



CORNING

Precision Glass
Solutions

Corning® EAGLE XG®

Wafer-Level Optic Solutions Product Data Sheet

Manufactured using Corning's proprietary fusion process, Eagle XG® is an alkaline earth boro-alumino-silicate glass, alkali-free and environmentally friendly containing no heavy metals (arsenic, antimony, barium). With optimized properties such as thermal expansion (CTE) matching Silicon, high strain point for elevated temperature processing, inherent dimensional stability, optical clarity, and chemical durability, Eagle XG® is an ideal glass for wafer-level optic applications.

Dimensions and Product Specifications

Typical Part Forms	100/150/200/300mm Diameter Wafers, Rectangular, Score-cut
Dimensional Tolerance	± 0.3 mm*
Thickness Range	0.2mm, 0.21 mm, 0.25mm, 0.3mm, 0.4mm, 0.5mm, 0.7mm
Thickness Tolerance	+/- 0.01mm*
Scratch/Dig	60/40 to 20/10
Surface Roughness (Ra)	≤10Å

*Corning Precision Glass Solutions can provide Eagle XG® glass products with tighter dimensional specifications upon request. Please contact precisionsgs@corning.com for additional information.

Mechanical Properties

Density	2.38 g/cm ³
Young's Modulus	73.6 GPa
Poisson's Ratio	0.23
Shear Modulus	30.1 GPa
Vickers Hardness (200 g load)	640 kgf/mm ²
Fracture Toughness	0.89 MPa · m ^{0.5}

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Electrical Properties

Dielectric Constant and Dissipation Factor

Frequency (MHz)	Dielectric Constant	Loss Tangent
100	5.28	0.002
1000	5.30	0.002
2500	5.18	0.004
10,000	5.14	0.008
15,000	5.14	0.008
24,000	5.14	0.009
60,000	5.11	0.011
70,000	5.11	0.013

Volume Resistivity (25 to 500°C)

Temperature (°C)	Log10 Volume Resistivity (ohm-cm)
25	22.92
250	12.98
350	10.87
500	8.72

Other Properties (0.5mm thickness)

Dielectric Strength (kV/mm)	217
Breakdown Voltage (kV)	107

Thermal Properties

Coefficient of Thermal Expansion (CTE) As-Formed (ppm/°C)

0 – 300 °C	3.4
20 – 260 °C	3.4

Viscosity (°C)

Softening Point (10 ^{7.6} Poises)	971
Annealing Point (10 ¹³ Poises)	722
Strain Point (10 ^{14.5} Poises)	669

Thermal Conductivity calculated value of the specific heat × thermal diffusivity × glass density

Temperature (°C)	Specific heat (J/kg·K)	Diffusivity (cm ² /sec)	Conductivity (W/m·K)
25	768	0.0060	1.10
100	896	0.0057	1.22
200	998	0.0055	1.30
300	1067	0.0053	1.35
400	1110	0.0052	1.38
500	1154	0.0052	1.42

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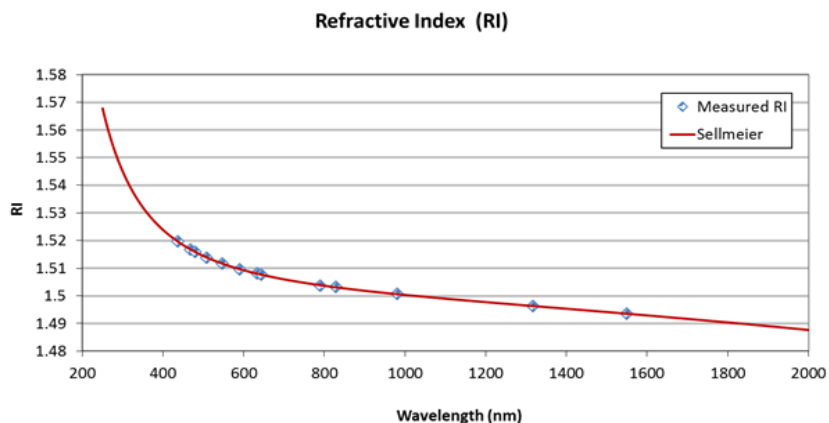
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Optical Properties

Refractive Index

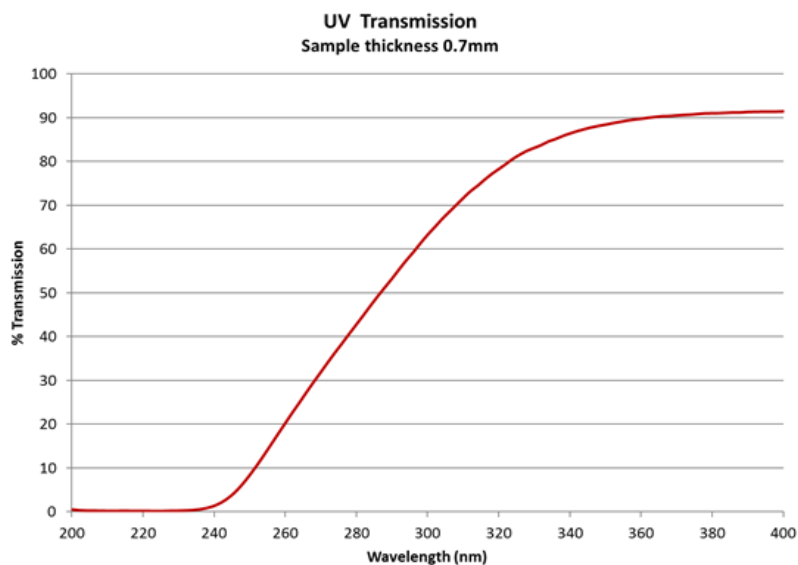
Wavelength (nm)	RI
480.0 $n_{F'}$	1.5159
486.1 n_F	1.5154
546.1 n_e	1.5119
587.6 n_d	1.5099
589.3 n_D	1.5097
632.8	1.5082
643.8 $n_{C'}$	1.5077
656.3 n_C	1.5073
850	1.5028
940	1.5013
980	1.5007
1000	1.5004



Sellmeier Dispersion Coefficients

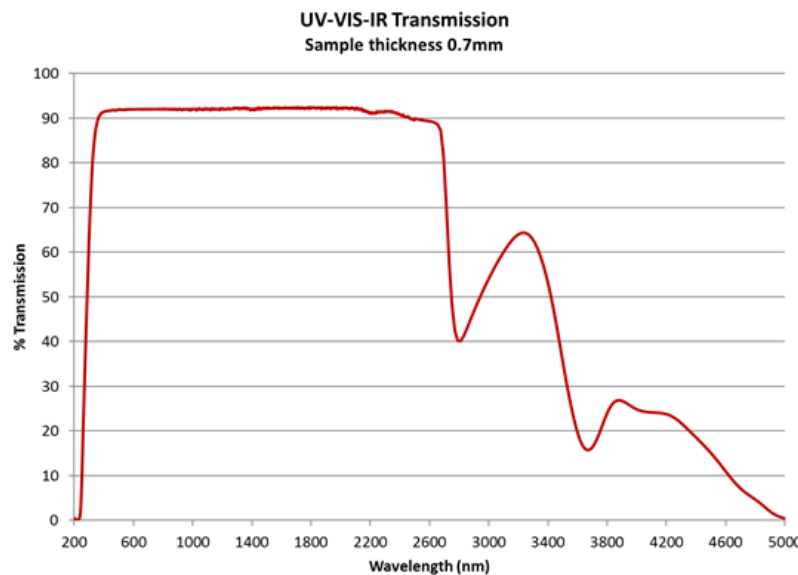
Constant	Fitted Values
P1	-135.23501
P2	-0.87692
P3	2.12661
P4	-1.38E+10
P5	8933.61495
P6	8941.38213
χ^2	4.38E-09
R^2	0.99996

Transmission



Other Properties

Birefringence Constant (nm/cm) / (kg/mm ²)	331
Dispersion (Abbe) Constant	62.7



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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.

Reagent	Time	Temperature (°C)	Weight Loss (mg/cm ²)
HCl - 5%	24 hrs	95	0.79
HNO ₃ – 1M	24 hrs	95	0.49
HF - 10%	20 min	20	5.18
NH ₄ F:HF - 10%	20 min	20	0.84
1HF: 10HNO ₃	3 min	20	1.48
1HF: 100HNO ₃	3 min	20	0.16
DI H ₂ O	24 hrs	95	0.00
Na ₂ CO ₃ – 0.02N	6 hrs	95	0.16
NaOH-5%	6 hrs	95	1.83

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

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