

Corning EAGLE XG™ AMLCD Glass Substrates Material Information



Display
Technologies

MIE 301

Issued: January 2006

Supersedes: None

Glass Type – Alkaline Earth Boro-Aluminosilicate
Forms Available – Fusion drawn sheet
Principal Uses – Substrates for Active Matrix flat panel displays

Properties

Where applicable, units are stated in Metric and English

Mechanical

	Metric	English
Density (20°C, 68°F)	2.38 g/cc	148.5 lb/ft ³
Young's Modulus	73.6 GPa	10.7 x 10 ⁶ psi
Shear Modulus	30.1 GPa	4.4 x 10 ⁶ psi

Poisson's Ratio	0.23
Vickers Hardness (200 gm load, 25 sec dwell)	640

Thermal Expansion

0 - 300°C	31.7 x 10 ⁻⁷ /°C (0 - 300°C)	17.7 x 10 ⁻⁷ /°F (32 - 572°F)
Room Temperature To Setting Point	35.5 x 10 ⁻⁷ /°C (25 - 675°C)	19.7 x 10 ⁻⁷ /°F (77 - 1247°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 (J/gm-°K)	Thermal Diffusivity (cm ² /sec)	Thermal Conductivity (W/cm-°K)
23	0.768	0.00601	0.0109
100	0.896	0.00572	0.0122
200	0.998	0.00546	0.0129
300	1.067	0.00530	0.0134
400	1.110	0.00522	0.0137
500	1.154	0.00518	0.0142

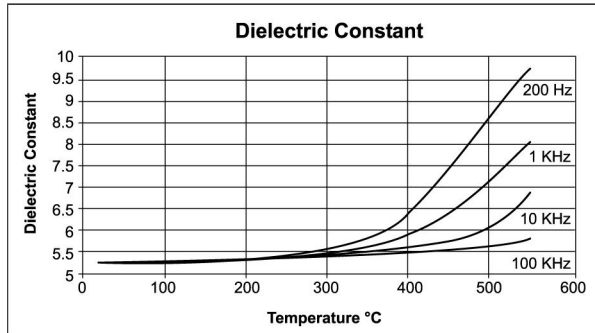
Viscosity

Working Point (10 ⁴ poises)	1293
Softening Point (10 ^{7.6} poises)	971
Annealing Point (10 ¹³ poises)	722
Strain Point (10 ^{14.5} poises)	669

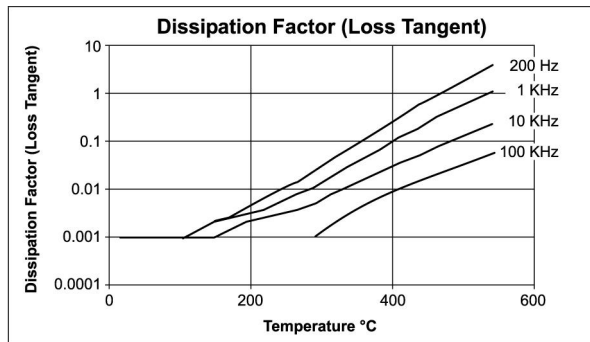
Electrical

Log₁₀ Volume Resistivity (ohm-cm)

12.9 (250°C, 482°F)
8.8 (500°C, 932°F)



Dielectric Constant: 5.27
(20°C/68°F – 1 kHz)



Loss Tangent: 0.30%
(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	0.79
HNO ₃ – 1M	24 hrs	95°C	0.49
HF – 10%	20 min	20°C	5.18
NH ₄ F:HF – 10%	20 min	20°C	0.84
1HF:10HNO ₃	3 min	20°C	1.48
1HF:100HNO ₃	3 min	20°C	0.16
DI H ₂ O	24 hrs	95°C	0.00
Na ₂ CO ₃ – 0.02N	6 hrs	95°C	0.16
NaOH – 5%	6 hrs	95°C	1.83

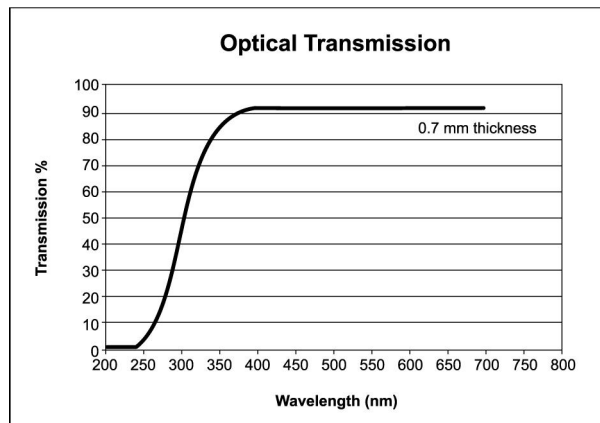
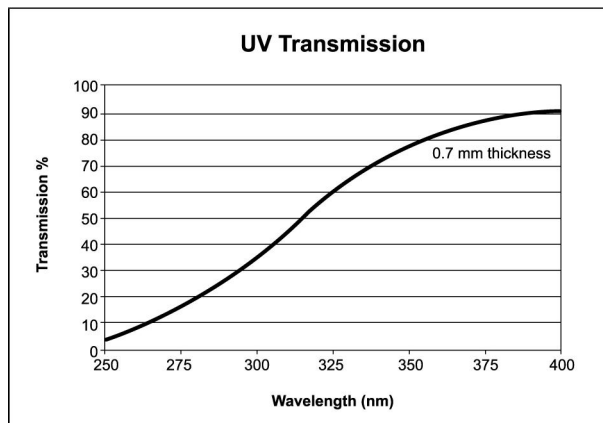
Total alkali content is approximately: 0.1 wt%
(Typical < 0.05 wt%)

Optical Wavelength	Refractive Index
435.8 nm	1.5198
467.8 nm	1.5169
480 nm	1.5160
508.6 nm	1.5141
546.1 nm	1.5119
589.3 nm	1.5099
643.8 nm	1.5078

Birefringence Constant

331 (nm/cm)/(kg/mm²)

Transmittance



North America and all other Countries

Corning Display Technologies

MP-HQ-W1

Corning, NY 14831

United States

Telephone: +1 607-974-9000

Fax: +1 607-974-7097

Internet: www.corning.com/displaytechnologies

Japan

Corning Japan K.K.

Main Office

Akasaka Intercity 7th floor

1-11-44, Akasaka

Minato-Ku, Tokyo 107-0052 Japan

Telephone: +81 3-5562-2260

Fax: +81 3-5562-2263

Internet: www.corning.co.jp

Nagoya Sales Office

Nihon Seimei Sasashima Bldg., 15th floor,

27-2 Meieki minami 1-chome, Nakamura-ku,

Nagoya 450-0003 Japan

Telephone: +81 52-561-0341

Fax: +81 52-561-0348

China

Corning (China) Ltd., Shanghai Representative Office

31/F, The Center

989 Chang Le Road

Shanghai 200031

P.R. China

Telephone: +86 21-5467-4666

Fax: +86 21-5407-5899

Internet: www.corning.com.cn

Taiwan

Corning Display Technologies Taiwan Co., Ltd.

Room #1203, 12F, No. 205

Tun Hua North Road,

Taipei 105, Taiwan

Telephone: +886 2-2716-0338

Fax: +886 2-2716-0339

Internet: www.corning.com.tw

Korea

Samsung Corning Precision Glass Co., Ltd.

12th floor, Taepyungro Building

310 Taepyungro-2ga

Jung-gu, Seoul, 100-767 Korea

Telephone: +82 2-728-0733

Fax: +82 2-728-0749

Internet: www.samsungscp.co.kr

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