**Sodium Resistant Sealing Glasses**

**Product Information**
SCHOTT offers sealing glasses that were specially developed for the hermetic sealing and joining of ceramics and/or metals to be used in highly corrosive environments, such as molten sodium batteries. These batteries operate at high temperatures above 300°C, where sodium and nickel chloride or sulfur are in a liquid state. In this highly challenging application, the long-term stability of the sealing glass is decisive for the overall product lifetime.

**Advantages of SCHOTT’s sodium resistant sealing glasses**
- **High chemical resistivity under both anodic and cathodic environments**
  Unlike other battery sealing glasses that have optimized chemical resistance for either electrode, SCHOTT’s sealing glasses were specially developed to resist both of these highly corrosive environments.

- **Reliable, long-term stability of the hermetic glass seal even after many thermal cycles**
  - CTE matched with ceramics such as α-Al₂O₃ as well as sodium-ion conducting ceramics such as β- and β”-Al₂O₃ and NaSICON
  - Compression sealing with stainless steels and nickel alloys

**Applications**
Sodium resistant sealing glasses are suitable for use in corrosive sodium environments (vapors and melts):

- As hermetic seals for
  - Sealing of battery components: Na/NiCl₂-type (ZEBRA); Na/S-type
  - Sealing of membranes

- As sensor feedthroughs in
  - Sodium production (chemical industry)
  - Rapid breeder technology (sodium cooled nuclear reactors)

**Technical Details**

<table>
<thead>
<tr>
<th>SCHOTT Glass Code</th>
<th>8436</th>
<th>8245</th>
<th>8455</th>
<th>G018-402</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Sodium vapor resistant sealing glasses</td>
<td>Molten sodium resistant sealing glass</td>
<td>Molten sodium resistant sealing glass</td>
<td>Molten sodium resistant sealing glass</td>
</tr>
<tr>
<td><strong>Tg</strong></td>
<td>624 °C</td>
<td>505 °C</td>
<td>565 °C</td>
<td>488 °C</td>
</tr>
<tr>
<td><strong>CTE (20-300 °C)</strong></td>
<td>6.5 10^{-6} K^{-1}</td>
<td>5.2 10^{-6} K^{-1}</td>
<td>6.7 10^{-6} K^{-1}</td>
<td>6.6 10^{-6} K^{-1}</td>
</tr>
<tr>
<td><strong>Sealing temperature</strong></td>
<td>920 °C</td>
<td>1.040 °C</td>
<td>1.030 °C</td>
<td>960 °C</td>
</tr>
<tr>
<td><strong>Compositional range in weight-%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SiO₂</td>
<td>50-70</td>
<td>60-75</td>
<td>50-70</td>
<td>40-50</td>
</tr>
<tr>
<td>B₂O₃</td>
<td>5-10</td>
<td>10-20</td>
<td>10-20</td>
<td>&gt;25-30</td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>1-5</td>
<td>5-10</td>
<td>5-10</td>
<td>17-25</td>
</tr>
<tr>
<td>Na₂O</td>
<td>5-10</td>
<td>5-10</td>
<td>10-20</td>
<td>5-15</td>
</tr>
<tr>
<td>MO (MgO + CaO + SrO + BaO)</td>
<td>10-25</td>
<td>_</td>
<td>1-5</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Others</td>
<td>10-20</td>
<td>1-5</td>
<td>1-5</td>
<td>free of ZrO₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ZnO 0-5</td>
</tr>
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<td></td>
<td></td>
<td>TiO₂ 0-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SnO₂ 0-5</td>
</tr>
</tbody>
</table>

Other sodium-resistant sealing glasses covering the CTE range of 5.5 to 8.5 10^{-6} K^{-1} available upon request. Optionally up to 30 Vol.% of an oxidic filler may be added to adapt the properties.

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    - Sealing of membranes
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**Application Form**
Sealants are available in powder, paste and preform formats.

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Electronic Packaging
SCHOTT AG
Christoph-Dorner-Strasse 29
84028 Landshut
Germany
Phone: +49 (0)871/826-702
Fax: +49 (0)3641/288-89096
jens.suffner@schott.com
www.schott.com/epackaging