

Corning® 1737 AMLCD Glass Substrates

Material Information



MIE 101

Issued: August 2002

Glass Type – Alkaline Earth Boro-Aluminosilicate
Forms Available – Fusion drawn sheet

Principal Uses – Substrates for Active Matrix flat panel displays

Corning 1737 is available in both, standard and arsenic-free substrates. The properties are essentially the same.

Properties

Where applicable, units are stated in Metric and English

Mechanical

| | Metric | English |
|----------------------|------------------------|--------------------------|
| Density (20°C, 68°F) | 2.54 g/cm ³ | 158.6 lb/ft ³ |
| Young's Modulus | 70.9 GPa | 10.3 Mpsi |
| Poisson's Ratio | 0.23 | 0.23 |
| Shear Modulus | 28.9 GPa | 4.2 Mpsi |

Vickers Hardness (200 gm load, 25 sec dwell) 633

Thermal Expansion

| | Metric | English |
|------------------|--|---|
| 0 - 300°C | 37.6 x 10 ⁻⁷ /°C (0 - 300°C) | 21.0 x 10 ⁻⁷ /°F (32 - 572°F) |
| Room Temperature | 42.0 x 10 ⁻⁷ /°C | 23.3 x 10 ⁻⁷ /°F |
| To Setting Point | (25 - 671°C) | (77 - 1240°F) |

Thermal Conductivity

Thermal Conductivity is a calculated value, and is equal to the product of the Thermal diffusivity multiplied by Specific Heat multiplied by Density of the glass.

| Temp (°C) | Specific Heat (cal/gm-°K) | Thermal Diffusivity (cm ² /sec) | Thermal Conductivity (cal-cm/cm ² -sec-°K) |
|-----------|---------------------------|--|---|
| 23 | 0.169 | 0.00504 | 0.00217 |
| 50 | 0.176 | 0.00506 | 0.00227 |
| 100 | 0.190 | 0.00511 | 0.00247 |
| 200 | 0.213 | 0.00503 | 0.00272 |
| 300 | 0.232 | 0.00496 | 0.00292 |
| 400 | 0.250 | 0.00491 | 0.00311 |
| 500 | 0.263 | 0.00490 | 0.00327 |
| 600 | 0.276 | 0.00496 | 0.00346 |

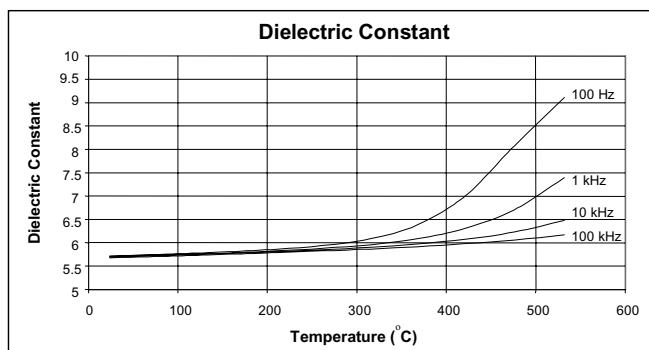
Viscosity

| | | |
|--|--------|--------|
| Working Point (10 ⁴ poises) | 1312°C | 2394°F |
| Softening Point (10 ^{7.6} poises) | 975°C | 1787°F |
| Annealing Point (10 ¹³ poises) | 721°C | 1330°F |
| Strain Point (10 ^{14.5} poises) | 666°C | 1231°F |

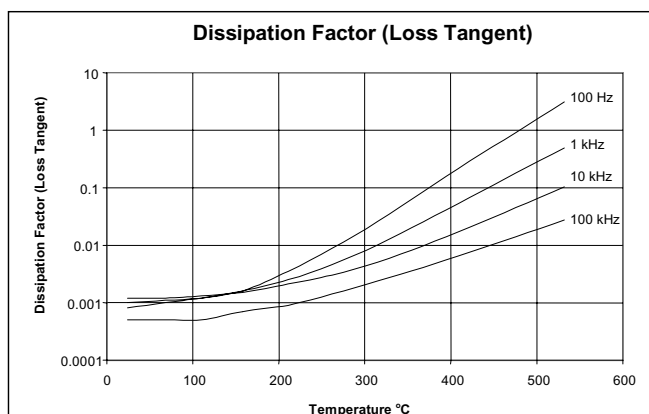
Electrical

Log₁₀ Volume Resistivity (ohm – cm)

| | |
|------|----------------|
| 13.5 | (250°C, 482°F) |
| 11.4 | (350°C, 662°F) |
| 9.3 | (500°C, 932°F) |



Dielectric Constant: 5.7
(20°C/68°F – 1 kHz)



Loss Tangent: 0.10%
(20°C/68°F – 1 kHz)

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.

| Reagent | Time | Temp | Weight Loss (mg/cm ²) |
|---|--------|------|-----------------------------------|
| HCl – 5% | 24 hrs | 95°C | 0.46 |
| H ₂ SO ₄ – 1M | 24 hrs | 95°C | 0.60 |
| HNO ₃ – 1M | 24 hrs | 95°C | 0.24 |
| HF – 10% | 20 min | 22°C | 6.34 |
| NH ₄ F:HF – 10% | 22 min | 22°C | 1.17 |
| 110 BHF | 5 min | 30°C | 0.23 |
| 63 BHF | 5 min | 30°C | 0.11 |
| 1HF:10HNO ₃ | 3 min | 25°C | 2.01 |
| 1HF:100HNO ₃ | 3 min | 25°C | 0.46 |
| H ₂ O | 24 hrs | 95°C | 0.007 |
| Na ₂ CO ₃ – 0.02N | 6 hrs | 95°C | 0.17 |
| NaOH – 5% | 6 hrs | 95°C | 1.76 |

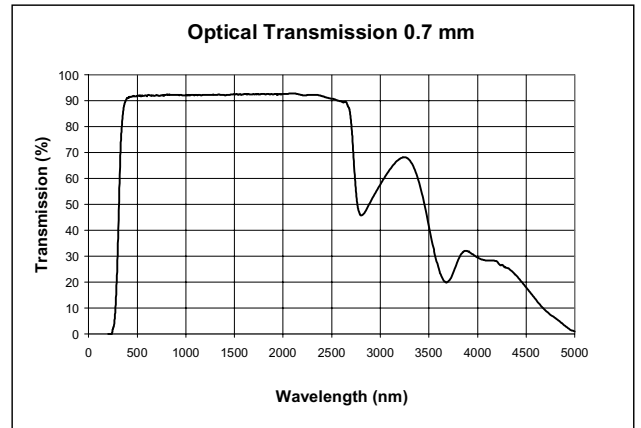
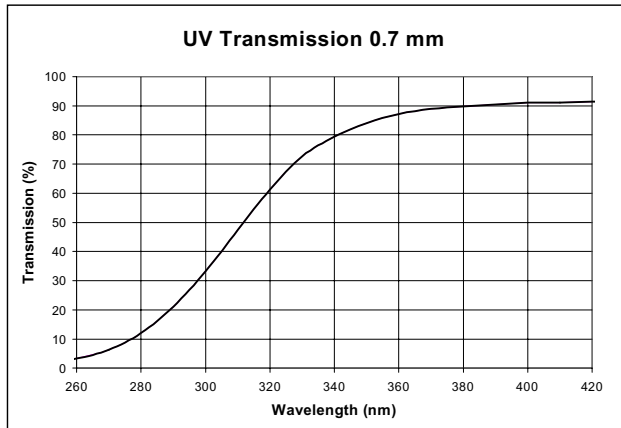
Total alkali content is approximately: 0.1 wt%
(Typical < 0.05 wt%)

| Optical Wavelength | Refractive Index |
|--------------------|------------------|
| 435.8 nm | 1.5247 |
| 480 nm | 1.5247 |
| 486.1 nm | 1.5244 |
| 546.1 nm | 1.5203 |
| 589.3 nm | 1.5183 |
| 643.8 nm | 1.5161 |
| 656.3 nm | 1.5160 |
| 1300 nm | 1.5051 |
| 1541 nm | 1.5023 |

Birefringence Constant

333 (nm/cm)/(kg/mm²)

Transmittance



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