



# Your partner in e-mobility

## Tools and system solutions

English | 2024

Premium grinding tools since 1919  
[www.tyrolit.com](http://www.tyrolit.com)

**TYROLIT**

# The Tyrolit Group

Tyrolit is one of the world’s leading manufacturers of grinding and dressing tools as well as a system provider for the construction industry.

Since 1919, our innovative tools have made an important contribution to the technological development in many industries. Tyrolit offers tailored grinding solutions for various applications, as well as a comprehensive assortment of standard tools for customers all over the world.

With roots in the heart of the Austrian Alps, Tyrolit combines the strengths of family values with a global vision and over a century of individual corporate and technological experience.



Tyrolit headquarters in Schwaz (Austria)

## Facts & Figures



**80,000+**  
products



**30+**  
production locations



**4,500+**  
employees worldwide



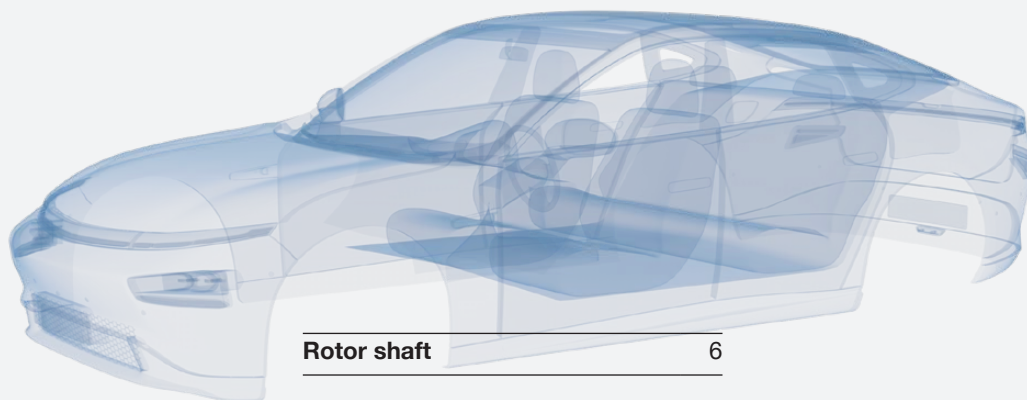
**140+**  
countries within our reach



**500+**  
international patents

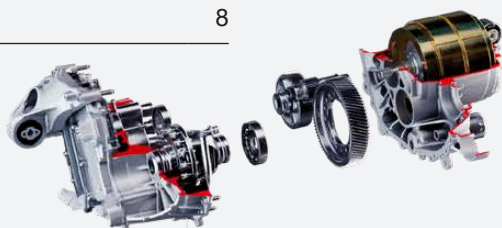
Sales companies in Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, India, Indonesia, Italy, the Netherlands, Norway, Poland, Portugal, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, the UAE, the UK and the USA. Distributors in 65 other countries.

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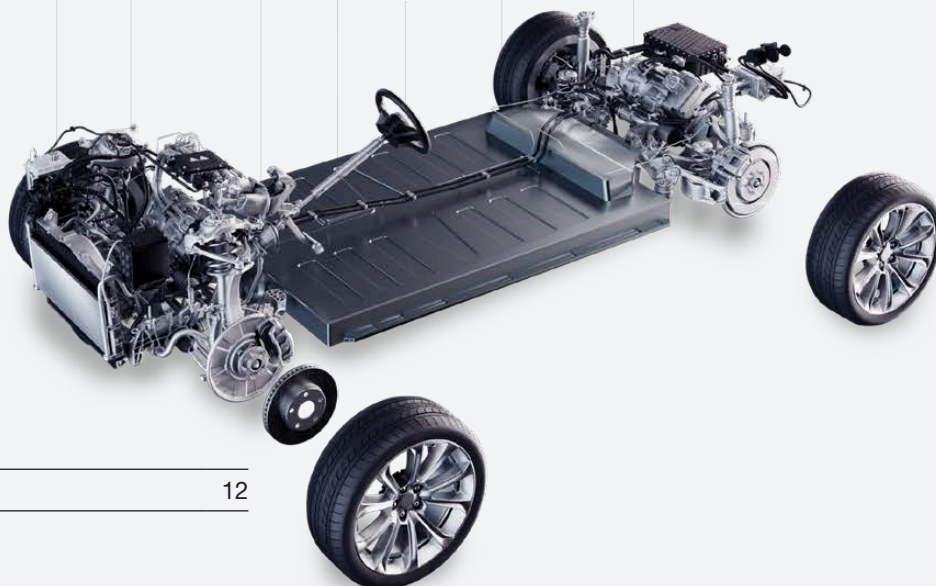


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## Your partner in e-mobility Innovative tools for all fields of application

The topic of e-mobility is more relevant than ever before, fueled primarily by detailed climate targets and a general change in people's thinking. New concepts for transporting goods and people are gaining momentum and offer possibilities and opportunities that need to be seized in the automotive industry. Last but not least, the goal of not registering any new cars with combustion engines after 2035 obliges car manufacturers to convert their production and to break new ground. For these reasons, new processes and high-quality tools are needed to implement this plan in an economical way and to steer the industry profitably onto new paths.



The grinding of special components in particular poses distinctive challenges. Optimum geometrical tolerances as well as the best surface finishes are essential for the production of high-tech parts for electric motors.


Tyrolit is your partner in the field of e-mobility to achieve any goal and provide sustainable support to manufacturers in the development of new solutions. This claim is based on our decades of experience in the automotive sector and our know-how in the production of cutting and grinding solutions for various industries.

### Innovative work processes with Tyrolit


Thanks to our extensive product portfolio, we can offer a solution for almost all grinding applications that meets the highest demands and is tailored to our customers' objectives. Tyrolit distinguishes itself as a development partner that supports its customers with know-how, innovative spirit and expertise. Our goal is clear: together with our partners, we want to become the innovation leader in this segment and fully support the positive and sustainable development of the transportation industry.



**Cost savings**  
due to the most economical grinding solutions on the market




**Know-how**  
of the world's best development team in the grinding industry




**System solutions**  
that are perfectly tailored to your requirements



**Innovation & Sustainability**  
as clear values of the technology leader



**First-class quality**  
from the leading manufacturer of precision abrasives



**Fast delivery**  
for our customers worldwide including global support

## Engine

### Rotor shaft

The rotor shaft is a central component of the electric motor and transmits the electrically induced torque to the transmission. Therefore, the quality of this component contributes significantly to the efficient locomotion of the vehicle.

Due to high RPM, these components must be able to withstand considerable loads, which means they have to be correspondingly strong and still meet the current requirements for lightweight construction. When machining the rotor shaft, it is important to achieve the best surface finishes and keep component costs as low as possible. This is mainly achieved by external cylindrical grinding of the bearing journals. Tyrolit's high-performance tools help you to optimise your processes by offering the best life times and highest precision. Our worldwide network of application experts, who are available to you at any time, plays a key role in this. Thanks to high-quality Tyrolit products, work cycles are significantly reduced which induces drastic time and money savings. From vitrified bonded grinding tools to electroplated CBN super abrasives, our extensive assortment contains everything you need to increase your process quality and achieve the best results in rotor shaft machining.



GENIS 2



GENIS 2 FT



CSS ULTRA



FACETEC MF

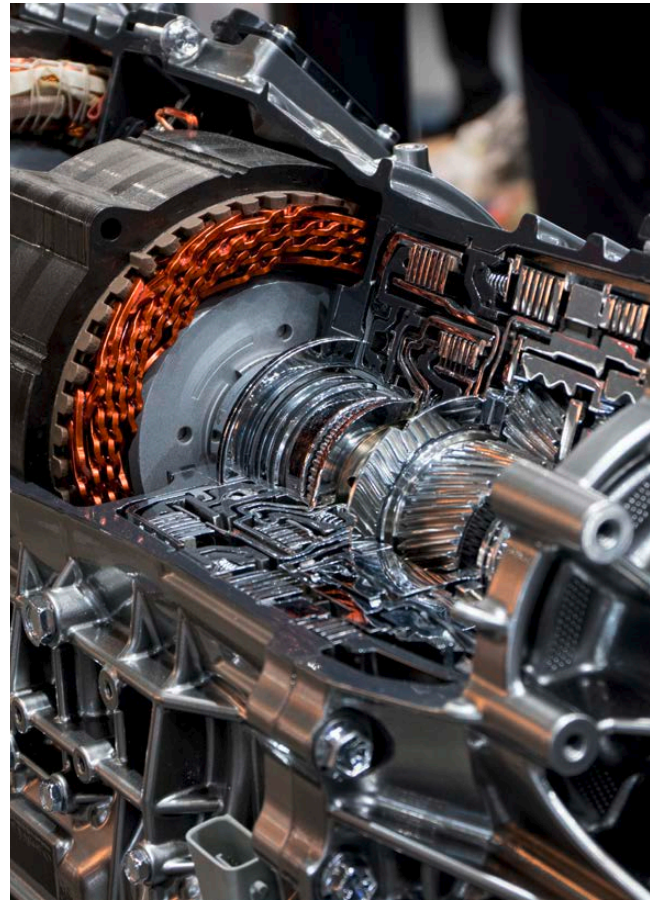
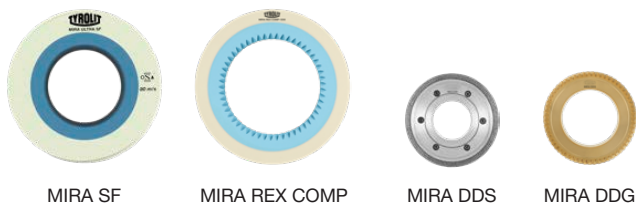




## Transmission

The transmission is also in e-mobility a very important component of the powertrain and must therefore meet the highest quality requirements.

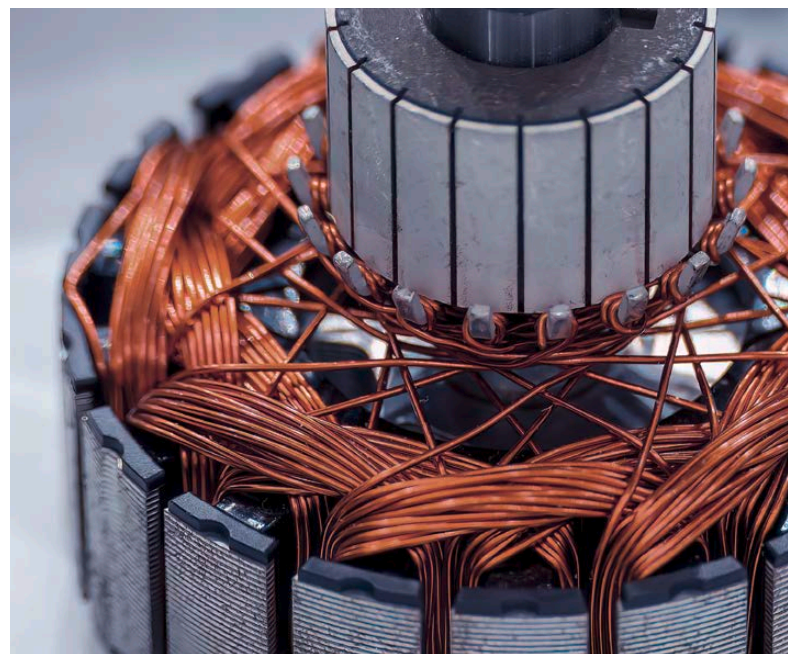
This requires perfectly ground surfaces and high gearing qualities. Gears for electric vehicles usually have even higher surface and geometry qualifications in order to minimise noise and vibrations due to significantly higher revolutions per minute. Tyrolit is the system provider for hard finishing gears for transmissions, offering high-quality grinding, honing and dressing tools as well as tool concepts for the superfinishing of tooth flanks.



## NdFeB magnets

Sintered magnets pose a particular challenge in production due to their complex material properties. Special processing steps, which can range from smooth and parallel grinding over external or internal grinding to the cutting of block magnets into smaller parts, require a selection of the highest quality diamond and CBN tools.

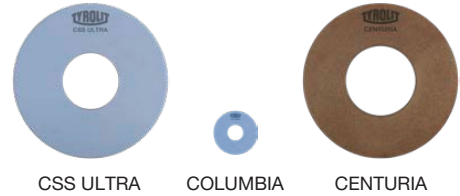
Due to the brittle and extremely hard magnet material, diamond wheels for cutting as well as diamond or special wheels for grinding must be used. If the cutting process is carried out with the highest precision, subsequent grinding is not necessary and working time is saved. In addition, splintering and cracking can be minimised through utmost care and perfectly adjusted tools. The Tyrolit product range stands for excellent quality, which means that the tightest shape and positional tolerances can be met.



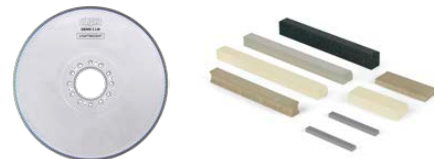
## Bearings

The bearing industry for e-vehicles is no longer set on steel but on ceramics as the material of choice in order to achieve lower weight and prevent current flow through the bearings.

The surface quality and shape accuracy of the bearing balls on the motor shaft have a significant impact on the performance of electric vehicles. It is therefore important to use tools of the highest quality when machining these parts. Tyrolit has been offering manufacturers in the bearing industry a comprehensive portfolio of first-class tools and excellent application technology support for decades, enabling them to master any challenges together.



CSS ULTRA COLUMBIA CENTURIA



GENIS 2 HONING STONES





## Battery



### Grinding of roller profiles

In the production of lithium-ion batteries, two factors will be decisive for competition in the future: Weight and energy density. The aim is to support a lightweight design and at the same time keep the energy density of the batteries at the highest level. This can be achieved primarily by reducing the thickness of the current collector, for which high-precision rollers are essential in production. Tyrolit's tools are used to continuously achieve consistent, comma-free surface qualities on different roller profiles.



CSS Rollstar 2.0



GENIS RS



FACETEC MF

### Sharpening of round knives

Cutting ultra-thin aluminium foils for electric vehicle batteries is an extremely complex and difficult process. If this production step is not carried out properly and precisely, it can lead to safety problems such as the formation of internal short circuits. Cutting tools must always be in flawless condition to prevent any burr formation and ensure perfect evenness of the electrode edges. We support customers in this process step with our tools, which prevent any damage and changes to the cutting edge during grinding. Tyrolit also offers first-class application technology support by our experts – worldwide.



CSS ULTRA



COOL CUT

## Battery housing

Components made of CFRP (carbon fiber reinforced plastic) and GFRP (glass fiber reinforced plastic) are characterised by high rigidity and strength combined with low weight. A battery housing made of CFRP can save a significant amount of weight compared to conventional covers – an important factor in the automotive industry.

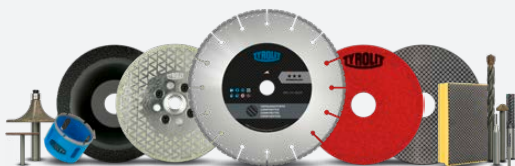
In addition, components made of composite materials increase fire protection, offer a strong underbody sealant and create optimum temperature conditions inside the battery. This significantly increases safety for the passengers of an electric vehicle. Our new TYROLIT POWER assortment makes us a system provider for the machining of composites – from the conditioning of uneven surfaces over cutting and grinding to drilling and milling. Innovative machining concepts guarantee low machining costs and increased safety for the operator without compromising work performance.



TYROLIT POWER Strips



Radial bristle brushes



TYROLIT POWER for composites

## Electronics

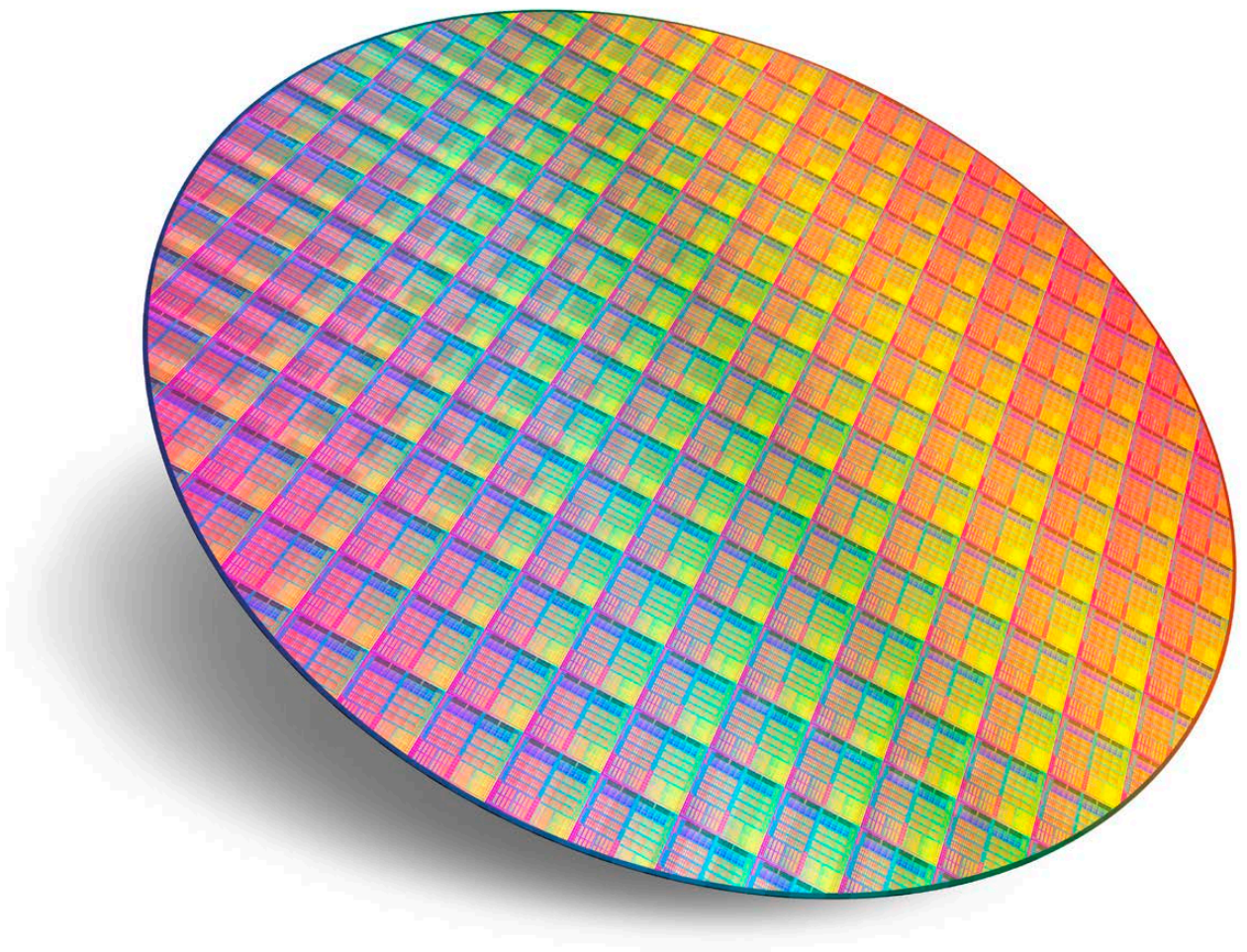
### Wafers

Less energy loss and therefore a longer range – the use of new silicon carbide (SiC) semiconductors will raise the battery performance of electric vehicles to a new level in the future. With the extensive CENTURIA-E product line for grinding wafers, Tyrolit is the innovative partner of the semiconductor industry.

Our abrasives distinguish themselves by a special bond system, optimised diamond qualities and a unique carrier body design, offering the lowest possible grinding forces during the grinding process. In combination with a grit size of less than 1 µm, the tools guarantee improved surface quality and a greatly increased flexural strength of up to 100%. The CENTURIA-E product line stands for shorter grinding times and the highest removal rates when machining wafers. In addition, our specialists will help you to carry out process adjustments and thus achieve outstanding efficiency in your production.



CENTURIA-E

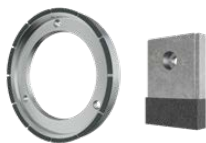




## Brakes

### Hard-coated brakes

With the new EU Euro 7 emissions standard, regulations for permissible brake wear and for tires will come into force from 2026 on, drastically changing the requirements for vehicle manufacturers. For the first time, e-vehicles will also be directly affected. This will immediately induce a further development of the brake concepts currently in use. By introducing hard-coated brake discs, manufacturers will achieve an optimum combination of first-class braking properties and minimal abrasion, which will directly lead to a reduction in particulate matter pollution in accordance with the regulations. Due to these innovations, new production technologies are needed for the economical and efficient grinding of brake discs. With the state-of-the-art GRAVIS portfolio, Tyrolit supports you in this change. Furthermore, we offer unique application engineering expertise in order to jointly develop new grinding processes and continuously optimise production.



GRAVIS



# Product recommendations





Component	Part	Applications	Product recommendation
Engine	Rotor shaft	External cylindrical grinding of bearing points	CSS Ultra GENIS 2
		Internal cylindrical grinding	COLUMBIA COLUMBIA-SA
		Superfinishing of bearing journals and tracks	FaceTec MF
	Transmission	Honing of gears (honing rings)	MIRA REX MIRA REX SF MIRA DDG
		Grinding of gears (worm grinding wheels)	MIRA Ultra MIRA Alpha MIRA SF MIRA DDS
	NdFeB magnets	Truing	POLARIS Basic
		Surface grinding	CENTURIA
		Drilling, sawing and cutting	Galvanic tools
	Bearings	External cylindrical grinding	CSS Ultra GENIS 2
		Internal cylindrical grinding	COLUMBIA COLUMBIA-SA
		Centerless grinding	CSS Centerless GENIS 2
		Finishing	FaceTec MF Honing stones
		Double side face grinding	CENTURIA



Component	Part	Applications	Product recommendations
Battery	Rollers for Al/Cu film Calender rollers	External cylindrical grinding	CSS Rollstar 2 CSS Ultra GENIS RS
	Round knives	Superfinishing	FaceTec MF
	Battery housing	Surface conditioning	TYROLIT POWER
		Drilling, sawing and cutting	Radial bristle brushes
		Galvanic tools	
Electronics	Wafers	Surface conditioning	CENTURIA-E
Brakes	Hard-coated brakes	Surface grinding of the hard layer	GRAVIS

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