

# Newsletter

SCHOTT Advanced Optics

VOL II NO. III, October 2007

## TECHNICAL INFORMATION & PRODUCT NEWS

- 1 New pocket catalog available
- 2 New low-Tg glass P-SF8 ( $n_d = 1.68893$ ;  $v_d = 31.25$ )
- 2 New optical glasses N-SF2 and N-KZF55

## VOICE OF THE CUSTOMER & INDUSTRY TRENDS

- 3 SCHOTT Advanced Optics' experts in close discussion with our customers

## REGIONAL & CLOSE UP

- 4 ZERODUR® telescope updates from around the world
- 6 SCHOTT celebrates 25 years of high tech materials in Singapore
- 7 A new look for Advanced Optics! Works underway to re-launch the website

## 7 UPCOMING SCHOTT EVENTS

## New pocket catalog available

This summer the new edition of our Optical Glass Catalog has been released.

SCHOTT's glass catalog covers the needs of a broad range of optical applications from consumer products to optical systems at the leading edge of research.

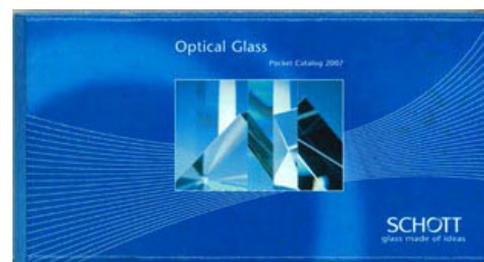
With this catalog we present our lead and arsenic free N-glasses and other optical materials addressing special requirements such as:

- Lead and arsenic free low-Tg glass types specially developed for precision molding process (P-glasses).
- Classical glass types with lead oxide as an essential component for outstanding optical properties.
- Calcium fluoride crystals and synthetic fused silica for optical applications with superb transmittance and radiation resistance in the UV spectral range.
- Radiation resistant glass types.

In order to provide our customers with the best service possible, the pocket catalog will be printed in various languages. The catalog is now available in English, for many regions in Asia, Europe and the US.

Furthermore we plan to have Chinese, German, Japanese and Russian versions of the catalog available in the coming months.

If you have questions or comments about our new glass types and the new pocket catalog, please contact Bernhard Hladik at [bernhard.hladik@schott.com](mailto:bernhard.hladik@schott.com).



### What's new:

- New lead & arsenic free low-Tg glass types for precision molding process (P-glasses)
- Calcium fluoride crystals & synthetic fused silica with superb transmittance and radiation resistance in the UV spectral range
- Preferred materials including new developed glasses
- Inquiry glasses which are regularly produced upon specific customer request

The new complete pocket catalog can be downloaded from our website [www.schott.com/advanced\\_optics](http://www.schott.com/advanced_optics).

**SCHOTT**  
glass made of ideas

## New low-Tg glass P-SF8 ( $n_d = 1.68893$ ; $v_d = 31.25$ )

SCHOTT Advanced Optics continues to expand its product range of lead and arsenic free low-Tg glasses suitable for the precision molding process with a new glass type P-SF8.

P-SF8 has specifically been developed for the use as aspherical lens and can be precision molded due to the low glass transformation temperature.

P-SF8 addresses strong growing consumer markets in Asia but will also be established in optical systems of industrial optics. Compared to the classical variant N-SF8 the internal transmittance

of P-SF8 has been significantly improved as shown by the color code of 40/36 (color code of N-SF8: 41/36).

The SCHOTT Advanced Optics low-Tg glasses are available in various forms of supply, like polished spheres and discs, precision gobs, rods and pressings. However, the most prominent one currently is the polished ball, which can be offered in a diameter range from about 0.8-14 mm and a surface roughness better than 3 nm Ra (roughness average).

[BACK TO INDEX](#)

## New optical glasses N-SF2 and N-KZFS5

SCHOTT Advanced Optics has further expanded its product range of optical glass types with the development of two new glasses N-SF2 ( $n_d = 1.64769$ ;  $v_d = 33.82$ ) and N-KZFS5 ( $n_d = 1.65412$ ;  $v_d = 39.70$ ).

N-SF2 has been developed to complement the product range and is the lead and arsenic free variant on the optical position of the lead containing SF2.

After the establishment of N-KZFS8, SCHOTT Advanced Optics has now developed N-KZFS5 as another special short flint that will address consumer and especially industrial optics applications.

The foci of this development were to improve the internal transmittance and to match the pronounced negative deviation from

normal line of the lead containing version KZFSN5. Both development foci have been achieved. N-KZFS5 shows significantly better transmittance in the blue area as compared to both our KZFSN5 as well as the competitor's lead free variant.

The  $\Delta P_g, F$  value of N-KZFS5 will be in the same order of magnitude as the  $\Delta P_g, F$  value of KZFSN5. Therefore, for most applications, N-KZFS5 can be considered as an equivalent glass type for KZFSN5.

All data sheets of our new glass types are available for download from our website ([www.schott.com/advanced\\_optics](http://www.schott.com/advanced_optics)).

[BACK TO INDEX](#)

**SCHOTT**  
glass made of ideas

## SCHOTT Advanced Optics' experts in close discussion with our customers

In parallel with the show "SPIE-Optics & Photonics" in San Diego, SCHOTT Advanced Optics hosted a workshop covering the topic "Components Expertise at SCHOTT" within its series of "SCHOTT – Experts Workshops."

Attendees learned about SCHOTT Advanced Optics' capability to produce Diffractive Optical Elements from optical glass, Fast Axis Collimation Lenses and Aspherical Lenses as well as the coating and polishing knowledge. SCHOTT also informed about its development know-how and precision processing capabilities as well as about its role as a reliable partner for finished, value-added and processed parts.

In a fruitful discussion, questions were answered, new ideas evaluated and various approaches considered.

The good response, beneficial input from all attendees and positive feedback has prompted the worldwide continuation of the "Experts Workshop Series" to be held, for example in parallel with our major trade shows.

If you have a specific topic to be discussed and/or are interested in attending the next workshop, please send an email to: [optics.newsletter@us.schott.com](mailto:optics.newsletter@us.schott.com).

We are also happy to visit your company and arrange together with you such a workshop discussing about optical glass and possible joint developments.

We look forward to receiving your requests and to addressing your challenges. See you at our next workshop!



Helge Vogt and Mayling Luong, the presenters of the San Diego workshop.



Interested audience following the presentation about our components.

[BACK TO INDEX](#)

**SCHOTT**  
glass made of ideas

## ZERODUR® telescope updates from around the world

ZERODUR®, the zero expansion glass ceramic, is known for its outstanding properties and is therefore the material of choice for various applications. Due to its almost zero thermal expansion, it can be found in the field of micro-lithography (e.g. reticle and wafer stages), in various industrial applications (e.g. precision spacers) as well as in the field of astronomy.

Out of these various applications the most spectacular projects are within the field of astronomy where SCHOTT already produced monolithic mirrors up to 8 meter diameter or delivered hexagonal elements for mirrors with a width of up to 10 meters. Here we want to shortly introduce 3 major proj-

ects, which went into operation within the last months and to which SCHOTT has made significant contributions.

**First**, the world's largest telescope, the Gran Telescopio Canarias (GTC), saw its "first light", during a ceremony on July 13, 2007 when Prince Felipe, heir to the Spanish throne, directed the instrument onto Polaris, the North Star. SCHOTT contributed to this telescope 36 ZERODUR® substrates of which 12 have already been mounted in the mirror. The rest of the mirrors are scheduled to be installed this year and the 10.4 meter instrument should be ready for its grand opening next summer.



Erik Lindbergh, Keynote Speaker at the SOFIA Dedication event at NASA's Dryden Research Laboratory. He is the Grandson of aviation pioneer Charles Lindbergh.

**Second**, in the United States, the US-American-German airborne SOFIA telescope was officially introduced by NASA/DLR on June 27, 2007, after a flight from Waco, Texas where the passenger aircraft had been modified to accommodate the telescope and its 2.5-meter ZERODUR<sup>®</sup> mirror from SCHOTT. The SOFIA 747 SP, rechristened Clipper Lindbergh, is now carrying out tests at NASA's Dryden Flight Research Center at Edwards Air Force Base in California and will be ready to go to space in 2009.

**Last but not least**, in Asia, on May 12, 2007, the largest telescope in China began operations at the Gaomeigu Observatory in Yunnan Province. It is the first of

seven major astronomical projects scheduled to begin operations in China over the next several years. A robotically-controlled telescope hosts a 2.4-meter ZERODUR<sup>®</sup> mirror from SCHOTT and is well suited to the highly variable temperatures in the Jade Dragon Snow Mountain (Yulong Mountain), which is up to 5,600 meters (18,360 feet).

**ZERODUR<sup>®</sup>**  
**Zero-expansion glass-ceramic**

- Highly isotropic and homogeneous  
CTE homogeneity  $\leq 0.005 \times 10^{-6}/K$
- CTE (0°C;50°C) typ.:  $0 \pm 0.05 \times 10^{-6}/K$
- Very good polishability
- Very good internal quality  
(i.e. very low levels of inclusions, striae & stress)
- 35 years application at the leading edge of mirror optics

[BACK TO INDEX](#)

## SCHOTT celebrates 25 years of high tech materials in Singapore



25 years ago, the SCHOTT Singapore sales office was founded with just 3 employees to establish business relationships to the optical, electronics, chemical and pharmaceutical industries.

With some 60 employees now on board, a team of 10 people work exclusively for the sale of optical products at SCHOTT Singapore. They support the strong emphasis of SCHOTT Advanced Optics in strengthening its presence and ties in the Asian region. This includes the founding of the Wuxi Unique SCHOTT optical joint venture in April 2006, the upgrading of our optical post-processing production facility and the establishment of the Asia Optical Warehouse in Penang, Malaysia during October the same year, as well as the opening of the Application Center in Suzhou, China in April 2007.

With these in place, our three aims for the business segment Advanced Optics in Asia can be realized. **First**, the supply of leading edge optical materials ranging from calcium fluoride, synthetic fused silica, various optical glasses to glass ceramics as well as the allocation of processed materials at the value-added level required by our customers; **second**, provision of better and faster services through substantially reduced lead times; **third**, availability of extensive local-based technical application support.

Moving forward, we look towards sustaining and building upon our customer relationships in the years to come.

[BACK TO INDEX](#)

**SCHOTT**  
glass made of ideas

## A new look for Advanced Optics!

Works underway to re-launch the website

Efforts to re-launch the Advanced Optics website have been underway in the past months to provide updated information that is easily accessible to our website visitors.

The new structure will be clearly divided into 5 sections – an introduction to our business segment, updated information about each product in our portfolio, features of some of the international projects that we have been honored to be a part of, as well as a list

of tools and papers available as downloads for our visitors, and recent information about our press activities and event participation.

The Global English website will be updated by the end of 2007. In line with our efforts to localize our marketing activities, plans to re-launch the Chinese, German, Japanese and US English AO websites are also in the pipeline.

[BACK TO INDEX](#)

---

## Upcoming SCHOTT Events

SEMICON Japan – December 5-7, 2007  
(SCHOTT Lithotec),  
Makuhari, Chiba, Japan

Photonics West – January 22-24, 2008  
San Jose, CA, USA

[BACK TO INDEX](#)