Suprasil® CG

Suprasil® CG is a high purity synthetic fused silica material manufactured by flame hydrolysis. It combines excellent physical properties with very good optical characteristics and excellent transmission from the deep UV to the near IR.

**Technical features**
- **Low Bubble and Inclusion content**
  - Ø 140 mm bubble class 0, occasionally isolated bubbles
  - Ø 320 mm bubble class 0, 1/1 * 0.16
  - Ø 650 mm bubble class 0, 1/1 * 0.16
- **High Purity**
- **UV-Transmission (typical)**
  - $k_{100}$: $3.5 \cdot 10^{-3}$ / cm
- **Standard Homogeneity in functional direction**
  - not specified
  - Stress Induced Birefringence in functional direction
  - $SIB \leq 20$ nm / cm
- **Well established production processes**

**Refractive index and dispersion**

\[
\begin{align*}
n_0 &= 1.45637 \text{ at } 656.3 \text{ nm} \\
n_g &= 1.45846 \text{ at } 587.6 \text{ nm} \\
n_y &= 1.46313 \text{ at } 486.1 \text{ nm} \\
n_g &= 1.46669 \text{ at } 435.8 \text{ nm} \\
n &= 1.50833 \text{ at } 248.4 \text{ nm}
\end{align*}
\]

At 20°C, 1 bar atmospheric pressure

Accuracy: $\pm 3 \cdot 10^{-5}$

**Transmission spectrum including reflection losses**

![Transmission Spectrum Diagram](image)
Geometry available today

**Diameter Ø**

- Ø 650 mm
- Ø 320 mm
- Ø 140 mm

**Typical chemical impurities in weight ppb**

<table>
<thead>
<tr>
<th>Element</th>
<th>AL</th>
<th>Ca</th>
<th>K</th>
<th>Na</th>
<th>Mg</th>
<th>Li</th>
<th>Cu</th>
<th>Fe</th>
<th>Ni</th>
<th>Cr</th>
<th>Mn</th>
<th>Ti</th>
<th>OH (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suprasil® CG</td>
<td>≤ 10</td>
<td>≤ 15</td>
<td>≤ 10</td>
<td>≤ 5</td>
<td>≤ 1</td>
<td>≤ 3</td>
<td>≤ 5</td>
<td>≤ 1</td>
<td>≤ 2</td>
<td>≤ 5</td>
<td>400 – 1000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mechanical Properties**

- Density (g/cm³) 2.2
- Mohs hardness 5.5 – 6.5
- Micro hardness (N/mm²) 8600 – 9800
- Knoop hardness (N/mm²) 5800 – 6200
- Modulus of elasticity at 20°C (N/mm²) 7.0 · 10⁴
- Modulus of torsion (N/mm²) 3.0 · 10³
- Poisson’s ratio 0.17
- Compressive strength (approx.) (N/mm²) 1150
- Tensile strength (approx.) (N/mm²) 50
- Bending strength (approx.) (N/mm²) 67
- Torsional strength (approx.) (N/mm²) 30
- Sound velocity (m/s) 5720

**Thermal Properties**

- Softening temperature (°C) 1600
- Annealing temperature (°C) 1120
- Strain temperature (°C) 1025
- Max. working temperature continuous (°C) 950
- short-therm (°C) 1200
- Mean expansion coefficient (K⁻¹)
  - -50 ... 0°C 2.7 · 10⁻⁶
  - 0 ... 100°C 5.1 · 10⁻⁶
  - 0 ... 200°C 5.8 · 10⁻⁶
  - 0 ... 300°C 5.9 · 10⁻⁶
  - 0 ... 600°C 5.4 · 10⁻⁶
  - 0 ... 900°C 4.8 · 10⁻⁶

**Minimum order length**

- Ø 140 mm (±10 mm) 200 mm or a multiple thereof
- Ø 320 mm (±15 mm) 100 mm or a multiple thereof
- Ø 650 mm (±5 mm) ~ 200 mm

The data given here is correct for May 2011. We reserve the right to make technical alterations as necessary.

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