

# News from "Your Partner for Excellence in Optics"

**SCHOTT**  
glass made of ideas

Advanced Optics – Newsletter 01 / 2013

## SCHOTT Advanced Optics invites to BiOS and Photonics West 2013

Continuing our established tradition, SCHOTT Advanced Optics of North America will once again be exhibiting at SPIE BiOS and SPIE Photonics West, the leading trade show for the photonics industry in the United States.

Besides a highly focused booth we will have at BiOS (booth 8218), we will be unveiling several of our highlights at Photonics West (booth 1600) on roughly 70 square meters of exhibition space:

We will present an ultra light weighted open-back mirror of ZERODUR® with a diameter of 1200 mm and a residual weight of only 45 kg which reflects an impressive lightweight factor of nearly 90%. This innovation was possible based on our exceptional knowledge of the material and its processing. With a rib strength of only 2 mm and a parallel mirror substrate surface only 8 mm thick, the performance data of this mirror meets the requirements of space missions aimed at observing the earth and space telescopes. This also underlines that SCHOTT is in a position to offer properties that can be considered a real novelty.

As yet another highlight, we will be presenting a monitor screen featuring

a CONTURAN® DARO cover. DARO stands for a new coating that combines anti-reflective and anti-fingerprint characteristics for the first time and also features proven durability and an easy-to-clean surface. Take the chance to experience and test the benefits of this new coating directly at our booth!

SCHOTT's products for use in laser applications as well as its IR materials represent another focus. In addition to laser glass that is usually doped with neodymium or erbium and our chalcogenide glasses, we will be presenting components made of these materials and our experts will be sharing information on SCHOTT's expertise in these areas.

In addition to the product presentations that the company will be holding at its booth, SCHOTT will also be presenting as part of the so-called "Product Demos" at BiOS and Photonics West. Here our experts will be holding presentations on defined topics and offer insights into innovations during an approx. 20 minute speech that follows a discussion. We invite you to take advantage of this opportunity and tune in to one of the following presentations:

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Sunday, February 3, 2013, 11:30 AM

South Hall @ BiOS (Demo Area)

### **Optical Materials for Microscopy Design**

Glass with large anomalous partial dispersion & low dispersion for best color correction – high transmittance glass improves light transmittance at the UV edge – pure raw materials for low fluorescence.

Dr. Ralf Jedamzik, SCHOTT AG, Advanced Optics

Wednesday, February 6, 2013, 3:30 PM

South Hall @ PW (ABC)

### **ZERODUR® goes EXTREME**

ZERODUR® **EXTREME** offers the tightest CTE tolerance on the market. ZERODUR® **TAILORED** is optimized to final application temperature profiles. An ultra-light weighted 1.2 m ZERODUR® piece will be on display.

Dr. Ralf Jedamzik, SCHOTT AG, Advanced Optics

Thursday, February 7, 2013, 11:30 AM

North Hall @ PW (D)

### **Perfect filters and designs for demanding customized applications**

Portfolio extension including new filter glass sets, interference filters and new designs and the introduction of a new filter calculation program and catalog.

Dr. Ralf Biertümpfel, SCHOTT AG, Advanced Optics

Thursday, February 7, 2013, 2:30 PM

North Hall @ PW (D)

### **Laser Damage Threshold of Optical Components**

The laser damage threshold of components depends on their surface quality and material properties – we now define this threshold for optical glass and present data on high reflective broadband coatings and components.

Dr. Todd Jaeger, SCHOTT North America Inc., Advanced Optics

**We look forward to your visit! Please contact us if you would like to arrange to meet with us.**



## **SCHOTT Advanced Optics keeps prices stable due to further process optimization**

### **Prices of optical glass products either being lowered or kept at normal level**

SCHOTT Advanced Optics, a division of the SCHOTT Group, is a recognized expert when it comes to manufacturing optical glasses. Advanced Optics has continued to grow over the last few years and today offers high precision components like prisms and lenses as well as special products such as IR materials and ultra-thin glass as thin as 25 µm.

Nevertheless, the origin and strength of our unit lie in manufacturing optical glass, whereby we regularly modify and expand our glass portfolio to reflect market developments and requests from our customers and re-examine our prices.

The prices of glass products are significantly affected by developments in the area of raw materials such as rare

earths, energy, and logistics, for instance. In order to limit the influence of these factors, our production experts continuously work on optimizing our processes. However, during the course of the annual review of our prices in 2010, we were forced to make a few adjustments since the influences were too significant. (see next page)

However, we have continued to optimize our production processes and, nearly two years later, would now like to pass on some positive results to our customers since we have managed to partially reverse the recent changes in prices despite the higher prices of various raw materials. For instance, the prices of glasses that contain rare earths were lowered by another 5% following a price reduction in May 2012 and have now reached a level that is more than acceptable, especially considering that lanthanum prices have remained at a relatively high level. In addition, we have managed to keep the price level of many of our glass products that

are available only on demand stable despite lower purchase quantities.

Generally speaking, SCHOTT Advanced Optics is keeping its prices stable to express to its customers that working together and sharing an outstanding customer-supplier relationship provides the basis for the economic success of all parties.

We look forward to continuing our successful relationship. The new price lists are available upon request. Please send us an e-mail to [info.optics@us.schott.com](mailto:info.optics@us.schott.com). Of course, you can also give us a call at 570-457-7485.

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## SCHOTT presents new Filter Catalog

Optical filters make up an important part of the product portfolio of SCHOTT Advanced Optics. With a wide variety of custom optical filter glasses and interference filters, SCHOTT offers solutions along the entire spectral range and utilizes its extensive range of experience and knowledge in producing and processing these products.

In order to share this knowledge and information in-depth with our customers, SCHOTT Advanced Optics has revised and completely redesigned its Optical Filter catalog.

Besides even more detailed descriptions of the excellent properties of all filters available, the content has been revised and now includes new sputtering capabilities such as magnetron sputtering or new filter glasses like BG61 & BG62, which have been especially developed

for use as IR cut filters in difficult environments. Both filter types "Interference & Special Filters," and "Optical Filter Glass", are presented together in this catalog. Whereas a distinction is made in each case between the "Description" and "Properties" sections, the "Description" part focuses on explaining the respective filter range, while the "Properties" section covers technical details, tables and graphics.

These catalogs can be downloaded from our website effective immediately: [www.us.schott.com/advanced\\_optics/downloads](http://www.us.schott.com/advanced_optics/downloads).

You will also find further details here: [www.us.schott.com/advanced\\_optics/overview-optical-filters](http://www.us.schott.com/advanced_optics/overview-optical-filters), and if you would like to get in touch with

us personally to share your thoughts, ideas and requests, we invite you to contact us at [info.optics@us.schott.com](mailto:info.optics@us.schott.com).

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## SCHOTT a main contributor to the SPIE conference “Optical Systems Design”



### Presentations on BK7 & BG60/61/62 blue glass IR cut filters round off SPIE event in Barcelona

Dr. Peter Hartmann, Dr. Steffen Reichel and Dr. Frank-Thomas Lentes presented the latest results on the optical glass N-BK7® and optical filter glasses BG60/61/62 at the SPIE conference “Optical Systems Design” in Barcelona at the end of November 2012.

Dr. Peter Hartmann, Director of Market and Customer Relations at SCHOTT Advanced Optics, held a presentation on the outstanding production and quality results that have been achieved with the optical glass type BK7.

BK7 is very common and has been around for years, therefore its performance is usually underestimated. On the

occasion of the 110th anniversary of the introduction of BK7, Dr. Hartmann’s presentation highlighted the progress on the optical characteristics and technical findings that have been made with this glass and its continuing improvement even until today.

At the same time, an article entitled “110 years of BK7 – An optical glass type with a long tradition and continued progress” will be published soon as part of the SPIE proceedings.

Furthermore, Dr. Steffen Reichel, Development & Application Engineer, and Dr. Frank-Thomas Lentes, Process Development Engineer, presented the

latest news on the blue filter glasses BG60/61/62 and its application as an IR cut filter in digital cameras like smart-phone cameras.

Based on a digital camera design, a recommendation was given on the internal quality of the blue glass (e.g. striae content) IR cut filter. In addition, the integration of both the filter function and lens function were discussed. Here, a lens made out of blue glass was designed and a recommendation was given on the blue glass transmission and its internal quality. An article will also be published on this topic very shortly.

## New insights on ZERODUR® design presented in SPIE journal

### New calculation procedure allows for reliable prediction of lifetime for given design stress

ZERODUR®, SCHOTT’s glass-ceramic with extremely low expansion, was once again the topic of an article published in SPIE’s journal “Optical Engineering” in December 2012. It discussed new insights on the design of ZERODUR® structures with respect to elevated application stresses.

The observation of minimum breakage stress values for defined surface conditions combined with a well proven procedure for incorporating the stress corrosion effect allows for the lifetime of given design stresses to be calculated. The new approach does away

with statistical uncertainties, doubtful extrapolations and overly conservative safety factors and thus leads to much higher admissible mechanical loads on ZERODUR®.

The article written by Dr. Peter Hartmann “ZERODUR®: deterministic approach for strength design” Opt. Eng. 51 (12), 124002 (December 18, 2012); doi: 10.1117/1.OE.51.12.124002 can be downloaded from the SPIE Digital Library.

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## Representatives of research and industry gained insights into the world of MEMS at SCHOTT

### SCHOTT Advanced Optics holds a successful technology day event at the Competence Center for thin glass in Grünenplan

SCHOTT Advanced Optics in Grünenplan is the Competence Center for manufacturing of thin and special glasses for applications in the area of medical technology, the semiconductor industry, optics and opto-electronics.

Manufacturing of ultra-thin glasses in various versions, for example, and a newly developed product called MEMpax®, are of particular importance here. This is an ultra-thin borosilicate glass that opens up entirely new possibilities for the MEMS industry thanks to its fire-polished surface, chemical and physical properties analogous to the well-known SCHOTT Borofloat® 33, comparatively low thickness (thickness spectrum between 100 µm and 700 µm), extremely good non-conductive properties as a result of its low alkali content, low autofluorescence and ability to be used in direct anodic bonding in conjunction with silicon wafers.

The development of MEMpax® is a project that is being supported by the German State of Lower Saxony.

In light of the enormous dynamics of these markets, the NMN e.V. organized a technology day entitled "New Products and Technologies Revolutionize the World of MEMS" in association with SCHOTT on November 6, 2012. The "State Initiative Nano and Material Innovations from Lower Saxony (NMN)" is a partner platform supported by the Ministry of Economics, Labor and Transportation aimed at increasing the innovativeness and strategic collaboration between business, science and politics and bundling Lower Saxony's expertise in the area of new materials, surfaces and lightweight structures.

The event gave representatives of research and industry the chance to address current developments, needs and expertise in the target field of

MEMS. About 30 participants took advantage of this occasion to discuss synergies and cooperation opportunities in the area of thin glass and exchange information on current trends and applications.

The tour of select areas of thin glass manufacturing was one of the highlights of the event.

As part of the series of presentations, representatives of business and science, including the Fraunhofer Institute for Electronic Nano Systems ENAS, the Laser-Laboratorium Göttingen e.V., Robert Bosch GmbH and the Fraunhofer Institute for Reliability and Microintegration IZM discussed current developments and applications in the relevant market. During the round of talks that followed, the participants joined in discussing the issues facing the industry today, the consequences of taking certain actions and product initiatives.

These were discussed even further and driven forward in the work groups supported by the state-sponsored initiative Nano and Material Innovations in Lower Saxony, whereby new participants are always welcome.

If you are interested in participating in the work groups, receiving the results of the study group or have a contribution to make, particularly in the areas characterization, functionalizing, monitoring and structuring in the target field of MEMS, please contact the administrative office of the LI NMN by sending an e-mail to [mail@nmn-ev.de](mailto:mail@nmn-ev.de) or calling them at +49 (551) 49 607 0 or contact us at: [info.optics@us.schott.com](mailto:info.optics@us.schott.com).

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