We produce components from ultra-hard materials for high-performance optical uses such as plano optics, mirrors, wedge windows, fibre optics and spherical lenses. Products in the field of laser technology all place the highest demands in matters of evenness, surface finish and the purity of the material. Thanks to our experience, our modern machinery and our quality control we can guarantee precise, quick production.

With us, you get everything from a single source. We will support you during the whole production process, from the development of the prototype to assembly.
OUR WORKFLOW

DEVELOPMENT AND SUPPORT
Our team provides comprehensive support in the development of new products. This includes the selection of suitable materials, definition of the working techniques, prototype development and establishing of serial production. We ensure the prototype’s suitability for series production, we document all the steps necessary for series production, and we define and implement suitable qualification methods.

PRODUCTION
First we cut the crystals into blanks. Therefore we use ID saws, wire saws, circular saws and multiblade saws.

Then we grind the blanks into the desired form. We can realize the most varied geometrical shapes using CNC-processing technologies, complex combinations are also possible. We possess a large number of tools or develop client-specific tools when necessary. Thanks to double-sided processing technology we are in a position to realize large quantities.

After grinding, we polish the parts. We offer a multitude of different polishing processes that make it possible to fulfill client-specific surface-finishing requirements according to DIN/ISO and also MIL standards.

ENGRAVINGS, COATINGS AND ASSEMBLIES
We offer laser engravings, part identification and reference marking. We also offer specific optical coatings such as AR coatings, ITO coatings and also mirror coatings. When joining sapphire parts to a casing or mounting, choosing the right technology is decisive. Besides mechanical mounting, the other usual joining technologies are gluing, soldering, welding and shrinkage.

QUALITY CONTROL
Our core focus is on the quality of the finished pieces which includes the material and the technological precision. From choosing the raw materials through production to assembly, each step of our work is subject to the highest requirements and is documented and traceable according to international standards.
TECHNICAL SPECIFICATIONS FOR HIGH-PERFORMANCE OPTICS

FLATS
- Optical flats in standard sizes or with customized dimensions and shapes
- Dimension range of round geometries from $\phi$ 1mm to $\phi$ 200mm
- Dimension range of square or rectangular geometries up to # 150mm $\times$ 150mm

WEDGES
- Wedge windows with an accuracy of 1 arc-minute

SPHERICAL LENSES
- Spherical lenses in standard sizes or to customized specifications
- Dimension range of spherical lenses from $\phi$ 4mm to $\phi$ 150mm
- Radius of curvature range from R 3mm to R 2,500mm
- Centring error realizable down to 3 arc-minutes
- Comprehensive range of radius tools available

RAW MATERIAL
- Selected single crystals that meet the highest purity requirements
- Raw material with perfect crystal lattice and precise orientation of optical axis

SURFACE QUALITY
- Surface finish with roughness values below 10 angstroms for minimum light scatter
- Surface form optimized for minimal wavefront errors
- Parallelism values of 0.5 arc-minute realizable

SURFACE TREATMENTS
- Optical coatings to optimize transmission properties on request

TYPICAL COMPONENTS
- Substrates
- Protective windows
- Pressure windows
- Laser mirrors
- Light guides
- Lenses

All products are made in-house by the Kyburz Sapphire Team, using materials of Mohs 9 hardness.