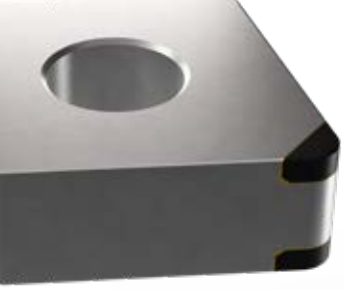
SPK by CeramTec

Available in the Program by the **End of 2026**

CUTTING TOOLS

CBN Grade BST 300 for Finishing of HRSA

MACHINING MATTERS



The BST 300 CBN grade for finishing nickel-based alloys

The last cut determines size and surface finish. Nickel-based superalloys challenge the process: high hot strength, low thermal conductivity, pronounced work hardening. A multi-stage strategy has proven successful. Ceramic handles roughing and semi-finishing. CBN performs final turning to the finished contour.

BST 300 in final turning

In finishing, repeatable contour and dimensional accuracy of the workpiece are what count. CBN combines high hot hardness with good abrasion resistance and shows controllable wear behavior in use. For the finish machining of high-quality components, these are important properties that produce the desired result.

An application-related starting range is v_c = 200 – 350 m/min, a_p = 0.05 – 0.5 mm and f = 0.08 – 0.3 mm/rev. The usable values depend on the workpiece alloy, material condition, workpiece geometry, insert geometry, cooling and system rigidity.

The added value lies in the edge preparation

The BST 300 features a micron-range edge hone as standard. The resulting sharp effective geometry ensures the best possible process reliability and reduces cutting forces as well as vibration.

This is made possible by our newly developed manufacturing process, which ensures excellent dimensional accuracy of the edge rounding. The high-precision edge rounding in the micron range significantly reduces the application risk on expensive HRSA components in the finishing cut.

- **Sharp cuts:** The smaller the radius in relation to the chip thickness, the earlier the material shears off instead of being compressed and pushed.
- **Lower forces:** The passive force decreases. This reduces the deflection of fine contours and the tendency to vibrate.

High-precision edge rounding in the micrometre range significantly reduces the risk of failure when finishing high-value HRSA components. Our newly developed manufacturing process ensures exceptional dimensional accuracy and consistency of the edge radius.

Properties of the BST 300

- Extremely wear-resistant.
- Very fine CBN microstructure with high-quality binders enables optimized surface quality.
- Increases productivity thanks to high-speed finishing of nickel-based alloys.

ISO	Workpiece material	Cutting material	Cutting conditions	v_c (m/min.)	a_p (mm)	f (mm)
S	Nickel-based alloys	BST 300	continuous to slightly interrupted cuts	200 – 350	0.05 – 0.50	0.08 – 0.30

When is ceramic used, when CBN?
For maximum economy, cutting materials can be applied according to their physical strengths in HRSA machining.

- **Stage 1** (roughing): SiAlON ceramics such as the SPK® LST grades are particularly suitable here. With very good toughness, they machine uneven scale at high metal removal rates (a_p up to 3.0 mm) and cutting speeds of 150 to 250 m/min.

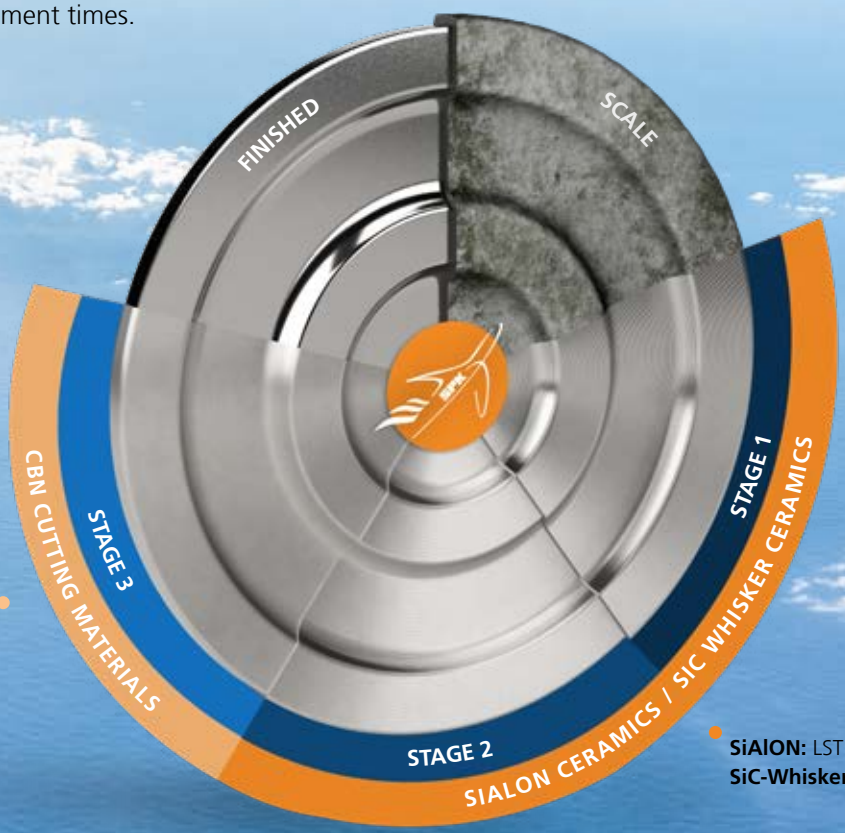
- **Stage 2** (semi-finishing): Two cutting material grades can be selected for this operation:

  1. **SiC-whisker-reinforced ceramics** such as RST 330 are used for contour cuts at medium depths of cut.

  2. **SiAlON grades** are used successfully where engagement conditions are constant on workpieces with less contour variation.

Whether SiC-whisker or SiAlON ceramics can be used is therefore usually determined by the component contour and component stability.

- **Stage 3** (fine-finishing): This is the domain of CBN, the SPK BST 300. At lower depths of cut it offers optimum wear resistance and ensures the required dimensional accuracy, surface zone integrity and surface quality (Ra < 0.8 µm) over long engagement times.



CBN: BST 300

SiAlON: LST 320, LST 350
SiC-Whisker: RST 330

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