

POLARIS

ELECTROPLATED CBN TOOLS FOR CYLINDRICAL PLUNGE GRINDING

- For precision work on highly-stressed profiles
- Reduces process costs by maximising tool life
- Reduces process costs by maximising stock removal performance



POLARIS CYLINDRICAL PLUNGE GRINDING WITH ELECTROPLATED CBN HIGH PERFORMANCE GRINDING TOOLS

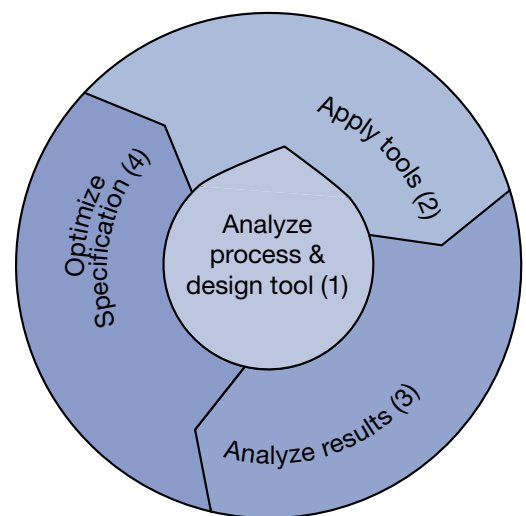
With the POLARIS product line, TYROLIT is setting a new performance-standard for electroplated CBN grinding wheels. The specification is tailored to your application to give the longest tool life and highest traverse speeds.

TYROLIT has many years of practical experience and has consequently acquired a wealth of expertise in the design of precision tools. This guarantees optimum process performance and costs. Even during the quotation process, our experienced design engineers will be already be working on the optimum tool design to suit your process (1).

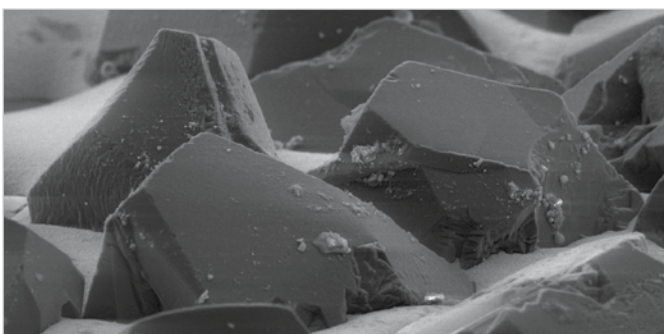
Experienced application engineers support you in the use of these high precision tools and contribute towards permanently reducing machining costs for each component while increasing process stability (2).

TYROLIT collaborates with you in assessing the grinding process and the potential for improvement it offers (3). The used CBN tool is also analysed and the main wear zones identified and optimised where necessary (4). The process documentation and the reproducibility of the products comply with the latest standards.

The new POLARIS product line combines these process stages to create an overall concept **from which you too can also benefit.**



POLARIS – overall product concept



CBN grains in a positively-charged nickel matrix

Product and application benefits

- Specifically targets zones with the highest levels of tool wear
- Maximum profile accuracy
- High process stability during use
- Longest tool life
- Can be replated more than once
- Uniform embedding characteristic also in complex profiles



POLARIS ENGINEERING EXCELLENCE AND QUALITY

Major investments in the latest technology and increases in capacity make Tyrolit the innovative partner your business needs allowing us to deliver and satisfy the steadily increasing demands of our customers.

VARIABLE LAYER THICKNESSES IN THE PROFILE GEOMETRY

To achieve the best possible grinding result, the thickness of the Nickel layer is carefully varied to match the zones with the highest level of tool wear. This ensures the best possible bonding strength for the CBN abrasive grain across the entire profile geometry.

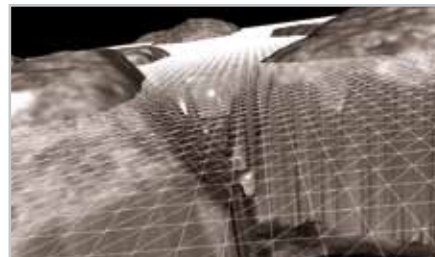


PARTICULAR CONCENTRATION ON ZONES WITH THE HIGHEST LEVELS OF WEAR

With its POLARIS product line, TYROLIT has for the first time adapted its CBN grain concentration to match the zones with the highest levels of wear during grinding. This technology enables significant increases in tool life to be achieved.

STATE-OF-THE-ART MEASURING METHODS

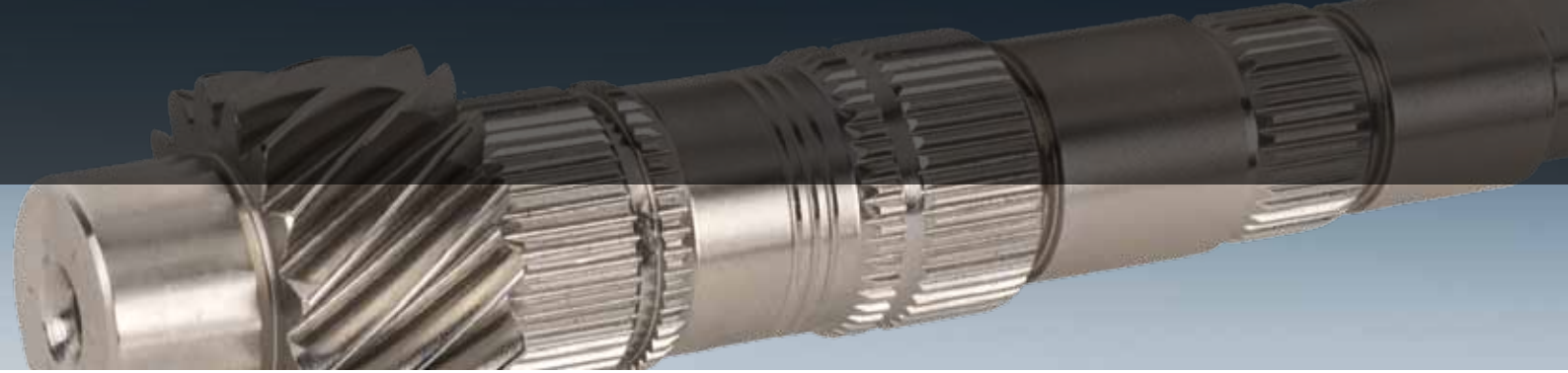
State-of-the-art measuring methods are used in the development and design of the tools for the POLARIS product line. Parameters such as Abbott curve, grain distribution and embedding depths of the CBN abrasive are introduced directly into the production process. As a result customers receive the perfect product specifically tailored to their application.



APPLICATION-SPECIFIC TREATMENT OF THE GRINDING LAYER

The high accuracy of the finished profile tolerances are taken into consideration at an early stage in the manufacture of the steel carrier body. This ensure that the CBN layer matches the profile exactly and that reproducibility can be guaranteed. The required surface quality of the component is ensured as a result of the targeted treatment of the grinding layer.

Tolerances		Dimensions	
Max. axial/radial runout	3 µm	Diameter up to	700 mm
Max. parallelism	3 µm	Width up to	450 mm
Max. perpendicularity	3 µm	Weight up to	150 kg
Max. profile accuracy	2 µm	Operating speed up to	180 m/s

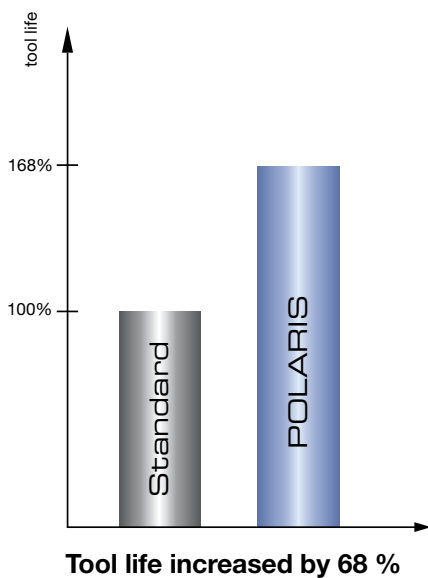


EXAMPLE APPLICATION

PLUNGE CUT GRINDING OF FLUTES IN GEAR SHAFTS

Technical data:

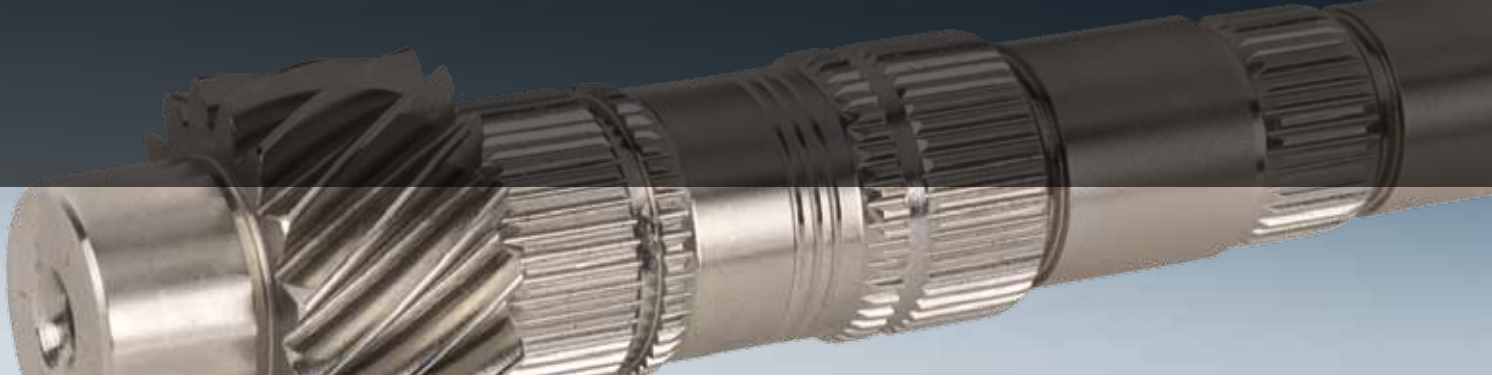
Material	20MnCr5
Hardness	58 - 60 HRC
Machine	TACHELLA
Peripheral speed	94 m/s
Cooling lubricant	Oil
Wheel dimensions	450x196,5x230 mm
Specification	POL B181
Traverse speed	0,5 - 7,0 mm/min



Result:

The targeted concentration of the CBN grains on the profile zones with the highest levels of wear enabled POLARIS to increase tool life by 68%.

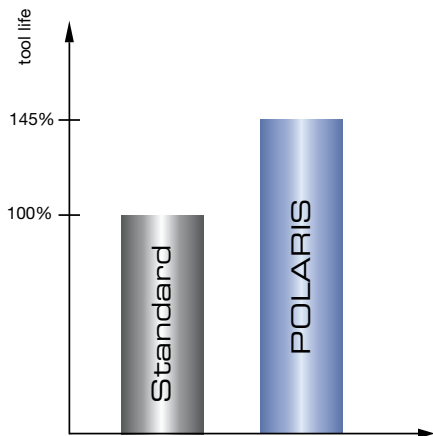




EXAMPLE APPLICATION

PLUNGE CUT GRINDING OF FLUTES IN GEAR SHAFTS

Technical data	
Material	20MnCr5
Hardness	58 - 62 HRC
Machine	EMAG-KARSTENS
Peripheral speed	100 m/s
Cooling lubricant	Oil
Wheel dimensions	450x36x127 mm
Specification	POL B181
Traverse speed	0.05 - 10 mm/min



Tool life increased by 45 %

Result:

The targeted improvements to the process and tools enabled tool life to be increased by 45% using POLARIS.



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