SCHOTT
glass made of ideas

September 28, 2021

SCHOTT Optical Glass

The Future is Now: New Glass Capabilities are Poised to Meet the Latest Markets Needs

Introduction

SCHOTT Academy of Optics is a free, online seminar series designed to take your industry knowledge and expertise to new levels.

Throughout the series, you will learn from leading glass and material experts as they cover various topics pertaining to the optics industry.

Visit our website for more information or to register for an upcoming seminar: www.schott.com/academy-of-optics

SCHOTT is constantly responding to new customer needs and market demands with new products and capabilities. From mobile phone cameras to autonomous driving, newly developed glasses and improved metrology capabilities are enabling next-generation light-based solutions.

1. Keeping it light

Mobile phone cameras and augmented reality systems require optics that are as small and light as possible. The new N-LASF55 glass is ideal for these applications because it can be used to make thinner lenses while maintaining high light dispersion. It can also be used to make high quality optics for automotive or robotics applications. Because this glass has a lower density and greater hardness than similar glasses, it is great for lightweighting while also providing higher processing yields. N-LASF55 has an Abbe number of around 30.5 and refractive index (RI) of 1.9 and is available off-the-shelf with a standard thickness of 20 millimeters. Some stock is also available at thicknesses up to 25 millimeters.

Figure 1: N-LASF55 glass is ideal for smartphone camera applications.

2. Keeping it bright

Microscopy applications come with a specific set of needs. For this type of optical setup, light transmission becomes critical due to the long optical path created inside the lens combination. The new classical glass type SF3 can meet this need thanks to its relatively high transmission in the blue wavelength range. This is ideal for fluorescence microscopy, coherent anti-Stokes Raman scattering (CARS) microscopy, Raman scattering, and related techniques. SF3, which has an RI of 1.74 and Abbe number around 28, is available off-the-shelf with a 40-millimeter thickness.

Figure 2: SF3 is ideal for long optical paths created inside the lens.

3. Designing for next-generation vehicles

There has been a lot of attention on LIDAR technology because of its application in helping autonomous cars navigate. LIDAR systems usually requires glass with transmission in either the 905-950 nm range or wavelengths around 1500 nm. To fulfill these needs, we developed RG905 and RG1000 filter glasses. These glasses appear black, are resistant to the environment, and robust. For applications where strength is a priority, a cemented solution combined with a Borofloat 33 can boost this property.

Whether vehicles are driven in a snowstorm or a heatwave, automotive cameras must maintain performance. With a low thermal expansion, the new N-LAK28 glass can be used to make camera optics that are robust against temperature swings.

Figure 3: New glass materials help autonomous cars navigate.

Because this glass pairs a high RI of 1.74 with an Abbe number of 51 it can be used together with SF3 to make the achromatic doublets lenses often used in the life sciences, security systems, sports optics, machine vision, and professional movie cameras. The glass's high hardness is beneficial for processing while its relatively low density is ideal for light-weighted designs. Stock N-LAK28 is available with a 40-millimeter thickness.

4. Stable over decades even in harsh environments

It's important to use radiation-resistant glasses in environments where ionizing radiation might be present, such as space, medical facilities, and nuclear power plants. We now offer radiation-resistant glasses off the shelf, even in small quantities. This makes it easier to access these useful materials, which include BK7G18, F2G12, K5G20, LAK9G15, LF5G19, and SF6G05 glasses. The transmission of these glasses been proven to retain stabile for decades, making them reliable for long-term use.

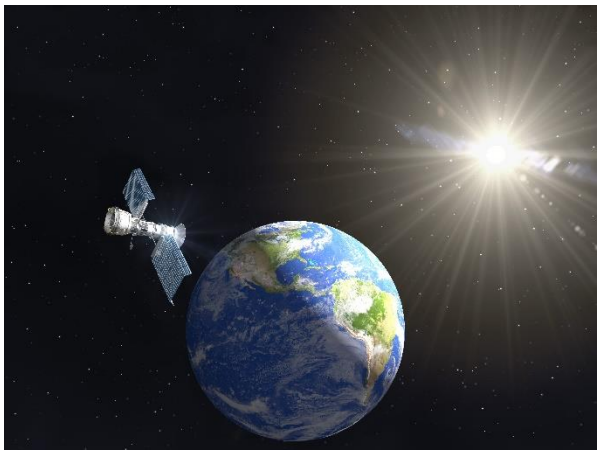

Figure 4: Radiation resistant glasses help in environments where ionizing radiation might be present.

5. Best products empowered by best metrology

As technology continues to advance, so do the tolerances required. For this reason, we are always looking for ways to boost our manufacturing accuracy. We recently invested in enhancing our metrology capabilities with two new V-block refractometers made in-house. These instruments increased our accuracy to +/- 1.0 X 10^{-5} (95%), allowing us to offer these tight tolerances as part of standard production. For applications with very tight requirements such as stimulated emission depletion microscopy, we can use our new prism spectral goniometer, which we call the Ultraviolet-to-Infrared Refractive Index Measurement System (URIS). This system offers an accuracy of +/- 0.4 X 10^{-5}.

Want to learn more about our new optical materials?

Visit our website for more information and resources: www.schott.com/products/optical-glass.

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