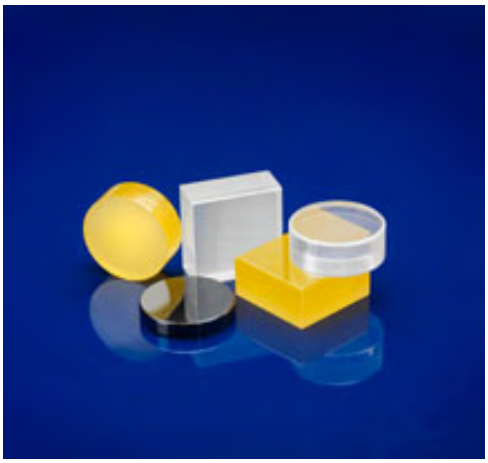
Newsletter
SCHOTT Advanced Optics

VOL III NO. I, January 2008

SCHOTT Introduces IR Material to its Product Portfolio

SCHOTT Advanced Optics has been widely recognized as an innovator and world-class supplier of quality material for the UV to Visible spectral range. Now we are pleased to announce that our product portfolio will expand to span from the UV into IR. The addition of these materials to our product offering will allow customers to have one source capable of addressing their optical and infrared material requirements. The new IR products will take advantage of SCHOTT's existing optical processing capabilities and vast experience. Any customers with applications such as thermal imaging, night vision, targeting pods, or other IR relevant projects are invited to learn more about SCHOTT's IR materials. Our initial product offerings include a family of chalcogenide glasses and both grades of zinc sulfide – flir and clear grades. SCHOTT is excited to enter the IR market and is ready to meet your IR material requirements.



IR material - a new addition to SCHOTT Advanced Optics' product portfolio.

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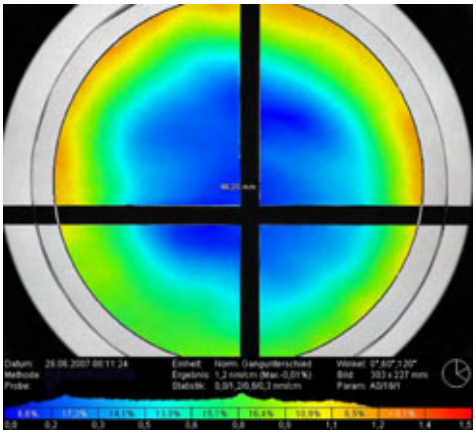
SCHOTT to use new inspection system for stress-birefringence measurement with high spatial resolution & accuracy

Optimization of production of large high homogeneous optical glasses

SCHOTT introduced a new automatic stress-birefringence measurement system for the quality assurance and optimization in the production of large high-homogeneous optical glass blanks with special stress birefringence requirements.

This system "StrainMatic M4", a stress-birefringence measurement device from the "StrainMatic" series of the company ILIS (Erlangen, Germany), works based on the classical "de Senarmont" method and has been adapted to the special requirements needed by SCHOTT. A large telecentric optical system captures the internal stress-birefringence distribution distortion free up to the edge of a 300 mm diameter measurement field, enabling a spatial resolution in the 1 mm range. This enables a fast, accurate measurement of the stress-birefringence of large samples. The results with "nm" accuracy are displayed in a color-coded diagram, enabling both a quick overview on the stress-birefringence distribution of the sample and a detailed analysis.

At SCHOTT the system is applied for materials and components of industrial optics, especially in the field of astronomy, micro-/lithography and laser optics. It is also used for the analysis of the mechanical stress in complex fabricated parts of glass- and glass-ceramic, as for example prisms or light-weighted ZERODUR® mirror blanks.



Stress birefringence distribution in a 270 mm diameter sample measured with the StrainMatic M4 system

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New Technical Information No.42: Radiation Resistant Optical Glasses

In space, nuclear power and other scientific applications, optical glass may be exposed to high energy radiation like gamma-, electron-, proton-, and neutron-radiation. With the accumulation of higher doses this radiation changes the transmittance of optical glass especially near the UV-visible edge of the spectrum.

SCHOTT offers a variety of radiation resistant glasses covering main parts of the Abbe diagram. These glasses are suitable for earth orbit based applications with lifetimes up to 10 years. The newly introduced technical information no. 42 gives background information on the impact of radiation on the transmittance of radiation resistant optical glasses.

http://www.schott.com/advanced_optics/english/download/tie-42_radiation_resistant_glasses.pdf

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New Technical Information No.19: Temperature Coefficient of Refractive Index

The refractive index of optical glasses changes with temperature, whereas the extent depends on the glass type and on the wavelength. The temperature coefficient of the glass describes the change of refractive index for any wavelength from near UV to near IR at a given temperature in a range from -100°C up to +140°C. The new technical information no. 19 gives a guideline on how to calculate the temperature coefficients of the refractive index and the refractive index itself for a given temperature by using the constants given in the datasheet of the glass. Additionally, the temperature coefficients for some optical glasses are displayed as a function of temperature and wavelength and athermal glasses, which help to minimize wave front deformations caused by temperature changes, are also listed in this technical Information.

http://www.schott.com/advanced_optics/english/download/tie-19_temperature_coefficient_of_refractive_index.pdf

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New Technical Information No.43: Optical Properties of ZERODUR®

ZERODUR® is mainly used as a mirror substrate for astronomical telescopes or as a mechanical component when geometrical dimensions and shapes are required to be extremely stable against temperature changes. In such applications the optical properties of ZERODUR® are of negligible importance.

Nevertheless the trend to build larger telescopes like the planned ELT (Extremely Large Telescope) projects also drives the need for large optical glass lenses and prisms. Therefore the question sometimes arises if large ZERODUR® blanks can also be delivered in optical quality grade. Technical information no. 43 gives a summary of the optical properties of ZERODUR® in geometries up to 300 mm in diameter and larger.

http://www.schott.com/advanced_optics/english/download/tie-43_optical_properties_of_zerodur.pdf

Besides the introduced TIEs please find our recently updated TIE-40 and TNE-04 on our homepage for download.

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Well prepared for major ZERODUR® projects

Process innovations & expansion of mass serial production are paying off for SCHOTT

After investing more than 15 million Euros to expand and optimize the ZERODUR® manufacturing (increasing melting capacities, optimizing processes, improvement of quality, introduction of new technologies) SCHOTT views itself to be the only industrial vendor capable of meeting the ongoing demand, yet also supplying products for additional major industrial and huge potential astronomy projects with its existing capacities. According to current planning, initial ZERODUR® deliveries for the new "Extremely Large Telescopes" could already take place in 2009. The "Thirty Meter Telescope" (TMT) in the United States is expected to have a mirror diameter of 30 meters that consists of around 500 mirror segments. In addition, the European Southern Observatory (ESO) is planning the "European Extremely Large Telescope" (E-ELT), whose mirror with a diameter of 42 meters will be composed of even more than 900 hexagonal segments. Other major projects are currently in planning in China and Japan. ZERODUR® glass ceramic offers extremely low thermal expansion, yet high chemical stability and can be produced in high, reproducible quality in large volumes. It is easy to process, polish and coat and with CNC-processing, a weight reduction of more than 80 percent can be achieved. Besides its applications in astronomy it is used for industrial applications such as precision components for micro-/lithography, ring laser gyroscopes, for precision measurement standards, as well as for prisms and mirrors that often weigh tons which are needed in LCD lithography (Liquid Crystal Display).

Quality assurance of a hexangular ZERODUR® blank with one of our customers

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Super polished SCHOTT glass as essential part of Neutron guides

One of the customers of SCHOTT Advanced Optics, S-DH GmbH from Germany, developed a special new technique of "super-polishing" and therefore strengthened its position as one of the world leaders in the production of low-loss neutron guides. S-DH, a spin-off company out of the university of Heidelberg, uses as one of its essential and key source materials glass from SCHOTT, BORKRON-N, which has already been polished with a highly precise "Four-Rhomb-Polish" at SCHOTT Switzerland in Yverdon. This process is being continued at S-DH, where through the usage of the internal developed processing of super polishing the surface roughness is being reduced from 1 nm down to 0.5 nm. This is essential once radiation with short wavelength needs to be reflected. The ultra polished surface will then be coated with metallic multi layers (up to 2000) which enables the reflection of neutrons and in combination with a source of neutrons, neutron beams are generated.

These rays can be used in various applications, e.g. in computerized tomography of tools and materials, which cannot be scanned by any other procedure/method.

One of the latest and most spectacular projects is the installation of an elliptic neutron guide at ISIS, close to the city of Oxford, UK, which enables the investigation of complex magnetic structures. As being part of this, SCHOTT contributes to the further development of the fundamental research.

Neutron guides made of double elliptic bended super mirrors

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Artistic Creations Using SCHOTT Glass

Christopher Ries: Artist-in-residence

Ries, a master sculptor of cold glass, employs the discipline of "classical reductive sculpture." Ries hand carves massive blocks of glass to create his exterior shapes by taking material away. The fact that Ries' sculptural material is some of the purest optical crystal manufactured in the world today lets him add an additional presence to his work. His use of light as a primary material for creating art sets his work apart from other hot and cold glass sculptors.

Ries has a 25-year association with SCHOTT. He began by purchasing glass from the Duryea, PA, USA facility in 1980 and came to work informally at the plant in the summer of 1982. In June of 1986, Ries even intensified his cooperation with SCHOTT and started with SCHOTT formally in a partnership role. As of today he has enjoyed a 21-year relationship with the company, which houses one of his sculpture studios inside the facility.

Two impressive sculptures of Christopher Ries

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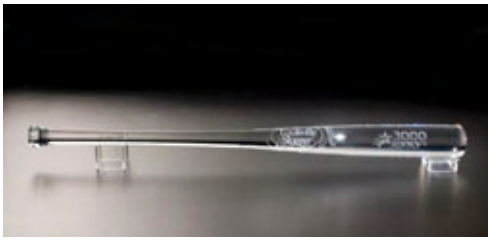
Michael Bokrosh: Unique use of N-BK7 Glass

Glass artist, Michael Bokrosh, was commissioned to create a crystal baseball bat that was presented to Craig Biggio of the Houston Astros baseball team. Craig was being honored for 3,000 plus hits and 20 years of service. The N-BK7 glass was manufactured at SCHOTT's facility in Duryea, PA, USA.



The baseball bat solely made of SCHOTT glass!

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Enhancing the Customer Experience

SCHOTT's Duryea site is embarking on a series of customer service focused initiatives, which will be implemented over the course of this year. The program is designed to provide customers with the highest level of service available. In addition to restructuring the order fulfillment process, as well as providing enhanced order tracking, the customer service and logistics teams will be in closer and constant communication. On the back end, product availability will be improved through balanced inventory of glass types and grades, in addition to increased processing capacity and capabilities.

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Worldwide Capabilities - Local Knowledge

SCHOTT's Advanced Optics business is known throughout the world as a leading international company that provides innovative solutions to the optics and advanced materials industries. With five production sites, spanning key regions of: Asia, Europe, and North America, high-quality products are never far. SCHOTT has taken the additional step to focus on its key markets, developing regional staff to meet customers' unique needs. Worldwide marketing and sales teams have been placed in each region, to ensure SCHOTT is providing the best possible service and products to the unique needs of each individual market.

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Upcoming SCHOTT Events

Laser China – March 18-20, 2008
Shanghai, China

In parallel to Laser.World of Photonics China, the German Federal Ministry of Economics and Technology initiated the special event "German World of Laser & Photonics": Within this show, driving German companies of the fields "laser", "illumination" and "photonics" will present their products and services. Dr. Johannes Hain, Head of the Business Unit "Advanced Materials" of SCHOTT will have the honored position as the president of this show!
Please feel welcome to visit us there!

SPIE Defense & Security Symposium – March 18-20, 2008
Orlando, Florida

Lens Design & Manufacturing Expo 2008 – April 23-25, 2008
Yokohama, Japan

CLEO – May 6-8, 2008
San Jose, CA

Sensor + Test 2008 – May 6-8, 2008
Nuernberg, Germany

Sensor Expo – June 9-11, 2008
Rosemount, Illinois

OptoComm – June 11-13, 2008
Taipei, Taiwan

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Optatec – June 17-20, 2008
Frankfurt, Germany

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