



Automotive & Trucking

Innovation drivers in machining:
Tool solutions for the mobility
of tomorrow



CERATIZIT is a high-technology engineering group specialised in cutting tools and hard material solutions.

Tooling a Sustainable Future

ceratizit.com



CERATIZIT
GROUP



Industry Solutions

Industry-specific applications and bespoke solutions

Every sector has its own specific requirements. Tools and materials are expected to offer maximum cutting performance, wear resistance, precision and quality – from large-scale production to the manufacture of single parts. This applies to the machining of aluminium alloys, cast materials and high-alloy steel as well as super alloys and titanium. As such, almost every sector of industry is affected – from the automotive and heavy duty machining sectors to aerospace and energy technology.

As the leading supplier of solutions for numerous industry-specific applications, we draw upon our wide-ranging expertise to offer you first-class advice and support. Whatever you need, we will work with you to find a successful, innovative solution to optimise your production process.



As our customer, you will benefit from one of the largest ranges on the market, an efficient sales operation and our leading expertise worldwide!

Tooling a Sustainable Future

CERATIZIT: a specialist in sustainable cutting tools and hard material solutions.

Are you looking for a reliable partner for your tooling and machining-process needs? Then look no further! CERATIZIT is not just a tool supplier. Our experts are also on hand to advise you with extensive industry knowledge and decades of experience.

What's more, anyone who wants to pay particular attention to their CO₂ balance, will find in us a sustainability-conscious partner with a concrete strategy and target set out in our vision of becoming the number 1 sustainable company in our industry.

For more than 100 years, CERATIZIT has been a pioneer in the field of ambitious hard material solutions for machining and protection against wear. This allows us to guarantee our customers the highest levels of quality and access to the latest developments in the carbide sector – all-round cutting tools expertise from a single source.



Overview Automotive

Innovation drivers in machining: Tool solutions for the mobility of tomorrow

The automotive industry is facing one of the biggest changes in its history. Aspects such as lightweight construction, electrification of drive systems or new concepts for increasing efficiency make vehicle development more challenging than ever. So it is good to be able to rely on a strong partner who has the right tools and strategies for every single vehicle component. We are ready to face the mobility challenges of tomorrow with maximum innovation, expertise and by working closely with our customers.

An unconditional service promise, wide-ranging expertise – in smart factory concepts for example – and a firm focus on special-purpose, customer-specific solutions make the CERATIZIT Group the ideal project partner for automobile manufacturers worldwide.

Powertrain

Whether it is a conventional vehicle with combustion engine, a hybrid, or powered by a fuel cell or battery: the machining tasks on the powertrain are as varied as the tool solutions that we have to offer. We are the driving force behind efficient production.

Engine

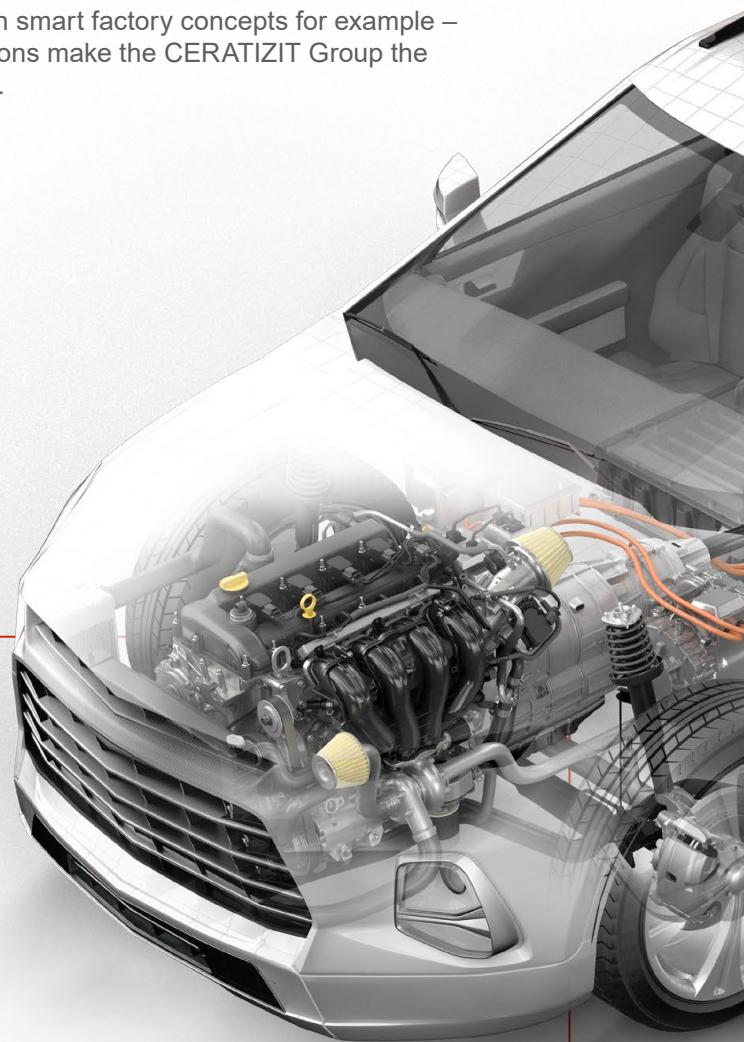
Cylinder head	→ Page 12–13
Crankcase	→ Page 14–15
Crankshaft	→ Page 16–17
Connecting rod	→ Page 18–19
Fuel rail	→ Page 20–21
Turbocharger	→ Page 22–23

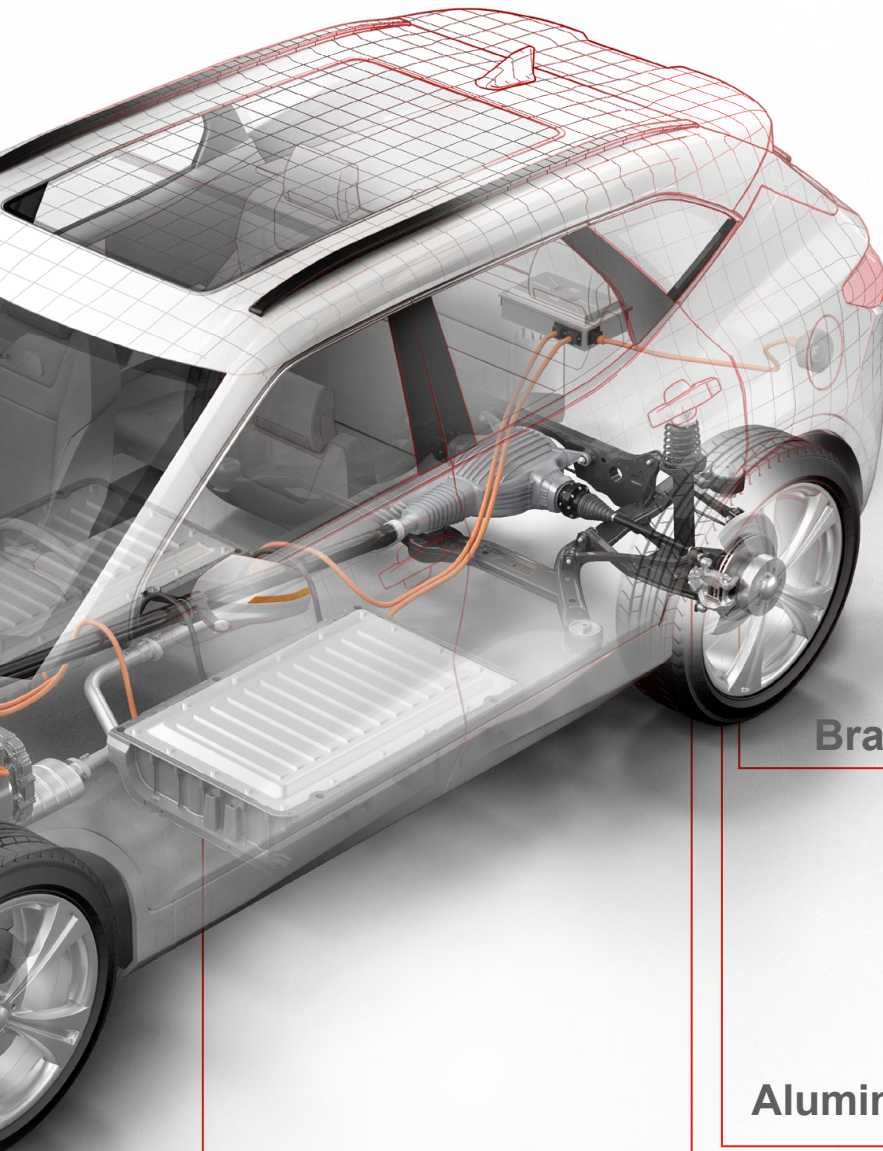
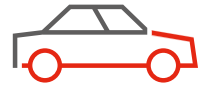
Gearbox

Gear housing	→ Page 24–25
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Electrification

Electric motor enclosure	→ Page 30–31
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Chassis

Lightweight concepts combined with the ultimate in ride comfort call for alternative processes when it comes to cutting. We develop solutions so that new materials can also be machined with maximum precision, quality and efficiency.

Braking system

- Brake calliper → Page 34–35
- Electronic braking system → Page 36–37

Aluminium wheel

→ Page 38–39

Wheel suspension

- Subframe → Page 40–41
- Control arm → Page 42–43
- Wheel bearing housing → Page 44–45
- Wheel hub → Page 46–47
- Roller bearing → Page 48–49

Overview Trucking

Heavy loaded, lightly machined: smart tool concepts for the trucking industry

In the trucking industry, stricter emissions regulations and the search for more environmentally friendly transport solutions are demanding a rethink in the direction of sustainable solutions. This includes hybrid, electric and hydrogen-powered trucks, as well as optimizing the fuel efficiency of diesel and natural gas vehicles. In addition, lightweight materials and innovative design methods are being used to reduce the weight of commercial vehicles while still increasing their payload.

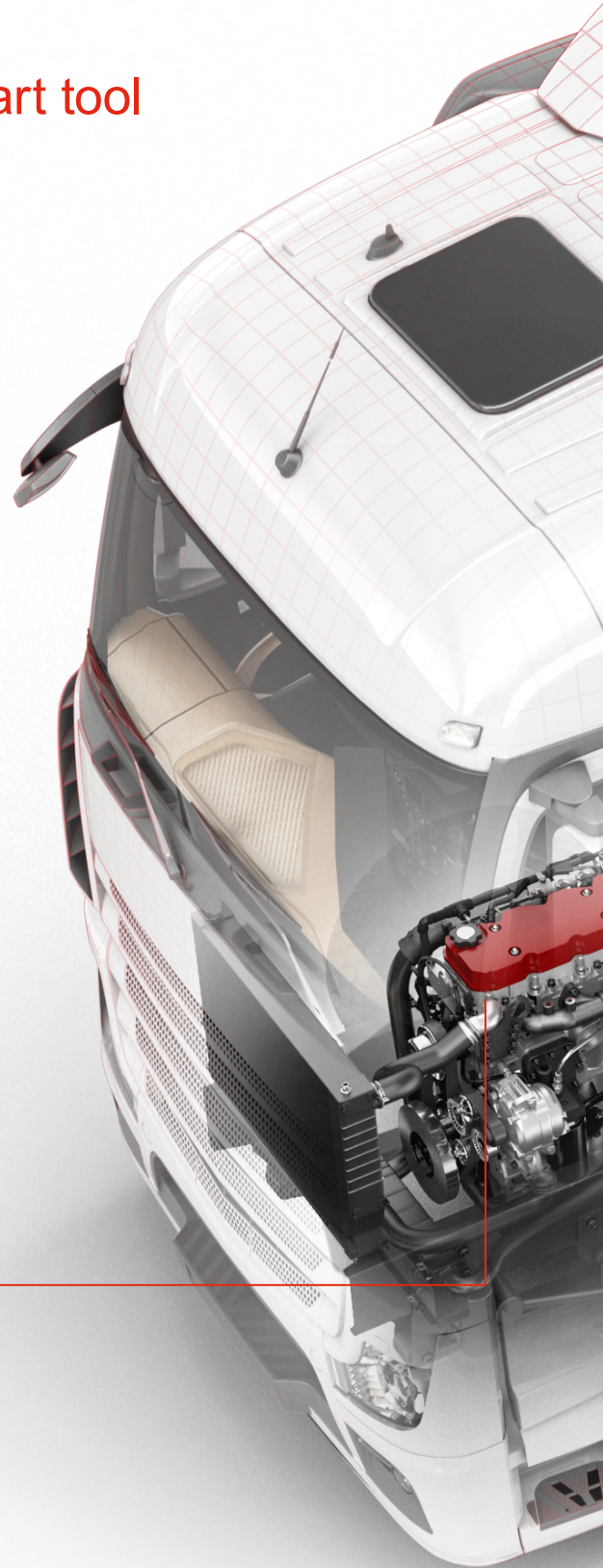
Do you want to be optimally prepared for the developments? Thanks to our cross-sector expertise, comprehensive tool portfolio and development of application-specific service solutions, we have established ourselves as a reliable partner for commercial vehicle manufacturers worldwide.

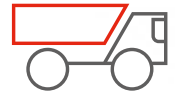
Powertrain

The number of powertrain variations is constantly increasing in the commercial vehicle segment: internal combustion, hybrid, fuel cell or purely battery electric are now common options. The tool solutions used must be correspondingly broad. This diversity is what drives us.

Engine

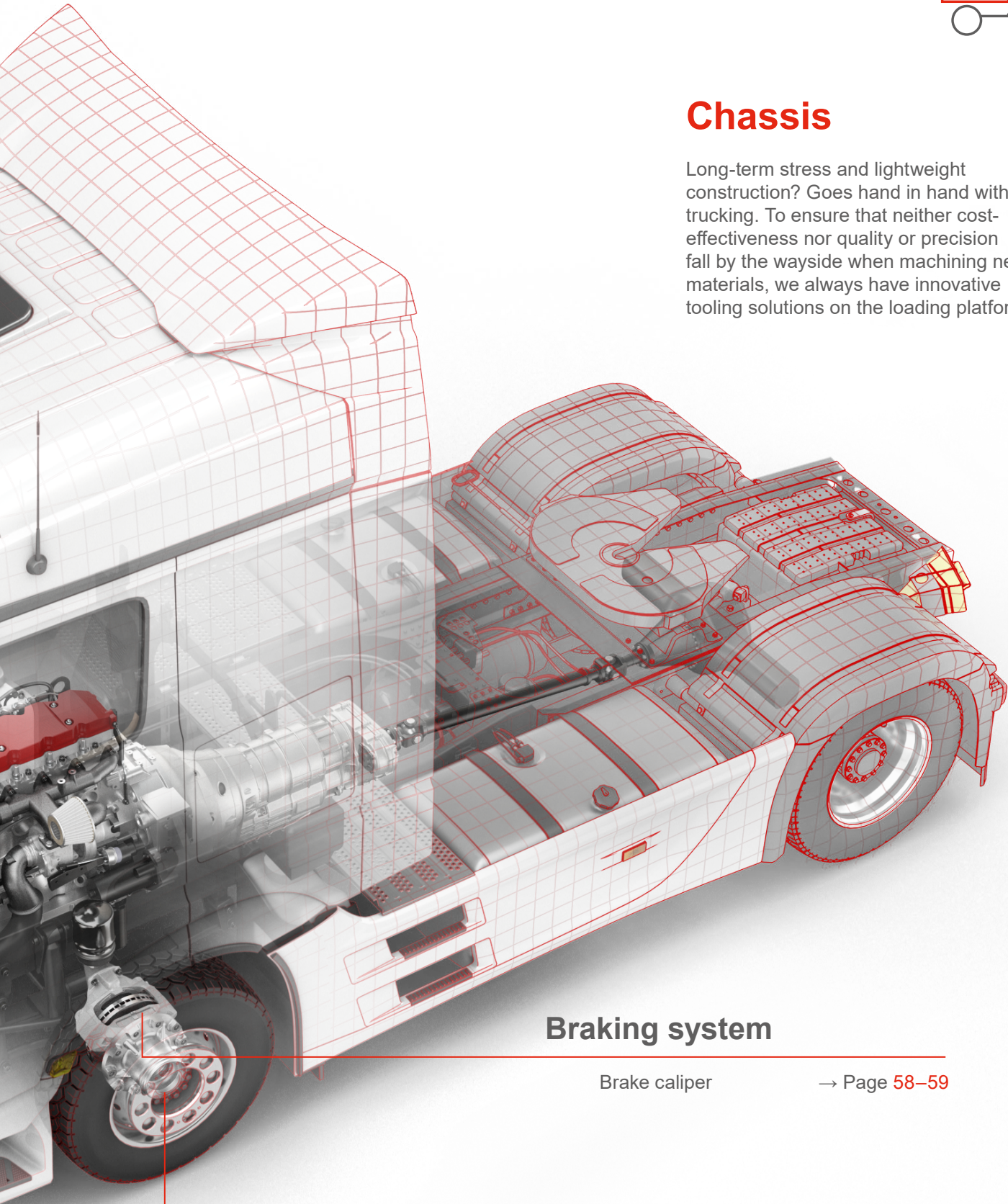
- Cylinder head → Page [52–53](#)
- Crankcase → Page [54–55](#)
- Con rod → Page [56–57](#)





Chassis

Long-term stress and lightweight construction? Goes hand in hand with trucking. To ensure that neither cost-effectiveness nor quality or precision fall by the wayside when machining new materials, we always have innovative tooling solutions on the loading platform.



Braking system

Brake caliper

→ Page 58–59

Wheel suspension

Wheel hub

→ Page 60–61

Our service – your competitive edge

Take advantage of our customer-specific service solutions that truly make the difference

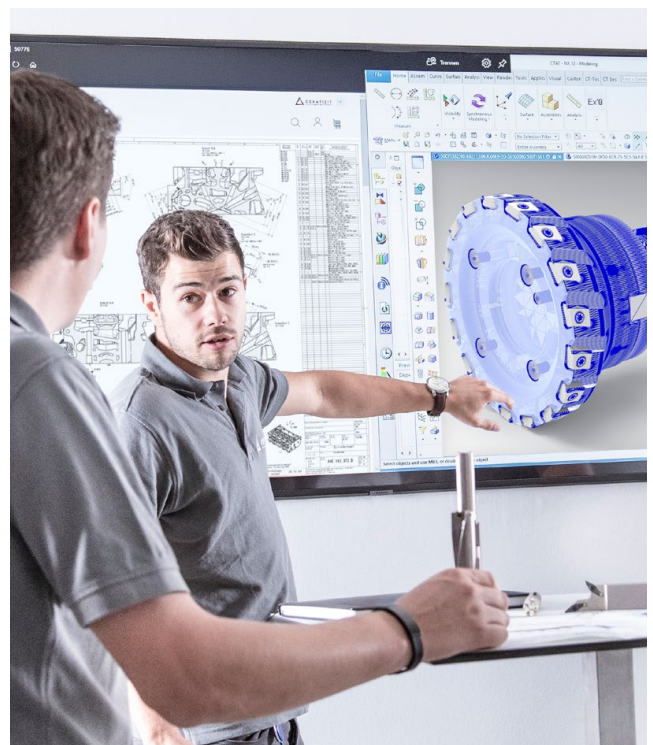
Do you want to set the pace on the international market? With CERATIZIT as your expert partner, you can! In addition to the latest technological standards, innovative materials and coatings, and unique special tools for the automotive industry, you can benefit from our highly attractive, comprehensive range of services.

The pioneering services we offer are specifically aimed at the automotive sector and, most importantly, are tailored to the goals of each individual customer – a unique offer that gives you a decisive competitive advantage. Take a closer look at our impressive range of services that will elevate your processes to an entirely new level and support you with the challenges you face.

Projects in the best possible hands

From expert advice and detailed project development to smooth implementation, our project engineering service will provide you with the ideal solution to meet your specific needs. Let our interdisciplinary expert team implement a customised solution for your projects.

More information → Pages [62–63](#)





Keep track of your processes with our digital solutions ToolScope and Cockpit

The fundamental components are the ToolScope tool & process monitoring system and Cockpit, which combines, visualises and analyses individual process data. These tools give you a clear overview of your production process around the clock, plus reveal hidden potential and unexpected problems in no time at all.

More information

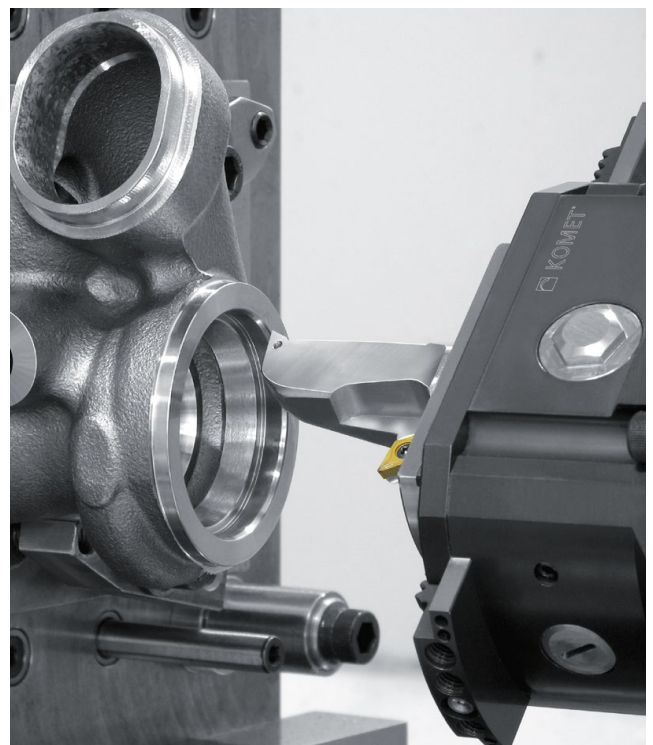
→ Pages 64–67

Master complex contours and tight tolerances

Complex contours, tighter tolerances and rapidly changing product life cycles require flexible manufacturing concepts. With the programmable KomTronic U-axis systems, we offer intelligent actuating tools that enable turning operations to be performed on parts that are not rotationally symmetrical. Coupled with customised snap-on tools and specially selected indexable inserts, these systems give you an unrestricted level of flexibility.

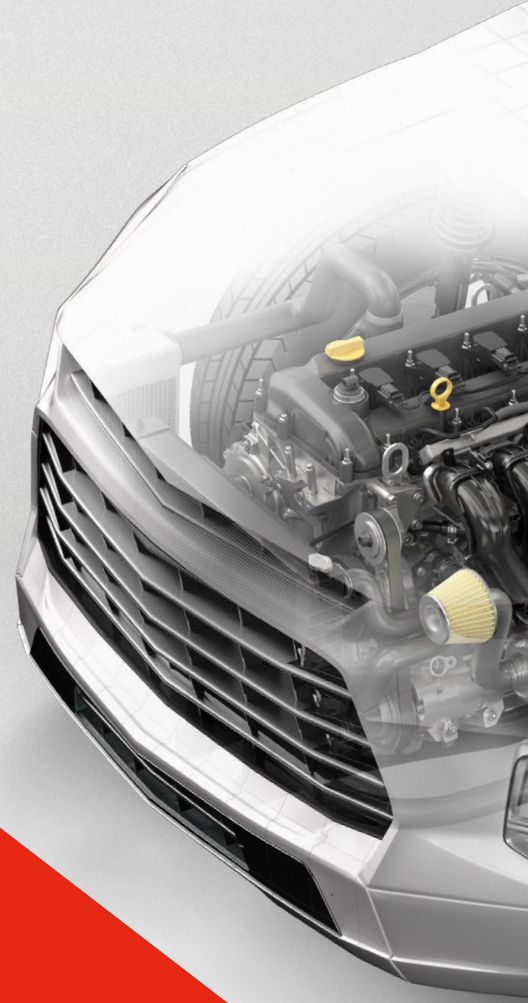
More information

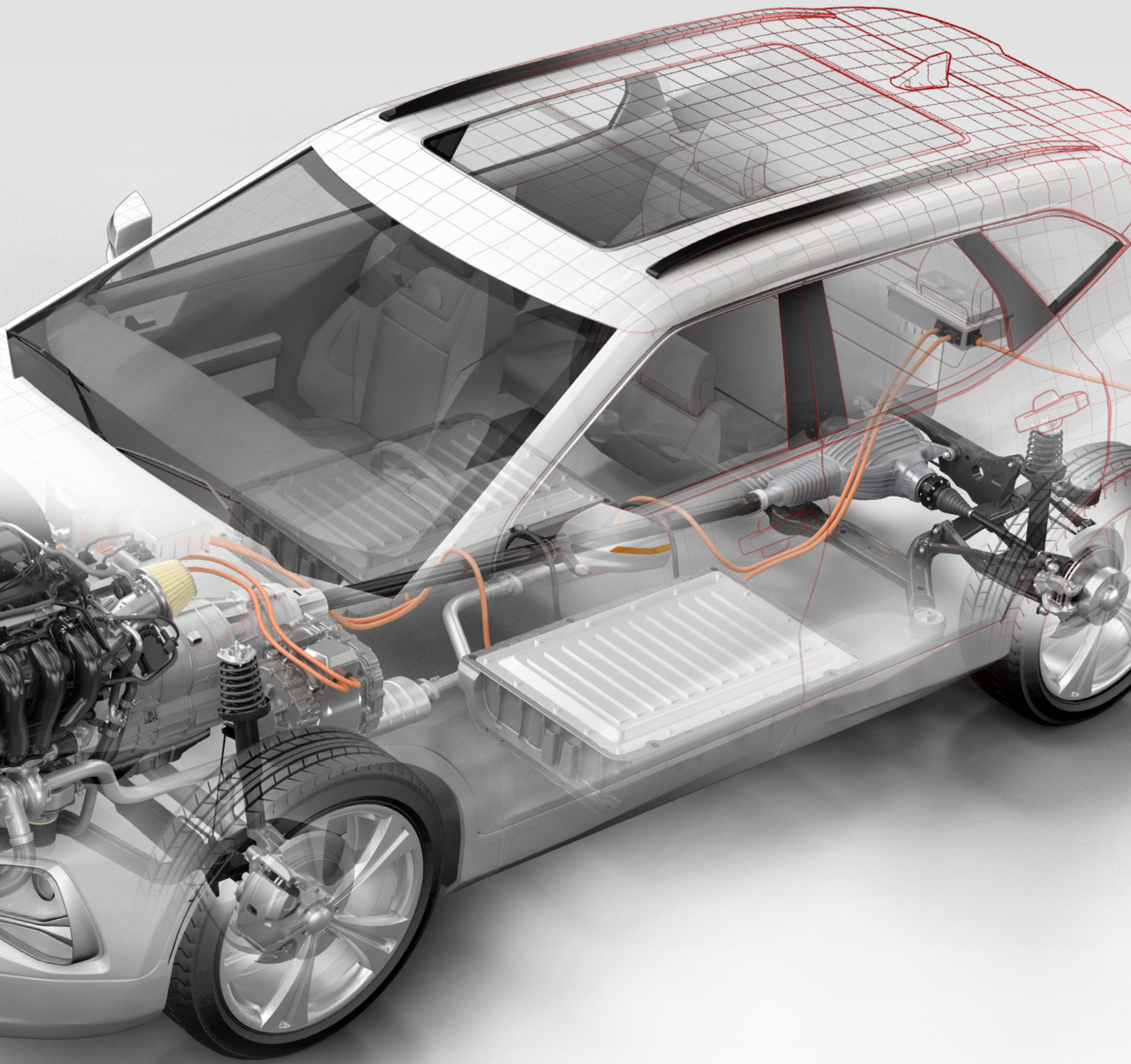
→ Pages 68–69





Machining solutions for the Automotive Industry





Cylinder head machining

Our tools turn heads

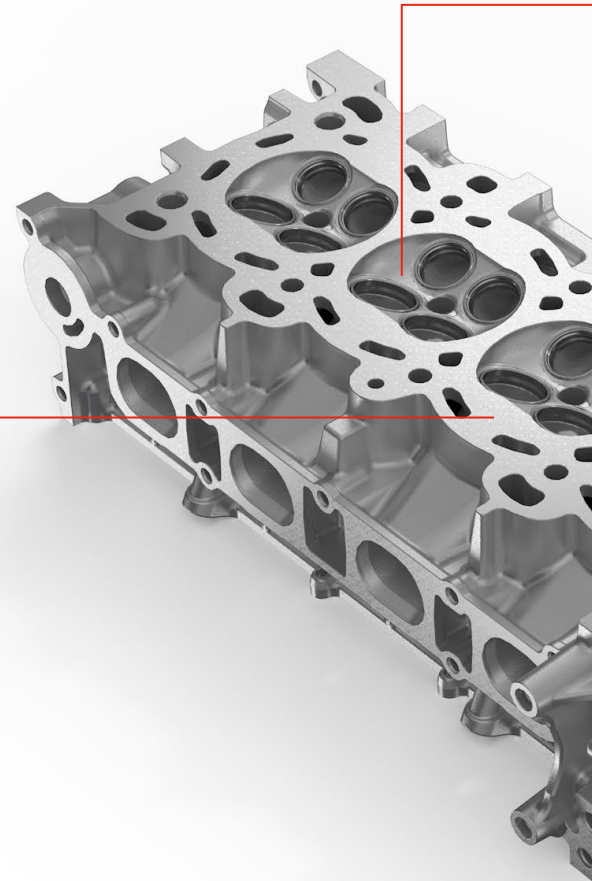
Modern cylinder heads made of aluminium alloys are a challenge for machine operators and tool manufacturers both in terms of material and process. Complex tasks such as machining valve seats, camshafts and injectors have to be more and more process-secure and efficient, as they make up a large proportion of the unit costs. At the same time, precision requirements are becoming more stringent with tighter tolerances and surface specifications.

The CERATIZIT Group responds to this with tool designs that are also user friendly.

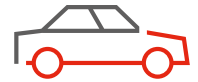
Face milling with the suction effect up to 100% chip-free interiors on the component

MaxiMill SEC12

- ▲ Uncompromising roughing up to an ap of 8 mm
- ▲ PCD-equipped indexable insert, robust and yet smooth cutting
- ▲ Extremely long service life above the usual market standard
- ▲ No adjustment required (plug & play)
- ▲ Modular structure of standard components (face mill, indexable insert, mill adapter)
- ▲ Standard Ø50 mm – Ø160 mm



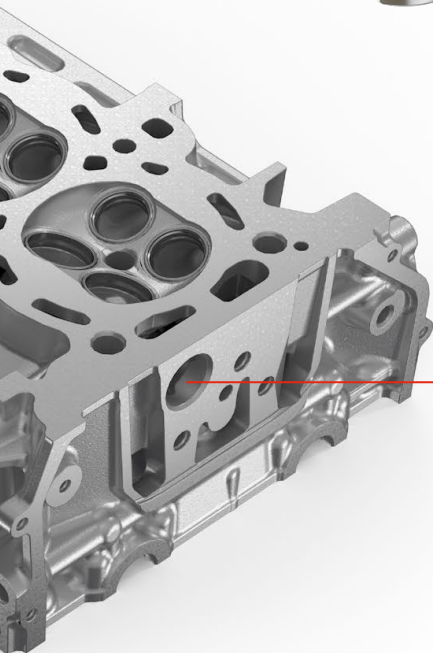
Further information
can be found on
→ Pages 62–63



Semi and finish machining for valve ring and valve guide on both the intake and exhaust

Semi multi-function tool and finish multi-function tool

- ▲ 3-edged full face CBN indexable insert solution
- ▲ SC-reamer up to Z8 for maximum cutting values (PCD also available)
- ▲ No adjustment required thanks to maximum precision (plug & play)
- ▲ Tool system with micrometre-accuracy for maximum process security and repeatability thanks to a special hydraulic clamping system
- ▲ Modular tool structure of standard and semi-standard components (DAH holder, hydraulic adapter, tool holder sleeve, insert, reamer)
- ▲ Runout and angle can be finely re-adjusted on the machine spindle thanks to DAH



Counterboring the water plug hole – up to 100 % chip-free interiors on the component

PCD counterboring tool



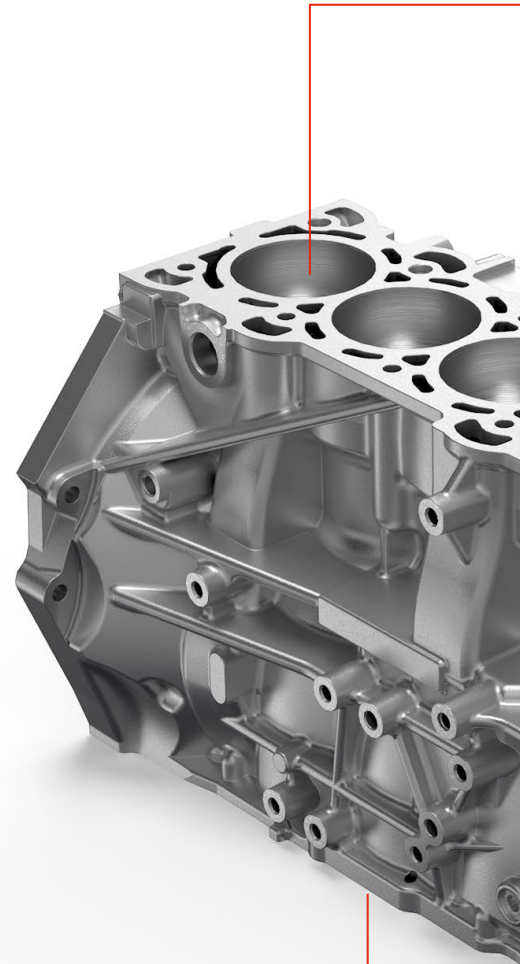
- ▲ 3D-printed chip spoiler for diverting the coolant to the chip and removing chips from the hole
- ▲ PCD with three edges for maximum efficiency
- ▲ Process-secure machining of water plug holes

Crankcase machining

We're on the case at the heart of the engine

Crankcases are currently made from a range of aluminium alloys, which often puts tool manufacturers to the test. When it comes to service life and precision, the cutting material and tool must be designed for maximum performance, especially given the coating technologies, such as wire arc spraying, that are now frequently used in the cylinder bore.

The expertise and development work by the CERATIZIT Group also pays off in terms of reliable and efficient processes when machining mixed materials with one cutting edge, such as in the cylinder and crankshaft bore and on the combustion chamber side.

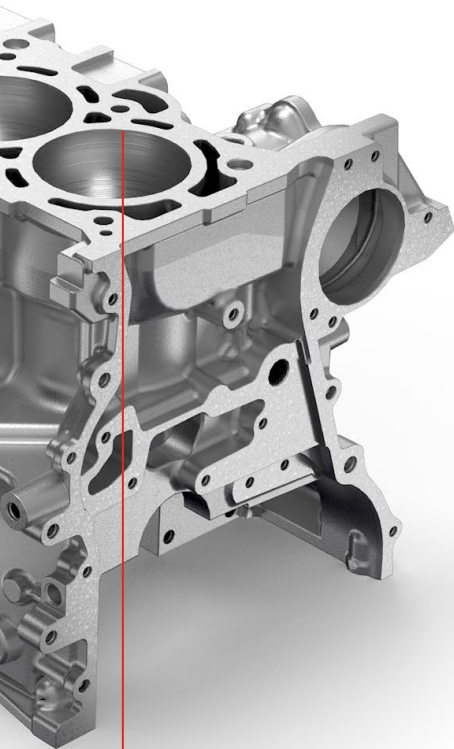
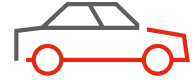


Uncompromising roughing with high cutting depths and casting burr

PCD tangential face milling cutter

- ▲ Tangential PCD indexable inserts with 4 cutting edges and ap up to 11 mm
- ▲ Extremely sturdy base body and indexable insert design, but still smooth cutting and quiet running
- ▲ Tangential carbide indexable inserts remove large projecting casting burr with ease
- ▲ Maximum service life and efficiency, much greater than the usual market standard
- ▲ Attractive solution for foundries





Roughing of the cylinder bore

Rough boring bar

- ▲ Split of cut 4+4 teeth to split the depth of material to cut and reduce the cutting forces
- ▲ 4- effective teeth for maximum efficiency
- ▲ Optionally with vibration damper to reduce vibrations in the machining process
- ▲ Long PCD blanks with chipbreaker for large cutting depths, controlled short chips and long tool life



High-precision finish machining of cylinder bores

Coolant-controlled boring bar

- ▲ Five-edges with PCD indexable insert for short process times thanks to accelerated retraction without leaving scores
- ▲ Hole roundness within 0.01 mm
- ▲ Cutting edge compensation for diameter correction (can also be integrated in the machine)
- ▲ Process-secure tool system with accurate repeatability
- ▲ Defined surface roughness if required

Crankshaft machining

Tools that are a stroke of genius

Whether it is a 12 or 3 cylinder engine, it would grind to a halt without a crankshaft. Likewise, when it comes to machining, nothing is possible without a large range of cutting materials and tool systems – after all, the most resistant and therefore challenging materials are used to produce these heavy-duty automotive components. Crankshaft machining goes hand in hand with complex cycle times and extremely variable machining steps, which present a huge challenge for machines, programming and, above all, the tools. Success comes to those who can reliably implement innovative ideas and intelligent tool solutions.

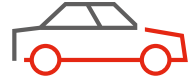
The CERATIZIT Group offers innovative cutting material grades, new geometries and tool solutions, which make machining processes more reliable, increase the cutting speed and cutting depth, raise productivity and therefore help to minimise production costs.



Turning chasing of the bearing seat diameter

Turning chasing wheel

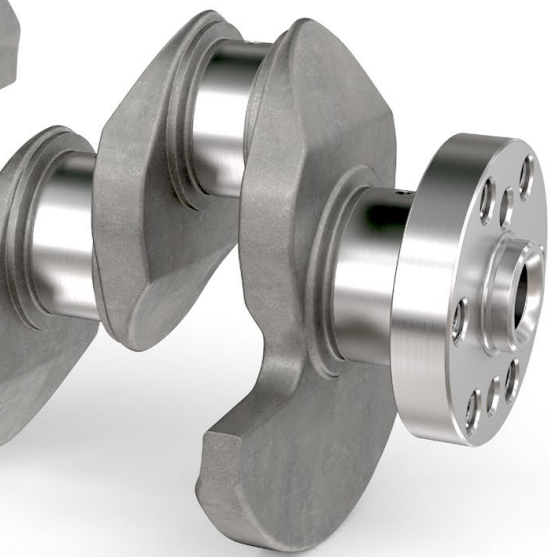
- ▲ Handling weight of less than 15 kg
- ▲ Tool change without lifting device
- ▲ Extremely quick tool changeover time
- ▲ Easy handling
- ▲ Cartridge design, flexible, individual
- ▲ Same level of stability as a monotool
- ▲ Extensive range of indexable inserts



Face milling and centering the flange (transmission side)

Special MaxiMill A273

- ▲ Face milling cutter including centre drill
- ▲ Combination of turning the length and centering
- ▲ 16 usable cutting edges for maximum efficiency
- ▲ DeTactor for visual monitoring of the tool life of the centre drill (milling inserts via machine control)
- ▲ Large selection of indexable inserts for steel and cast iron



Turning and chamfering of the shaft (control side)

Boring bar

- ▲ Short machining time for facing and chamfering with only one tool
- ▲ Stable inserts with a wide selection of insert shapes and geometries
- ▲ Wide range of steel and cast iron inserts

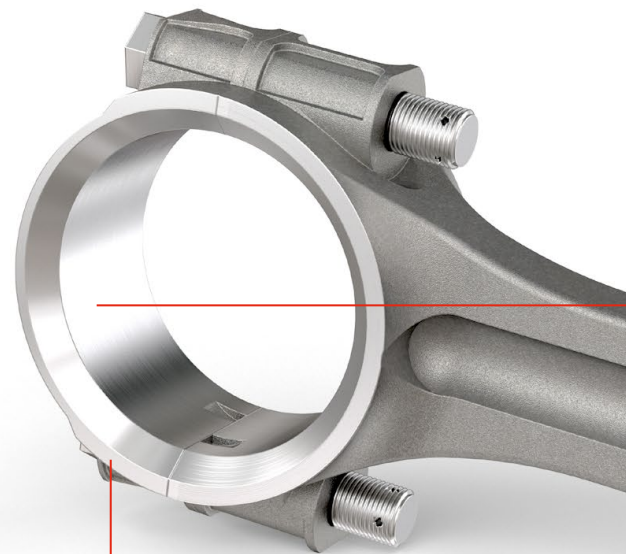


Connecting rod machining

Hot rod your process! Fewer tool changes, longer service life

The connecting rod connects the piston and the crankshaft and converts the linear upward and downward motion of the piston into the circular motion of the crankshaft. Unsurprisingly, it is subjected to unrelenting tension, pressure, bending and torsion. Microalloyed or carbon-manganese steels, which are processed using a drop forging method, ensure that connecting rods can withstand such permanent stress when the engine is running.

For these kinds of materials, which are being steadily refined, vast expertise in tool systems and cutting materials is needed – such as that offered by the CERATIZIT Group.

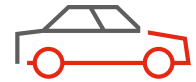


Big end finish machining

Snap-on tool for tilt drill head

- ▲ Sturdy four-edge Quatron indexable insert
- ▲ Outstanding drilling quality with no retraction scoring
- ▲ Long service life and efficiency





Roughing, semi finishing and chamfering of the big end

Boring bar

- ▲ Tool combines 3 machining operation, thus short machining time due to reduction of tool changes
- ▲ Extremely stable tangential inserts arranged vertically and horizontally for roughing (forging skin) with 8 usable cutting edges Fewer tool changes
- ▲ Defines consistent allowance for finish machining through adjustable short clamp holders with stable S-inserts with 4 usable cutting edges
- ▲ Stable S-inserts with 4 usable cutting edges for chamfering on both sides
- ▲ Extremely economical tool concept due to high number of usable cutting edges
- ▲ Also available with Detector



Reaming including chamfering of the small end (before the brass sleeve gets pressed in)

Reamax Fix

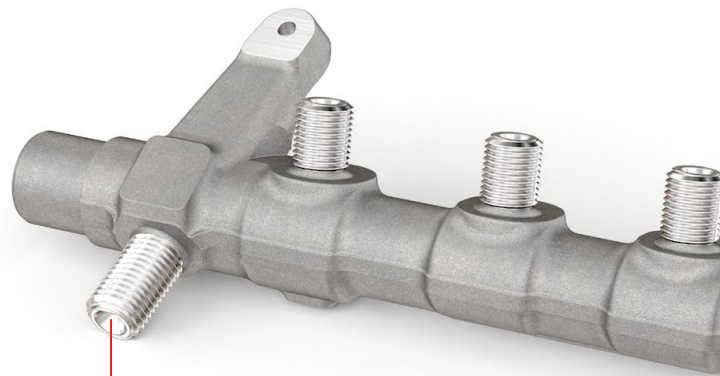
- ▲ Reaming head with 6 cutting edges and chamfering insert for a short machining time well below 1 second
- ▲ Chipbreaker geometry of the reaming cutting edges for very short and small chips for highest process reliability
- ▲ Geometry for a defined surface roughness
- ▲ High economic efficiency due to cost-effective disposable head and S-insert with 4 cutting edges without logistical effort for regrinding
- ▲ No adjustment effort (plug & play)

Fuel rail machining

Take the pressure off: High-end machining for short process cycles

Highly efficient common rail injection systems are an essential component of modern engines, designed to reduce consumption and emissions. Their fuel rails release the pressure evenly across all the components that make up the high-pressure system. The load on these components is extremely high, so cutting-edge, difficult-to-machine materials are needed.

Thanks to the extensive range of tools and the expertise of CERATIZIT Group, the pressure in the machining halls is also evenly spread: Machining there is as efficient as the latest generation of engines.



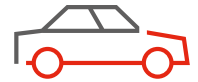
Over turning and countersinking the fuel connection

Multi-purpose overturning tool

- ▲ Three-edged, smooth cutting indexable insert
- ▲ Turning, face milling and countersinking with just one tool
- ▲ Fewer tool changes
- ▲ Long service life and efficiency thanks to multi-purpose solution



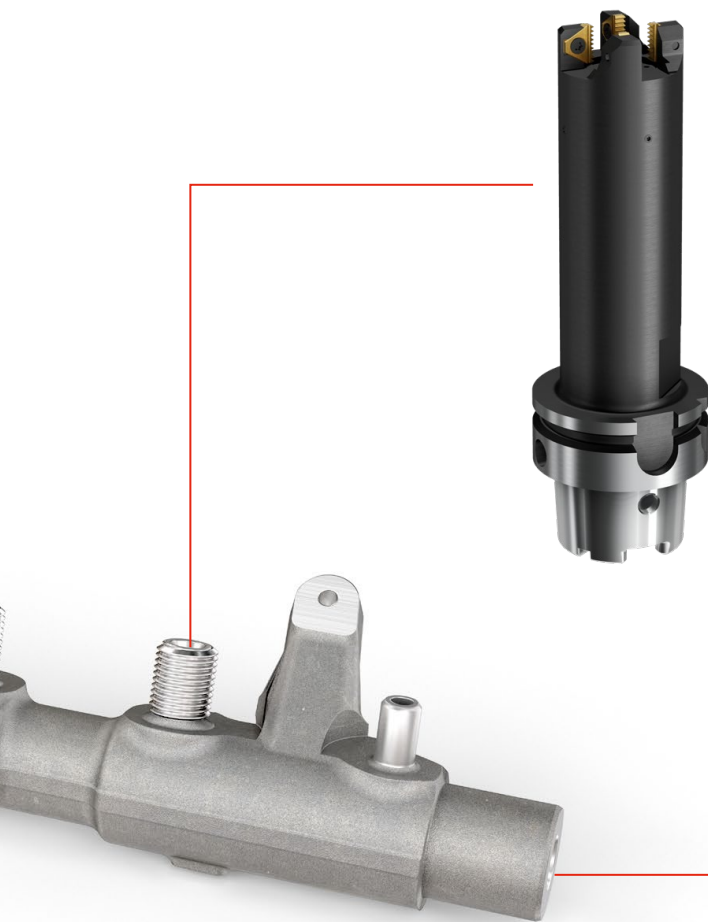
Further information on monitoring and optimising all machining processes using ToolScope can be found on → Pages [64-65](#)



External thread milling on the pressure pipe connections

Thread milling tool

- ▲ Reduction in the machining time through 4x thread profile indexable inserts
- ▲ High tool stability enables high cutting values and therefore shortens the process time
- ▲ Indexable insert can be quickly changed with no adjustment required (plug & play)
- ▲ Very short, manageable chips
- ▲ Perfect cutting edge cooling thanks to thro' coolant supply, resulting in a longer service life
- ▲ Thread profile indexable inserts can be reground



Thread milling the connection thread

MGF HPC thread milling cutter

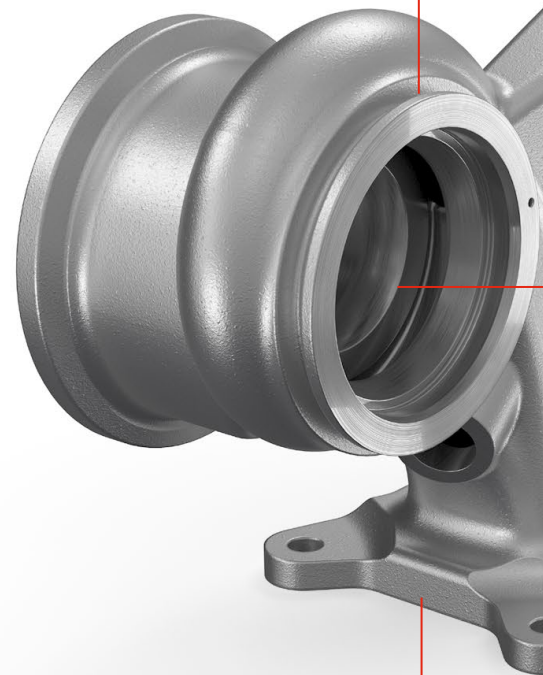
- ▲ Process-secure thread milling with accurate repeatability
- ▲ Reduction in the process time compared to conventional threading
- ▲ Eight cutting edges for maximum cutting values and efficiency
- ▲ Thread depth down to the base possible
- ▲ The same tool can be used on different materials (steel up to a tensile strength of 1200 N/mm², stainless steels, cast iron materials, titanium alloys)
- ▲ Very short, manageable chips
- ▲ M4-M20 available in 1.5xD and 2xD from stock
- ▲ M4x0.5-M16x1.5 available in 1.5xD and 2xD from stock



Turbocharger machining

No-compromise tools for turbo speed

Turbochargers are a common component in modern vehicles as they offer greater efficiency than their naturally aspirated counterparts, whilst also helping to lower emissions. However, these advantages come at the expense of a challenging machining process. On the exhaust side, high-alloy, heat-resistant materials with a high level of nickel and chromium or cast iron are used. Both materials are either extremely abrasive or result in very high temperatures in the machining zone – neither of which are economical conditions for tools. Yet thanks to clever interpolation turning and circular milling strategies and combined 4-in-1 tool systems, machining times are reduced and precision is ramped up – production is also turbocharged.

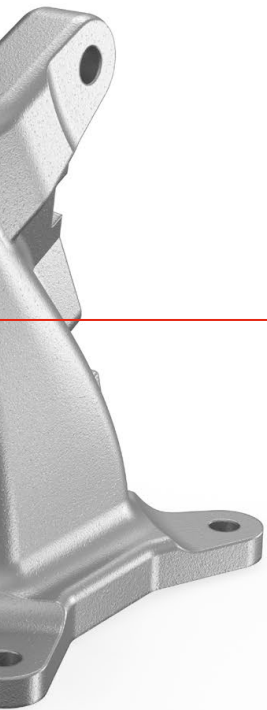


No-compromise milling of the manifold face

MaxiMill A273 face milling cutter

- ▲ Robust design, stable seat in the base body
- ▲ Octagonal indexable inserts with 16 usable cutting edges
- ▲ Special cutting material designed for maximum thermo-mechanical loads
- ▲ Defined, stable cutting edge guide
- ▲ Ensures maximum productivity, process security and efficiency
- ▲ Available in diameters ranging from 63 – 125 mm as standard





Finishing the V-belt with interpolation recess turning

Boring bar

- ▲ Extremely sturdy tool design
- ▲ Cutting edge geometry adapted to the machining process
- ▲ Thro' coolant supply directly at the cutting edge
- ▲ Turning operation can be performed on the machining centre thanks to circular motion of two linear axes
- ▲ Coated solid carbide grades, specially developed for machining nickel-based alloys

Complete finishing of the V-belt side

KomTronic U-axis system

- ▲ Time savings of up to 67%
- ▲ Up to 25% quicker machining
- ▲ One tool instead of four
- ▲ Better surfaces and greater accuracy of form
- ▲ Integrated micrometre-precise path measurement system for ultimate precision
- ▲ 3D-printed snap-on tools can be used, perfectly suited for the process
- ▲ The U-axis system has an extremely long service life with maintenance and repair service



Further information on the U-axis system can be found on
→ Pages 68-69

Gearbox housing machining

Silky-smooth gear changes, thanks to high-precision production

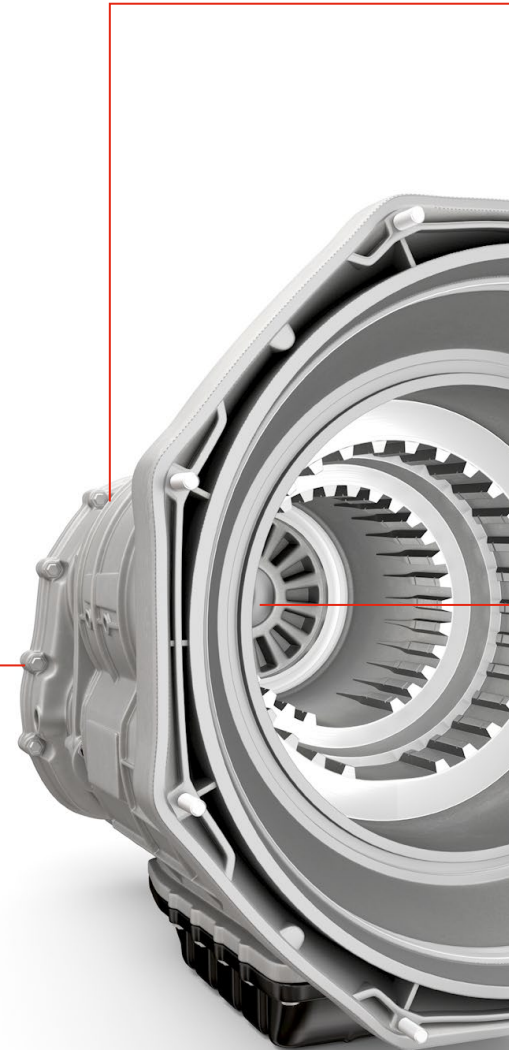
Six manual gears and up to nine in automatic transmissions are a common feature today. The gearbox is protected and supported by a housing consisting mainly of cast aluminium alloy, which is no small feat to manufacture. Ever tighter geometric and positional tolerances call for extreme care when designing the tool. Only the right machining concept can fulfil these stringent requirements. Tools with a long overhang often have to carry out several machining operations simultaneously, and in a manner that is process-secure.

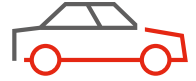
At the same time, minimum quantity lubrication is often used instead of traditional wet lubrication for environmental and financial reasons – with the tools from the CERATIZIT Group this means no compromises when it comes to cutting values and cycle times.

Reaming and counterboring the selector fork group with minimum quantity lubrication

Multi-purpose tool

- ▲ Reaming, counterboring and chamfering with a single tool saves on tools and reduces cycle times
- ▲ Maximum performance despite long overhang length, thanks to dynamic balancing
- ▲ Diameter can be precisely set via micrometre-precise fine adjustment



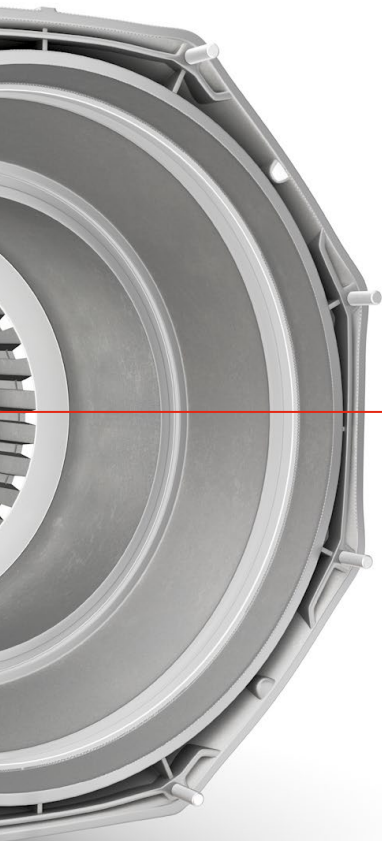


Reaming and fine boring the selector unit hole with minimum quantity lubrication



PCD Multi-purpose tool

- ▲ A combination of soldered PCD reamer and steel base body with indexable inserts that can be adjusted with micrometre-precision
- ▲ Challenging machining due to high standards for geometric and positional tolerances
- ▲ Maximum performance despite long overhang length, thanks to dynamic balancing



High-precision forward and reverse machining of the output shaft hole with minimum quantity lubrication



Boring bar

- ▲ Diameter can be precisely set via micrometre-precise fine adjustment
- ▲ VCGW insert for fine boring and axial groove
- ▲ Maximum performance despite long overhang length, thanks to dynamic balancing
- ▲ Forward and reverse machining to keep concentricity errors to an absolute minimum

Differential housing machining

Get ahead of the curve with smart tool solutions

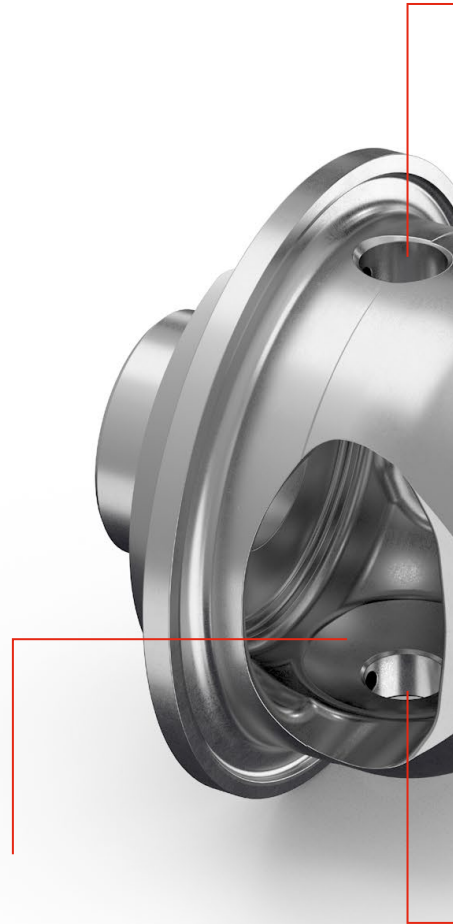
The differential plays a key role in a car's driving stability. On corners, it compensates for the difference in speed between the inner and outer wheels. Machining the inner contour of a differential is an extremely difficult task. Clever tool systems, however, enable high-precision production methods to be used – without much adjustment at all.

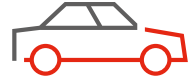
Whether you are working with special-purpose machines or machining centres, the CERATIZIT Group will help you corner the market with the aid of our perfect tool solutions.

Internal turning of the spherical countersinks with a mechanically-actuated special-purpose tool

Ball turning tool

- ▲ Tools with fixed insert seats for special-purpose machines
- ▲ High-precision insert seats thanks to special production methods
- ▲ No adjustment required after the indexable insert has been changed
- ▲ Quick and process-secure
- ▲ Rotary slide is driven by drawbar





Internal turning of the spherical countersinks

U-axis with snap-on-tool

- ▲ Tools with fixed insert seats for machining centres
- ▲ High-precision insert seats, thanks to special production methods, i.e., no adjustment required after the indexable insert has been changed
- ▲ Quick and process-secure
- ▲ Tool cross-section optimised by FEM analysis for reliable machining
- ▲ Reverse internal turning of the entire contour with one U-axis tool



Further information on the U-axis system can be found on
→ Pages **68-69**

Sphere production through bilateral countersinking

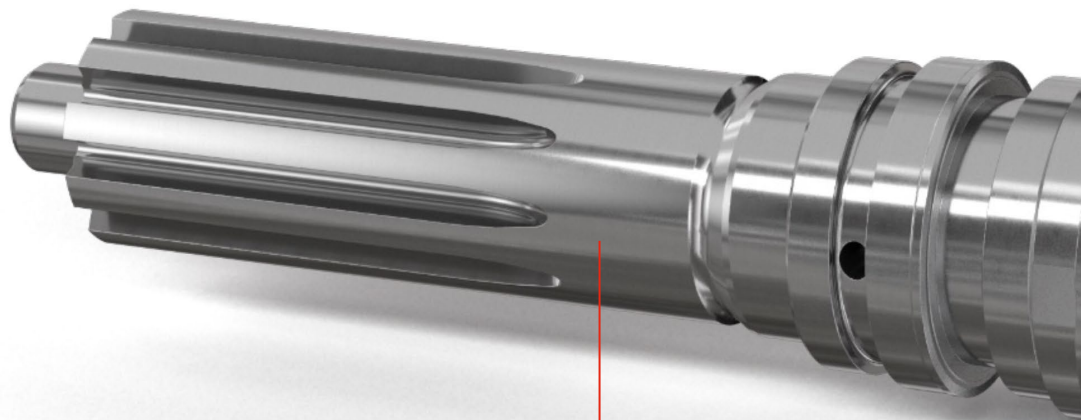
Ball countersink

- ▲ Tools with fixed insert seats for special-purpose machines
- ▲ High-precision insert seats thanks to special production methods
- ▲ No adjustment required after the indexable insert has been changed
- ▲ Quick and process-secure
- ▲ Ideal for large quantities

Gear shafts machining

Laid-back steel machining

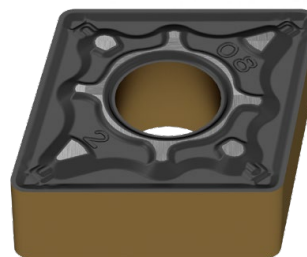
The machining of transmission shafts requires a combination of several skills. These include state-of-the-art machines, concentrated expertise, and advanced tools, because this is the only way to meet the high demands for precision, strength, and surface quality. Not least due to the complex geometries of the high-strength steels and alloys - with CERATIZIT tools you can be on the safe side.

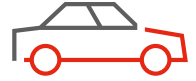


Pre-machining with our new ISO-P steel grade

ISO-P insert

- ▲ Improved wear detection on the free surface
- ▲ Up to 45% longer tool life thanks to our new ISO-P coating
- ▲ Availability of different grades for individual cutting conditions
- ▲ Three different grades for smooth, universal and interrupted cutting

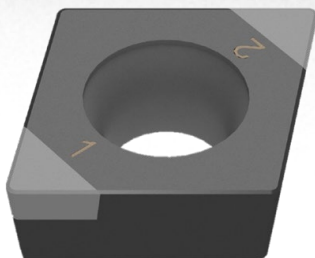
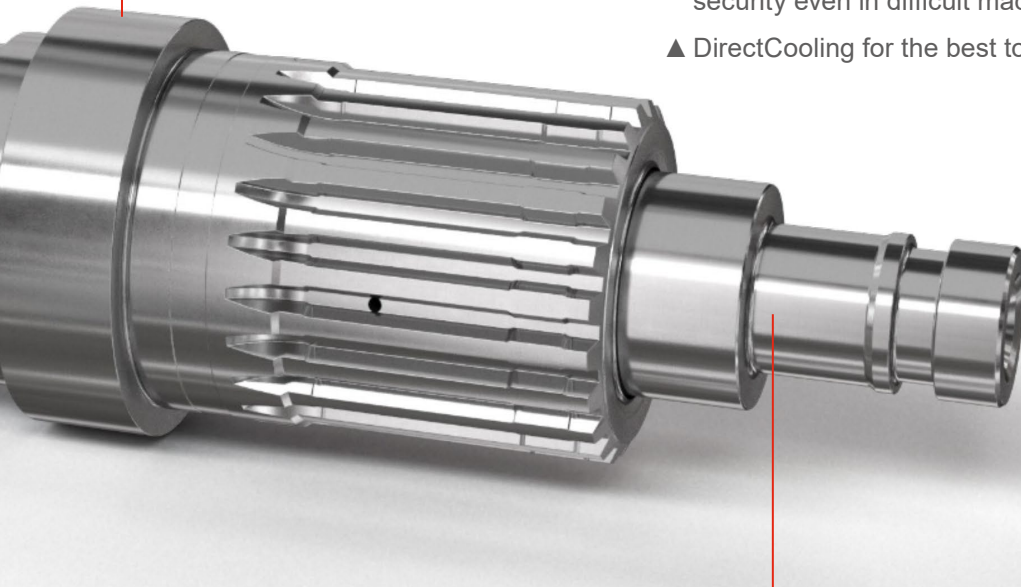




Turning tool holder for our ISO-P inserts

Tool holder ISO

- ▲ Clear, consistent range easy selection of indexable insert
- ▲ High cutting speed and longer service life increases productivity
- ▲ Universal application with high reliability and outstanding performance
- ▲ For maximum process security and reduction of the reject rate
- ▲ Greater stability in the tool holder increases process security even in difficult machining situations
- ▲ DirectCooling for the best tool life



Finishing the hardened shaft with our new CBN hardcut grade

CBN hardcut

- ▲ Faster cycle time
- ▲ Several machining steps possible with one tool:
Longitudinal and face turning, external and internal machining in one clamping
- ▲ Roughing and finishing in one process
- ▲ Three grades available
 - CTBH1000 – smooth cut grade
 - CTBH2000 – all purpose grade
 - CTBH3000 – interrupted cut grade

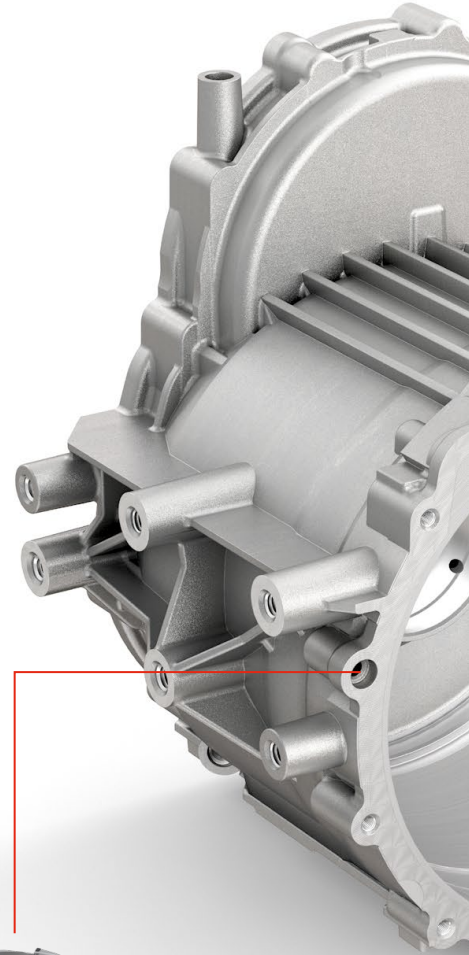
Electric motor housing machining

The home of torque

Hybrid or fully electric cars move to the beat of their heart – the electric motor, which has become the key element in the powertrain, thanks, in part, to its enormous torque.

Of particular interest to machine operators is the electric motor housing made of a wide range of aluminium alloys. Given that annual quantities have now reached series production levels, unit costs are becoming increasingly important. The stator bore is the most cost-intensive part, placing high demands on the tool and cutting edge. In the case of bore diameters of 200 mm and above, reducing the weight of the tools plays an essential role in preventing the breakdown torque and torque of the machining centre used from being maxed out.

The CERATIZIT Group has the perfect solution to hand for these challenges too.

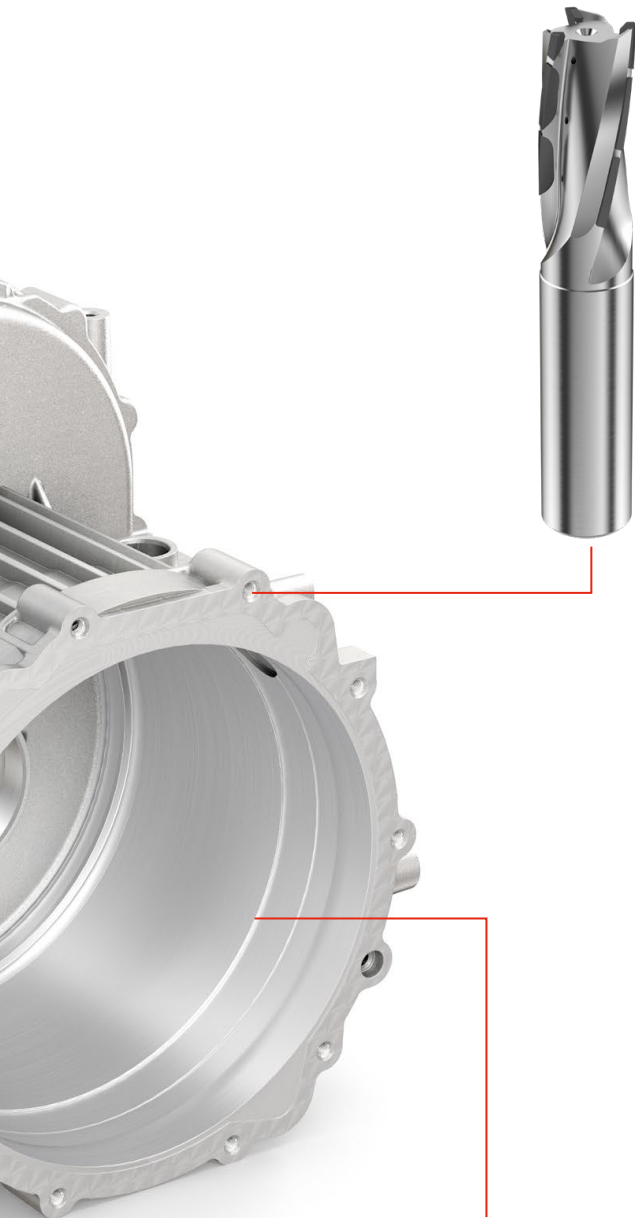
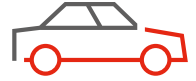


For diameter roughing of the stator housing

PCD roughing cutter

- ▲ Roughing the stator bore
- ▲ Highest productivity thanks to five tool cutting edges
- ▲ Universally applicable also for face milling of the stator housing





Machining of flat surfaces and hard to reach places

PCD porcupine cutter

- ▲ Standard PCD Hedgehog cutter
- ▲ Universally applicable for a wide range of applications in stator machining
- ▲ Highest productivity thanks to three cutting edges
- ▲ Burr-free machining thanks to very sharp cutting edge



Finished machining of the high-precision bore of the stator

PCD finish tool

- ▲ Adjustable cartridges for highest accuracy
- ▲ Lightweight construction think aluminum base body
- ▲ PCD Inserts
- ▲ Different standard grade available
- ▲ Different standard forms available
- ▲ DAH for perfect runout

Battery tray machining

Take charge: efficient series production of the battery box

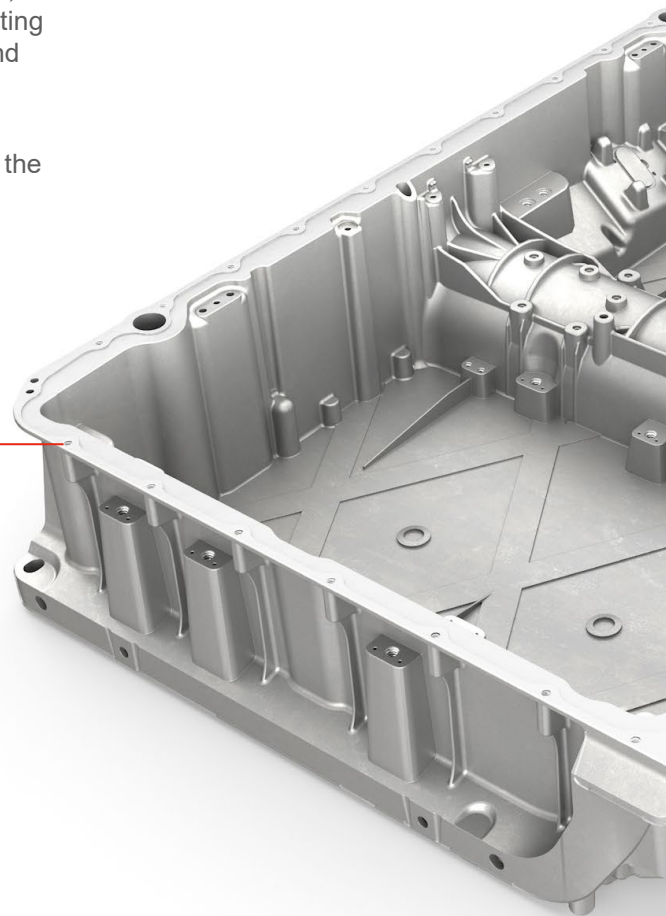
The batteries for electric and hybrid vehicles must be carefully protected to ensure safety and a long service life. Thin-walled battery trays made of high-strength aluminium alloys are the container of choice as they add little to the overall weight. To keep the cost at a reasonable level, durable and innovative tool systems which can carry out several cutting operations in one go, for example, are used for the array of holes and threads. Speed is also essential when it comes to the long seating surfaces for the battery tray lid.

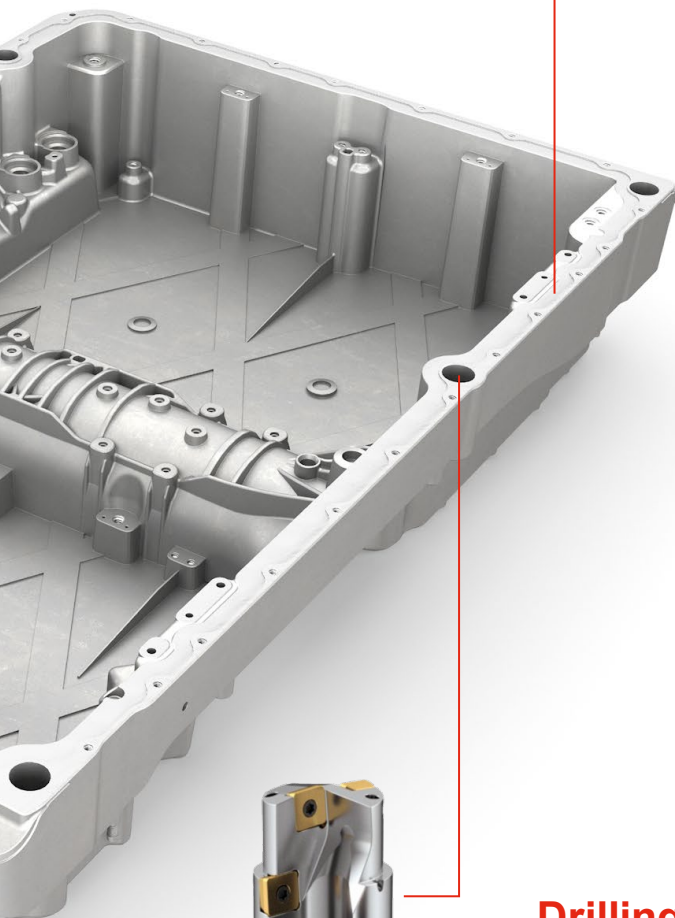
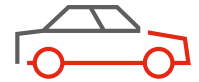
HSC and HPC-tested milling tools from the CERATIZIT Group fly in the face of all speed limits.

Drilling, threading and chamfering the screw thread in a single operation

Drill thread milling cutter

- ▲ Three tools in one
- ▲ Extremely efficient on large quantities of threads
- ▲ Precise thread depths with accurate repeatability
- ▲ Over 50% reduction in the primary processing time, thanks to high cutting speed and feed
- ▲ No chip residue in the thread
- ▲ High-speed cutting (HSC) can be performed
- ▲ Free TPT app for creating CNC programs and for use as a tool finder





Face milling of the long sealing surfaces

PCD-Mill HPC

- ▲ Significant reduction in the primary processing time by up to 72%
- ▲ 3D-printed milling ring for maximum number of cutting edges and perfect coolant supply
- ▲ Maximum cutting data values and service life for efficient production
- ▲ Reduced burr formation and quieter running than conventional PCD milling cutters
- ▲ PCD cutting edges can be re-lasered
- ▲ Available as face mills, screw-in cutters or monobloc milling cutters from stock (dia. 10 – 100 mm)

Drilling of the clamping holes of the battery tray

Step-drill with countersinking



- ▲ Drilling the holes responsible for clamping the battery tray to the chassis
- ▲ Insert Stepdrill with countersinking
- ▲ Configurable semi-standard product portfolio
- ▲ Insert portfolio for aluminium machining
- ▲ Shortest delivery times under 3 weeks
- ▲ High-Tech Tools for the highest productivity
- ▲ Fixed prices at the Standard-tool pricing level

Brake calliper machining

Get a grip on service life and performance with cast iron and aluminium

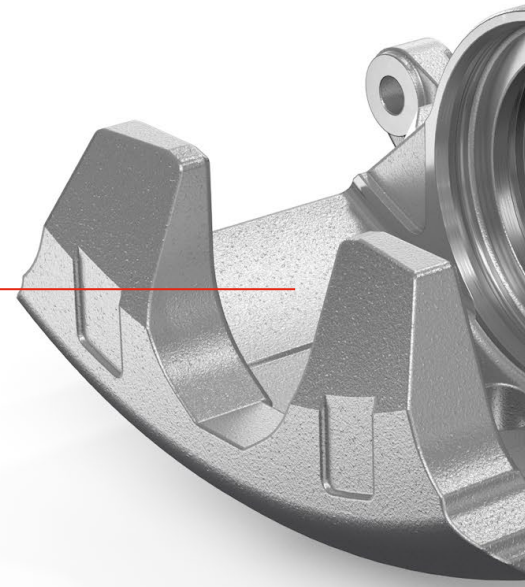
Machining brake callipers comes with a range of challenges. If nodular cast iron is used, then the service life of the tools is what counts, whereas if aluminium is used, it is the performance. On top of that, the machine concepts also have an effect on the tool alloys in question. But no matter whether a machining centre, a lathe, or a special-purpose machine is used, our customers always receive the perfect solution for their particular application.

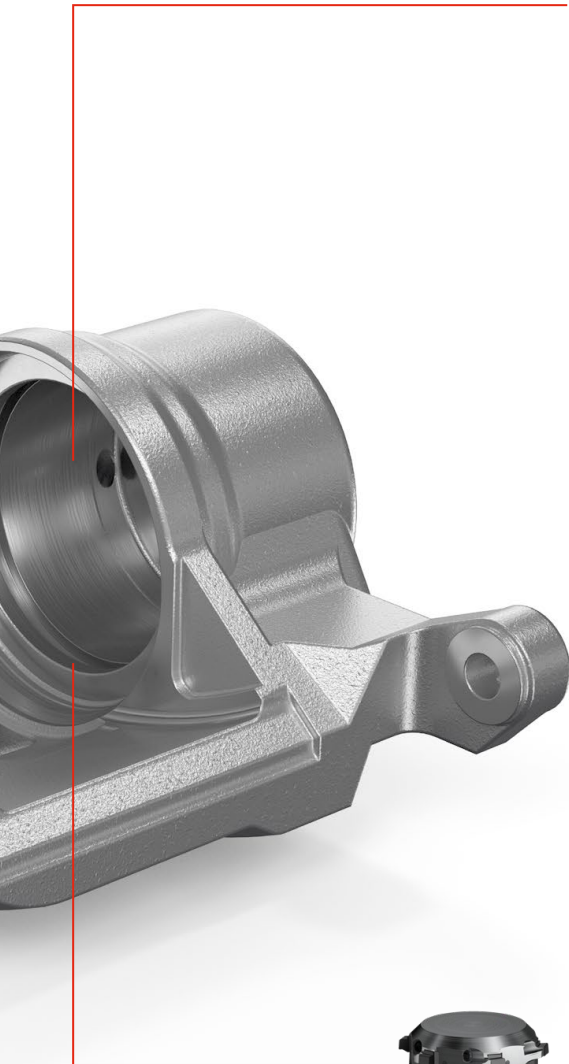
A wide range of tools, and many years of experience in machining brake callipers worldwide, enables the CERATIZIT Group to surpass all requirements, from the simplest of carbide drills to a high-end solution with mechatronic tools.

Milling of pad face, disc clearance and dust cap face in one cut

Side and face milling cutters

- ▲ Cycle time savings of approx. 50%
- ▲ Tangential inserts for maximum performance
- ▲ Surface completion in a single step or rough/finish machining is possible with a two-part milling disc with adjustable width
- ▲ Cross-pitching of the inserts eliminates vibrations
- ▲ Left and right-hand cutting can be used





Roughing and chamfering the piston bore in a single operation

Roughing boring bar

- ▲ TOHT indexable inserts with POWER support chamfer technology enable high feeds and quiet running despite long overhang lengths
- ▲ Additional solid carbide support elements at 90° to the indexable insert axis also stabilise the tool when countersinking the base of the piston bore
- ▲ Additional tangential inserts for the control cut



Simultaneous machining of the sealing ring groove and clamping ring groove

Sealing ring groove milling cutter

- ▲ Maximum precision thanks to ground cutting body and eroded adapter chambers
- ▲ Tool accuracy of +/-0.025 mm in diameter
- ▲ No complicated adjustment
- ▲ Wear resistant CTCP325 cutting material guarantees a long service life despite high cutting speed

Electronic braking system machining

ABS, TCS and ESC: on the cutting edge

Electrification has been on trend for decades. Assistance technology such as antilock braking systems, traction control systems or electronic stability control all play a huge role in vehicle safety and are now included as standard in modern cars. In terms of quality, the holes in the control housing pose somewhat of a challenge for machine operators and tools, and complex contours often have to be produced with absolute precision.

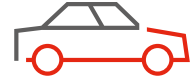
To prevent jams on the production lines, state-of-the-art tool concepts from the CERATIZIT Group release the brakes and guarantee a clear run for efficient production.

Drilling the solenoid valve bore with maximum precision

PCD stepped drills solenoid valve bore

- ▲ Carbide base body with centring tip and soldered-in 5-stage PCD blanks
- ▲ Complex drilling contour
- ▲ A cutting speed of up to 400 m/min can be reached
- ▲ Surface quality R_a 0.8

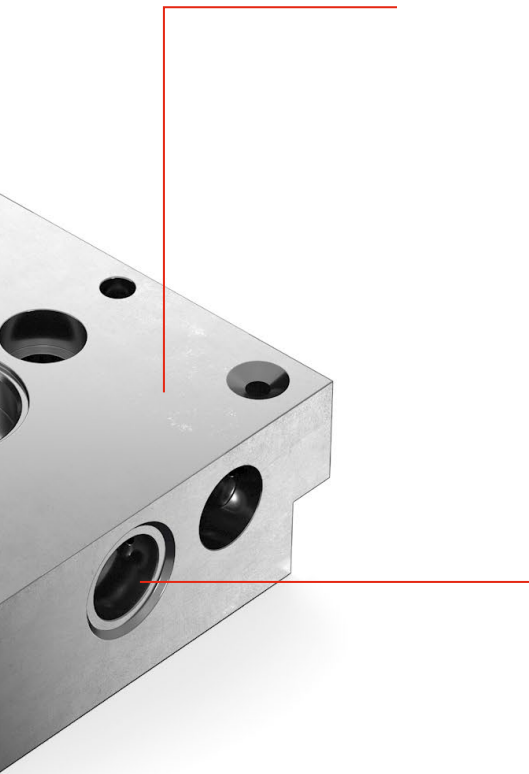




Face milling the exterior

HPC PCD milling cutters

- ▲ Significant reduction in the primary processing time by up to 72%
- ▲ 3D-printed milling ring for maximum number of cutting edges and perfect coolant supply
- ▲ Maximum cutting values and service life for efficient production
- ▲ Less burr formation and quieter running than conventional PCD milling cutters
- ▲ PCD cutting edges can be re-lasered
- ▲ Available as face mills, screw-in cutters or monobloc milling cutters from stock (dia. 10 – 100 mm)



Complex drilling contour of the pump interface in a single operation

PCD stepped drills pump interface

- ▲ Carbide base body with centring tip and soldered-in 5-stage PCD blanks
- ▲ Complex drilling contour
- ▲ A cutting speed of up to 400 m/min can be reached
- ▲ Surface quality $< R_a 0.8$

Aluminium wheel machining

Run rings round your competitors

The machining of aluminium wheels requires high cutting speeds and extremely hard cutting materials. Robust tools are needed to withstand the enormous centrifugal forces that arise at high speeds.

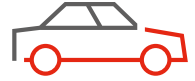
The CERATIZIT Group has decades of knowledge and experience in this segment, and has consistently expanded and optimised its range of tools and indexable inserts. We are now full-service providers: We are able to offer the optimal tool for every process involved in the production of aluminium wheels – from machining the inside and outside profiles through to valve and screw hole bores. Today, our tools are used to machine around 50 percent of all aluminium wheels found on cars, motorbikes, HGVs and even aeroplanes.

Turning for internal and rest face machining

OvalFlex

- ▲ A modular tool system tailor-made for complete machining of aluminium wheels
- ▲ Maximum stability thanks to backlash-free interface, oval and conical design and sturdy X32 inserts
- ▲ Reduced stock requirements due to large standard range
- ▲ Excellent repeatability during tool head changeover





Turning the outside profiles

Shank tool system

- ▲ Excellent surface quality and process security
- ▲ Identical positioning, thanks to standardisation
- ▲ Optimum designs, thanks to FEM calculations



Hub machining

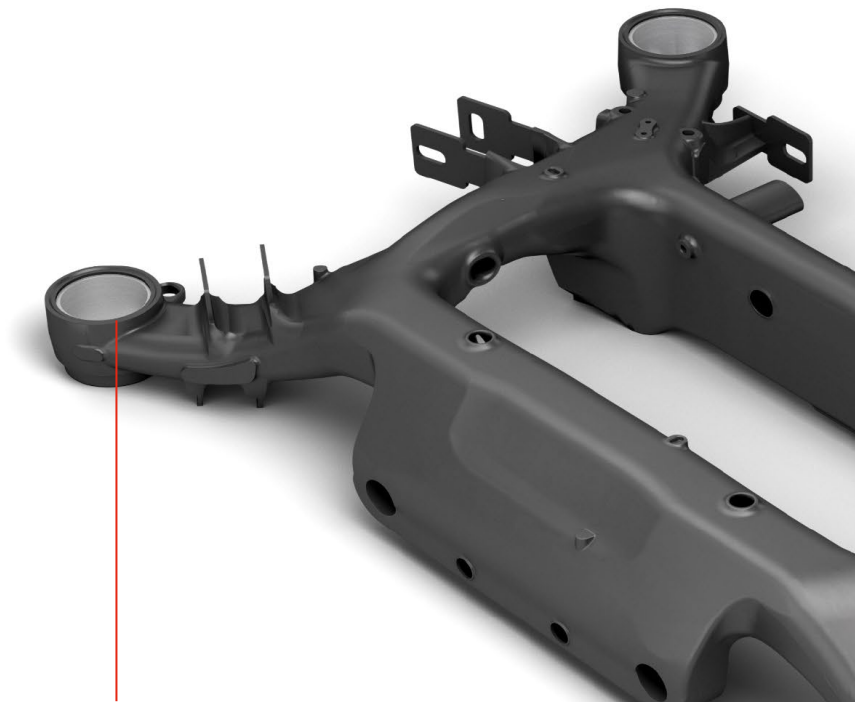
HubStar

- ▲ Excellent time savings (up to 50% per wheel)
- ▲ Maximum stability, thanks to oval and conical design
- ▲ Reduced stock requirements (no need for complex special-purpose tools)
- ▲ Maximum application reliability and efficiency

Subframe machining

Stability pact that connects

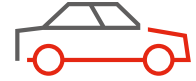
It bears responsibility in equal measure for the components of the wheel suspension. The subframe works in secret and yet has numerous tasks to perform. It too is geared to lightweight construction, its structure is becoming more complex and the materials more demanding. In order to still be able to machine efficiently and quickly, our special tools often combine several process steps into one - without being out of the ordinary.



Pre-machining the rubber bearing bore

Roughing boring bar

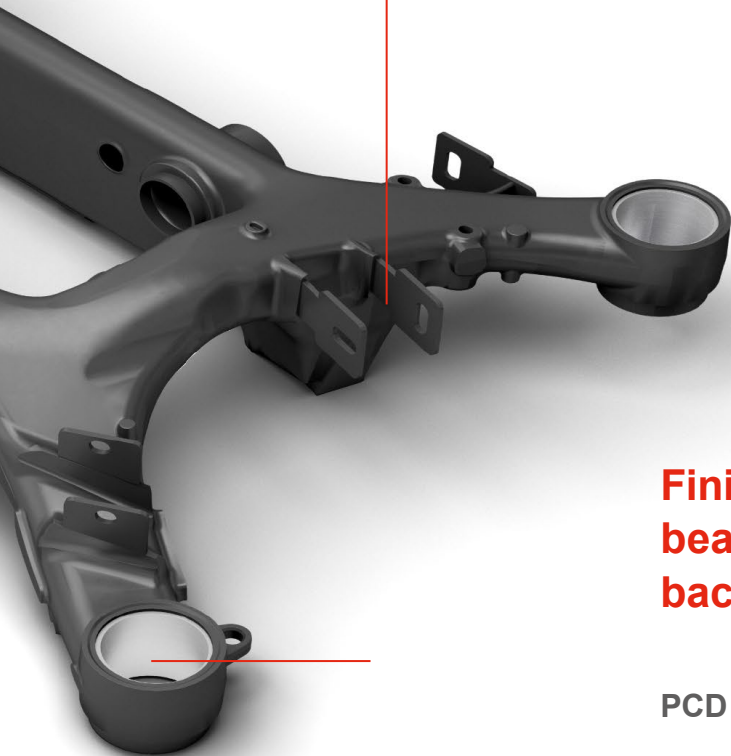
- ▲ Indexable inserts with TiB² coating for high cutting speeds and feeds
- ▲ Indexable inserts are arranged as step drills
- ▲ Better chip control as a result
- ▲ Lower cutting forces
- ▲ No bending of the long subframe arms
- ▲ Available as PCD indexable insert



General purpose face milling cutter with long cutting length for all applications

PCD milling cutter

- ▲ Highest productivity in face milling
- ▲ High infeed depths thanks to long cutting edge and very stable tool structure
- ▲ Suitable for many narrow places thanks to long tool shank



Finish machining of the rubber bearing bore with forward backward face machining

PCD multi-purpose tool

- ▲ PCD special tool with several processing steps simultaneously
- ▲ Finish machining of the diameter
- ▲ For- and backward face machining
- ▲ Chamfer machining for bearing pressing

Control arm machining

Always in control

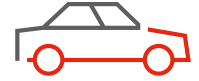
When it comes to the safety, control and ride comfort of a vehicle, the control arm plays an important role: It has to permanently withstand enormous loads. Only wear and corrosion-resistant materials can be used, but they must not increase the weight. Easy to machine? Nope, but with our adapted tooling solutions, your costs will also stay in line.

Pre- and finish machining the rubber bearing bore

Roughing and finish boring bar

- ▲ Drilling the control arm with our Pentron insert
- ▲ Finish machining with our 3D-printed cassette solution made of PCD
- ▲ One tool with two steps
- ▲ Saving cycle times
- ▲ Saving tool costs





Finishing the ball contour of the control arm via U-axis

U-Axis

- ▲ Finishing the ball contour with our mechatronic U-Axis
- ▲ Very flexible to machine different contours
- ▲ Reduce the cost per part
- ▲ Highly precise and adjustable



Further information on the U-axis system can be found on → Pages **68-69**



Roughing step drill for the ball contour of the control arm

Special step-drill

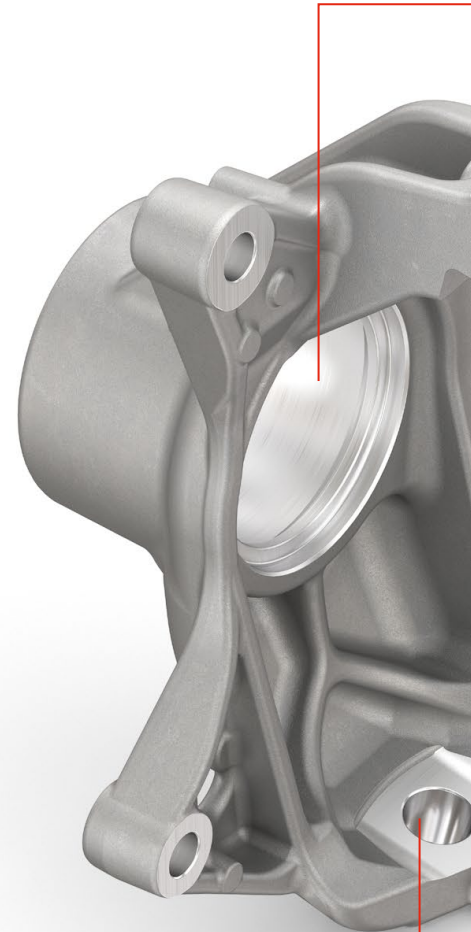
- ▲ Drilling the control arm with our Pentron insert
- ▲ Inside, outside and plan surface machining in one tool
- ▲ Different inserts available for steel and aluminium

Wheel bearing housing machining

Complex shapes are a challenge for the tool and machine

The complex geometries of a wheel bearing housing made of aluminium alloys often pose a challenge for many machine operators. For example, the milling and drilling operations in the bearing seat have to be ever more process-secure, accurate and efficient, as they account for a significant proportion of the production time. The sheer variety of cylindrical, conical or spherical holes call for state-of-the-art machining centres and precision drills to ensure optimum machining.

The CERATIZIT Group can provide the latter.

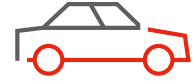


Machining the wheel carrier eye

PCD multi-purpose tool

- ▲ Special multifunctional tool for the machining of the wheel carrier eye
- ▲ Helix cutter for roughing the bore
- ▲ Finish machining of the bore
- ▲ Forward backward machining of the two faces
- ▲ Detector for tracking the cycles of the helix cutter





Pre-machining the wheel bearing bore

Roughing boring bar

- ▲ Indexable inserts with TiB² coating for high cutting speeds and feeds
- ▲ Diameter can be adjusted via short clamping holder for a consistent pre-machining dimension on the wheel bearing bore and therefore excellent process stability during finish machining
- ▲ Quiet running during machining despite long overhang length, thanks to high balance quality



Finish machining the mounting surfaces and wheel bearing bore

PCD multi-purpose reamer

- ▲ Multi-stage special-purpose tool with soldered PCD blanks
- ▲ A single tool for milling over several surfaces and counterboring/intermediate machining
- ▲ Excellent cycle time savings, thanks to several tools combined in one
- ▲ Quiet running during machining despite long overhang, thanks to high balance quality

Wheel hub machining

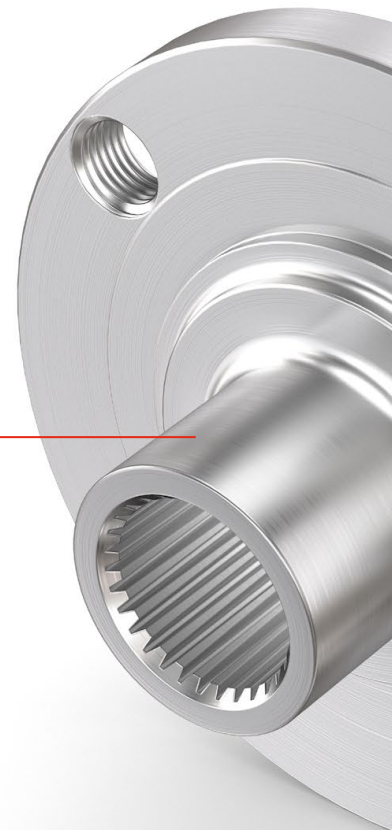
Precision and a long service life that turn things to your advantage

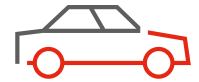
Many assume that a wheel hub is an easy-to-produce turned part. However, tools with a long service life are required to manufacture these components, which are made of tempering steel, efficiently and accurately. If wheel hubs made of case hardened material are needed, then in-depth expertise and intensive development work are needed to create the tool's cutting edge, to ensure continued precision and a long service life.

Multifunctional turning tool for wheel hubs inside and outside machining

Turning with CERATIZIT

- ▲ Clear, consistent range easy selection of indexable insert
- ▲ High cutting speed and longer service life increases productivity
- ▲ Universal application with high reliability and outstanding performance
- ▲ For maximum process security and reduction of the reject rate
- ▲ Greater stability in the tool holder increases process security even in difficult machining situations





Drilling the wheel screw connections

WTX – UNI solid carbide drill

- ▲ High feeds and cutting speeds can be achieved, thanks to wear resistant substrate and the latest PVD coating technology
- ▲ One of its key features is the special post-treatment of the cutting edges
- ▲ Drill into all materials up to 1200 N/mm²
- ▲ Dia. 3 – 25 mm
- ▲ Lengths: 3xD, 5xD, 8xD
- ▲ Available with/without thro' coolant

Thread cutting the wheel screw connections

UNI machine taps

- ▲ Powder metallurgy HSS with TiN coating
- ▲ A reliable all-rounder for the majority of applications in ISO groups P, M, K, N
- ▲ For threads $\leq 3xD$
- ▲ Version available for various thread types

Roller bearing machining

Speed things up with the Swiss army knife of cutting tools

Roller bearings are used wherever components rotate at high speed or heavy loads need to be set in rotational motion. Their simple design – inner ring, outer ring and rolling element – belies the sophisticated functions and high quality standards of these components. And the tool systems used must be up to the job, so that stringent requirements relating to service life and precision are met during the machining of these complex parts.

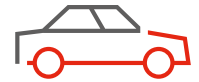
Whether it is grooving, turning, drilling or all these things with a single tool: The CERATIZIT Group will help you optimise your processes with multi-talented tools.

Drilling into solid, external turning, face turning and internal turning of the roller bearing contour

ProfileMaster multi-function tool

- ▲ Race turning without steps with a single tool
- ▲ Turning inside profiles
- ▲ Turning grooves and undercuts
- ▲ Turning outside profiles
- ▲ Range: Dia. 10 – 32 mm
 Lengths 1.5xD, 2.25xD





Drilling into solid, external turning, face turning and internal turning of the roller bearing contour

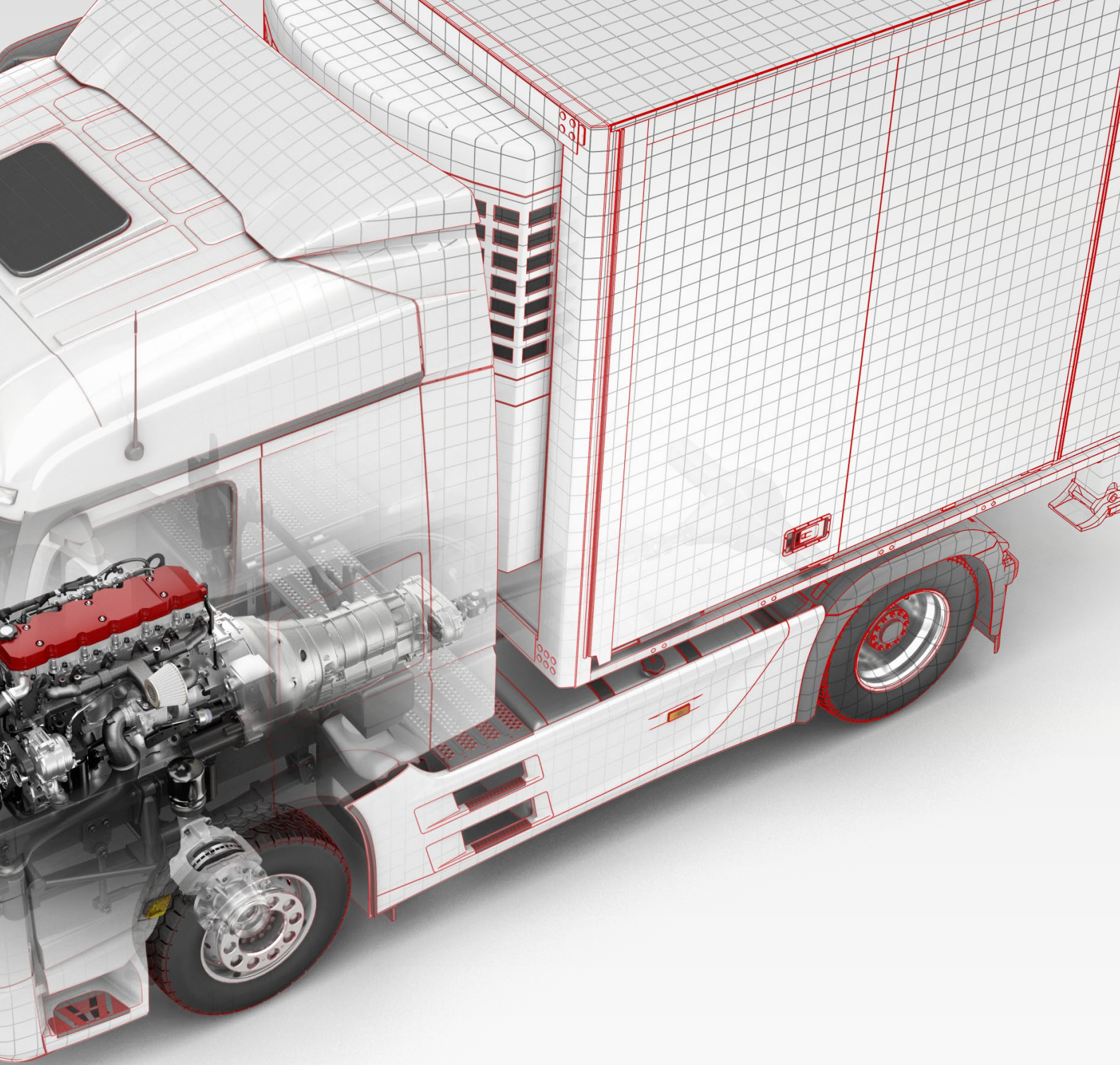
EcoCut multi-function tool

- ▲ One tool for several machining operations
- ▲ Fewer tool stations occupied
- ▲ Fewer tool changes
- ▲ Reduced machining times
- ▲ Range: Dia. 8 – 32 mm
 Lengths 1.5xD, 2.25xD, 3xD



Machining solutions for the Trucking Industry





Cylinder head machining

Head work for machinists and tools

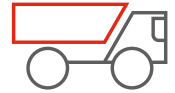
Whether cast iron or high-strength aluminium, producing truck cylinder heads is demanding for machinists and tools. Inlets and outlets, valve pockets and other complex structures require high-precision tooling systems that can simultaneously withstand the material requirements for as long as possible. The ingenious solutions from CERATIZIT demonstrate foresight and intelligence.

Finishing of valve seat and guide patent bore in one tool

Valve seat and guide tool

- ▲ Solid carbide reamer clamped with central hydraulic chuck
- ▲ Insert cutting ring centered and clamped with external hydraulic chuck
- ▲ High-precision tangential Inserts for an easy change of inserts resp. cutting edge





Finishing of the injector bores with high-precision tangential inserts



Injector bore tool

- ▲ No allocation of the inserts to a specific pocket, all can be freely positioned due to highest grinding precision
- ▲ CPP reduction up to 40%
- ▲ Useable in all Cast Iron materials, Geometries and Coatings can be selected accordingly
- ▲ Compensation Holder for an easy Run-Out correction

Roughing/Finishing of water plug bores



Water plug tool

- ▲ All Inserts with tangential technology
- ▲ Combination of a roughing tool and a finishing tool in one single tool
- ▲ Insert pockets of finishing step pre-shimmed in diameter to ensure an easy and adjustable-free change of inserts

Crankcase machining

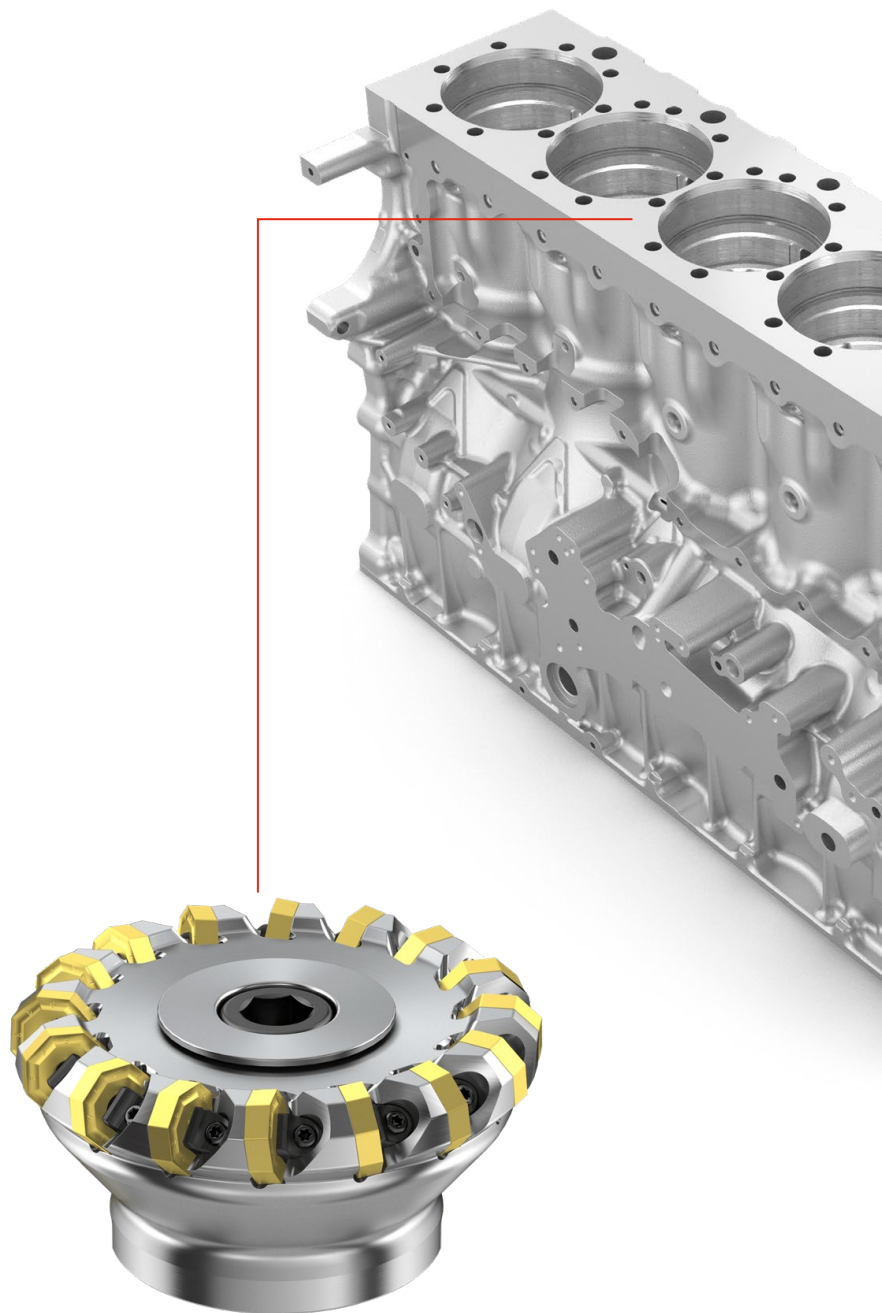
Precise work on the big engine

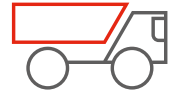
To ensure that both tool life and precision can keep pace, for example in cylinder and crankshaft bores, the hour has come for mechatronic slide boring bars. With our expertise and continuous research and development work, you too can keep your production running.

Indexable insert milling cutter

Face milling cutter

- ▲ Special milling cutter based on the MaxiMill A273
- ▲ Octagonal double sided milling inserts with selected coatings and substrates for highest performance
- ▲ Extremely stable wedge clamping guarantees a perfect fit of the indexable inserts even with the highest cutting forces
- ▲ Extremely rigid wedge clamping guarantees perfect sitting even at the toughest cutting conditions

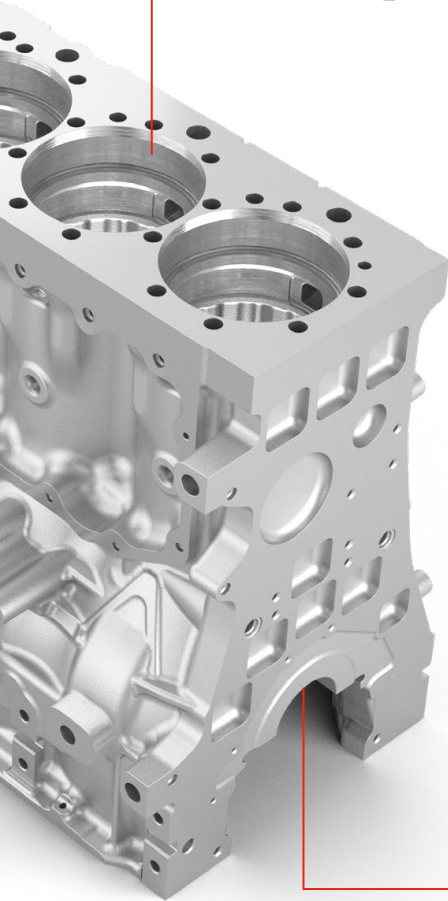




Mechatronic slider boring bar

Cylinder bore tool

- ▲ Finish machining cast liners parent bore, diameter adjustable via CNC-control
- ▲ Machining of seal grooves, diameter adjustable via CNC-control
- ▲ Top-Side mounted vibration damper, fine adjustable
- ▲ „Best in Class“ tool



Line boring bar for a precise bore

Crank bore tool

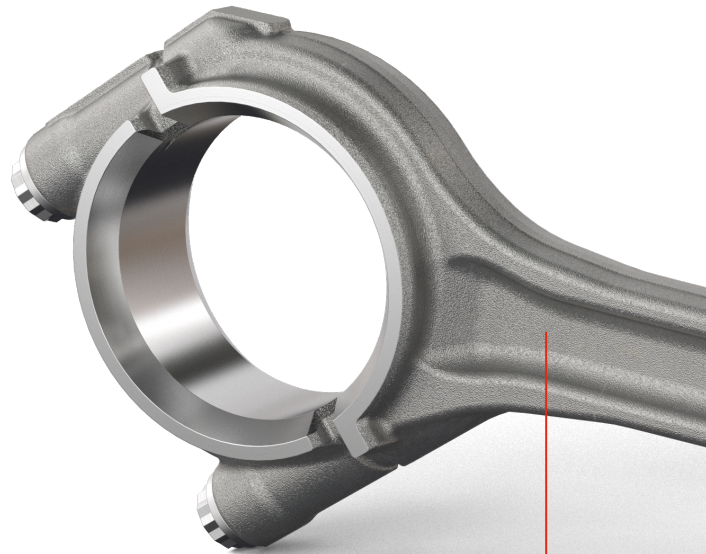
- ▲ Semi-finish and finish inserts on one boring bar, guaranteeing a perfect alignment
- ▲ Easy adjustable cartridges
- ▲ Floating holder for correction of misaligned roughing position
- ▲ „Best in Class“ tool

Con rod machining

Important player between piston and crank

Con rods are marathon runners in engine operation:

They are constantly subjected to tension, compression, bending and torsion, which is why they are usually made of micro alloyed or carbon-manganese steels as anti-stress agents. In order to not pass on the pressure to the machinists, highly efficient and high-performance tooling systems from CERATIZIT provide relief.

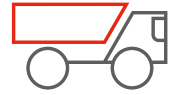


Roughing tool big eye and small eye

Roughing tool

- ▲ Two steps boring bar with easy adjustable cartridges
- ▲ SOEX inserts for highest performance also in challenging steel materials
- ▲ Small eye Step Z=2
- ▲ Big eye Step Z=3

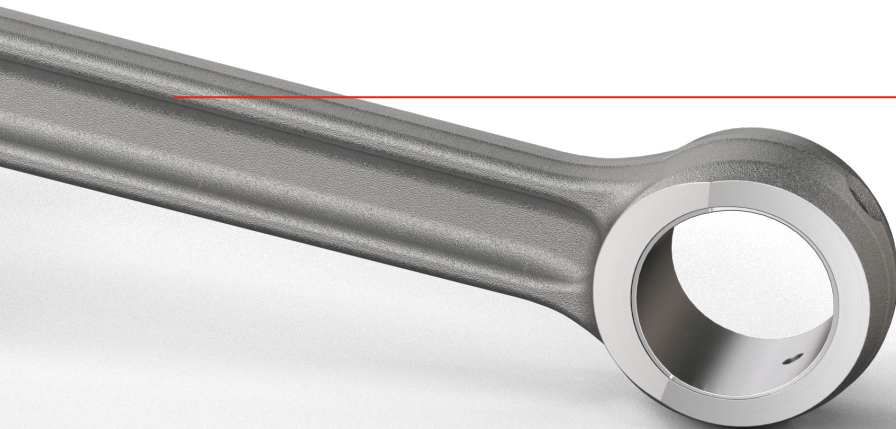




Combination of semi-finish and finish in one single tool

Front tool

- ▲ Precise Adjustment of all cartridges in diameter and length
- ▲ Forward machining semi-finish with $Z_{eff}=4$
- ▲ Backward machining finish with $Z=1$
- ▲ Useable e.g. on a tilting head



Roughing tool big eye and small eye

Combi boring bar

- ▲ Two steps boring bar with easy adjustable cartridges
- ▲ SOEX inserts for highest performance also in challenging steel materials
- ▲ Standard pentron inserts for different materials available



Brake calliper machining

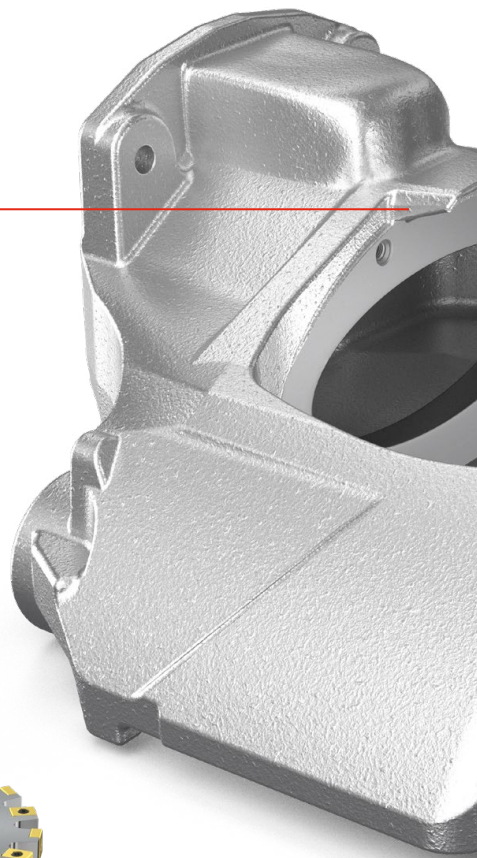
Stable tools with the best performance

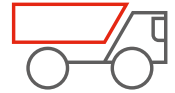
Tool life and performance are at the top of the list of tool requirements for machining brake callipers for trucks. This is why we combine a large portfolio of tools with our great machining know-how in the automotive & trucking industry, even for such special cases.

Milling of all interior faces with highest cutting parameters

Disc milling cutter

- ▲ Rigid tangential Inserts
- ▲ Eight useable cutting edges
- ▲ Sequential machining of pad faces and clearance
- ▲ Adjustable insert version available if a specific surface roughness is required





U-Axis with front tool

U-Axis tool

- ▲ Grooving seal groove and backward turning pin bore
- ▲ Both diameters adjustable via CNC-control
- ▲ Proven U-Axis technology with high durability of mechanical strained parts

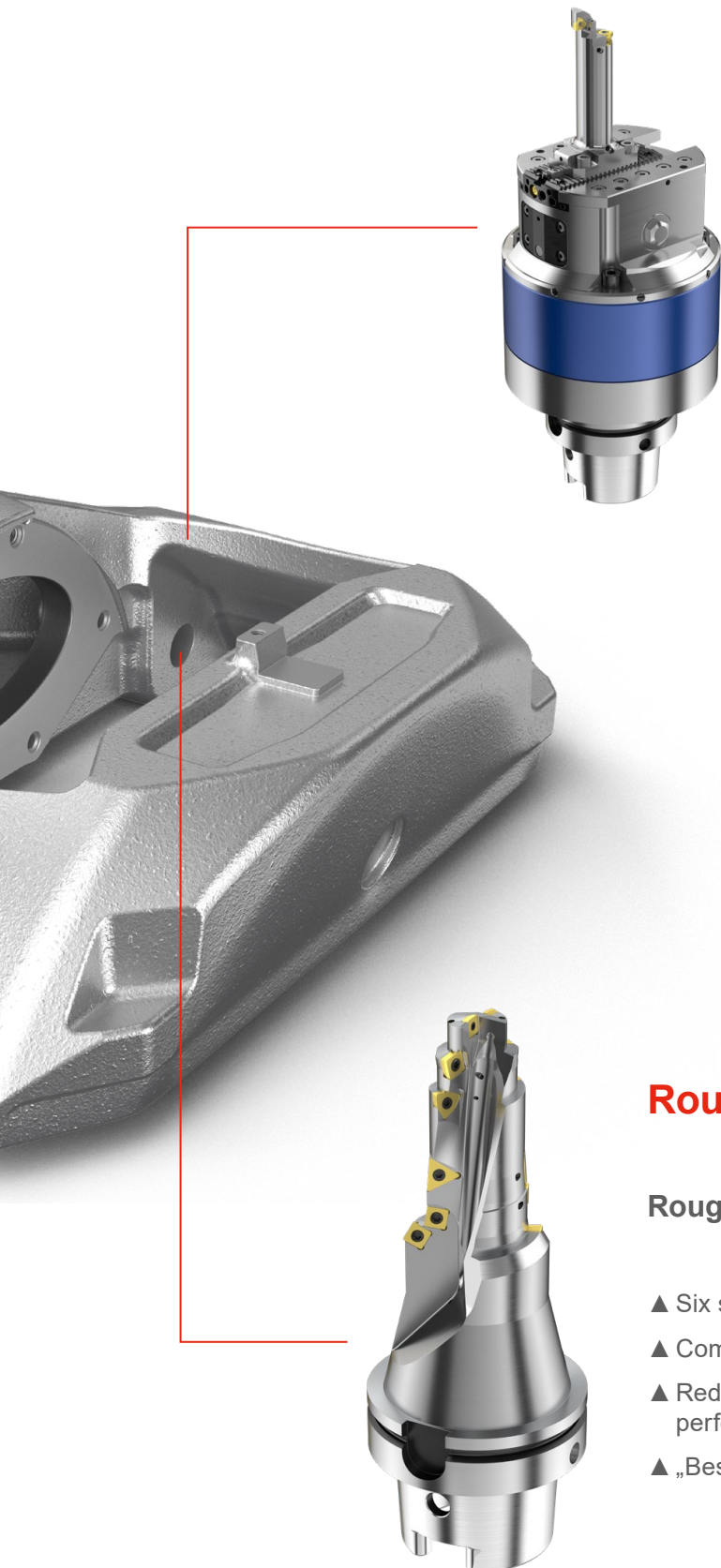


Further information on the U-axis system can be found on
→ Pages **68-69**

Roughing of PIN bores

Roughing tool

- ▲ Six step boring bar
- ▲ Combination of originally 2 tools into one
- ▲ Reduction of cycle time and CPP due to high performance inserts
- ▲ „Best in Class“ tool



Wheel hub machining

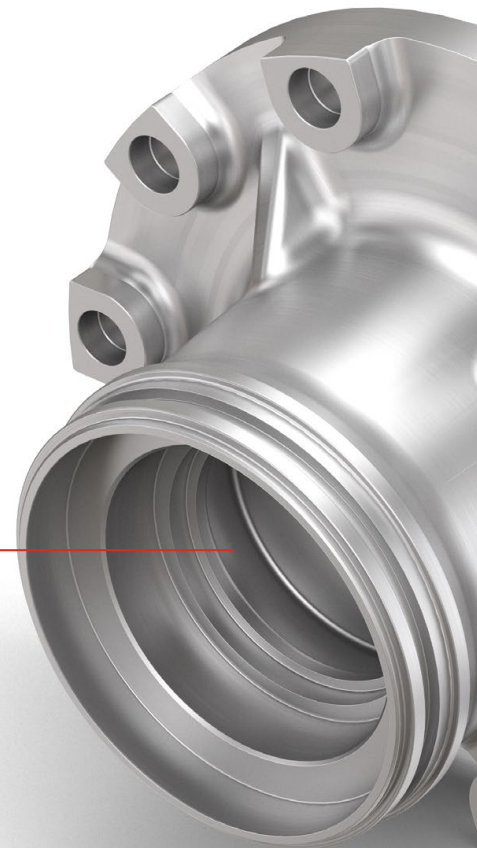
They have to carry a heavy load

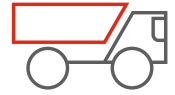
Even more than in cars, truck wheel hubs have to put up with a lot. High-strength steels and cast iron are the right materials to use, because their high strength and durability make them ideal for use under heavy loads and high stresses. The wide range of cutting materials and tools make CERATIZIT solutions the clear favourite.

For the inside roughing machining of the wheel hub

C-Clamp 2.0 turning tool

- ▲ C-Clamp 2.0 boring bar
- ▲ Solid carbide clamping
- ▲ Changeable inserts made with ceramic or solid-CBN
- ▲ Very stable clamping situation
- ▲ Different diameters available





Drilling the wheel screw connections



WTX UNI solid carbide drill

- ▲ High feeds and cutting speeds can be achieved, thanks to wear resistant substrate and the latest PVD coating technology
- ▲ One of its key features is the special post-treatment of the cutting edges
- ▲ Drill into all materials up to 1200 N/mm²
- ▲ Dia. 3 – 25 mm
- ▲ Lengths: 3xD, 5xD, 8xD
- ▲ Available with/without thro' coolant

Thread cutting the wheel screw connections



Machine tap type uni

- ▲ Powder metallurgy HSS with TiN coating
- ▲ A reliable all-rounder for the majority of applications in ISO groups P, M, K, N
- ▲ For threads ≤ 3xD
- ▲ Version available for various thread types

Projects in the best possible hands

From consulting to successful completion, we realise your application-specific project goals

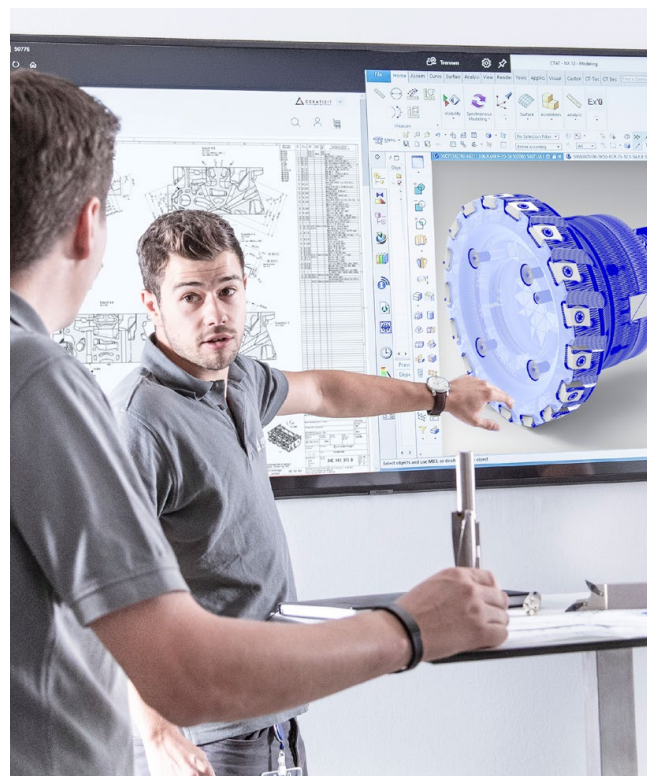
In order to machine increasingly complex workpieces cost effectively and to a high level of quality, all the process parameters need to be tailored to the specific task. Those who succeed in meeting these challenges will remain competitive on the global market.

However, the reality is that businesses often do not have the capacity to analyse manufacturing processes and optimise them to make them more efficient. There is also usually not enough time to tailor new cutting materials, tool geometries or process technologies to the individual machining operations.

This is precisely where our project engineering comes in. As one of the leading tool manufacturers and innovators in the machining industry, we develop ideal tool concepts for you based on key success factors such as efficiency, time and quality.

Why are we the ideal system partner for you? We have many years of experience in the development of innovative tool solutions, can draw on sound technical expertise and provide first-rate service. We are a full-service provider in machining, offering one of the most comprehensive ranges of cutting tools and services.

If you want to set the pace rather than risk falling behind the international competition, then get in touch with us!



For further information about
Project-Engineering

<https://cutting.tools/int/en/project-engineering>

Project consulting

We always keep your objectives in mind and provide you with advice across all industries in all application areas. Benefit from our many years of experience and our innovative solutions.

Project development & quotation

Our interdisciplinary project team develops the ideal machining concept for your individual specifications and objectives using high-end CERATIZIT tools.

Project implementation

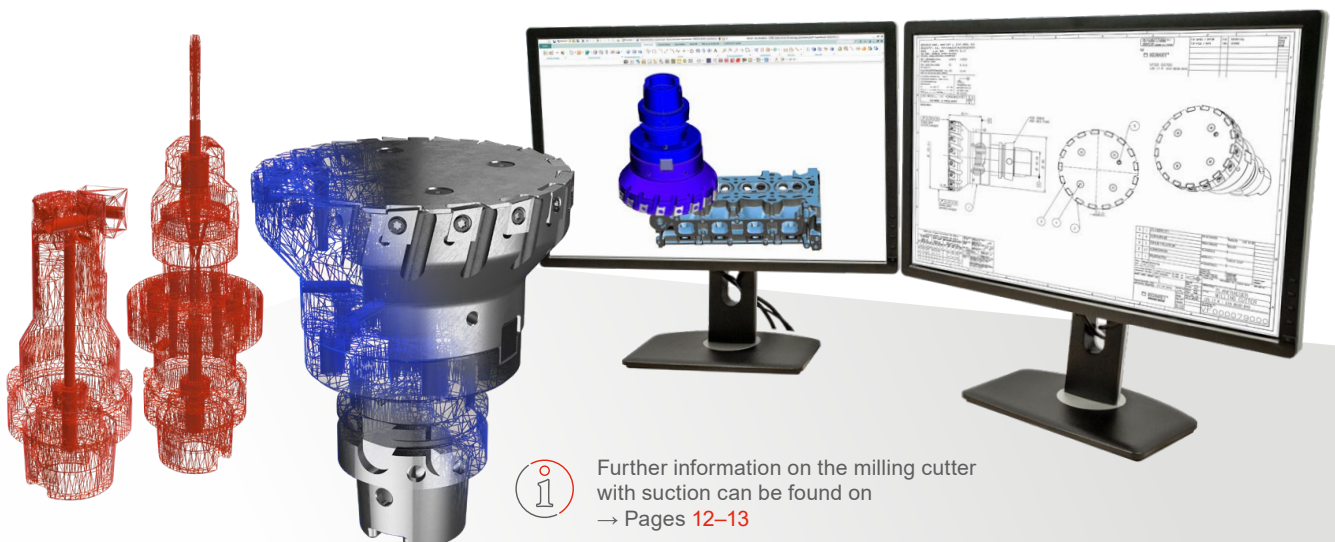
Our expert team implements the concept on your machine, working closely with you and your dedicated CERATIZIT application engineer. This on-site support guarantees you will receive a stable and cost-effective manufacturing process for your product.

Ongoing support

Even after successful implementation of the project, we are here for you. Your dedicated application engineer keeps an eye on your manufacturing processes, determines further potential for optimisation and provides you with ongoing support for all the challenges you face.

The path to developing the perfect tool solutions

The more complex a workpiece, the more innovative the tool concept needs to be in order to ensure the highest level of quality and cost effectiveness. Our project engineering service is designed to develop tool solutions of this kind. For example, face milling with the "suction effect" was developed due to one customer's specific requirement and enables 100% chip-free interiors during cylinder head machining. We are certain we can develop the perfect tool concept for your requirements too. Why not put us to the test?



Further information on the milling cutter with suction can be found on
→ Pages 12–13



ToolScope

Full process control – with digital monitoring

The automotive industry must overcome major challenges in the coming years. In addition to strong competitive pressure and the constant increase in productivity in high volume production, manufacturing electric vehicles in the millions is a key issue. As a strong partner to the automotive sector, we not only offer suitable tools and strategies for optimal processes, but also an advanced smart factory solution. With ToolScope, the pioneering monitoring and assistance system, nothing will be left to chance. You will have full transparency concerning your machining operations and, with this knowledge, can increase the efficiency of your processes.

ToolScope is a digital assistance system for your production environment that monitors and optimises all machining processes. Its innovative functions are customised machining solutions that are integrated in the machine. With ToolScope, we are the only company to offer not only the right tool, but also the expertise and capabilities to master and improve machining processes. CERATIZIT's 100 years of tool manufacturing expertise and in-depth understanding of digital systems make us the ideal partner to offer services encompassing all aspects of process optimisation.

Some of our customers have already achieved their goals ...

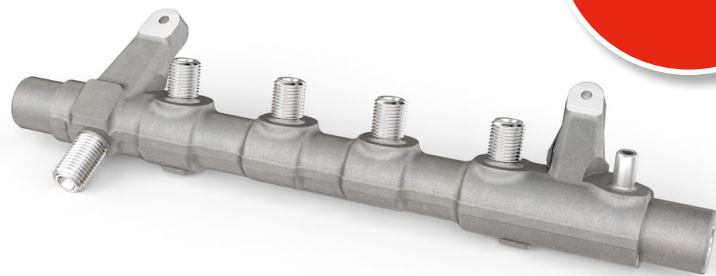
Component: Fuel rail

Measures:

- ▲ Optimisation of the tool concept
- ▲ Adaptation of the machining strategy with ToolScope

Result:

- ▲ Reduction in cycle time of 15%
- ▲ Tool service life increased by 30%
- ▲ Process security increased by 25%

**30%**

increased tool service life

Component: Gearbox housing

Measures:

- ▲ Optimisation of the tool concept
- ▲ Adaptation of the machining strategy with ToolScope

Result:

- ▲ Reduction in cycle time of 12%
- ▲ ROI after 2 months

**12%**

reduction in cycle time

We can optimise your process too – why not throw down the challenge!

We get the best out of your processes and develop the ideal production process, tailored to your requirements!

For further information on
ToolScope

<https://cutting.tools/int/en/toolscope>

Optimal use of your digital production data!

Cockpit combines all aspects of digital machining. We can provide you with a custom combination of evaluated data – from production data and machine data to tool data or even quality management data.

This ensures that you have an optimum overview of your production processes at all times.

Cockpit

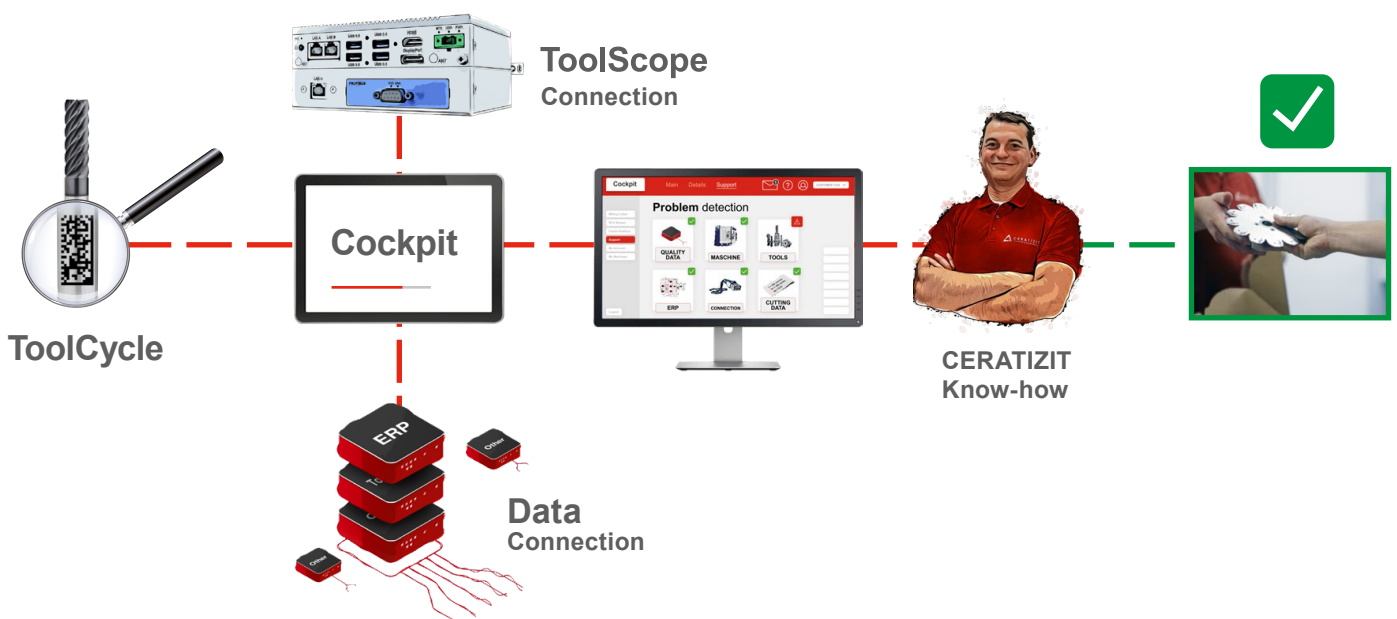
Want to keep an eye on the entire machining process? Here's how.

The main job of Cockpit is to record measurable data from the entire production process and then visualise and analyse it logically. The aim of this is to detect process problems that are not obvious as quickly as possible, interpret them correctly and rectify them with the help of CERATIZIT. This results in significant time savings in data recording, identifying problems and troubleshooting.

Helping you increase the efficiency of your manufacturing processes!

Create a custom Cockpit package to meet your needs.

You can either access Cockpit via the CERATIZIT Cloud or have it installed in your own network environment. Different Cockpit modules – **ToolScope Connection**, **ToolCycle** and **Data Connection** – can be selected depending on your requirements. These modules contain defined features that provide, visualise and analyse data from different process steps.



For further information about Cockpit

<https://cutting.tools/cerasmart-cockpit>

Would you like to optimise your processes too?

Then get the most out of your digital production data today!

What your process looked like up to now:

- ▲ Manual data gathering & data evaluation
- ▲ Manual and individual problem tracking, detection and troubleshooting

Benefits with Cockpit:

- ▲ Automated data collection & data evaluation in real time
- ▲ Automated and structured problem tracking, detection and troubleshooting

90%

time saving
for data
recording

80%

time saving
for trouble-
shooting

0,5%

improvement in
the OEE (overall
equipment
effectiveness)



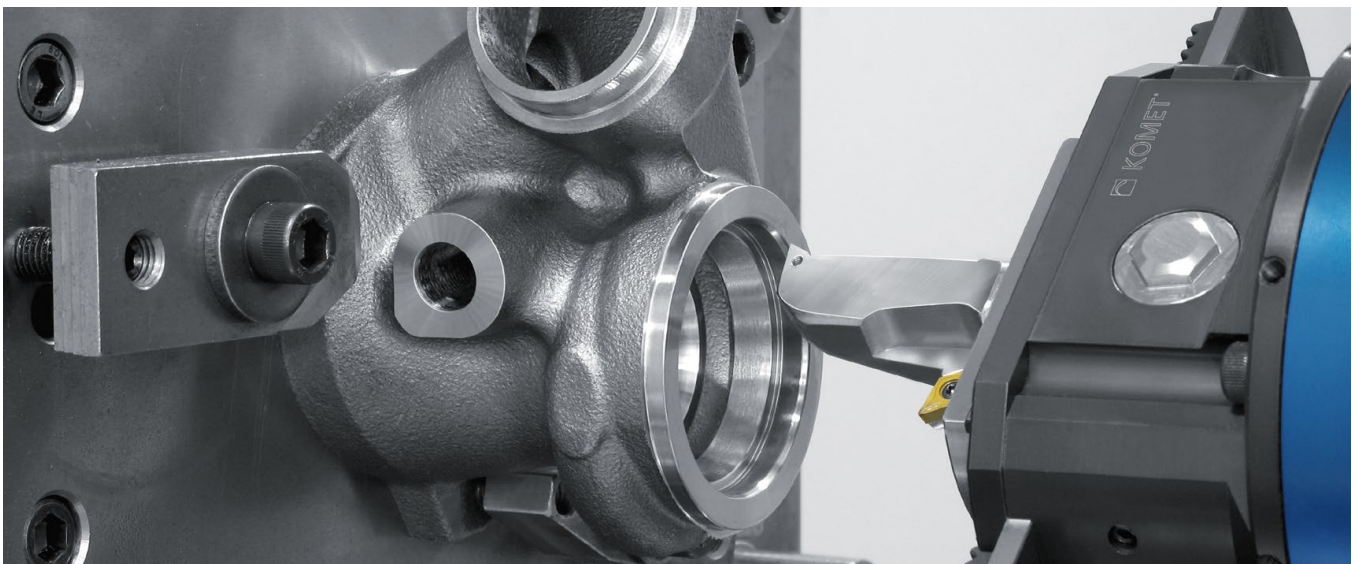
U-Axis system KomTronic

Efficient feed-out tools for turning contours on the machining centre when working with a stationary workpiece

Complex contours, tighter tolerances and rapidly changing product life cycles – many components in the automotive industry make flexible manufacturing concepts a must. With the KomTronic U-axis system, connecting rods, differentials, turbochargers, hubs, stator housings and more can be manufactured efficiently.

The KomTronic U-axis systems are programmable and are used for contour turning and turning operations on parts that are not rotationally symmetrical. Maximum flexibility can be achieved using customised snap-on tools and specially selected indexable inserts, with which contouring in bores and external machining are also possible. This results in significantly shorter production times with an improved level of quality and greater accuracy of form.

Users can make further time and cost savings thanks to the reduction in the variety of tools required. The U-axis can be operated in a fully closed (unmanned) loop and adapted to new machining contours at any time, meaning it boasts high precision and robustness. Innovations like the direct path measurement system on the operating slide, permanent oil lubrication and remote maintenance via web server make the KomTronic U-axis system future-proof and the first choice for cost-effective machining of stationary workpieces.



Your technical sales engineer will be happy to answer any further questions or please contact directly

Offer.Actuatingtools@ceratizit.com

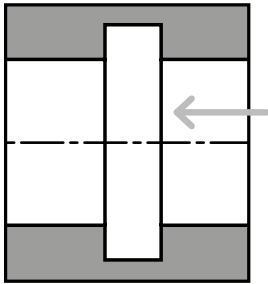


Further information on the
U-axis systems can be found on
→ Pages 23, 27, 43, 59

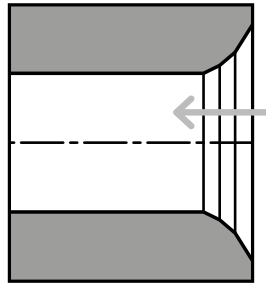
For further information about
U-Achssystem KomTronic

<https://cutting.tools/int/en/komtronic>

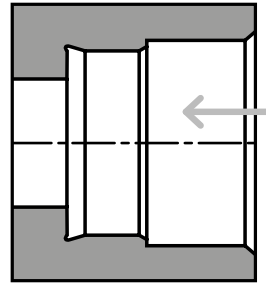
Machining examples



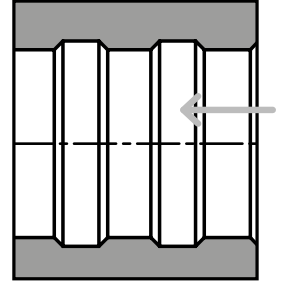
Grooving



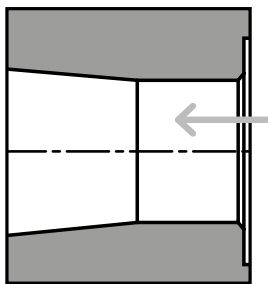
Turning valve seats



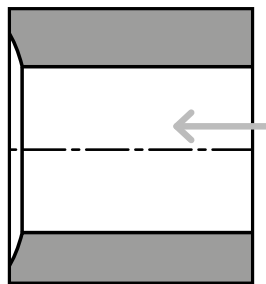
Bearing seat



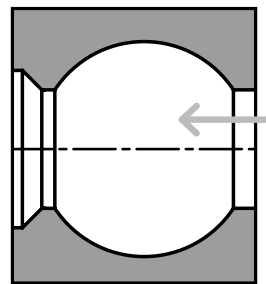
Bore with coolant passages



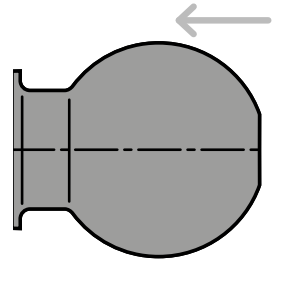
Tie rod



Undercutting differential housing



Internal contour turning



External contour turning

It makes turning contours possible when working with a stationary workpiece

Higher economy

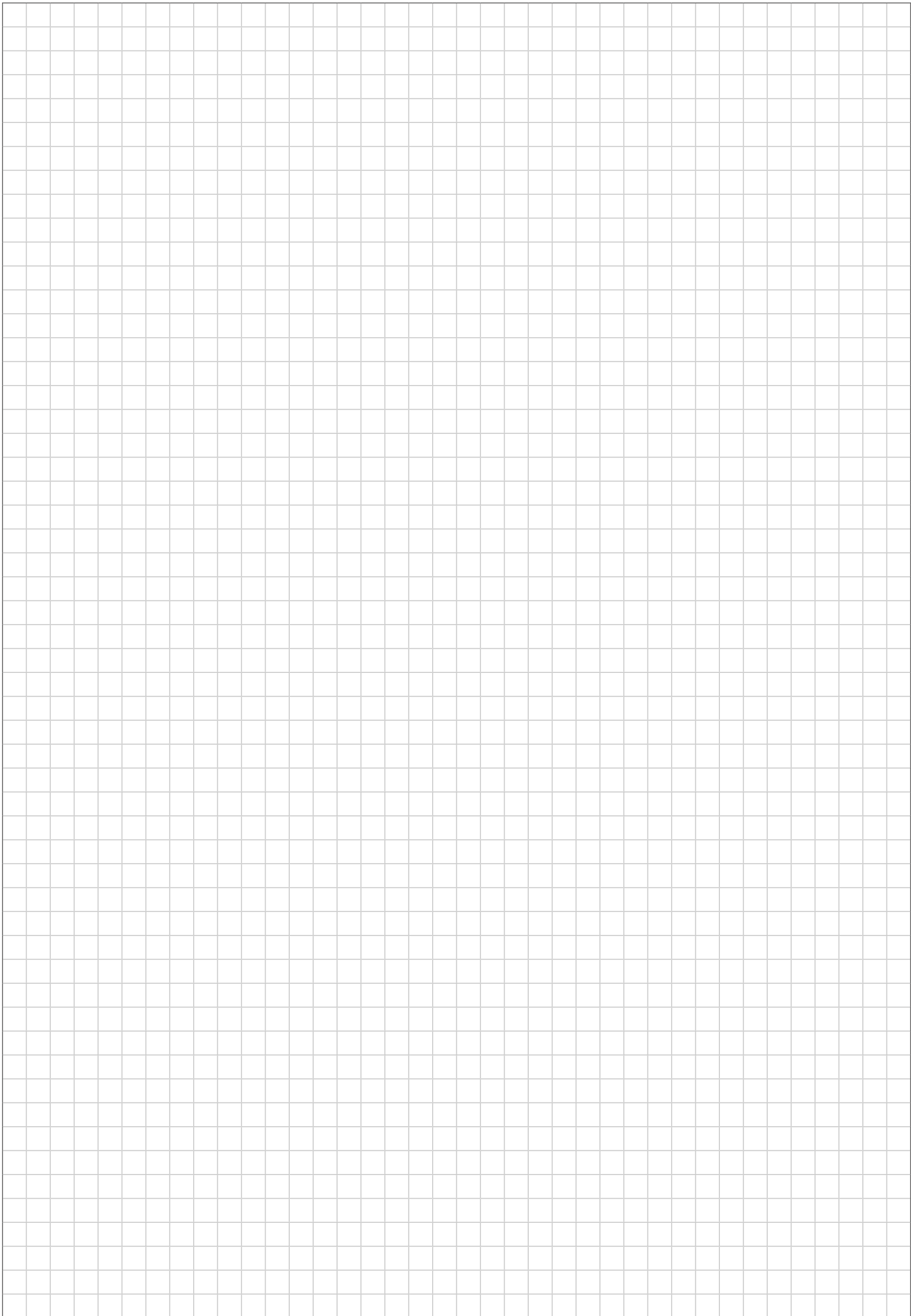
- ▲ Use of standard instead of special machines
- ▲ Reduction in number of tools
- ▲ No need for clamping devices for finish machining on turning machines

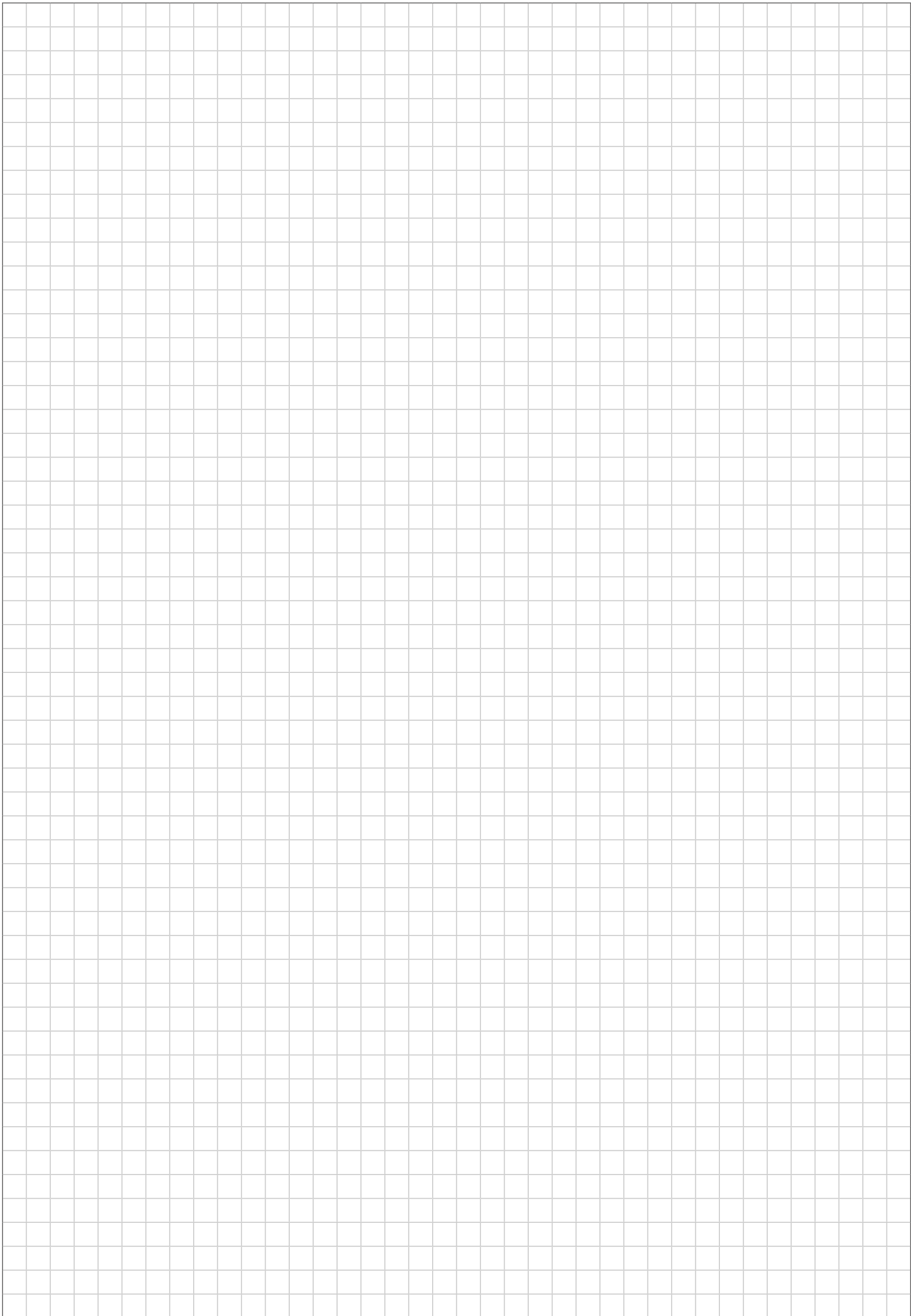
Reduced unit costs

- ▲ Reduction in machining and throughput times
- ▲ Savings on tool changes
- ▲ Replacement of time consuming circular machining operations
- ▲ Reduced holding times
- ▲ High cutting capacity

Lower operating costs

- ▲ Complete machining on one machine without the workpiece being rotated
- ▲ Minimum power consumption because of U-axis systems







We reserve the right to make technical changes and product improvements.



Part of the Plansee Group