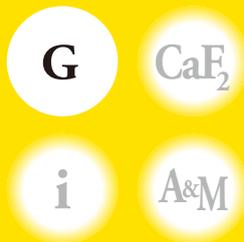


# News Letter



## Nikon's NIFS series high-performance large-sized synthetic silica glass



### •Optimized for high-end optics and equipment

Silica is a type of material commonly found in nature. Transparent colorless silica is known as “crystal” and is widely used, such as for oscillators in quartz clocks. Amethyst, another type of silica, has been highly valued as jewelry since ancient times. Recently, industrially manufactured synthetic silica glass (SiO<sub>2</sub>) is used in various components and devices. Synthetic silica glass, which is both hard and has high transmittance, is suitable as a material for lenses and is utilized in the cutting-edge optical field. Nikon’s NIFS series comprises high-quality synthetic silica glass manufactured using our unique synthetic technology and strict process control. The glass features a homogeneous refractive index, low birefringence, laser durability and high transmittance from ultraviolet to infrared. We offer various grades to meet customer specifications for high-end optics and equipment. In addition, large-sized synthetic silica glass of φ800 mm has been made possible by taking advantage of certain features of the glass, such as its high homogeneous index and low birefringence, through optimization of the manufacturing process and strict management of the annealing process. Nikon’s “*Super Flat Mask*,” the FPD photomask substrate made from synthetic silica glass, is optimized for lithographic exposure of next-generation panels such as high-resolution FPD panels and organic light-emitting diode (OLED) panels. It can respond to various sizes and has achieved a global flatness of under 7 μm thanks to our high-precision polishing technology. Using visual inspection equipment independently developed by Nikon, we can guarantee no defects of over 1 μm.

### •Nikon’s experience and expertise in integrated system production

There are many processes required in the manufacture of optics, including manufacturing and procurement of materials (glass and crystal), grinding, polishing and coating. Each process requires a specific technology, so suppliers may be different for each process. As a result, customers can find the process cumbersome and experience difficulties with stock control and finished products.

Nikon takes advantage of its in-house integrated production system, including manufacturing optical materials, processing, coating and optics assembly. Therefore, we can provide a one-stop solution for all customer requirements in a timely manner.

Furthermore, Nikon has developed and manufactured semiconductor and FPD lithography systems for many years. We can offer optimized solutions for customers based on our experience in developing optics and our understanding of the whole system.

In particular, Nikon’s synthetic silica glass meets customer needs for high-performance, large-sized optics and has been adopted not only in the semiconductor manufacturing field but for new applications in the medical and astronomical fields.



It takes about one month to grow a one-ton ingot of synthetic silica glass.

#### Terminology

**[Homogeneous refractive index]** This shows whether the refractive index is the same inside the glass. Glass with a higher homogeneous refractive index is higher in quality. The index significantly decreases when the glass is uneven inside.

**[Birefringence]** The phenomenon of light dividing into two when passing through glass. Generally, birefringence should be kept to a minimum.

**[Transmittance]** The rate that light passes through glass. It is subject to change due to a number of factors, such as impurities and the condition of the glass.

## TOPICS

Nikon Glass Business Unit will exhibit at Photonics West 2015.

### Photonics West 2015

Date: February 10 (Tue.) – 12 (Thu.), 2015 Venue: The Moscone Center, San Francisco