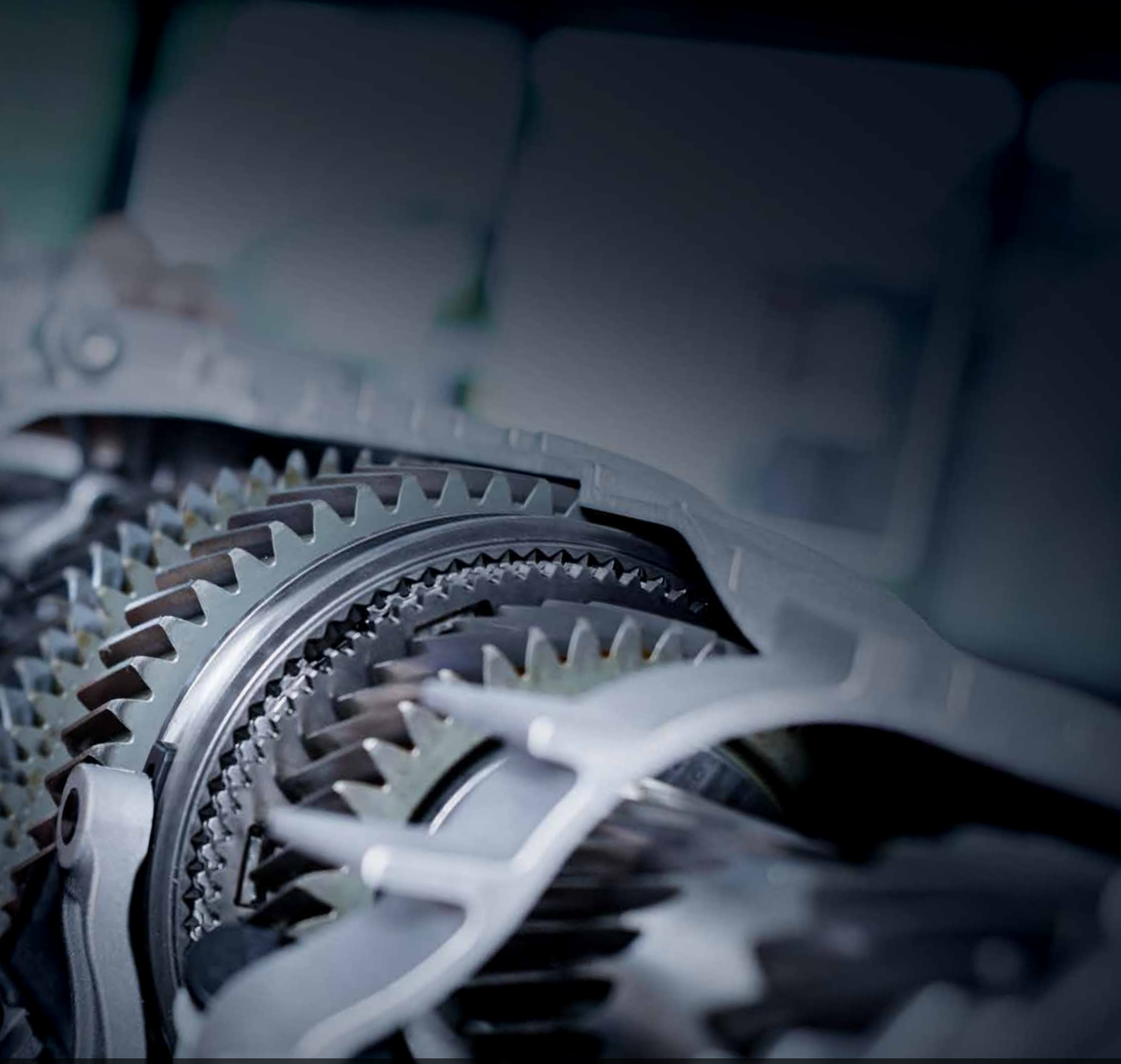


TYROLIT – YOUR PARTNER IN THE TRANSMISSION INDUSTRY

TOOLS AND SYSTEM SOLUTIONS

A Company of the SWAROVSKI Group
www.tyrolit.com

TYROLIT Group
A global company

As one of the world's leading manufacturers of bonded grinding, cutting, sawing, drilling and dressing tools and a system supplier of tools and machines for the construction industry, the familyrun TYROLIT company has been synonymous with superior quality, innovative spirit and outstanding service since 1919.

Day in, day out the experts at TYROLIT are busy working on solutions that accommodate the individual requirements of customers around the world; thus contributing to their business success. Some 80,000 available products set the standard in various industrial sectors.

TYROLIT Unternehmenssitz in Schwaz / Österreich

TYROLIT Business units

Metal / Precision

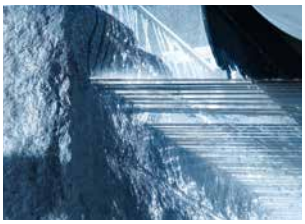
From precision machining in the engine and gear industry to the production of cut-off wheels with diameters up to 2,000 mm for the steel industry – the TYROLIT product range in the Metal & Precision business unit includes high-tech tools for a huge variety of applications.

Trade

Thanks to its global sales network, in addition to premium product solutions in the three core areas of cutting, grinding and finishing, TYROLIT's Trade business unit guarantees truly customer-focused marketing support.

Construction

In the Construction business unit TYROLIT is a leading system supplier of sophisticated drilling systems, wall and wire saws, floor saws and for grinding uneven surfaces such as motorways made of concrete.



Stone – Ceramics – Glass

Our customised diamond tools and grinding solutions in the Stone – Ceramics – Glass business unit cannot fail to impress through their exceptional performance and quality.

Neuenrade Competence Centre
The TYROLIT performance package at a glance

The machining of gears poses enormous challenges in terms of the quality of the tools used. High levels of application expertise are also demanded, as well as fast, flexible customer service. The extensive range of services makes TYROLIT a competent partner for its customers in all questions regarding the hard-finishing of gears.

Expertise & experience

Global presence

Application engineering

Customer-specific tools

Expertise & experience
Professional industry know-how

TYROLIT underlines its position as a technology leader with the **Competence Centre Gearing** in Neuenrade. Here highly specialised industry expertise and ambitious innovation are brought together at a central location. Many years of experience, combined with the latest production technologies, guarantee our customers in the transmission industry reproducible, economically efficient grinding and honing processes.

The TYROLIT Competence Centre Gearing in Neuenrade, Germany.

How you benefit

- Customer-specific system solutions from a single source
- Individually tailored tool specifications for machines and processes
- Optimum tool design for maximum economic efficiency
- Close cooperation with machine manufacturers
- Process simulation on in-house test equipment
- Hosting of workshops and training courses

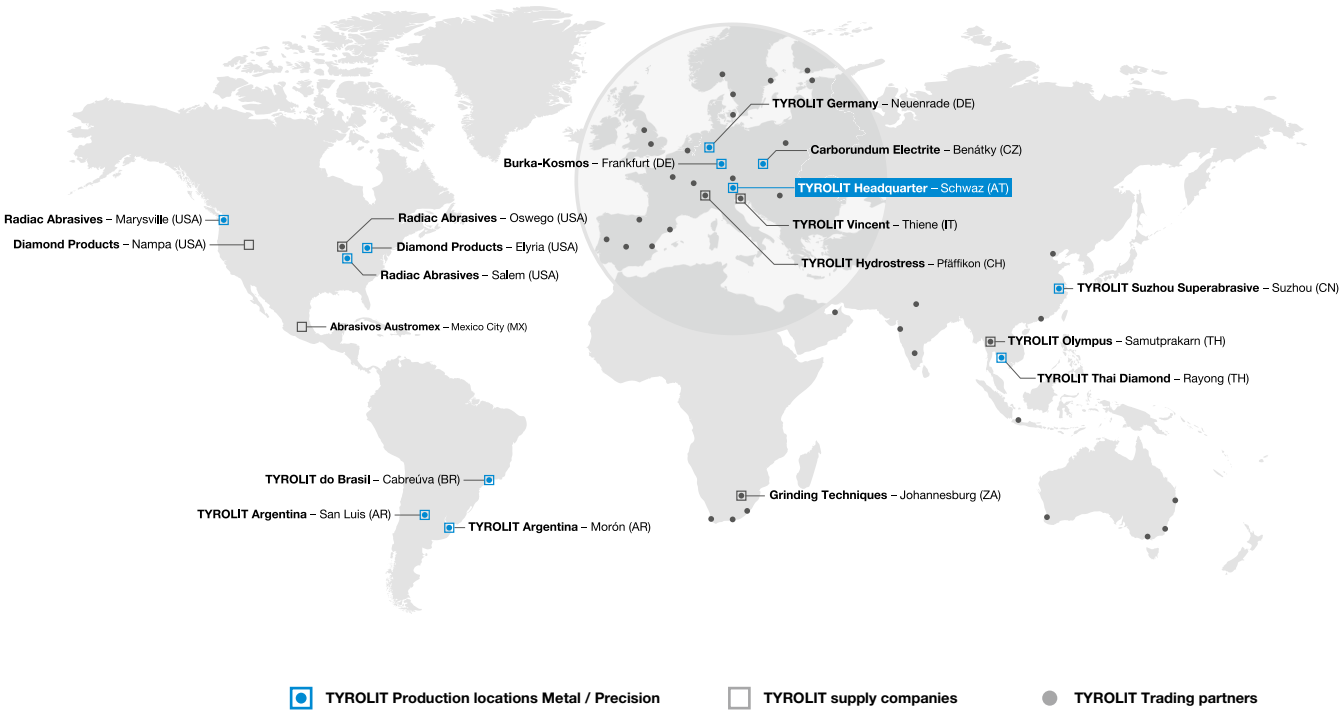
Global presence
Directly at the customers' premises

A global presence
TYROLIT stands for global strategies. With a worldwide sales network in 65 countries and production centres in 27 countries on four continents, we offer our customers all the benefits associated with a global business.

Local availability
Global thinking, local action – in the customer's national language and directly on their premises. This is the principle we follow as we grow hand-in-hand with our customers. Our experts are permanently available directly on your doorstep. Local contacts and technical local distribution also guarantee optimum customer support.

How you benefit

+ Global presence with local contacts
+ Short response and service times



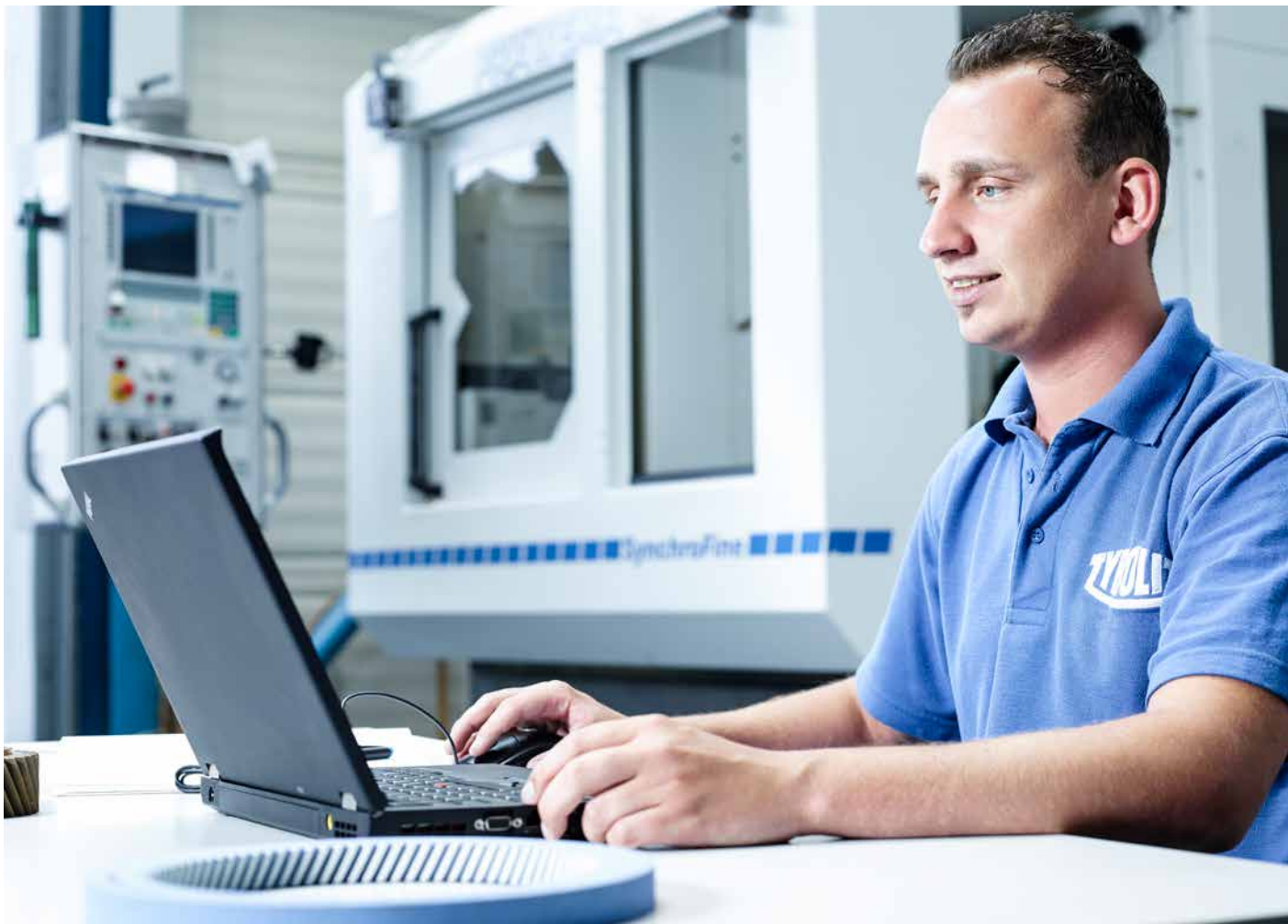
Application engineering
The best team for your application

An experienced team of application engineers is available to our customers throughout the world and works to produce the most economically efficient solutions.

All employees in the various countries have excellent links to the Competence Centre Gearing in Neuenrade and receive intensive support from there in relation to all technical issues.

How you benefit

- The global presence of our application engineers
- Process solutions and optimisations in close cooperation with customers
- Close cooperation with machine manufacturers
- Internal and external seminars and training courses



Customer-specific tools
Top performance guaranteed

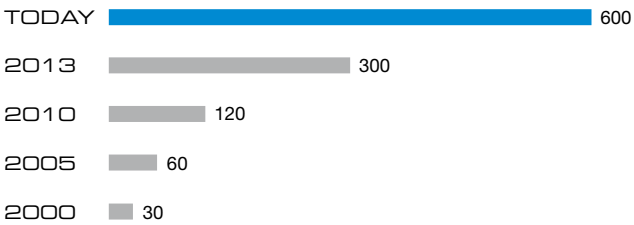
The name TYROLIT is synonymous with innovative products and tool quality at the highest possible level. In our Development Department we are constantly working on new and innovative products, aiming to make our customers' future processes even more efficient.

How you benefit

- Continuous improvement of existing products
- Developments innovative products and solutions for optimising economic efficiency
- Grinding and dressing tools system solutions from a single source
- Cooperation with machine manufacturers and university research institutions
- In-house test centre for internal simulations and customer tests

Continuous innovations increase economic efficiency on the customer side

Number of components produced per dressing cycle*



* based on the example of vitrified bonded honing wheels for high-performance honing

Hard-fine machining
Requirements profile

A gearbox only reveals its maximum performance through the optimum interplay of all the individual components. Thus, the requirements for the machining of the individual components are extremely complex. Carriers, shaft components and the associated gearing all demand maximum finishing precision.

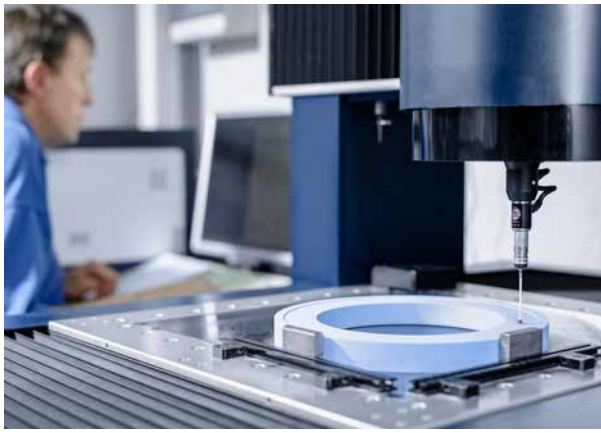
Optimised product qualities, low noise emissions, great running smoothness, long service life and optimised performance data play a key role when it comes to choosing the right tool.

Hard-fine machining is enormously important in terms of tooth geometry and surface quality. Gear grinding and honing are cost-intensive processes whose economic efficiency can primarily be improved by optimising processes and tools.

As a world market leader, TYROLIT offers a broad range of tools for the hard-fine machining of gears in the MIRA product line and the new BURKA-KOSMOS product MIRA ICE. The assortment is rounded off by the CCS ULTRA, POLARIS and GENIS product lines, which are used in external cylindrical grinding an plunge grinding.

Processes and tools
TYROLIT system solutions from a single source

Application	Process	Tools
Gear grinding and dressing	Profile gear grinding	BURKA-KOSMOS **MIRA ICE** profile grinding wheels
	Continuous generating gear grinding	**MIRA** gear grinding wheels **MIRA ULTRA** gear grinding wheels **MIRA ICE** gear grinding wheels
	Bevel gear grinding	**MIRA** bevel gear grinding cup wheels
Gear honing and dressing		**MIRA REX** honing wheels **MIRA DDG** dressing gears
External cylindrical grinding and plunge grinding		**CSS ULTRA** grinding wheels **GENIS 2** vitrified bonded CBN grinding wheels **POLARIS PLUS** electroplated CBN grinding wheels

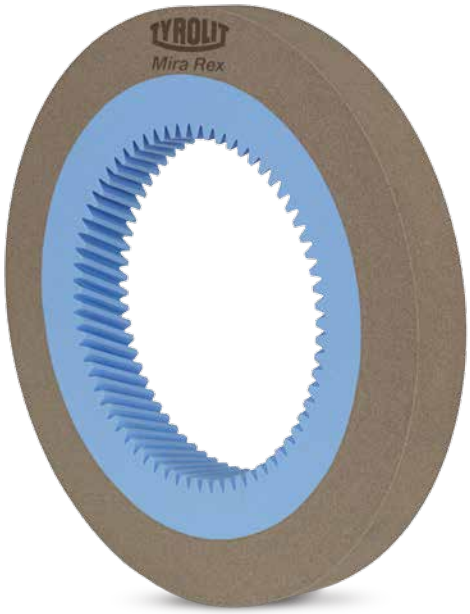


MIRA REX honing wheels
Top quality tooth flank honing

Over 25 years of experience make TYROLIT the market and technology leader in the field of gear honing. As a professional partner, we guarantee our customers the highest product quality, intelligent system solutions, fast on-site service and reliable lead times.

The MIRA REX product line has made it possible to provide the most economically efficient solution for all honing processes. REX specifications for vitrified bonded and epoxy resin bonded and compound construction were developed to meet customer-specific requirements. Honing wheels with both internal and external gearing are available.

Our experienced design engineers calculate the profile pattern for honing wheels and diamond dressing gears and draw up individual system solutions. Thanks to the innovative machining methods used during preprofiling, the effort involved in initial dressing is significantly minimised.



MIRA REX

- Top quality honing wheels
- Maximum dressing cycles
- Broad product range
- MIRA REX system solution with MIRA DDG

MIRA DDG diamond dressing gears
Dressing honing wheels

Honing wheels are trued and sharpened with maximum precision during the dressing process. Diamond dressing gears from the MIRA DDG product line are used for this purpose. These precision tools are manufactured using a positive electroplating process. It is also possible to replate worn tools.

MIRA DDG products guarantee optimum dressing results, the best possible toothwork and surface quality, as well as maximum service life.

MIRA DDG

- Optimum dressing results
- Customer-specific profile modification
- MIRA DDG system solution with MIRA REX

MIRA ULTRA gear grinding wheels **Gear flank grinding at the highest performance level**

Excellent economic efficiency and component quality make continuous generating gear grinding the leading machining process in the medium- and large-scale production of gears. The cylindrical gear grinding wheel lies at the heart of this process.

TYROLIT has developed the MIRA Ultra product line specifically for the continuous generating grinding of gears. All specifications are produced without the addition of sintered aluminium oxide and combine high performance data with optimum economic efficiency. The new type of grinding wheel structure was specially designed for operating speeds of up to 100 m/s, and allows reliable operation on modern high-speed machines.

MIRA ULTRA

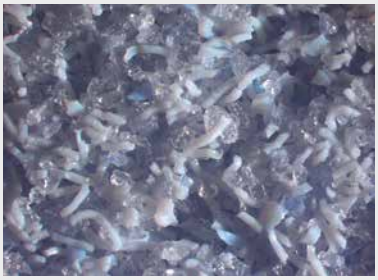
- Increased operating speed of up to 100 m/s
- Maximum process stability with homogeneous grinding wheel structure
- Cool grinding with highly porous bond system
- Optimised economic efficiency with high performance parameter
- Rapid availability with stock program

MIRA ICE gear grinding wheels
Gear flank grinding with reduced processing time

The MIRA ICE product line has been specially developed for the continuous generating grinding of gears. A new kind of development approach enables unprecedented results to be achieved in terms of economic efficiency and cool grinding.

New approach to development

- New grain qualities and geometry
- New high-strength bond system
- Increased porosity of grinding wheel



MIRA ICE grinding wheel structure

MIRA ICE

- Shorter grinding times due to the significantly higher stock removal rates and fewer rough grinding passes
- Longer tool life due to reduced shift travel and increased dressing cycles
- Highest process stability with a completely homogeneous grinding wheel structure
- High-precision pre-profiling for module sizes 1 – 12 with one or more starts in maximum quality

MIRA ICE profile grinding wheels
Grinding large and special gears

The merger with BURKA-KOSMOS sees TYROLIT, one of the largest abrasives manufacturers in the world, expand its portfolio of high-quality products. BURKA-KOSMOS is an experienced specialist in the grinding of large gears and a technology and market leader in this sector.

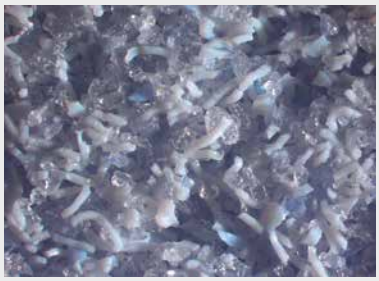
In the MIRA ICE product line, TYROLIT, together with BURKA-KOSMOS, has developed a new kind of tool that allows higher stock removal without risking burning.

The MIRA ICE product line was developed together with established TYROLIT experts in order to meet the requirements for grinding large gears.

A new kind of development approach enables previously unknown results to be achieved in terms of economic efficiency and cool grinding. MIRA ICE has been further optimised on the basis of the leading product line from BURKA-KOSMOS and sets new standards throughout the industry.

New approach to development

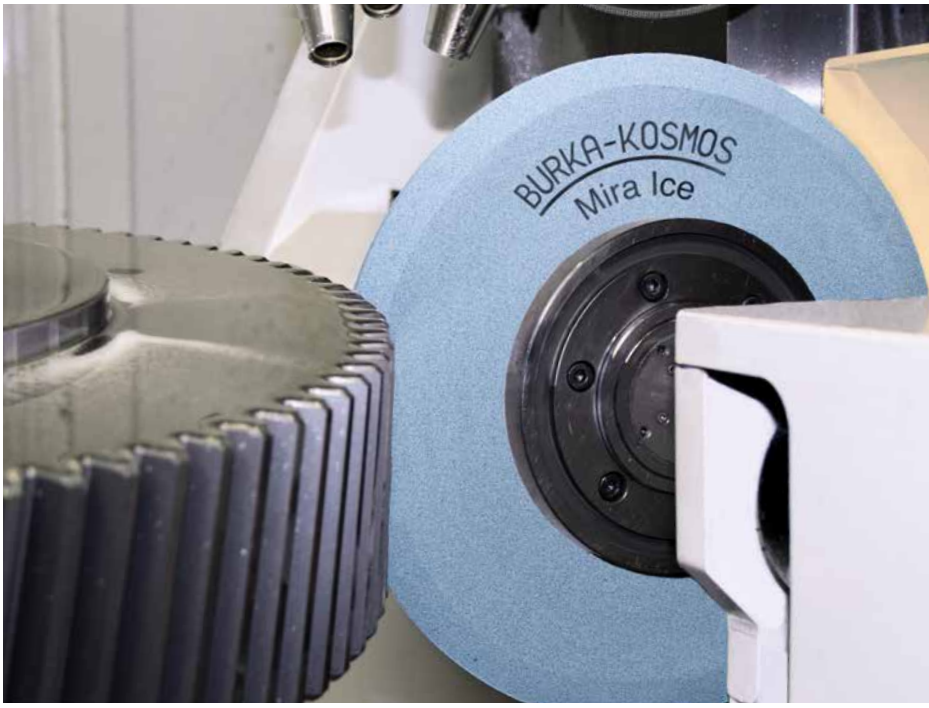
- New grain qualities and geometries
- New, high-strength bond system
- Increased porosity of the grinding wheel



MIRA ICE surface structure

MIRA ICE

- Cool grinding with the use of new grit qualities
- Optimised economic efficiency with high performance parameter
- Maximum process stability with novel wheel structure



MIRA bevel gear grinding cup wheels
Economically efficient grinding of bevel gears

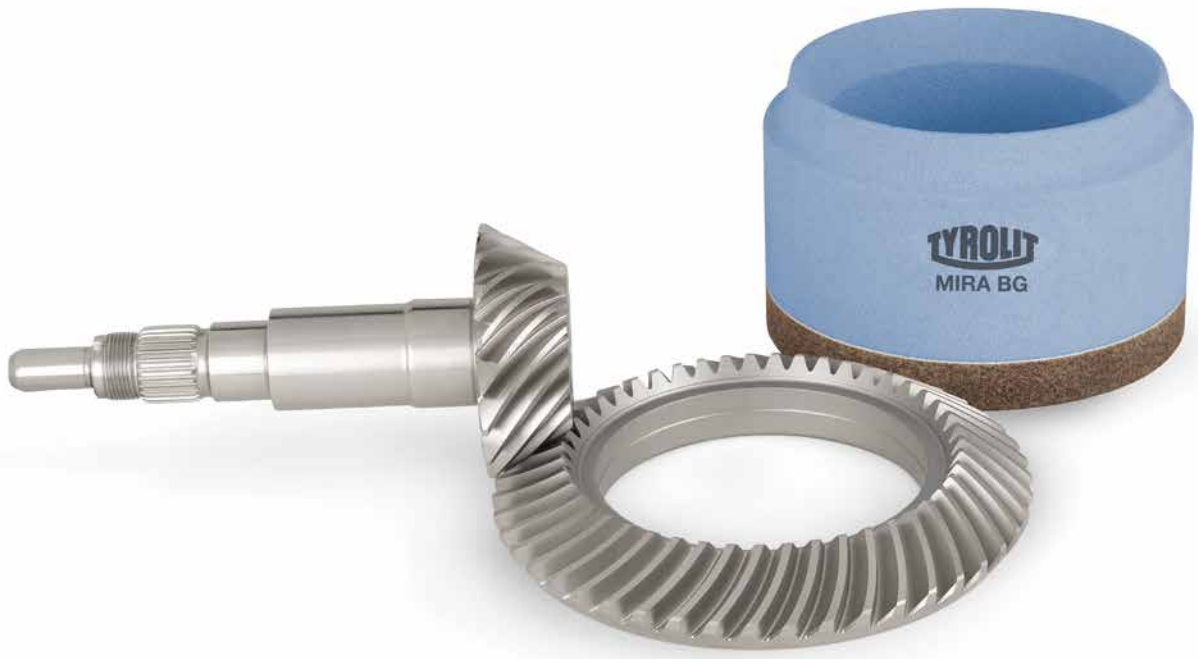
The higher quality requirements for the production of bevel gears demand hard-fine machining.

In the MIRA BG product line TYROLIT offers an optimum solution for grinding bevel gears. Maximum profile holding in conjunction with reduced thermal stress on workpieces allow a larger number of units to be machined in each dressing cycle.

The steel cores used can be processed more than once, enabling them to be reused. Alternatively, less expensive one-way cores can be used.

MIRA BG

- High productivity
- Low heat build up
- Highest profile retention
- Available with or without mounting plate



Shaft finishing
External cylindrical grinding and plunge grinding

TYROLIT offers a wide range of products for machining gear shafts. Conventional ceramic wheels (CSS ULTRA), vitrified bonded CBN wheels (GENIS) or positive electroplated CBN wheels (POLARIS) are used, depending on the requirements of the relevant machining task.

CSS ULTRA grinding wheels
External cylindrical grinding of gear shafts

With the CSS ULTRA product line, TYROLIT has succeeded in sustainably optimising the micro-architecture for a vitrified-bonded grinding wheel using new high-quality components and an innovative sintering technology. This improvement has proven itself in practice in the high performance grinding process.

Application range

+ External cylindrical grinding
+ Angular plunge grinding

CSS ULTRA

+ High profile holding
+ Cooler grinding
+ Low wear

GENIS 2 grinding wheels
External cylindrical grinding of gear shafts

With the GENIS 2 product line, TYROLIT defines a new performance level and a wider range of applications for external cylindrical grinding with vitrified-bonded CBN tools. GENIS 2 is characterised by a high-strength bond with excellent moistening properties, which securely binds the CBN grain. Low bond volumes enable very porous, cool-grinding and extremely easy-cutting specifications with a long lifetime.

GENIS 2

- Optimum grain utilisation
- High economic efficiency
- High running precision
- Wide range of applications

POLARIS PLUS grinding wheels
Pluge grinding of gear shafts

With its POLARIS product line, TYROLIT is the market and technology leader in the production of galvanic bonded grinding tools. Cutting-edge production equipment, manufacturing know-how and application expertise are essential for maximum tool lives. Even the smallest amount of axial and radial run out or the slightest imbalance can reduce the service life of the tool. Additionally with the POLARIS PLUS variant, the zones with the highest levels of tool wear can be specifically reinforced, extending the life of the grinding wheel even further.

POLARIS PLUS

- Individual production
- Maximum lifetimes
- Replating-compatible
- Maximum profile accuracy
- Constant optimisation

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