Newsletter
SCHOTT Optics for Devices

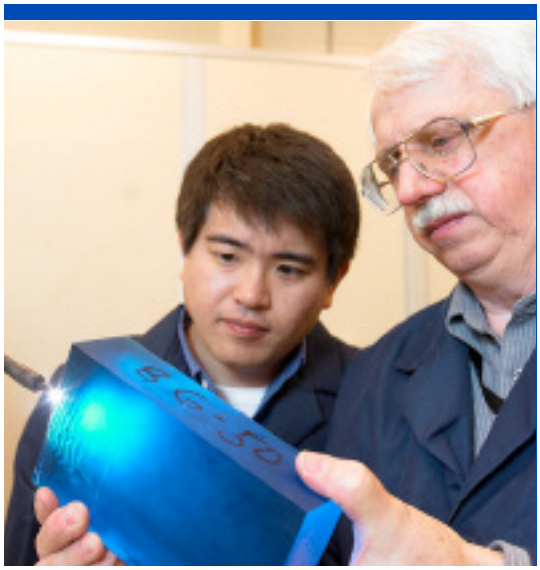
VOL. I NO. I MARCH 2006

True Colors: New Blue Filter Glass for Image Sensors

SCHOTT's new BG50 and BG55 filter glasses are designed as color compensating filters for image sensors, such as CCD and CMOS (digital imaging applications like Digital Video Camera, Digital Camera). By limiting IR transmission, the filter glass will allow a detection of the true colors of the image. BG50 and BG55 are effective in:

- low CTE value
- high transmittance in the visible wavelength
- effective blocking in the near-IR range
- high chemical durability, and
- high humidity durability (passes 1000 hours at 65 degrees C/95% relative humidity).

BG50/BG55 is available from SCHOTT with optical precise polished surfaces in a thickness down to 0.2 mm. Both types meet the RoHS environmental standards set by the European Union.



New Development BG50 Color Compensating Filter:

www.us.schott.com/optics_devices/english/download/33855_infobl_bg50_v3.pdf

New Development BG55 Color Compensating Filter:

www.us.schott.com/optics_devices/english/download/33855_infobl_bg55_v3.pdf

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New high refractive index special short flint N-KZFS8 (n_d=1.72047, ν_d=34.70, $P_{g,F}$=0.583)

SCHOTT has developed a special short flint which combines high refractive index and deviation from the normal line of partial dispersion. N-KZFS8 will be established in consumer and industrial optics applications such as digital imaging, microscopy and sports optics especially when highly corrected optical systems are required. N-KZFS8 will be shortly transferred into continuous production. Please contact us for preliminary data sheets.

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Night Vision Comes to the Dashboard

Although the night accounts for only 20 percent of driving, 40 percent of auto accidents take place after sunset. New kinds of automobile displays, using new kinds of auto lights and filters from SCHOTT will improve driver night vision and may help bring down that ratio and make for safer roads everywhere. To the standard headlamps, the new system adds permanent high-beam headlamps using Halogen bulbs, which normally emit both visible and infrared light, invisible to the human eye. To work on the roads, their visible light must be filtered out. The challenge is doing this without a standard red filter, because cars may not use red headlights according to regulations. The SCHOTT interference filter works due to the fact that light behaves like a wave: by means of a series of layers with different refractive index values on the glass that transmit the desired wavelengths and reflect away the rest. Bottom line: the new SCHOTT filters transmit the infrared light to the sensors, but reflect back only white light. The color appearance of the infrared headlights is the same as for standard headlights. Tests showed the filters continued to work perfectly regardless of temperature. The objects on the road ahead are detected in the system's camera and electronically transmitted to a heads-up display on the dashboard or windshield. This display shows more distant objects than can be seen in the visible spectrum of the headlights.

www.us.schott.com/optics_devices/english/products/filter/interference-filter.html

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PHOTONICS WEST

High Demand for Optics Will Continue

Robert Fischer emphasized the continued growth of optics in commercial products, and its influence on technological advancement. The big story in consumer products was how digital cameras will continue to lead sales. In 2004 they accumulated $24 billion in sales, and growth in sales of 100 million units is expected by 2008. Mr. Fischer noted how aspherics will play a big part in the future of optics as demand for technologically advanced aspheric surfaces will grow in tandem with demand for quality digital cameras. Optical glass is in great demand, and will become more so in the future. For 100 million cameras, an incredible 194,300 lbs. of glass will be needed. When other markets' need for glass is considered, that could mean over 1 million lbs. of glass per year. Mr. Fischer also discussed how hybrid, refractive, diffractive,

Bob Fisher, President, Optics 1

lenses can have nearly zero chromatic aberration; thus creating a superior lens. As new technologies and applications become more popular, manufacturing developments, such as compression molded glass, and design codes will help answer the demand.

Optics 1 designs, develops, produces, and supports precision optical assemblies, sub-systems, and integrated systems for leading global technology customers. Optics 1 has offices in West Lake Village, CA and Manchester, NH.

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PHOTONICS WEST

Potential in Poor Camera Phone Pictures

Gail Redmond, CEO of SozoTek Inc., pointed to the growing influence of camera phones in the future of the market. An estimated half the world's population will use mobile phones by 2009 – and 90 percent of those phones will have a camera in them, poor picture quality notwithstanding. The mobile industry stands to gain from better pictures. Picture messages account for 70-85% of multimedia messages, generating potential revenues for service providers that can only improve with better pictures to send. Imaging related services can be a key profit center for mobile companies. However, camera phone performance needs improvement. "Increasing sensor pixel counts while maintaining inadequate lens performance and constrained in-camera processing capability causes image-noise to rise. Image quality and color stability continues to struggle in common picture capture settings, such as indoors," Redmond observed. Essentially the mobile device OEMs are advancing their mega pixel capacity without enough consideration for these factors. This, Redmond said, is where the opportunity lies. Range-

Gail Redmond, President & CEO, SozoTek Inc.

extending software helps compensate for the lack of a flash. Noise elimination software remedies the effect of inadequate photon or light capture. Picture quality can be further improved by increasing the light the lens picks up and gearing it more for indoor photography. Even simple improvements, such as a lens cover, can aid quality. These changes would greatly help the picture quality and drive explosive growth and use of mobile imaging around the world.

SozoTek is an imaging science company delivering unrivaled image quality advancement technologies for the wireless and imaging industries. SozoTek's advanced science and solutions are used in software-delivered network systems and are embedded into consumer products and camera module/systems. The company is based in Austin,Texas.

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PHOTONICS WEST

Digital Projection Poses New Challenge for Optics

Scott Dewald detailed projection technologies and their impact on optics, emphasizing that with digital projection technology expanding and new products being released, there is a need for high quality lenses. LED pocket projectors, VGA gaming projectors, and DVD instant theatre projectors are creating new business. A 2003 End User Market Research chart shows 83 percent of consumers in Germany would be interested in projectors for use in the home. How will this impact the glass industry? Short throw lenses should become the norm, increasing the need for aspheres of glass to resist exposure to dust and fingers. The challenge will be to create a tough, aspherical, glass lens that will create a brilliant picture and last for some time. 2006 will be a big year for digital cinema and DLP, with a deal with Landmark Cinemas for DLP projectors that will put its projectors in nearly half the screens in the U.S. Cinematic telecentric projection lenses require large amounts of low-dispersion glasses, as well as flint glasses that minimize light absorption, especially at short wavelengths. Also, a low cost, high quality top quality BK7 glass is needed for the cinema prisms, with light absorption limited to maintain stability at a power greater than 25,000 lumens. Dewald noted that these challenges present an opportunity for optics producers.

Developed by Texas Instruments, DLP Technology is a revolutionary display solution that uses an optical semiconductor to manipulate light digitally. Texas Instruments is based in Plano, TX.

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National Ignition Facility at Lawrence Livermore Labs Marks 30-Year SCHOTT Partnership

National Ignition Facility (NIF) may seem like an odd name for a national treasure. Centered on a Laser Building the size of Yankee Stadium at the Lawrence Livermore National Laboratory in California, its primary purpose is to conduct nuclear research and testing using the world's most powerful laser – 60 times more powerful than the next most powerful laser system. It will also serve as a powerful research tool for fusion power and astrophysical research. In many ways it marks a climax of the 30-year partnership of SCHOTT and the Lawrence Livermore National Laboratory. It was SCHOTT who introduced the first rectangular-shaped glass for laser lenses, the LG770 Phosphate Laser Glass a decade ago. For the NIF, SCHOTT worked closely with researchers, led by Jack Campbell, to develop and perfect the continuous melting process which not only speeds up production twenty-fold and cuts costs by 80 percent but also produces even higher quality glass. In the pilot test of the system, at the SCHOTT plant in Duryea, Pa., 200 glass slabs – 5 percent of the total needed – were produced and all technical specifications met.

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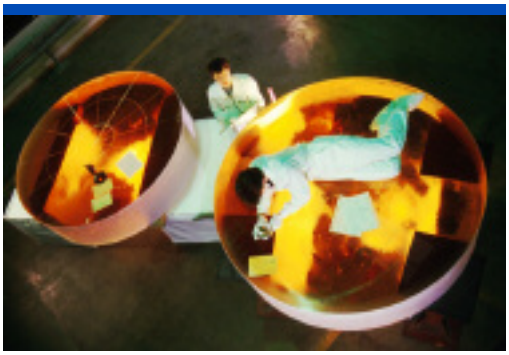
ZERODUR® Glass Vital to Keck Telescopes, World's Largest, Used in DEEP2 Project

The twin Keck Telescopes in Hawaii, the largest in the world, both of which use SCHOTT ZERODUR® low expansion glass ceramics mirrors, played key roles in the DEEP2 (Deep Extragalactic Evolutionary Probe) team's discoveries that stars are formed largely by materials within galaxies, rather than violently through massive galactic collisions/ mergers. The DEEP2 team used the most powerful telescopes in the world, with assistance from the Hubble Space Telescope, to create a survey of the weights and star formation rates of 3,500 very faint galaxies in one of the most intensively



studied regions of the sky, the Extended Groth Strip. That area is populated by galaxies up to 9 billion years old, about two-thirds the age of the universe. Phase 2 of the project, using one of the Keck telescopes, has gathered spectroscopic data from almost 40,000 galaxies using the DEIMOS spectrograph on the Keck II telescope. DEIMOS also uses optical materials from SCHOTT.

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Successful Hot Transport for Four Meter ZERODUR® disk

The end of January marked the successful casting of a new large ZERODUR® disk four meters in diameter and 500 mm thick destined to become the mirror in an astronomical telescope. The distinguishing feature of this job was the first use of hot transport, with a truck bringing the mould filled with 15 tons of the more than 1000°C hot viscous-liquid melt to a nearby hall with annealing furnaces. Now that hot transport has been proven on this scale, SCHOTT will be able to respond even more flexibly to customer requests. ZERODUR® is the preferred mirror material for astronomical

telescopes for more than its zero-expansion properties. Optics workshops appreciate its exceptional and economic polishability, which allows them to achieve the precision and smoothness needed for the great telescopes.

www.us.schott.com/optics_ devices/ english/products/zerodur/index.html

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SCHOTT will appear at these events

CLEO – LONG BEACH, CA
May 23–25

ASTRONOMICAL TELESCOPES & INSTRUMENTATION – ORLANDO, FL
May 25–30

IODC – VANCOUVER, B.C., CANADA
June 5–7

OPTOCOMM – TAIPEI WORLD TRADE CENTER, TAIWAN
June 14–17

OPTATEC – FRANKFURT, GERMANY
June 20–23

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