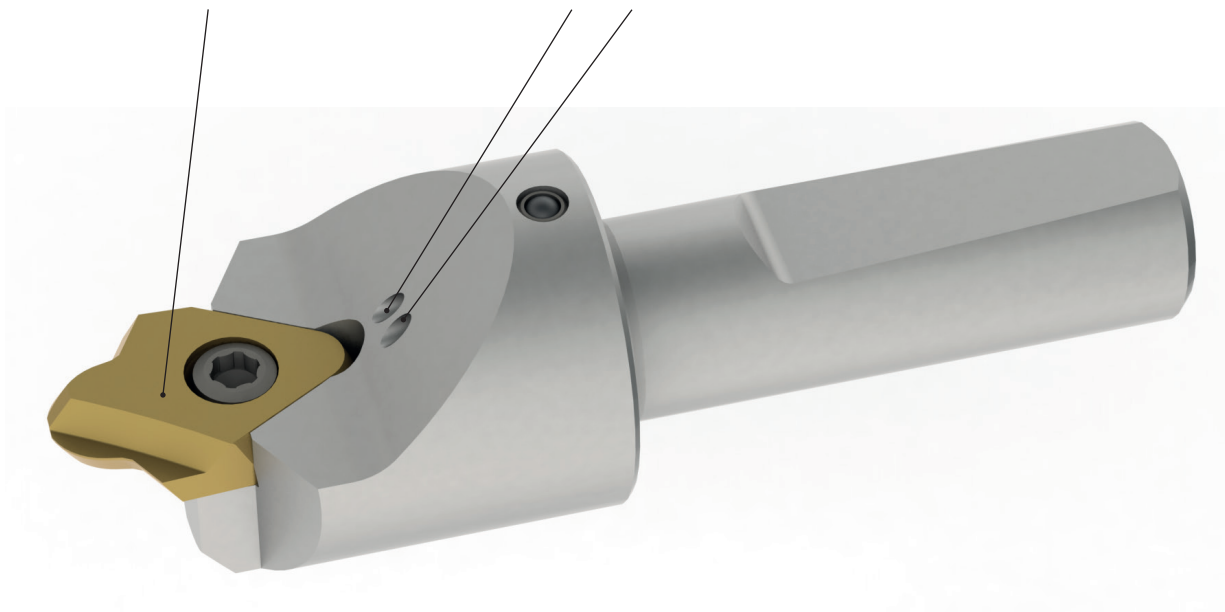
**Today, the customer uses only the combination tool instead of three individual tools. Tool change times are eliminated and no tools have to be adjusted relative to each other. Reduction of machining time by 20 %.**

# FORM SINK WITH EXCHANGEABLE INSERTS



Form boring insert type S117  
as special version

Targeted coolant supply directly  
to the cutting edge



## REQUIREMENT

Manufacture of a countersink on a lathe.

## TASK FOR HORN

A solution for an efficient form boring tool for series production.

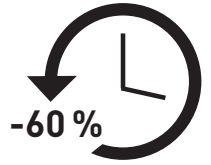
## TOOL SOLUTION

A form boring tool type D117 with exchangeable inserts. The tool has targeted internal cooling and a high-precision insert seat.

## ADVANTAGE

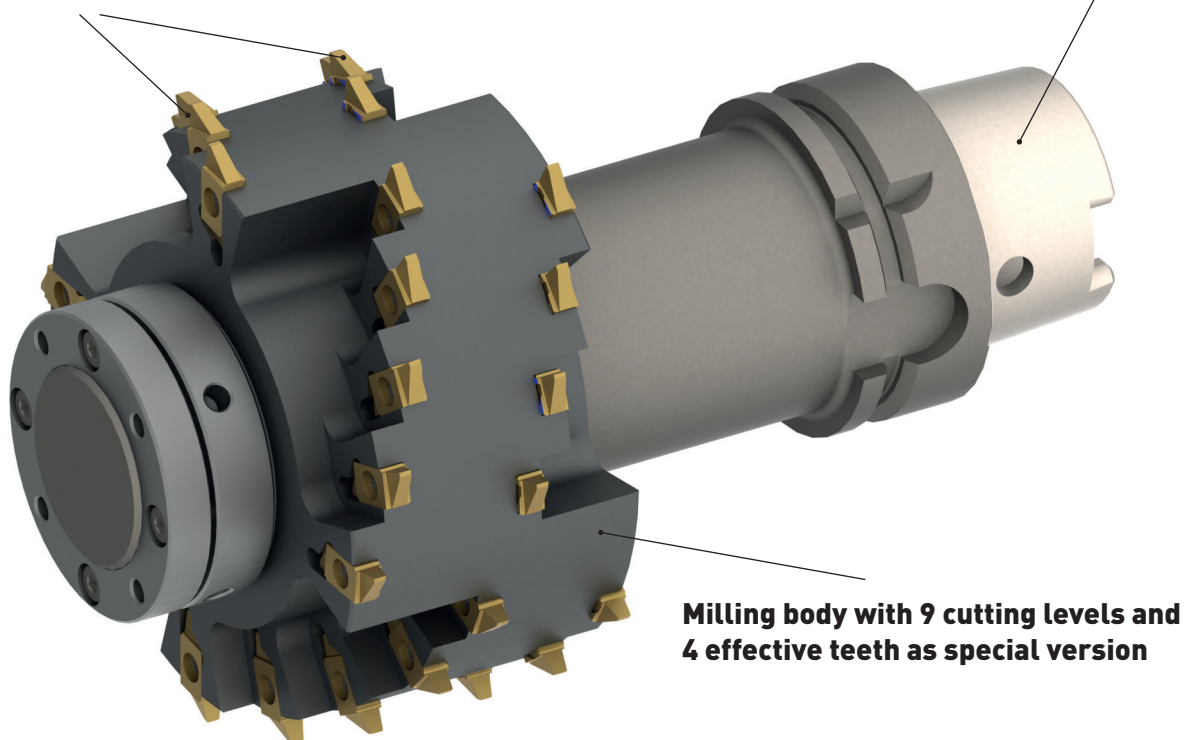
**The S117 insert seat provides quick insert change and short cycle times due to the double-edged design. The carbide grade EG55 promotes long tool life. Reduction of machining time by 50 %.**

# PRODUCTION OF A SPUR GEAR IN ONE PASS



**Milling inserts type S274  
as special version**

**HSK A-63**



## REQUIREMENT

The production of a spur gear in one pass of module 6.8 with nine teeth.

## TASK FOR HORN

The design of a tool that produces the required gear quality and reduces machining time.

## TOOL SOLUTION

A modular special milling tool type M274 with 36 inserts, nine cutting levels with four inserts each and four effective teeth in cut.

## ADVANTAGE

**The customer can mill the complete gear in just one pass. By using the precision-ground S274 inserts, the required gear quality is achieved. Reduction of machining time by 60 %.**



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TOOLING SOLUTION NOW.

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