Corning® EAGLE^{2000}™ AMLCD Glass Substrates

Material Information

MIE 201
Issued: August 2002

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)	2.37 g/cm^3	147.9 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 642
(200 gm load, 25 sec dwell)

Thermal Expansion

0 - 300°C	31.8 x 10^{-7}/°C	17.7 x 10^{-7}/°F
	(0 - 300°C)	(32 - 572°F)
Room Temperature	36.1 x 10^{-7}/°C	20.1 x 10^{-7}/°F
To Setting Point	(25 - 670°C)	(77 - 1238°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	0.176	0.00511	0.00213
50	0.185	0.00512	0.00225
100	0.201	0.00510	0.00244
200	0.226	0.00507	0.00272
300	0.244	0.00503	0.00291
400	0.260	0.00499	0.00307
600	0.288	0.00507	0.00344

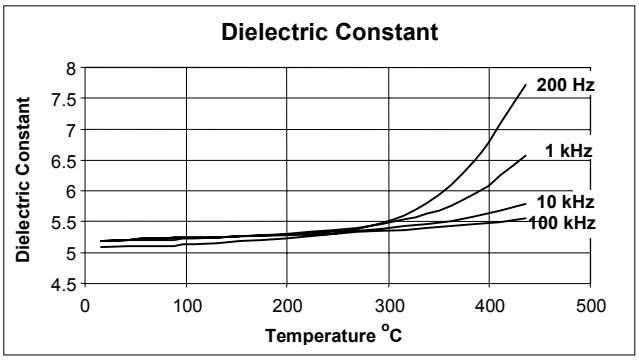
Viscosity

Working Point (10^4 poises)	1321°C	2410°F
Softening Point ($10^{7.6}$ poises)	985°C	1805°F
Annealing Point (10^{13} poises)	722°C	1332°F
Strain Point ($10^{14.5}$ poises)	666°C	1231°F

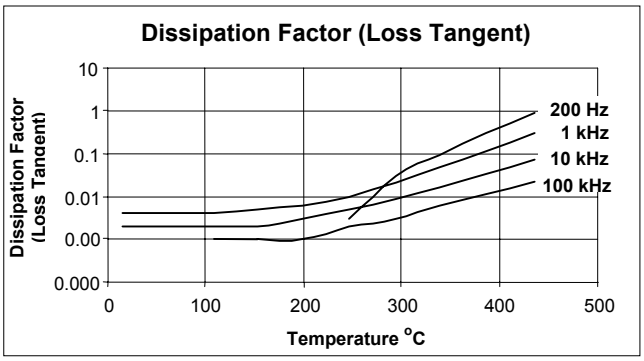
Electrical

Log_{10}Volume Resistivity (ohm-cm)

12.5	(250°C, 482°F)
10.5	(350°C, 662°F)
8.5	(500°C, 932°F)



Dielectric Constant: 5.181
(20°C/68°F – 1 kHz)



Loss Tangent: 0.40%
(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. Data is reported for EAGLE^{2000} and Corning 1737 glasses run concurrently. Unless otherwise noted, concentrations refer to weight percent.

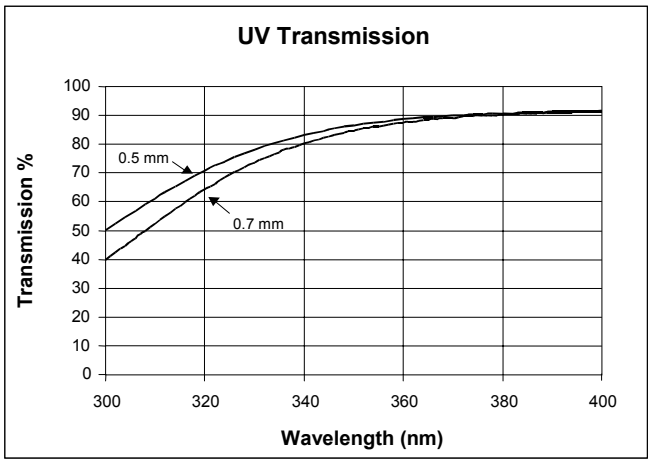
Reagent	Time	Temp	Weight Loss (mg/cm^2) EAGLE^{2000}	Corning 1737
HCl – 5%	24 hrs	95°C	0.30	0.46
HNO_3 – 1M	24 hrs	95°C	0.17	0.24
HF – 10%	20 min	22°C	3.71	6.34
NH_4F:HF – 10%	20 min	22°C	0.75	1.17
1HF:10HNO_3	3 min	25°C	1.35	2.01
1HF:100HNO_3	3 min	25°C	0.40	0.46
DI H_2O	24 hrs	95°C	0.00	0.01
Na_2CO_3 – 0.02N	6 hrs	95ºC	0.14	0.17
NaOH – 5%	6 hrs	95°C	1.61	1.76

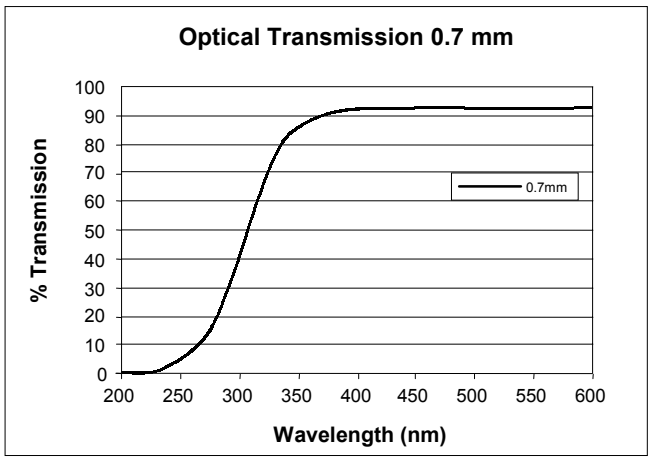
Total alkali content is approximately: 0.1 wt%
(Typical < 0.05 wt%)

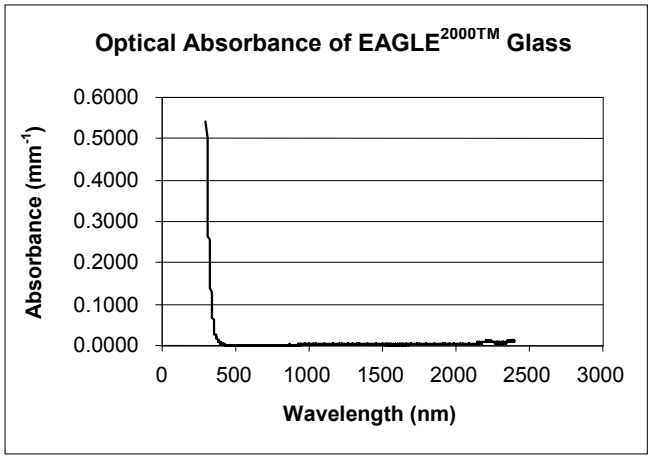
Optical Wavelength	Refractive Index
435.8 nm	1.5170
480 nm	1.5131
486.1 nm	1.5126
546.1 nm	1.5090
589.3 nm	1.5068
643.8 nm	1.5050
656.3 nm	1.5046

Birefringence Constant
327 (nm/cm)/(kg/mm^2)

Transmittance







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