Ultra-Thin Glass for Electronics Applications

SCHOTT is offering a portfolio of glass types in the thickness range of 25–210 μm

**Product Information**

SCHOTT ultra-thin glass is available in different glass types with different chemical and physical properties. It is produced with the untouched surface of our continuous down-draw process.

**Applications**

- Semiconductor IC Packaging and 2.5D Interposer
- Electronic and Optical Sensors
- Energy Storage Devices
- Organic Electronics incl. Oxygen and Moisture Barrier
- High Strength, Scratch Resistant Touch & Cover Glass

### Mechanical Properties

<table>
<thead>
<tr>
<th></th>
<th>D 263® T eco</th>
<th>AF 32® eco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>2.51 g/cm³</td>
<td>2.43 g/cm³</td>
</tr>
<tr>
<td>Knoop hardness</td>
<td>470 @ 0.1/20</td>
<td>580 @ 0.1/20</td>
</tr>
<tr>
<td>Young’s modulus</td>
<td>72.9 KN/mm²</td>
<td>74.8 KN/mm²</td>
</tr>
</tbody>
</table>

### Supply Formats and Geometrical Tolerances

- Thickness: 25, 30, 50, 70, 100, 145, 175 and 210 μm
- Sheet size: up to 500 x 500 mm²
- Wafer size: 50, 100, 150, 200 and 300 mm Ø
- Surface roughness Ra: < 1 nm
- Total thickness variation: ≤ 5 μm
- Thickness tolerance: ± 10 μm
- Format tolerance: ± 200 μm

### The CTE of AF 32® eco and D 263® T eco Over Temperature

![Graph showing the CTE of AF 32® eco and D 263® T eco over temperature](image_url)
Thermal Properties | D 263° T eco | AF 32° eco
--- | --- | ---
Tg | 557 °C | 717 °C
CTE (20°C – 300°C) | 7.2 \times 10^{-6} \text{ K}^{-1} | 3.2 \times 10^{-6} \text{ K}^{-1}
Thermal conductivity | 1.06 W/mK @ 90 °C | 1.16 W/mK @ 90 °C

Electrical Properties | D 263° T eco | AF 32° eco
--- | --- | ---
Dielectric constant $\varepsilon_r$ | 6.7 @ 1 MHz | 5.1 @ 1 MHz
| 6.4 @ 1 GHz | 5.1 @ 1 GHz
| 6.3 @ 5 GHz | 5.1 @ 5 GHz
Dissipation factor $\tan \delta$ | 0.006 @ 1 MHz | 0.003 @ 1 MHz
| 0.007 @ 1 GHz | 0.004 @ 1 GHz
| 0.010 @ 5 GHz | 0.005 @ 5 GHz

Chemical Properties | D 263° T eco | AF 32° eco
--- | --- | ---
Glass type | Borosilicate | Alumino-borosilicate
Hydrolytic resistance | HGB 1 | HGB 1
Acid resistance | S2 | S4
Alkaline resistance | A2 | A3
Alkaline free | no | yes

Examples of Competencies to Modify Ultra-Thin Glass
Structuring by Laser or Powder Blasting
to generate vias or microchannels

Example: laser structuring of SCHOTT AF 32° eco,
100 μm thickness, via diameter: 30 μm, pitch: 50 μm

Optical Properties AF 32° eco and D 263° T eco

Chemical Strengthening
By chemical toughening the edge strength of D 263° T eco
can be increased by a factor of 4

Gas Barrier Properties of Ultra-Thin Glass

Example: laser structuring of SCHOTT AF 32° eco,