MIRA is the world's first complete product line for grinding and honing operations in gear manufacturing.

TYROLIT offers a complete product range:

- Single and multi-profile grinding wheels
- Internal and external toothed honing rings
- Stationary and rotating dressing tools
- Grinding tools for internal and external cylindrical grinding
- Cut-off wheels for gear deburring
- Diamond dressing master for hard gear finishing rings

If you have special application problems, please contact your TYROLIT specialist.

TYROLIT will introduce you to a world of opportunities and a comprehensive package of benefits – an entire range of solutions from a single source.
Continuous grinding has been accepted as the process of choice for gearwheel fine finishing.

We distinguish two continuous grinding methods: **generating grinding and contour grinding** with multi-profile grinding wheels.

Special and sintered aluminum oxide grains are combined with our innovative VM bonding system resulting in superior profile stability, a reduction in stress exposure on the workpiece, increased dressing cycles and shortened grinding times.

Minimized diamond dressing tool wear is a distinctive feature of **TYROLIT MIRA** grinding wheels.

**Non-profiled and precisely pre-profiled grinding wheels for continuous generating grinding** (e.g. Reishauer RZ 701, RZ 362A systems) are available. Example: Shape 1SCH2G = number of starts: 2

Module range  \( m = 0.5 \) to 8
For the continuous contour grinding system (Reishauer RZP and RZF), wheels of the required dimensions are available. The grinding wheel is dressed on the machine with a TYROLIT diamond dressing gear master to give a globoid wheel shape. The gear master profile is transferred to the grinding wheel.

### Specification Examples:

<table>
<thead>
<tr>
<th>Outer diameter</th>
<th>Width</th>
<th>Bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>62, 84, 104</td>
<td>160</td>
</tr>
<tr>
<td>400</td>
<td>84, 104</td>
<td>160</td>
</tr>
</tbody>
</table>

### Explanation of the Specification:

12KS 120 F 11 VM1

- **Abrasives**: size
- **Grain**: size
- **Hardness**: size
- **Structure**: size
- **Bond**: size

Specifications apply in particular to case hardened or heat-treated steel grades.

Only precisely profiled grinding wheels are capable of achieving the required accuracy of the given involute shape. The grinding wheel is dressed in the machine with a TYROLIT diamond dressing wheel set either SPA or DSA.

### Grinding Wheel for System RZP and RZF

Precisely pre-profiled grinding wheel for the RZ 362A system

### Specification Examples:

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### Specification Examples:

- 5 KS 150 C 2 VM2
- 6 KS 90 C 4 VM2
- 6 KS 120 C 4 VM2
- 8 KS 90 C 3 VM2
- 12 KS 120 G 11 VM1
- 14 KS 120 F 11 VM1

### Precise pre-profiled grinding wheel for the RZ 362A system

### Specification Examples:

- 4 KS 1002 B3 VM2
- 6 KS 120 C5 VM4
- 8 KS 100 C3 VM2
- 12 KS 1002 C3 VM1
- 12 KS 120 F11 VM1
HONING TOOLS

Highly precise gears and high stock removal rates are the convincing benefits of TYROLIT tools for gear honing e.g. Fässler, Gleason-Hurth, Gleason-Pfauter, Reishauer and Präwema.

As the gear flank is machined in the hardened state, the contact area and profile tolerances are improved. This translates into a noise reduction in operation of the whole transmission system.

Depending on the application requirements, internal toothed and external toothed honing rings can be used. In connection with the Reifix™ centering clamping system, the initial dressing infeed is drastically reduced. This increases the overall life of the honing tool and thus reduces per piece cost.

THE PRODUCT RANGE INCLUDES:

- **Epoxy rings** (sintered aluminum oxides are embedded in an epoxy bond).

- **Compound rings** (vitrified-bonded conglomerates are bonded in an epoxy matrix). This patented TYROLIT product combines the outstanding chip removal properties of the vitrified-bonded grinding tool with the damping properties of the epoxy matrix.

- **Vitrified-bonded rings** (sintered aluminum oxides are embedded in a special vitrified bond).

Especially for applications on the Reishauer RZF machine type, we have developed an extremely high performance external toothed geared honing wheel.

Because of its complex design with fiber reinforced contact area, this honing wheel offers superior profile stability and clearly increased parts per dress. The Reifix centering clamping system is positioned on the inner diameter to reduce vibrations.
DRESSING TOOLS

Only a perfectly profiled master tool is capable of achieving the high precision geometry and surface quality required for gearwheel machining tasks.

TYROLIT offers the ideal dressing tool for every process.

1. Diamond dressing discs for dressing multi-profile grinding wheels

TYROLIT offers diamond dressing wheel sets for the SPA and DSA systems to dress the grinding wheels for continuous generating grinding applications (e.g. 350x104x160); two manufacturing methods are available:

1. Bonding of the diamond grains is achieved by means of sintering in a direct plated process with metal matrix.

2. Electroplated bonded diamond coating on a high precision steel core with or without PCD edge reinforcement.

2. Diamond dressing gear masters for grinding and honing wheel profiling operations

TYROLIT diamond dressing gear master used on RZP and RZF machines are specially designed to accommodate specific customer requirements.

The desired lead and profile modifications on the workpiece are reproduced on the diamond dressing gearwheel. Due to the optimized design and production processes, contact areas, exact geometry and long life of the component are achieved. Extremely complicated gear cutting corrections including topological profiles are realized on topological gear grinding machines.

TYROLIT diamond dressing gear masters are manufactured both in the direct plated and in the double reverse plated processes.
COMPLEMENTARY RANGE

Vitrified CBN for cylindrical grinding operations

Vitrified CBN is capable of exploiting the full potential of the most modern machine generations. The combination of short grinding times with minimized dressing cycles and increased wheel life, high stock removal rates, consistent surface quality, and minimized thermal stress guarantees maximum efficiency, and process reliability.

Conventional external cylindrical grinding with CSS-Basic™ and CSS-Matrix™

Optimize your tool and machine system with our innovative CSS-Basic and CSS-Matrix products. The unique CSS bond system (crystal stabilized sintered) in combination with the latest special aluminum oxides offers top stock removal performance, long life and minimized machining costs.

Conventional internal cylindrical grinding with COLUMBIA™

COLUMBIA - your ticket to cost reduction.

COLUMBIA cuts process costs up to 30% by combining innovative bond systems with high quality abrasives.

SECUR® cut-off wheels for gearwheel deburring

SECUR® 41F, the easy-cutting high performance cut-off wheel, is a fiber reinforced resin-bonded cut-off wheel. Diameters between 22 and 80 mm and thicknesses between 1 and 3 mm plus all customer specific dimensions are available.

We also offer nonreinforced cut-off wheels, shape 41N, diameter 35 to 100, thickness 0.4 to 0.95 mm.