STRATO ULTRA

THE NEW FORCE IN CREEP FEED GRINDING

- Reduction of the grinding time
- Significantly increased profile retention
- Decrease in the risk of burning
- Increase in the number of parts per wheel

TYROLIT

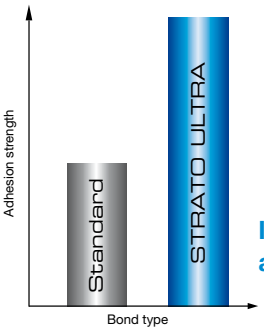
A Company within the SWAROVSKI Group

STRATO ULTRA
HIGHLY POROUS GRINDING WHEELS FOR CREEP FEED GRINDING

The development of high strength bond systems is of great importance at TYROLIT. To meet the high demands of todays creep feed market, the bond matrix needs a high level of adhesion to the abrasive grain in order to withstand the high dynamic loads encountered during an optimized grinding process.

The goal is to hold the abrasive grain in the bond matrix for as long as possible, so the grain is utilized fully before it breaks out of the bond. This requirement was been successfully met with the development of the new **STRATO ULTRA** bond system.

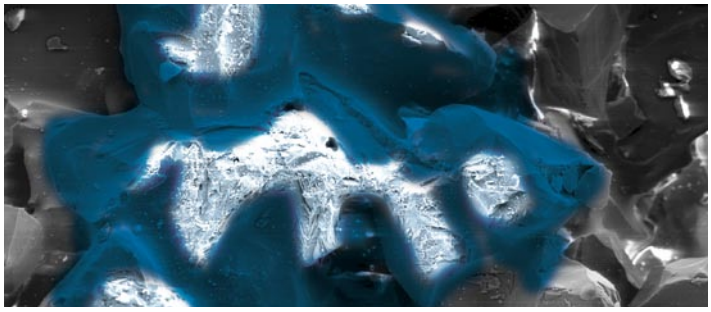
The result was higher metal removal rates and significantly improved profile retention while avoiding grinding burns. In creep feed grinding in particular, highly porous bond systems are required due to the large arc of contact, and high material removal rates. The larger the pore space, the greater the capacity the wheel has for transporting coolant and grinding chips.



Increase of the grain adhesion strength by 100 %

For example, in the turbine industry this innovative bond matrix in combination with a new type of firing process, allows for substitution of expensive special fused AlOx grain through the use of standard AlOx grain types, without any loss of wheel performance.

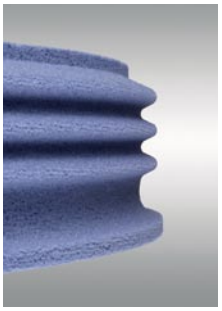
The main fields of application are in the creep feed grinding of aerospace and turbine industry components, and in the “general“ creep feed grinding of steels in a variety of other industrial sectors.

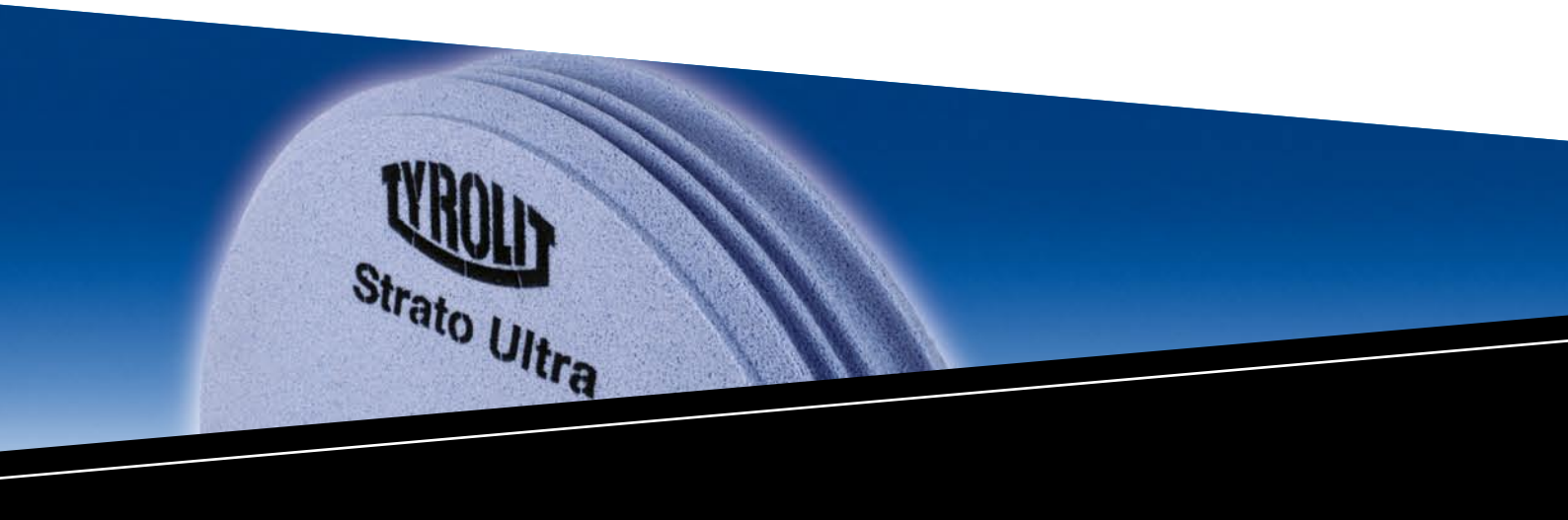


The SEM image shows the pore spaces, bond bridges and embedded abrasive grains of a STRATO ULTRA wheel

Available dimensions

Diameter	**300 to 610 mm**
Width	**10 to 250 mm**
Hole	**Machine-specific**





STRATO DIAMOND ROLLER DRESSERS
THE COMPLETE SYSTEM SOLUTION FROM TYROLIT

Profile roller dressers for dressing of highly porous **STRATO ULTRA** wheels, specially designed for the customer requirements.

We produce high-precision profile roller dressers for all machine types. The rolls can be used for all types of creep feed grinding processes, both with or without CD (Continuous Dressing) while making customer advantages the top priority.

Profile roller dressers are tool-specific but multiple profiles can also be placed on a single roller dresser (multi-profile rollers).

The advantages of dressing with profile roller dressers:

- Reduction of dressing costs per piece
- Higher level of machine utilization
- Consistent production with low scrap rates
- Fast transfer of complex profiles onto the grinding wheel

Thanks to a new type of high-precision manufacturing, TYROLIT has succeeded in reducing the reworking of the roller dresser profiles to a minimum. This allows for the best possible utilization of the grinding wheel on the machine, and optimal tool life values for the roller dressers.

Either you provide us with a finished drawing of the dresser roller to be produced, or our design team designs the dresser roller according to your requirements based on a component drawing.

In combination with the technical process know-how of our application engineers, we offer you the option of obtaining the entire grinding and dressing process from the market leader in the turbine industry.

SUCCESS STORIES

NGV contact area

Customer	**Aviation industry**
Material	**Nickel Alloy**
Machine	**ELB CAM-Master**
Dressing	**CD**
Wheel speed	**15 - 50 m/s depending on process step**
Table speed	**1000 - 4000 mm/min**
Cooling lubricant	**Emulsion**
Competition wheel	**St. Gobain Altos**
Parts / wheel competition	**160**
STRATO ULTRA	**SU33A802HH11VB01**
Parts / wheel TYROLIT	**200**
Dimensions	**450x80x203,2**
Results	• **Capacity increase by 30%** • **Process cost savings of € 150,000 for 20,000 parts /a** **Note: Roller dresser has at least 4x longer tool life** • **Avoidance of burn-related scrap**
Measure	• **Optimization of the grinding & dressing parameters** • **Use of STRATO ULTRA**

Nozzle guide vane – fir-tree profile

Customer	**Stationary turbines**
Material	**Nickel Alloy**
Machine	**Blohm Profimat**
Dressing	**CD**
Wheel speed	**12 - 35 m/s depending on process step**
Table speed	**180 - 2000 mm/min**
Cooling lubricant	**Emulsion**
Competition wheel	**ELBE**
Parts / wheel competition	**9**
STRATO ULTRA	**SU33A542GG12VB01**
Parts / wheel TYROLIT	**10**
Dimensions	**550x120x203,2**
Results	• **Reduction of process steps from 14 to 11** • **Reduction of the grinding time by 210%** • **Capacity increase by 100%** • **Process costs savings of € 88,000 for 2,475 parts /a** • **Avoidance of burn-related scrap**
Measure	• **Optimization of the grinding & dressing parameters** • **Use of STRATO ULTRA**

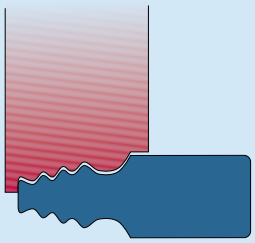
Gear profile – steering gear rack

Customer	**Automotive industry**
Material	**Steel (VAM-G10 400MX-BR01)**
Hardness	**Soft**
Machine	**Mägerle MFP**
Dressing	**1 x per cut**
Wheel speed	**35 m/s**
Table speed	**200 - 240 mm/min adaptiv**
Cooling lubricant	**Emulsion**
Competition wheel	**Winterthur**
STRATO ULTRA	**SU35A60HH10VO1**
Dimensions	**500x200x203,2**
Results	• **Initial equipment of the machine** • **Avoidance of burn-related scrap**
Measure	• **Optimization of the grinding & dressing parameters** • **Use of STRATO ULTRA**

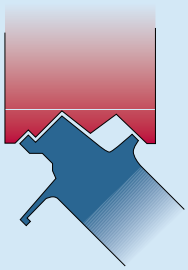
Various system plates – shear comb plate

Customer	**Blade industry**
Material	**100Cr6**
Hardness	**58 - 60 HRC**
Machine	**Mägerle MGC**
Dressing	**1 x per table charge = 8 parts**
Wheel speed	**22 m/s**
Table speed	**230 mm/min**
Cooling lubricant	**Emulsion**
Competition wheel	**St. Gobain Altos**
STRATO ULTRA	**SU33A100HH11VB01**
Dimensions	**500x93,5x203,2**
Results	• **Process cost savings of € 38.100** • **Avoidance of burn-related scrap**
Measure	• **Optimization of the grinding & dressing parameters** • **Use of STRATO ULTRA**

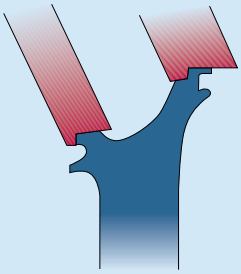
TYPICAL **PART APPLICATIONS**



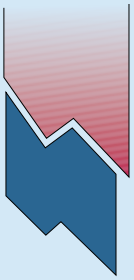
Turbine rotor blade
Fir-tree profile



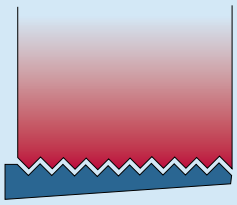
Turbine nozzle guide vane
Radial profile



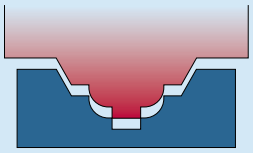
Turbine rotor blade
Root platform



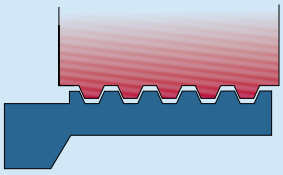
Turbine rotor blade
Z-profile



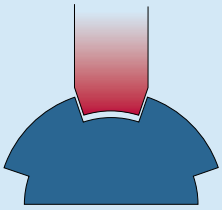
Saw blade
Tooth profile



Guide rail
Track



Thread profile
Gear profile



Hub
Key groove

ADVANTAGES OF STRATO ULTRA

Product advantages

- Optimal profile retention
- Minimum thermal load on the part (no grinding burns)
- Low radial wear
- Low roller dresser wear

Application advantages

- Reduced dressing amounts allow for more parts per wheel
- High infeed rates possible
- High efficiency / productivity
- Approved to 63 m/s

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