

SUPRASIL® 3001 and 3002



Highlights

- **Low OH-content**
OH-content ~ 1 ppm OH
- **Low absorption***
Absorption at 946 nm: 1.5 ppm/cm
Absorption at 1064 nm: 0.3 ppm/cm
Absorption at 1319 nm: 1 ppm/cm

Index homogeneity

Striation

SUPRASIL 3001:

- No striations in all three dimensions, i.e. superior to striae class A according to MIL-G-174-B

SUPRASIL 3002:

- No striations in the primary functional direction, i.e. striae class A according to MIL-G-174-B
- Weak striations, if any, are parallel to the major faces

Index homogeneity (Δn)

Specified over 90% of the diameter or of the side length of a ground piece, respectively 80% for raw ingots.

SUPRASIL 3001:

- In three dimensions $\Delta n \leq 4 \cdot 10^{-6}$
on request $\Delta n \leq 1 \cdot 10^{-6}$
- Maximum weight approximately 15 kg,
bigger unit weight on request

SUPRASIL 3002:

- In primary functional direction $\Delta n \leq 10 \cdot 10^{-6}$
on request $\Delta n \leq 1 \cdot 10^{-6}$
- Dimensions and weight are practically not limited.

Residual strain

SUPRASIL 3001 and 3002:

- 5 nm/cm over 70% of the diameter or of the side length
- 6 nm/cm over 80% of the diameter
- 5 – 15 nm/cm within the peripheral zone

Bubbles and inclusions¹⁾

Bubble grade

- Superior to 0 (according to DIN 58927 2/70)
- The sum of the cross sections of all bubbles within a piece is 0.03 mm² and is related to 100 cm³ of a volume (TBCS-value).

Bubbles according to DIN ISO 10110

SUPRASIL 3001: 1/2*0.10 unit weight < 6 kg

SUPRASIL 3002: 1/1*0.16 unit weight < 6 kg

1/1*0.25 unit weight 6–30 kg

¹⁾ Bubbles and inclusions < 0.08 mm diameter are not counted.

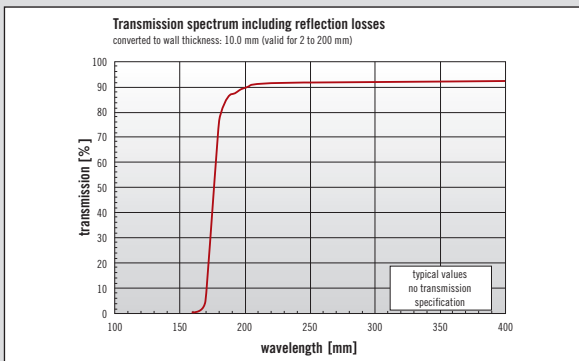
Inclusions

- none

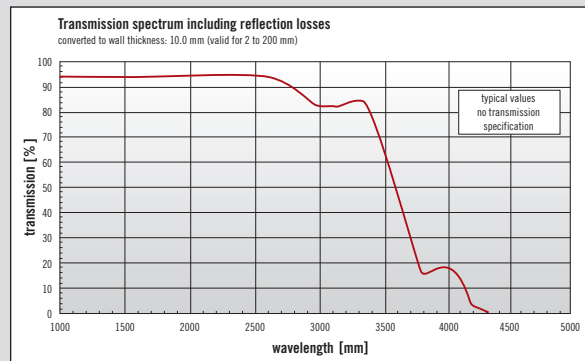
Spectral transmission

Typical transmission graph (including Fresnel reflection losses) for a wall thickness of 10 mm

Broadband transmission covers 190 nm – 2600 nm



NIR transmission covers all NIR lasers from 800 – 2600 nm



Decadic absorption coefficient at 200 nm

$$k_{200} < 0.005 \text{ cm}^{-1} \quad (\text{typical})$$

$$k_{200} < 0.01 \text{ cm}^{-1} \quad (\text{specified})$$

$$\text{Internal transmission } T = 10^{-kd}$$

and $d = \text{wall thickness}$

Infrared absorption (typical)*

- Practically no OH absorption
 - Absorption at 946 nm 1.5 ppm/cm +1/-0.4 ppm/cm
 - Absorption at 1064 nm^{1), 2)} 0.3 ppm/cm ±0.2 ppm/cm
 - Absorption at 1319 nm¹⁾ 1 ppm/cm
- ¹⁾ Kondilenko & Co-Workers, Ginzton Lab, Stanford University, private communication, 2005
²⁾ Dr. Mühlig, IPHT Jena

Fluorescence: light blue

At stimulation with light at a wavelength of $\lambda = 254 \text{ nm}$ (Hg low pressure lamp and Schott UG 5 filter) and visual inspection.

* Data was taken under laboratory conditions. Actual data may differ.
Customer is recommended to test under his own environmental conditions.

Application range

- Ideally suited for high power NIR lasers
- Medical Science e. g. 940 nm lasers
- Material handling e. g. Nd-YAG lasers
- Telecommunications
- Spectroscopy

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