

## PRODUCT NOTE

# HIGH TRANSMISSION SILICON (HiTran™) FOR IR APPLICATIONS

### Material solutions for high quality components and instrumentation

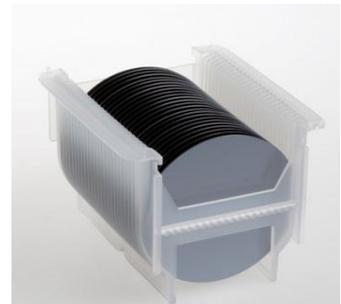
Topsil is the world leading supplier of high purity, high transmission silicon (HiTran™) for a number of infrared (IR) applications.

HiTran™ silicon has unique transmission performance across most of the infrared band including the far infrared region. The purity of HiTran™ silicon eliminates all impurity related absorptions over the whole of the band. Intrinsic lattice vibrations in silicon reduce the transmission of infrared light of thick HiTran™ silicon in the wavelength band from 7-16  $\mu\text{m}$ , but in many cases HiTran™ silicon can replace other infrared materials even in the 8-12  $\mu\text{m}$  region.

In addition the superior mechanical and environmental performance of HiTran™ silicon in comparison with other infrared materials makes it a perfect choice not only in the 3-5  $\mu\text{m}$  band where it is unsurpassed by any infrared material, but also by control of the silicon resistivity in the far infrared region starting at 20  $\mu\text{m}$ , including the THz range.

High transmission components are key elements of any IR instrument. High transmission is essential to keeping signal-to-noise ratios at acceptable levels and is moreover essential building blocks of different wavelength selective devices. Topsil offers products with the highest purity and thus the best transmission properties at IR wavelengths above 1.2  $\mu\text{m}$ . This combined with more than half a century's experience in the production of float zone material and state-of-the-art manufacturing equipment makes Topsil HiTran™ silicon an excellent choice for IR components and instrumentation.

Typical IR applications that will benefit from using HiTran™ silicon are:



- Thermal Imaging Systems
- Silicon Prisms, Gratings, Grisms, Lenses and Blanks
- Silicon Fresnel Lenses
- Passive Infrared Detector Filters
- Transmission windows for debris protection
- Micromachined IR devices

#### CONTACT

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Topsil offers Float Zone HiTran™ material with the listed parameters. Other parameters are available upon request.

Growth method	Monocrystalline Float Zone, HiTran™ Czochralski silicon (Optical grade) Polycrystalline silicon also available
Crystalline form	<100>, <111> ±1°
Transmission	>50% (30-10,000 μm) 20-50% (6.7-13 μm)* <50% (1-6.7 μm)
Diameter and size	100-200 mm
Shapes	Ingot, Spheres, Flat, Wedges, Bullets, Blanks
Surface Finishes	Application specific

\*Dependent on sample thickness. Present example is 2 mm thick polished slices.

## Topsil Semiconductor Materials A/S

Topsil is a world leading supplier of ultrapure silicon to the global semiconductor industry. Engaging in long term relations with customers, Topsil focuses on premium quality, an efficient production process and a safe delivery of products.

Silicon is used in electronic components to aid conversion and control of electrical power. Topsil provides ultrapure silicon mainly for the most demanding purposes, based on extensive knowledge and significant investments in new technology, facilities and equipment.

Headquartered in Copenhagen Cleantech Park, Topsil spans production sites in Denmark and Poland and sales locations in Europe, Asia and the US. Topsil is publicly listed at the Nasdaq OMX Copenhagen stock exchange and was founded in 1959.

#### Topsil Semiconductor Materials A/S

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