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 \((\Delta n)\)
- 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 \(\Delta n \leq 10 \cdot 10^{-6}\)
- Dimensions and weight are practically not limited.

Residual strain

SUPRASIL® 3001 and 3002:
- 6 nm/cm
- The residual strain value is specified over 90% of the diameter or edge length of a fine ground piece, or 80% of a raw formed ingot.

Bubbles and inclusions 1)

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

Inclusions
- none

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

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

Broadband transmission covers (190 nm – 2600 nm)

Transmission spectrum including reflection losses

(n = 10–4)

and d = wall thickness

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)}

Internal transmission T = 10^{-kd}

Infrared absorption (typical)*

Practically no OH absorption

absorption at 946 nm \: 1.5 \text{ ppm/cm} +1/-0.4 \text{ ppm/cm}

absorption at 1064 nm \: 0.3 \text{ ppm/cm} \pm0.2 \text{ ppm/cm}

absorption at 1319 nm \: 1 \text{ ppm/cm}

1) Kondilenko & Co-Workers, Ginzton Lab, Stanford University, private communication, 2005

2) Dr. Mühlig, IPHT Jena

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

Fluorescence: light blue

At stimulation with light at a wavelength of \( \lambda = 254 \) 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.

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