

# OPTICO

Industrieoptik AG

*manufactured for you*



# Who we are?



We appreciate your interest in our company and hereby briefly introduce ourselves. Optico AG was founded in 1987 and has since well established itself in the market. Our optical production for the industry has specialized to the production of high-tech parts, primarily in the segment of prototypes, small and mid-sized series. Optico AG is characterized by a manageable, close at hand facilitated production, our creativity, dynamic approach and our diversified skills.



New extraordinary materials and special geometries are challenges we consistently welcome.



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Image 1: Measuring with an interferometer  
Image 2: Polishing a spherical lens  
Image 3: Lapping of a plane plate

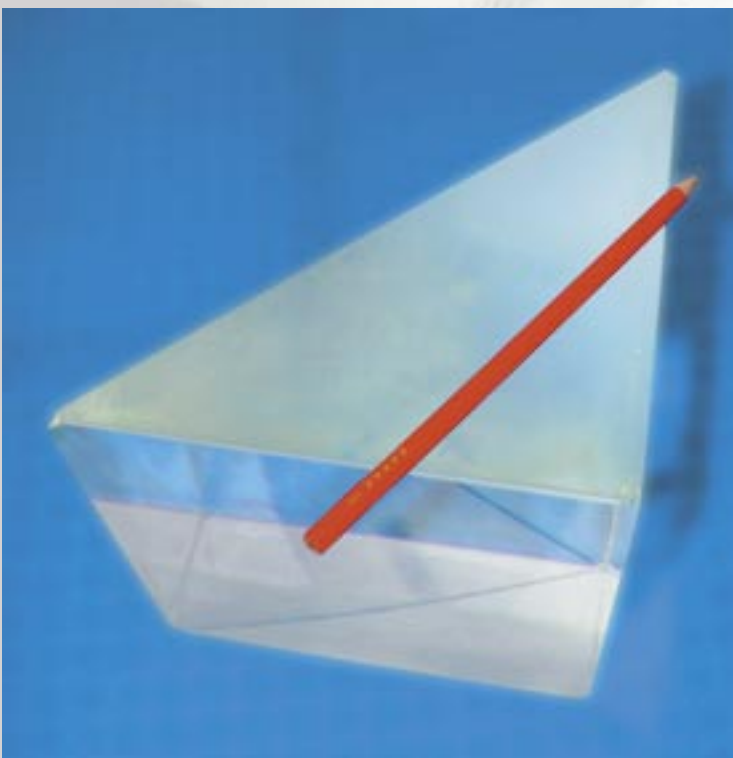
# What we produce?



We produce optical components according to client drawings such as plane optics, spherical optics, prisms, wedges, Wafer and much more out of glass, sapphire, germanium or silicon.

Furthermore we are produce components like bonded elements, objektives, filters, mirrors, Laser optics, wafer supports, protective glass for combustion chambers, pressure drum windows, and custom tailored optical fibers, to mention some examples. Glass and ceramic components with free geometries are amongst our production portfolio. Of course we process and refine semi-finished products according to your requirements.

Our production counts on 20 experienced long-time staff and is based on extensive and modern machine equipment.



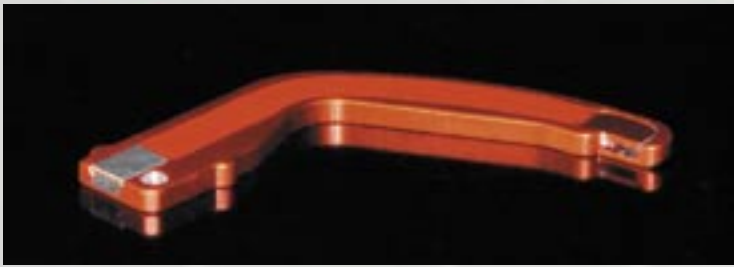
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Image 1: Polishing a single lens

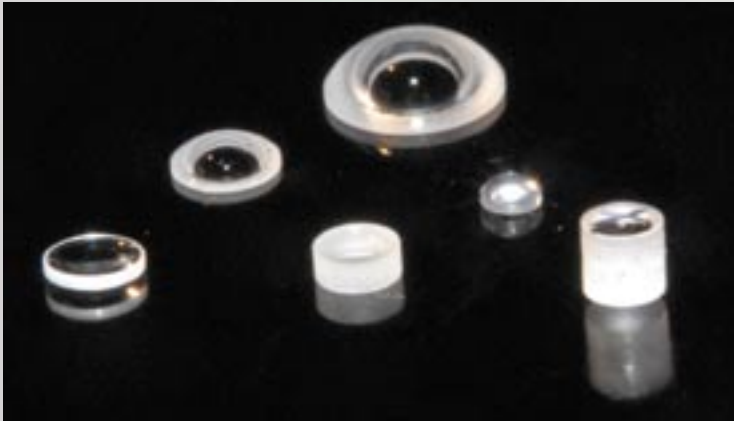
Image 2: Ring lens for a measure system

Image 3: 90° Prism, 180 mm cathetus length for holography

# Sample products:



Optical fiber for sensoric, especially developed for this use with the client and produced by us.



Lenses for a wide-angle lens, diameters 4-12 mm. The front lens has a concave hemisphere. Completely manufactured and assembled.



Various raw-parts and technical glass components which will be finished at the client's site.



Prism made of ULE-Glass® completely cut in one clamping; therefore highest preciseness of angles.

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# Our material competence:



We process a great diversity of materials for our clients. The following list is not concluding.

## Glasses

- Optical glass
- fused glass
- Borosilicate glass
- float glass
- Zerodur®
- ULE-glass®
- Absorbent filters

- ...

## Crystals

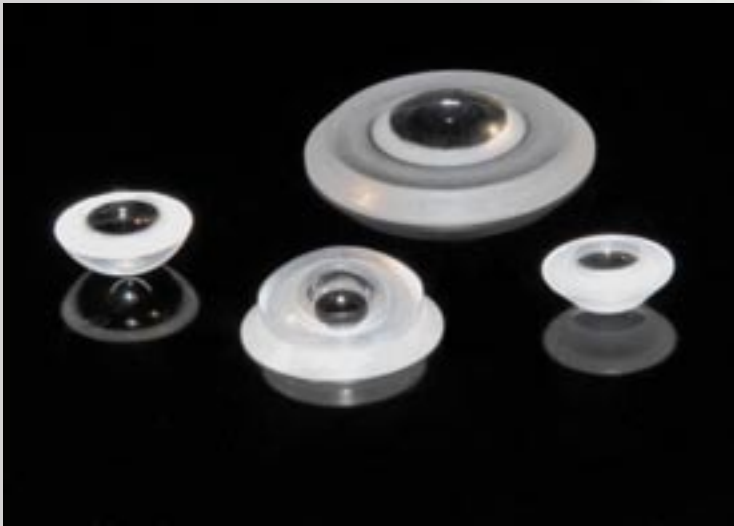
- Sapphire
- CaF<sub>2</sub>
- MgF<sub>2</sub>
- Germanium
- Silicon
- Yag

- ...

## Ceramic

- Macor®
- Aluminum oxide
- Silicon oxide
- Silicon nitride
- Zircon oxide

- ...



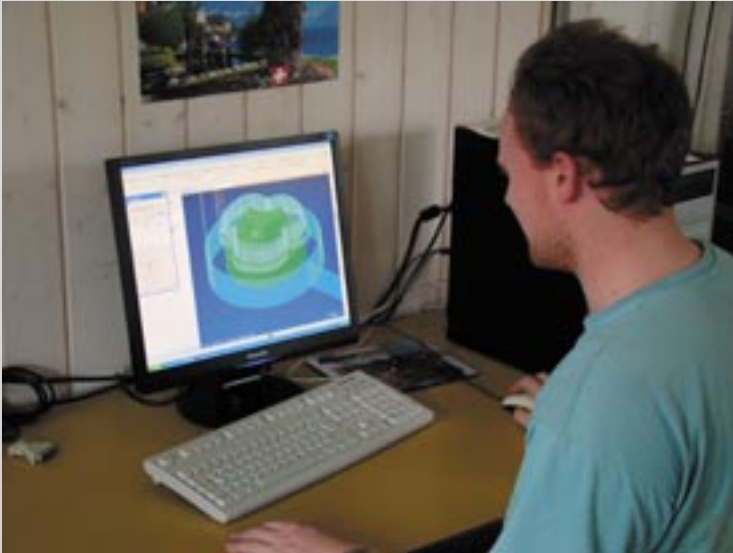
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Image 1 bonded attenuation wedge made of neutral glass and optical glass

Image 2 Sapphire lenses with complex geometries C-oriented with high optical requirements including a concave hemisphere. A lens for spacecraft, diameter 11-33 mm

Image 3 Ceramic components

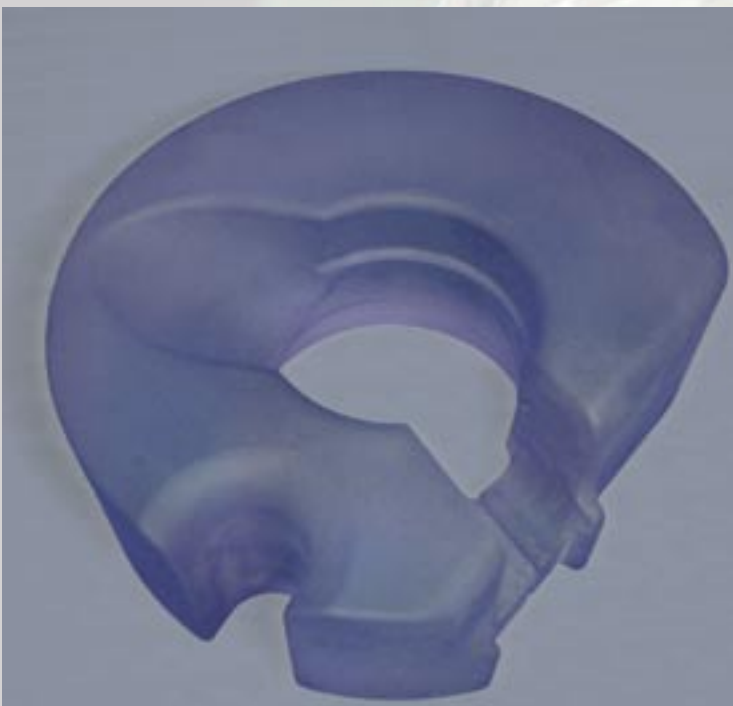
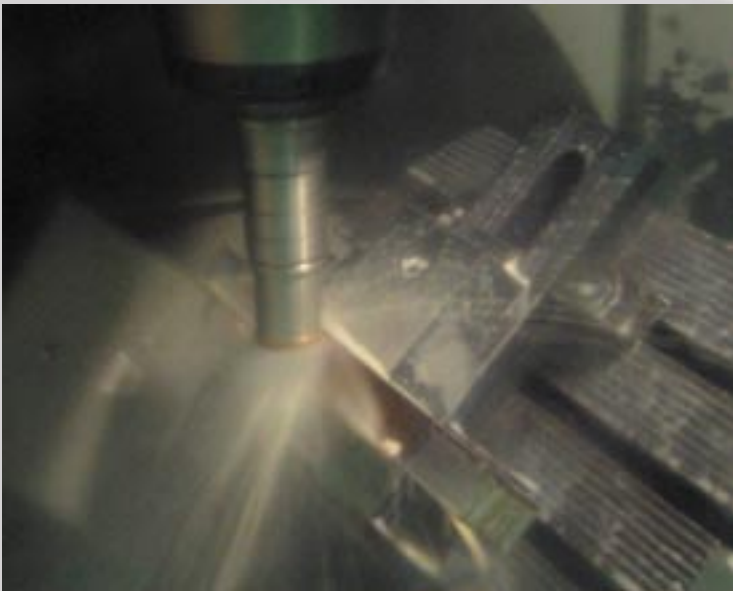
# Which geometries we produce?



**Our CAD-CAM system allows generating a great diversity of geometries and the direct import and processing of client data-files.**

## **Possible geometries:**

- Plane surfaces
- Spherical surfaces
- Prism geometries
- Wedge planes
- Aspherical geometries
- Free form surfaces
- metered drilling from 0.5 mm on
- Pockets
- Relief grinding
- Channels
- Grooves
- Pins
- Thread in glass



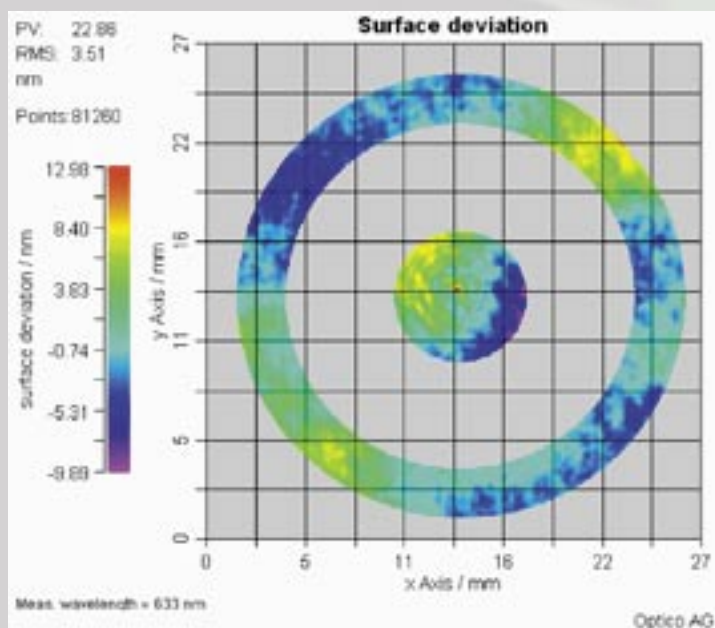
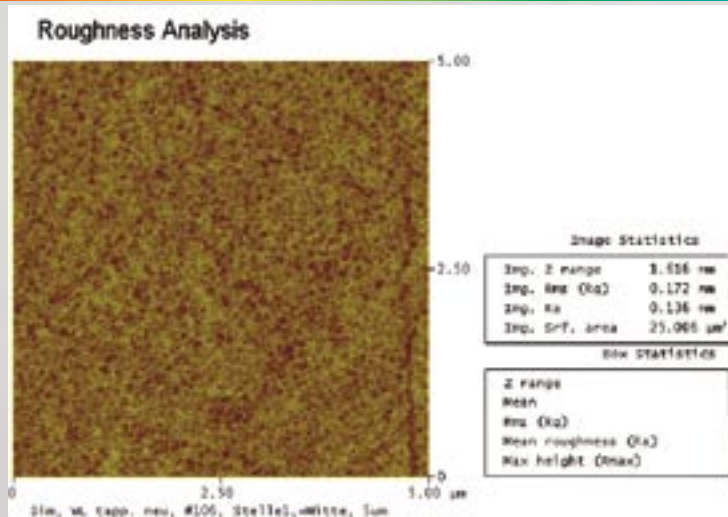
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Image 1: Programming with CAM-system

Image 2: 5-side-processing of a high temperature window

Image 3: Fused glass free-form body for noble metal casting, diameter 250 mm

# Our quality assurance



The manufacturing of parts with high quality requirements belongs to our core competences and is assured due to multi-level quality controls.

During the production process an enduring quality monitoring is performed. Following this all parts are examined in a final quality control, during which the achievement of all specific data required of the part is controlled and documented prior to the dispatch of goods.

In order to enable the retracement of goods we provide our clients with all required documents, (i.e. melting certificate, material certificate, declaration of conformity, coating diagrams, certificate of origin, etc.).

Some examples of our quality values:

- RMS-value for surface processing <math>< 0,1\text{nm}</math>
- Form-exactness  $\lambda/10$  (possible even for sapphire)
- Best possible surface quality for reticule plates and laser optics

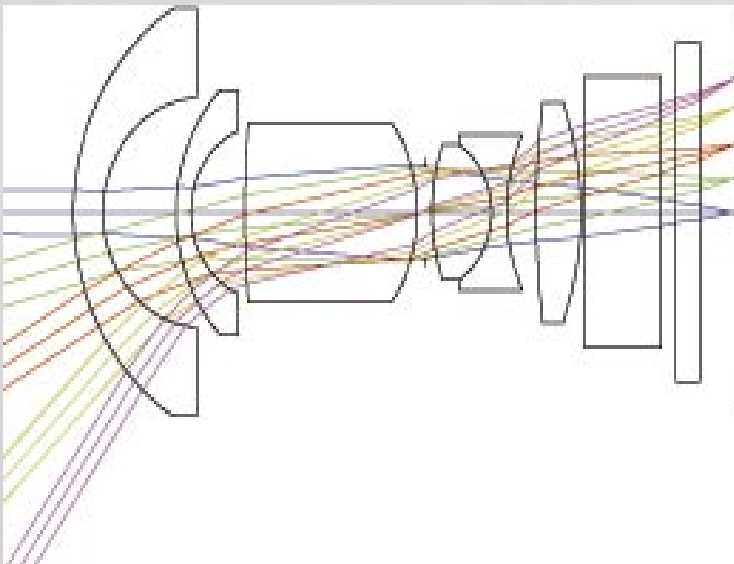
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Image 1: Roughness profile of fine-polished optic with AFM.

Image 2: Interferometric measuring of glass membrane, total imperfection  $< \lambda/10$

Image 3: Surface control with stereo microscope

# What can we do for you?



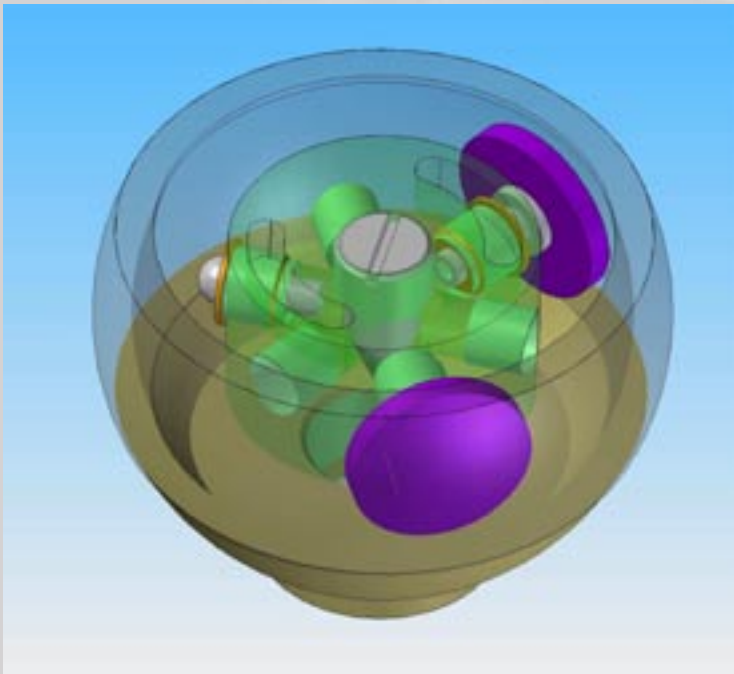
**We support you in the construction of optical components and systems, of glass and ceramic parts and generate solution concepts.**

**We test manufacturing processes of single parts and if necessary provide you with suggestions to change in regard to the realizability and cost optimization.**

**Whether prototypes, small or mid-sized series, we produce all parts for you accurately and corresponding to the drawings.**

**We mount assembly groups such as objectives, holders, sockets and produce complete optical components for you.**

**For further information, please do not hesitate to contact us. We shall be pleased to assist you.**



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Image 1: Calculation and construction of a wide-angle lens for sewer line renovation

Image 2: Tool development for a special lens

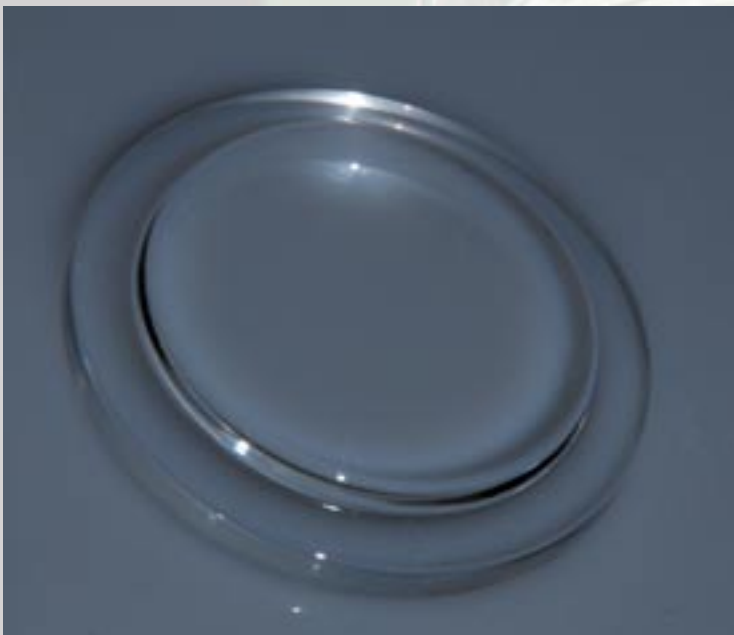
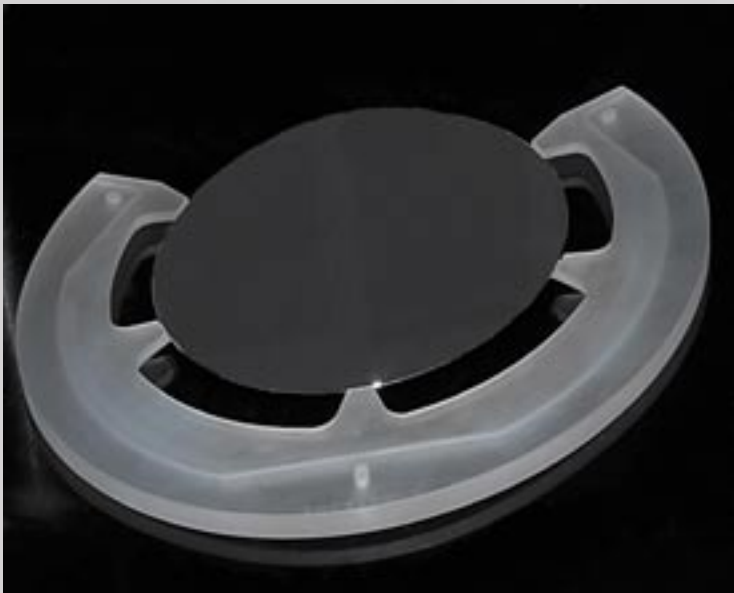
Image 3: Light deflecting optic for special microscope illumination



# Our core competences:



- Processing very thin glasses  
i.e. 0.05 mm  
fused glass/Zerodur®
- Processing of sapphire under  
consideration of technical form  
exactness and surface  
imperfections
- Processing of very hard ceramic  
materials (after sintering)
- Roughness values of <math><0,1\text{nm}</math> can  
be achieved with the conventional  
manufacturing of super-polished  
surfaces,
- MRF-polishing  
(magnetorheological finishing )  
corrective polishing of spherical  
and plane surfaces
- Adaptation and reworking of  
customer substrates
- Du to our flexibility we can react  
to client demands on a short-term  
schedule
- We possess very extensive  
experiences in the processing of a  
large variety of materials and in  
the manufacturing of a range of  
diversified geometries



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Image 1: Fused silica, sapphire and borosilicate  
viewing glasses for high temperature and  
vacuum processes,  
possible length up to 450 mm

Image 2: Fused quartz wafer support for the semi-  
conductor industry,  
possible diameter up to 450 mm

Image 3: Fused silica window in reticule plate quality  
for sensoric applications

# Highlights of our machine equipment:



## CNC-grinding machine

- High frequency spindle
- CAM programmable
- Integrated measure sensing device for process control

## CNC-processing center

- 5-achsles simultaneous processing
- High frequency spindle
- CAM programmable
- Large operation area

## Two-side grinding center

- Air-supported material bearing spindles for extraordinary exact processing

## CAM programmable

- Automatic work piece exchange
- Automatic two-sided processing

## Inner Diameter Saw

- Very exact cutting is possible
- Minimal cutting loss

## Double lapping and polishing

- assures high planeness and parallelism values

## MRF-polishing machine

- Corrective polishing of plane and circular optics
- Super-polishes
- Polishing rotation symmetric aspheres

## X-Ray goniometer

- Orientation of mono-crystals
- Exactness 0.1°



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Image 1: Complete processing of lenses

Image 2: MRF-polishing, corrective polishing up to  $\lambda/10$

Image 3: Definition of crystal orientation with a X-Ray goniometer

# Our Clients:



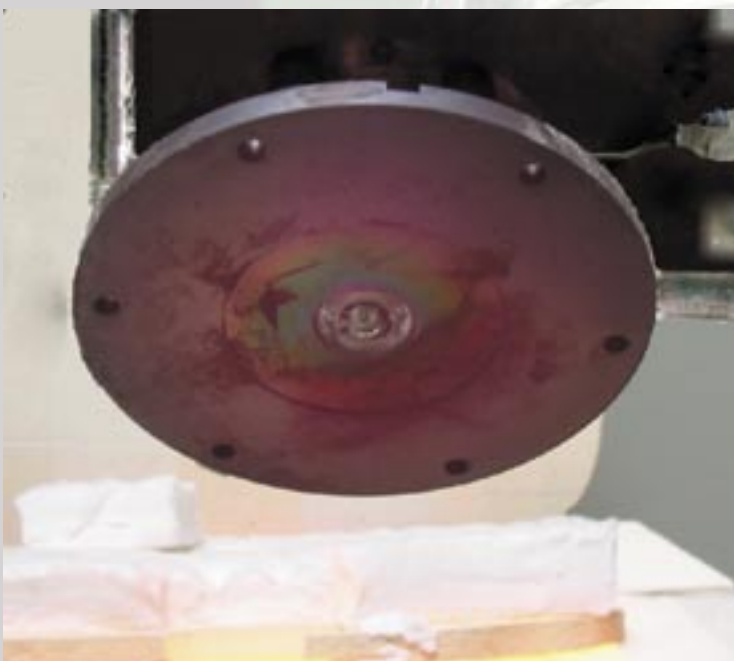
**We are proud of our reference list!  
Amongst our world wide spread  
clients you find:**

- Universities
- Technical colleges
- Research centers and institutes
- Aerospace companies
- Innovation centers
- High temperature research institutions
- Constructing engineers and developers



**We supply to Industry companies of  
various branches, i.e.:**

- Facility and machine construction
- Laser technology
- Semi-conductor industry
- Medical equipment technology
- Measure and sensor technology
- Textile machine manufacturers
- Aerospace industry
- Lighting technology



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Image 1: Different lenses

Image 2: Use of silica glass rings in the  
semi-conductor industry

Image 3: wide-angle lens for aerospace application in  
heavy load test

# Contact Information:

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## How to find us

