

# Newsletter

## SCHOTT Optics for Devices

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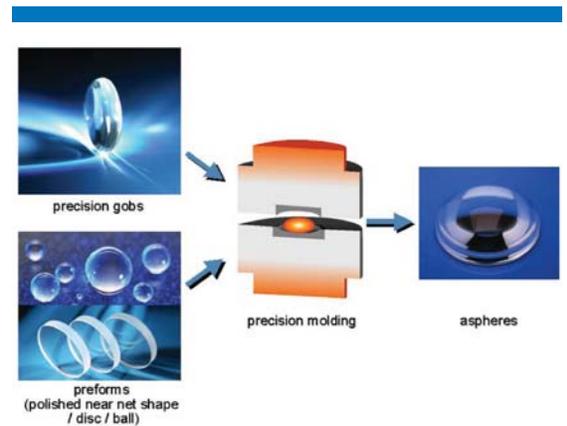
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## Technical Information No. 40: Optical glass for precision molding

SCHOTT offers a variety of so called low transformation temperature glasses (low Tg glasses) for precision molding. These glasses are available either as precision gobs or as polished preform. Precision gobs are manufactured using a unique continuous glass melting and hot forming process exhibiting an excellent surface quality. The new technical information No. 40 gives an overview on the properties of optical glasses for precision molding and their available preforms. Additionally this technical information contains background information on the influence of the precision molding process on the refractive index and Abbe number of the glass, including a list of index drop based on a SCHOTT precision molding process.



[http://www.us.schott.com/optics\\_devices/english/download/tie-40\\_optical\\_glass\\_for\\_precision\\_molding\\_us.pdf](http://www.us.schott.com/optics_devices/english/download/tie-40_optical_glass_for_precision_molding_us.pdf)

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## New 0.9 mm FAC Lens offers potential for cost reduction in the fabrication of laser modules

Fast Axis Collimation (FAC) micro lenses are used to collimate the "Fast Axis" of high power laser diode bar. After successful market launch of 0.6 mm focal length FAC lenses, SCHOTT now offers 0.9 mm focal length FAC lenses to the market. This type of lens as well as the 0.6 mm lens can be manufactured using various Low Tg glasses. SCHOTT FAC lenses are diffraction limited and maintain the beam characteristics of the laser bar. The low scattering of quality simplifies

the alignment and mounting of the lens in the laser and therefore allowing a cost reduction in this fabrication step of the laser module.

[http://www.us.schott.com/optics\\_devices/english/products/fast\\_axis\\_collimation.html](http://www.us.schott.com/optics_devices/english/products/fast_axis_collimation.html)

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## Realizing weight reductions and shorter lead times – Introducing a new bonding technology for ZERODUR®

SCHOTT has developed a bonding technology that enables the construction of complex ZERODUR® structures. By using the bonding technology geometries can be produced which would require high-level traditional CNC-machining efforts. This bonding technology is possible at operating temperatures of up to 150 °C and

ensures a mechanical strength with no restrictions compared to a monolithic layout. Customized adaption to individual applications can be performed based on a broad range of experiments.

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## Joint Venture in China's Wuxi High Tech Zone will answer regional demand for prism and optical blanks



In April, the new Joint Venture *Wuxi Unique SCHOTT Optical Co. Ltd.* plant in the Wuxi National High Technology Development Zone in the Jiangsu province, about 100 miles northwest of Shanghai was officially opened.

The US \$8 million facility, constructed on approximately 30,000 square meters of land, employs 200 people for the mass production of optical blanks for the market leaders in imaging and projection in Asia. "We plan to have monthly production of about 300,000 prism blanks and six million optical blanks," says Unique Optical President Chung-Cheng Chen.

The plant's central location gives customers in and around China better and faster service through substantially reduced lead times. Good local infra-

structure ensures rapid delivery, especially for customers in the Shanghai, Nanjing and Hangzhou regions. In 2005, more than 80 million cameras were sold worldwide, 96 percent of them digital. Moreover, 70 percent were made in China. So the Wuxi operation is sited at one of the centers of global camera production.

Based in Taichung, Taiwan, Unique Optical Industrial Co., Ltd manufactures and trades optical instruments, camera lens and similar products. The strategic partnership combines SCHOTT's advanced processing equipment and top quality raw glass with Unique Optical's operational expertise.

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## Largest optical glass warehouse in Europe trimmed for efficiency

The largest warehouse in Europe dedicated to optical glass is part of the SCHOTT plant in Mainz (Germany). Inside at any given time is about 800 tons of specialized glass, including 350 tons of optical glass. The inventory of optical glasses consists of blocks and strips of the over 100 catalogued glass types as well as some non-catalogued types. In addition to the warehouse in Germany, SCHOTT has an equally extensive warehouse for optical glasses in the US (Duryea/Pennsylvania) to serve the North American customers. For customers in Asia, the warehouse in Malaysia (Penang) with about 200 tons of optical glasses largely for pressings is currently being expanded.

In the recent past, the warehouse in Germany has been turned from a static facility into a key part of each customer's supply chain. While at the same time as customer forecasts are taken into account, internal information and supply processes have speeded up. Upon receipt of an order for standard optical glass, the customer service representatives will reply to the customer within 24 hours, both acknowledging the order and setting an estimate of the delivery time.



Orders of standard glass, direct from the inventory, will ship from the warehouse latest one week after order receipt and confirmation. When further processing or inspection of the glass is required, the customer will receive the information about the extended lead time and in all cases, the customer is given a shipping date, for special custom-made designs within one week.

A key warehouse priority has been the improvement of delivery reliability. Improved internal planning tools have boosted reliability by 12 percent in the last year. Whether the glass is coming straight off the shelves to be packaged and shipped or sent for further processing first, the warehouse has the tools to calculate and accurately advise customers of when they can expect their optical glass.

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## Good times roll for Aspheres: SCHOTT expands polishing capacity in Europe

Aspherical lenses, which eliminate spherical aberration in the transmission of light, along with improving focusing and collimation accuracy, are becoming the lenses of choice in many laser applications, as opposed to more complex multi-layer lenses that do the same job. They combine superior performance and less weight to make for smaller, more efficient devices of all kinds.

To answer increased demand for aspheres SCHOTT Optics for Devices has expanded its machine park at its Swiss production facility, SCHOTT Guinchard. Moreover, that expansion is not merely "on spec" but at the request of a major laser products producer looking to expand its own output. Laser tools play a growing role in the kind of precision cutting and welding done by auto and aircraft component manufacturers.



Whereas SCHOTT Guinchard had in the past based its main asphere capabilities on deterministic, computer-controlled ultra high precision polishing processes, thus producing very high quality aspheres, further machines have now been acquired that perform standard to high quality polishing, thereby offering a broader range of capabilities. Lenses produced by these techniques are used in telescopes, projection TVs, scientific research instruments, and as focusing optics in laser machines used for large scale welding and cutting, e.g. in the automotive industry.

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## Cerium stabilized glasses from SCHOTT prevent radiation blindness on ESA's Venus Monitoring Camera

Early in April, the European Space Agency's first mission to Venus, the Venus Express, went into orbit around Venus. The craft will spend some time moving into the proper polar orbit for its mission, but the first test photography by the Venus Monitoring Camera (VMC) has already been better than expected. Venus Express will be monitoring the Venusian atmosphere through at least two Venusian days or about 486 earth days.

Built for the Max Planck Institute for Solar Research, the VMC has four lenses in a single mount, each for a different wavelength, including ultra violet, visual, and two two near-infrared wave lengths (known as NIR 1 and NIR 2). The non-UV lenses are made from special Cerium stabilized glasses as well as special filter glass from SCHOTT. The cerium in the glass protects the lenses from being blinded by high-energy and ionizing radiation in space.



Photo: ESA - AOES Medialab

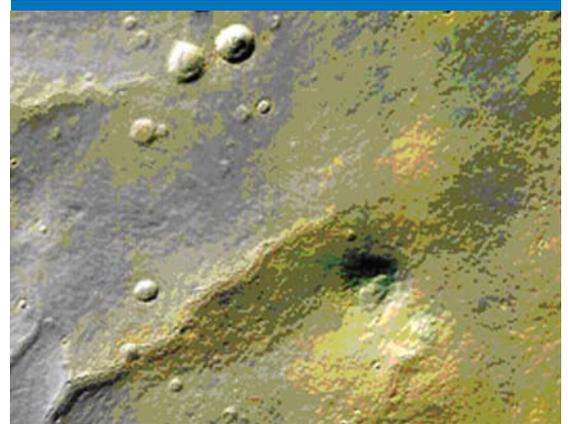
The first pictures taken with the VMC camera were of the earth and moon from 3.5 million miles away and served as calibration shots for the instruments. Upon arrival in orbit, the camera took test shots of Venus that ESA reports were even better than expected, leaving the scientists looking forward to the pictures to come, when the Venus Express is in its proper orbit.

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## HiRISE Telescope reaches Mars; best pictures to come

Late in March, the NASA Mars Reconnaissance Observer arrived into Mars space and went into orbit, with the mission to develop the most detailed mapping of the planet's surface ever, with a telescope camera that can resolve boulders a meter across.

The heart of the MRO mapping mission is the HiRISE (High Resolution Imaging Science Experiment) telescope and camera apparatus, with its ZERODUR® mirror blanks and filter glasses from SCHOTT. The primary mirror is 50 cm (about 20 inches) across, in a Cassegrain configuration, which means light is reflected from the primary mirror to a secondary mirror and then through a hole in the center of the primary and on to the focal plane, which in this case means bouncing off two more mirrors. The Cassegrain design allows for the maximum focal length in the minimal space, making it ideal for spacecraft, where weight and volume are at a premium. A focal length of 12 meters is crammed into an instrument about 3 meters long.



*Photo: Jet Propulsion Laboratory/California Institute of Technology*

Although the real observation program will not begin until the circular orbit is achieved late this year, the first test pictures taken early in March delighted scientists and the one color photo produced an intriguing result. The two circular green patches in the first color photo may indicate unusual metals, so the Orbiter will be returning for a closer look, with both the HiRISE camera and its on board spectrometer. The blue areas near the bottom indicate fog near the Martian surface. It should be noted that the color is not "natural" color that we would see with our eyes, but rather infrared color, the product of one of the SCHOTT-made filter glasses.

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## SCHOTT will appear at these events

INTEROPTO '06 – MAKUHARI MESSE, CHIBA

July 12-14

OPTICS & PHOTONICS – SAN DIEGO, CA

August 15-17

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