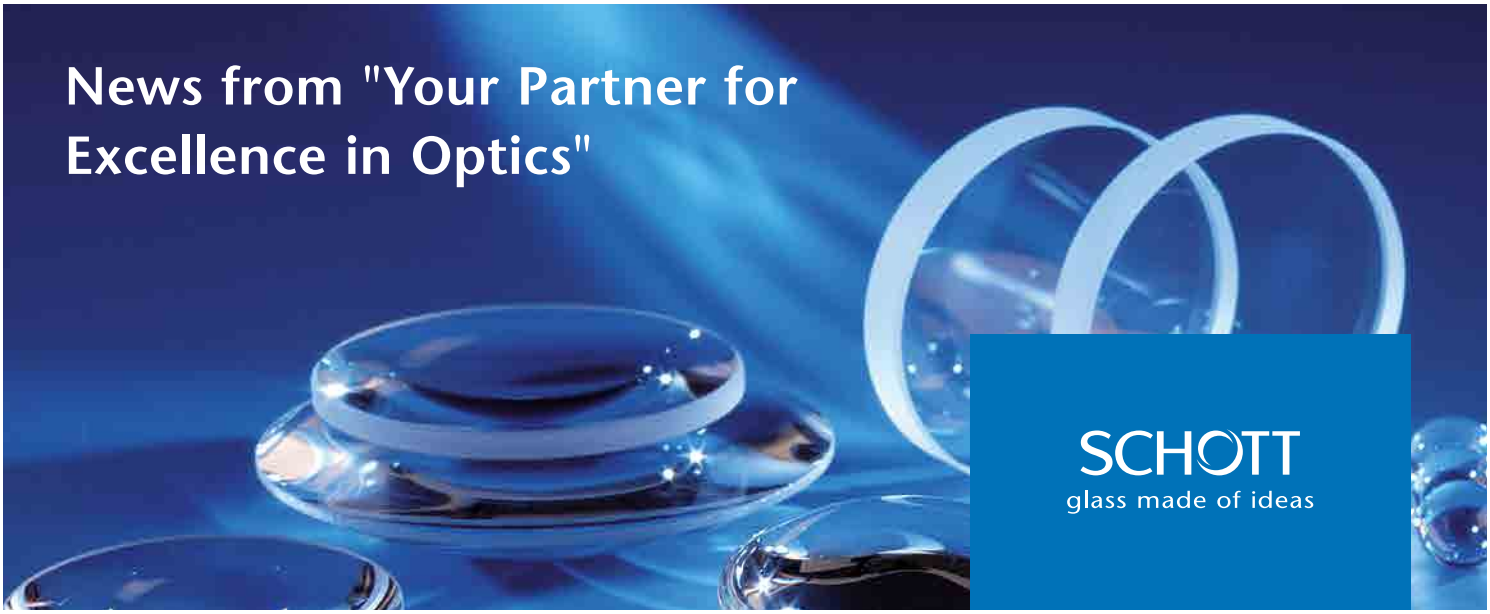

Advanced Optics – Newsletter 02 / 2013

CUSTOMER'S STORY

And the Oscar goes to: the "Cooke Look"

Cooke Optics is defining the look of motion pictures with glass from SCHOTT

The Oscar statuette, an iconic symbol of the motion picture industry, pays tribute to the greatest achievements in filmmaking. While the "Academy Award of Merit," as it is officially called, may be best known for honoring categories such as Best Picture, this year's Scientific and Technical Oscar is worth particular mention. That's because it was presented to Cooke Optics "for their continuing innovation in the design, development and manufacture of advanced camera lenses that have helped define the look of motion pictures over the last century" – camera lenses, like the 5/i and S4/i lenses that feature SCHOTT glass.

Since the end of the 19th century, the Leicester, UK-based Cooke Optics has been manufacturing outstanding camera lenses for the growing motion picture industry. They are used not only in Hollywood, but in hundreds of feature films globally, including Martin Scorsese's latest 3-D movie, "Hugo." The company uses SCHOTT glass in its cameras to help achieve the unique "Cooke Look" – the organic, warm colors that have made the company so famous.

"The greatest camera in the world is worthless if you don't have good lenses in front of it. And the quality of the glass is what makes the quality of the picture," said Robert Howard, CEO of Cooke. "From hundreds of optical glasses, we make selections based on their index of refraction, as well as their color transmission characteristics. By combining ten to more than 20 pieces of glass in our lenses, we govern the amount of various color frequencies that get to the film."

The precision lenses are still handmade at Cooke, beginning as clear, bubble-free, special optical glass that, to a large

(see next page)

LASER World of PHOTONICS

Visit us at our booth

May 13th – 16th 2013
Munich
Hall B2, booth 306

„SCHOTT – Your Partner for Excellence in Optics"

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Events

extent, comes from SCHOTT. Over 70 different glass types, with different refractive and chemical properties, are used to produce the finished lenses. The glass is supplied pre-molded to closely match the required shape, and is then ground according to exact specifications. It is a highly guarded and skilled task, matched only in precision and quality by another high-end grinding business: diamond cutting.

"Selected optical special glasses from SCHOTT, i. e. short flint glasses, enable the lenses' high color fidelity," explains Andreas Hädrich, Sales Director Europe. "By closely controlling the melting and annealing processes during glass manufacturing, we have succeeded in keeping the tightest tolerances. In the highest quality level, the deviation from the nominal values listed in the datasheet is only ± 0.0001 with the refractive index and ± 0.1 % with the Abbe number. This is the level of quality an innovative, industry-leading camera manufacture like Cooke demands for its art."

In the end, art is the driving force behind Cooke's skillful work. "We are thrilled that the company has been recognized by the Academy after more than 120 years' continuous service to the motion picture industry," said Les Zellan, Chairman and Owner of Cooke Optics. "Cooke has been an innovative force in this industry from the birth of motion pictures to the current digital film revolution. Our commitment has always been to enable customers to realize their vision and help them create the films that capture the imaginations of audiences around the world."

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IG renamed IRG

SCHOTT took advantage of the SPIE DDS conference to announce the new name of our chalcogenide glass product line

Did you know that SCHOTT Advanced Optics has been offering IR-Glasses since 1970?

At the 2013 Defense, Security and Sensing (DSS) Conference in Baltimore, MD, SCHOTT Advanced Optics of North America took the opportunity to unveil the new name for our chalcogenide glass product line to the market. Originally called IG, our first-rate glass technology has been officially renamed IRG in order to better express its successful development and connect the product line to its 1980s predecessor. The portfolio includes the newly renamed IRG 22, IRG 23, IRG 24, IRG 25 & IRG 26 glasses, all of which are produced in our Duryea, PA facility.
If you are interesed in our IR-Glasses, contact us: info.optics@schott.com

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PRODUCTS

Introducing SCHOTT's new "Laser Components Folder"

SCHOTT Advanced Optics offers an assortment that ranges from raw glass to complete optical solutions and serves the entire value chain: from development to manufacturing, including comprehensive analysis, and even high-performance coatings. In addition, Advanced Optics also provides a broad range of materials and components for use as high-quality optical solutions in state-of-the-art laser applications.
In response to the growing laser market in Europe and Asia, especially in the area of high-power lasers, SCHOTT Advanced Optics is planning to further extend its presence in this market and is now introducing a Laser Components folder to the market that contains more information on its expertise in this area.

This folder emphasizes the fact that SCHOTT is a "one-stop shop" that covers the complete product spectrum with active laser glasses (APG, LG and IOG), passive materials (optical glasses, ZERODUR® or Zinc Sulfide (ZnS)), but also passive components, like aspherical lenses, prisms, polarizers and optical filters that are ideally suited for use in laser applications. Data sheets that contain all of the important information on the materials and components referred to in the folder are also included.
The Laser Components folder can be downloaded from our website from now on: www.schott.com/advanced_optics/downloads-e.

More detailed information is available under: www.schott.com/advanced_optics/laser-glass, but, of course, we would be happy to discuss these topics with you in person. All you need to do is send us an e-mail: info.optics@schott.com.

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Don't just see red

SCHOTT's new filter glass VG20 ensures a clear view while protecting against laser beams

Infrared lasers are playing an increasingly more critical and common role in medical and industrial applications, so much so that desired attributes of modern protective eyewear have expanded. In addition to being comfortable, lightweight and, of course, providing safety, it's important that the eyewear conveys true color to the human eye. As a result, SCHOTT has developed the 1 mm thin, band-pass filter VG20 – an exceptionally lightweight, special filter glass that displays strong absorption in the near infrared (NIR) range.

VG20's outstanding transmittance in the visible spectrum ensures the colorfast eyesight that today's industrial and medical applications call for. At the same time the solid-colored glass safely provides the important protection from laser beams our delicate eyes require, comfortably and regardless of the angle of incidence. "By bringing more color into the glass, we have been able to produce a very thin optical filter that keeps radiation in the wavelength range of 600 – 1100 nm away from the eye," explained Dr.-Ing. Ralf Biertümpfel, Application Manager Filter Glass at SCHOTT Advanced Optics. "For laser safety eyewear, VG20 offers improved wearing comfort – it's roughly one third lighter than conventional filter glass."

VG20 is extremely transparent in the visible range of the electromagnetic spectrum, conveying true colors with very little darkening. The cut-off wavelength λ_{05}, at which the glass has a transmittance of 50 percent, is at 565 nm and then drops steeply. The green glass is suitable as protection from red and NIR lasers in a wavelength range above 650 nm, such as those lasers used in metrology and medical technologies. In wavelengths of 750 – 1100 nm, it is nearly impenetrable. In addition, the filter glass is highly climate-resistant: it stays moisture- and heat-proof, permanently transparent, and corrosion-free for hundreds of hours. The filter properties can also be optimized with additional coatings to address customer-specific applications.

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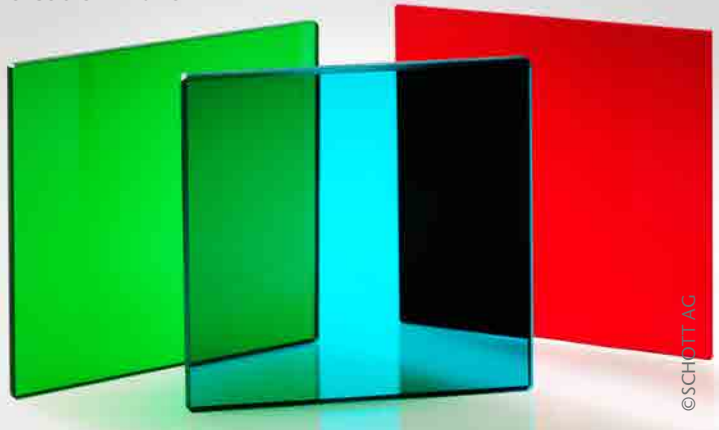
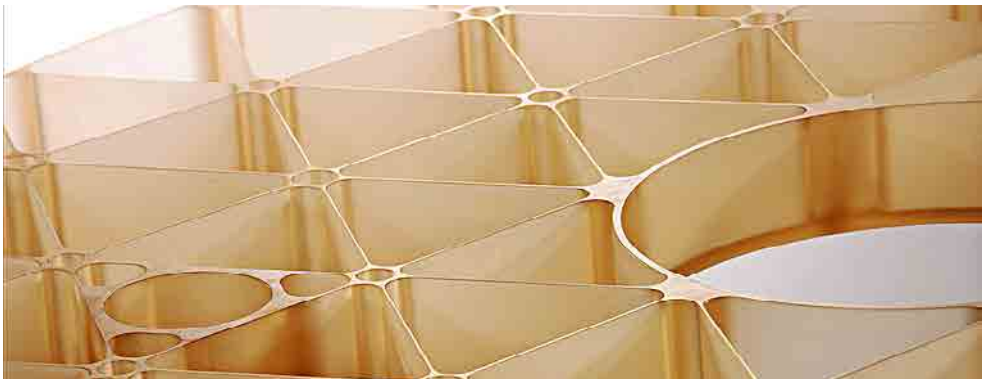


EVENTS

ZERODUR® at AAS

The extremely light weight ZERODUR® mirror technology took the floor of the 221st meeting of the American Astronomical Society

In January, SCHOTT Advanced Optics took part in the 221st American Astronomical Society Meeting; the major astronomical conference for 2013. Held in Long Beach, CA, the winter meeting was attended by more than 4000 participants from around the globe, including top-level decision makers from NASA and prime contractors, as well as members from the Astronomy Principal Investigator community. This meeting provided SCHOTT with an ideal setting to present our market-changing technology – the extremely light weight ZERODUR® mirror, which provides a cost-effective solution for improving telescope capabilities.



The ZERODUR® mirror boasts an impressive 1200 mm diameter, while weighing only 45 kg. This makes it the first open-back mirror to achieving a light weighting factor close to 90 %. Through diamond grain standard CNC grinding, the aggressive weight reduction was achieved by producing a rib thickness of only 2 mm and face sheet parallel to the front side curvature as small as 8 mm.

The performance data SCHOTT provided highlights the ZERODUR® mirror's ability to fully address today's space-born mission requirements for earth observation and space telescopes. The technology's potential to improve scientific observation and data collection clearly apparent to the attendees and initiated intensive discussions and excitement within the satellite and astronomical community.

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Success at SPIE DSS

SCHOTT Defense provided attendees with a unique look at our IR-Glasses, Laser Glass and CONTURAN® DARO coating

In April, SCHOTT Advanced Optics attended and presented at the 2013 SPIE Defense, Security, and Sensing (DSS) Conference in Baltimore, MD. Organized annually by SPIE, the international society for optics and photonics, DSS is the year's most important scientific conferences on optics, imaging and sensing for the defense, security, industrial and environmental markets.

With more than 6,500 top scientists, engineers and product developers in attendance, SCHOTT had the opportunity to connect with industry leaders and government program directors regarding many of our products. This included IR-Glasses, Laser Glass and CONTURAN® DARO coating developed by SCHOTT Advanced Optics. Product demonstrations and technical paper presentations were well received by conference attendees, and included an introduction to our extensive Laser Glass product offerings; a demonstration of the excellent transmission capabilities of our IR-Glass in the SWIR, MWIR, and WIR ranges; and a presentation on the breakthrough anti-reflective, oleophobic characteristics of our durable CONTURAN® DARO coating. The conference was a major success and allowed the SCHOTT team to introduce our latest optic glass innovations to new and existing customers.

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SCHOTT Advanced Optics at this year's LASER World of PHOTONICS

SCHOTT Advanced Optics will be presenting its latest developments to the public and welcoming its guests and partners once again to the 21st Laser World of Photonics in Munich, the world's leading exhibition and conference on components, systems and applications for laser technology.

SCHOTT Advanced Optics always strives to expand its capabilities and therefore also its product range. Besides our well-known product portfolio, we will also be presenting the following highlights this year:

- The laser glass component LG-940, an erbium and Yb-doped laser glass that emits laser light at 1.5 microns. One area in which this can be used is medical cosmetics, for instance.
- Partnership with Research Electro-Optics (REO) on precision optical components. This strategic alliance now puts us in a position to also offer a broad range of coated precision optical components like lenses, prisms and windows.

This year, we will also be putting on several product demonstrations as part of the Photonics Forum. Please visit us at our **booth no. 306 in hall B2** and be our guest at the following presentations, which will all be held in **hall B2 – Forum on Optical Technologies:**

- "Active laser glass and components for high power applications"
  Tuesday, May 14, 2013, 10:20 AM – 10:40 AM
  Frank Elsmann
- "VG20 – a new absorbing glass"
  Tuesday, May 14, 2013, 11:40 AM – 12:00 AM
  Dr.- Ing. Ralf Biertümpfel
- "Measurement of the bulk laser damage threshold of optical glasses"
  Wednesday, May 15, 2013, 01:40 PM – 02:00 PM
  Dr.- Ing. Ralf Jedamzik

LASER World of PHOTONICS

For the first time this year, SCHOTT Advanced Optics will also be inviting its customers to attend a developer workshop in Munich that will be held at the same time as the conference. Trade customers from Germany, Austria and Switzerland will receive deeper insights into the topics "Optical Filters" and "Optical Materials." SCHOTT always works hard to engage in close and intensive exchanges with its customers' experts in order to be able to develop products that meet their individual needs in a more targeted manner.
Have we captured your interest? Then kindly visit us at **booth 306 in hall B2** so that we can share our highlights and insights from the product demonstrations with you.

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SCHOTT Advanced Optics to attend 114th DGaO Annual Conference in Braunschweig, Germany

DGaO Deutsche Gesellschaft für angewandte Optik
The German Branch of the European Optical Society

SCHOTT Advanced Optics will be participating in the Annual Conference of the DGaO (Deutsche Gesellschaft für angewandte Optik e.V. / German Society for Applied Optics e.V.) for the 15th time in a row once again this year as both an exhibitor and a presenter. This time around, this event will be taking place from May 21 – 25, 2013, at the Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig, Germany.
This conference will be focusing on the main topics optical precision measurement technology, interferometry, aspheres, photometry/radiometry and microscopy. Our experts at booth 11 located inside the PTB's Seminar Center will be happy to provide you with information on all of the latest product developments in the area of optical filters, glasses, components, ZERODUR®, IR materials and ultra-thin glass products.
In addition to the presentations we will be holding at our booth, SCHOTT will also be represented in the form of presentations and poster sessions. So, please take advantage of this opportunity and listen in on the following presentations we will be holding:

Presentation:
Thursday, May 23, 2013, 9:45 AM
Hall B (PTB Seminar Center)
- **"Inner quality of blue glass IR cut filters and the use of blue glass lenses"** (Presentation B12)
  Prof. Dr. Steffen Reichel, SCHOTT AG, Advanced Optics

Poster sessions:
- **"The latest developments in optical materials from SCHOTT"** (Presentation P40)
  Dr.-Ing. Ralf Jedamzik, SCHOTT AG, Advanced Optics
- **"New IR shortpass filter glasses for imaging sensors"** (Presentation P41)
  Dr.-Ing. Ralf Biertümpfel, SCHOTT AG, Advanced Optics

We look forward to meeting with you! You'll find further information on the presentations and poster sessions under www.dgao-proceedings.de/programm/chronologisch_d.php. More general information on the DGaO's 114th Annual Conference can be found under www.dgao.de/info/tagung13_d.php.

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GENERAL INFORMATION

Worth the wait

SCHOTT postpones the release of its Pocket Catalog to address everything that's new in optical glass

With the LASER München trade fair quickly approaching, we know many SCHOTT customers are anxiously awaiting the release of our new Pocket Catalog – we promise it will be exciting. However, to ensure our customers have the most up-to-date and comprehensive review of our optical glass capabilities, we have chosen to delay our catalog's release until January 2014. This reworked version will include new and interesting information that details current products and advancements we expect to complete within the next 6 months. For those customers interested in receiving the 2014 Pocket Catalog, please contact us at info.optics@schott.com directly, and we will make sure you receive a copy "hot off the press."

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Upcoming SCHOTT Events

Here we are listing the events where "Advanced Optics" proactively attends as an exhibitor, speaker or has an active part such as "chair of technical conferences," etc.

May 13

Location: Munich
Country: Germany
Booth: B2-306
Date: May 13th – 16th 2013

LASER World of PHOTONICS

May 21

Location: Braunschweig
Country: Germany
Booth: 11
Date: May 21st – 25th 2013

DGaO Deutsche Gesellschaft für angewandte Optik
The German Branch of the European Optical Society

June 18

Location: Taipeh
Country: China
Booth: 11F-K422
Date: June 18th – 20th 2013

OPTO TAIWAN 2013

July 03

Location: Tokyo Big Sight
Country: Japan
Booth:
Date: July 03rd – 05th 2013

nanomicro biz

Sep. 04

Location: Shenzhen
Country: China
Booth: 9K49
Date: September 04th – 07th 2013

CIOE CHINA INTERNATIONAL OPTOELECTRONIC EXPO

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