EAGLE XG® Slim Glass

Product Information Sheet

Glass Type:
Alkaline earth borosilicate

Forms Available:
Fusion-drawn sheet

Principle Uses:
Substrates for active-matrix flat panel displays

Properties
Where applicable, units are stated in Metric and English

Mechanical

<table>
<thead>
<tr>
<th>Property</th>
<th>Metric</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (20°C, 68°F)</td>
<td>2.38 g/cc</td>
<td>148.5 lb/ft³</td>
</tr>
<tr>
<td>Young's Modulus</td>
<td>73.6 GPa</td>
<td>10.7 x 10⁶ psi</td>
</tr>
<tr>
<td>Shear Modulus</td>
<td>30.1 GPa</td>
<td>4.4 x 10⁶ psi</td>
</tr>
<tr>
<td>Poisson's Ratio</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Vicker's Hardness (200 gm load, 25 sec dwell)</td>
<td>640</td>
<td></td>
</tr>
</tbody>
</table>

Thermal Expansion

<table>
<thead>
<tr>
<th>Condition</th>
<th>Metric</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 300°C</td>
<td>3.17 x 10⁻⁷ / °C</td>
<td>17.7 x 10⁻⁷ / °F</td>
</tr>
<tr>
<td>(0 - 300°C)</td>
<td>(32 - 572°F)</td>
<td></td>
</tr>
<tr>
<td>Room Temperature</td>
<td>35.5 x 10⁻⁷ / °C</td>
<td>19.7 x 10⁻⁷ / °F</td>
</tr>
<tr>
<td>To Setting Point</td>
<td>(25 - 76°)</td>
<td>(77 - 127°)</td>
</tr>
</tbody>
</table>

Thermal Conductivity

Thermal conductivity is a calculated value, and is equal to the product of the thermal diffusivity multiplied by specific heat multiplied by the density of the glass.

<table>
<thead>
<tr>
<th>Temp (°C)</th>
<th>Specific Heat (J/gm-°K)</th>
<th>Thermal Diffusivity (cm²/sec)</th>
<th>Thermal Conductivity (W/cm-°K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>0.768</td>
<td>0.00601</td>
<td>0.0109</td>
</tr>
<tr>
<td>100</td>
<td>0.896</td>
<td>0.00572</td>
<td>0.0122</td>
</tr>
<tr>
<td>200</td>
<td>0.998</td>
<td>0.00546</td>
<td>0.0129</td>
</tr>
<tr>
<td>300</td>
<td>1.067</td>
<td>0.00530</td>
<td>0.0134</td>
</tr>
<tr>
<td>400</td>
<td>1.110</td>
<td>0.00522</td>
<td>0.0137</td>
</tr>
<tr>
<td>500</td>
<td>1.154</td>
<td>0.00518</td>
<td>0.0142</td>
</tr>
</tbody>
</table>

Viscosity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Point (10⁴ poises)</td>
<td>1293</td>
</tr>
<tr>
<td>Softening Point (10⁷ poises)</td>
<td>971</td>
</tr>
<tr>
<td>Annealing Point (10¹³ poises)</td>
<td>722</td>
</tr>
<tr>
<td>Strain Point (10¹⁴ poises)</td>
<td>669</td>
</tr>
</tbody>
</table>

Electrical

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log₅ Volume Resistivity (ohm-cm)</td>
<td>12.9 (250°C, 482°F)</td>
</tr>
<tr>
<td></td>
<td>8.8 (500°C, 932°F)</td>
</tr>
</tbody>
</table>

Dielectric Constant

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>Dielectric Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°C</td>
<td>5.27</td>
</tr>
<tr>
<td>20°C</td>
<td>5.47</td>
</tr>
</tbody>
</table>

Dissipation Factor (Loss Tangent)

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>Dissipation Factor (Loss Tangent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°C</td>
<td>0.30%</td>
</tr>
</tbody>
</table>

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Chemical

Weathering: 1
Weathering is defined as corrosion by atmospheric-borne gases and vapor such as water and carbon dioxide. Glasses rated 1 will almost never show weathering effects; those rated 2 will occasionally be troublesome, particularly if weathering products cannot be removed; those rated 3 require more careful consideration.

Durability:
Durability is measured via weight loss per surface area after immersion. Values are highly dependent upon actual testing conditions. Unless otherwise noted, concentrations refer to weight percent.

<table>
<thead>
<tr>
<th>Reagent</th>
<th>Time</th>
<th>Temperature</th>
<th>Weight Loss (mg/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCl – 5%</td>
<td>24 hrs</td>
<td>95°C</td>
<td>0.79</td>
</tr>
<tr>
<td>HNO₃ – 1M</td>
<td>24 hrs</td>
<td>95°C</td>
<td>0.49</td>
</tr>
<tr>
<td>HF – 10%</td>
<td>20 min</td>
<td>20°C</td>
<td>5.18</td>
</tr>
<tr>
<td>NH₄F:HF – 10%</td>
<td>20 min</td>
<td>20°C</td>
<td>0.84</td>
</tr>
<tr>
<td>HF:10HNO₃</td>
<td>3 min</td>
<td>20°C</td>
<td>1.48</td>
</tr>
<tr>
<td>HF:100HNO₃</td>
<td>3 min</td>
<td>20°C</td>
<td>0.16</td>
</tr>
<tr>
<td>DI H₂O</td>
<td>24 hrs</td>
<td>95°C</td>
<td>0.00</td>
</tr>
<tr>
<td>Na₂CO₃ – 0.02N</td>
<td>6 hrs</td>
<td>95°C</td>
<td>0.16</td>
</tr>
<tr>
<td>NaOH – 5%</td>
<td>6 hrs</td>
<td>95°C</td>
<td>1.83</td>
</tr>
</tbody>
</table>

Total alkali content is approximately: 0.1 wt%
(Typical <0.05 wt%)

<table>
<thead>
<tr>
<th>Optical Wavelength</th>
<th>Refractive Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>435.8 nm</td>
<td>15198</td>
</tr>
<tr>
<td>467.8 nm</td>
<td>15169</td>
</tr>
<tr>
<td>480 nm</td>
<td>15160</td>
</tr>
<tr>
<td>508.6 nm</td>
<td>15141</td>
</tr>
<tr>
<td>546.1 nm</td>
<td>15119</td>
</tr>
<tr>
<td>589.3 nm</td>
<td>15099</td>
</tr>
<tr>
<td>643.8 nm</td>
<td>15078</td>
</tr>
</tbody>
</table>

Birefringence Constant
331 (nm/cm) / (kg/mm²)

Transmittance

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