

# AGC EN-A1 Alkali Free Boro-Aluminosilicate Glass

Displays • Image Sensors • LC Devices • Biosensors/Arrays

## Glass Fabrication



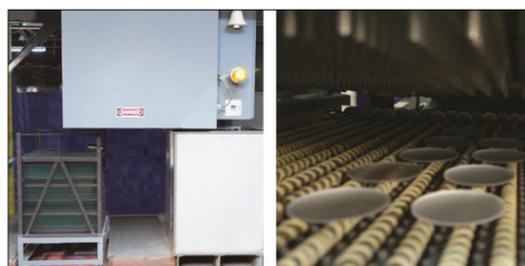
## Coating Deposition



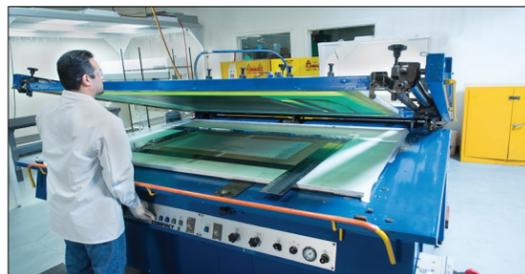
## CNC Machining



## Strengthening - Chemical & Heat



## Screen Printing of Graphics



Abrisa Technologies, a member of HEF Photonics, is a globally recognized technology glass fabrication and optical thin film coating company with expertise in high volume manufacturing and engineering capabilities, delivering Total Solutions that provide excellent performance, fitness-for-use and economies of scale.

Our US based, state-of-the-art ISO 9001:2015 and ITAR registered facilities include Abrisa Industrial Glass in Santa Paula, CA and ZC&R Coatings for Optics in Torrance CA. These two divisions produce solutions from cut-to-order coated glass components to custom complex and Ready-to-install fabricated, strengthened, optically coated, electronically enabled and branded sub-assemblies.

Our Total Solutions serve a variety of markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors, Imaging, Photonics, Medical & Dental, Life Science and more.



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ENA! 10/22



Your Total Solution Partner

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Abrisa Technologies offers Asahi Glass Corporation (AGC) EN-A1 material, a highly transmissive, alkali-free thin boro-aluminosilicate glass that is ideal for highly sensitive bio-photo detection applications, high throughput sensor applications and as enhancement glass for thin displays and cover glass for micro arrays.

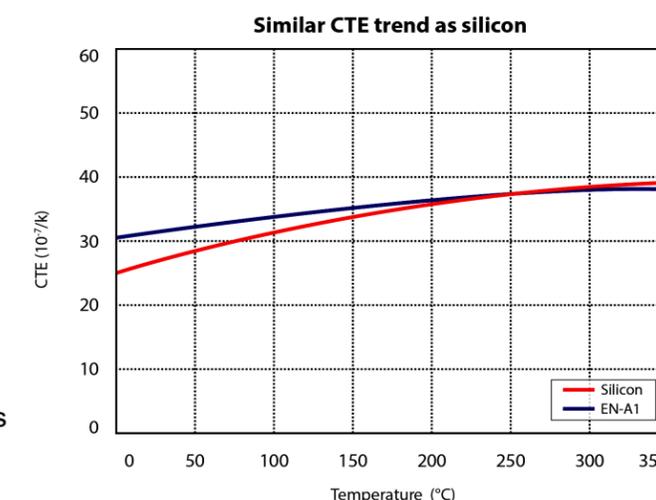
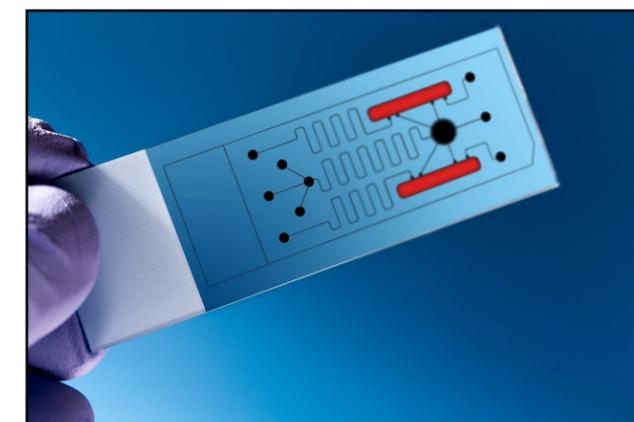
Its coefficient of thermal expansion (CTE) of  $38 \times 10^{-7}$  is well matched to silicon, making it an ideal and economical choice for use as a glass polishing substrate for the thinning process (back grinding) of semiconductor chips supporting low profile electronic device manufacture.

## Key Features:

- Alkali-free
- CTE well matched to silicon
- Standard thicknesses 0.3, 0.5, 0.7mm
- Sizes up to 25" x 20" (635mm x 508mm)
- High Transmittance from 400 - 2300nm
- Good chemical resistance
- Low fluorescence at genomic excitation wavelengths

## Applications:

- Image sensor windows
- Cover glass for micro arrays
- Display enhancement glass
- Biosensors
- Glass for semiconductor thinning
- Low weight, reduced profile designs



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# AGC EN-A1 Alkali Free Boro-Aluminosilicate Glass

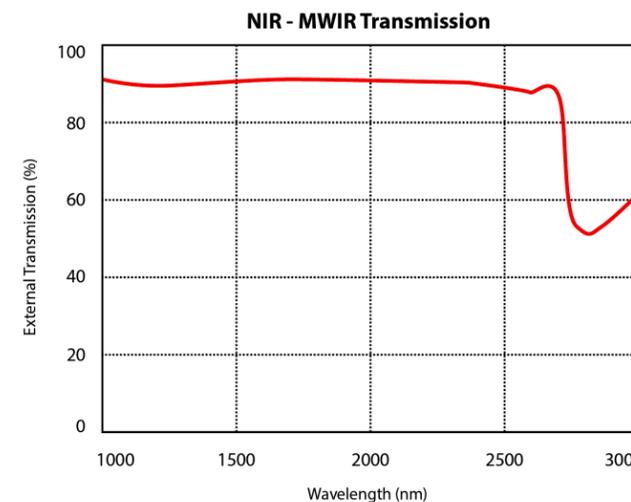
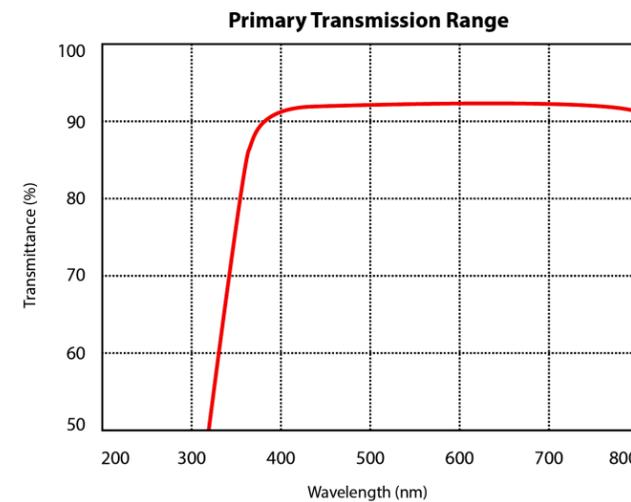
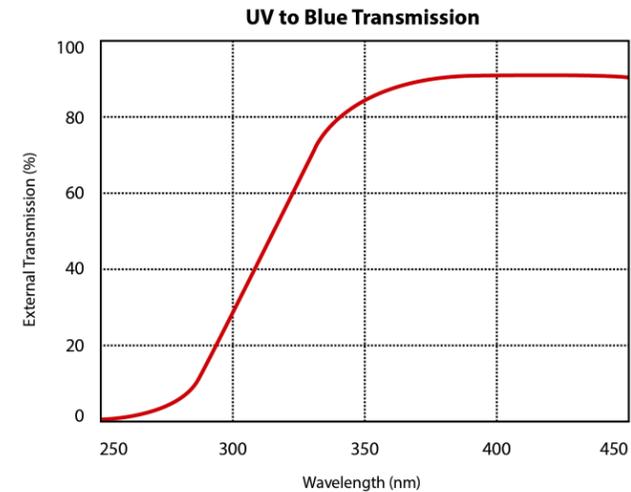
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Mechanical Properties	Measurement	EN-A1
Density	g/cm <sup>3</sup>	2.51
Young's Modulus	GPa	77
Poisson's Ratio		0.22
Thermal Properties		
CTE (Thermal Expansion)	(50-250°C) x 10 <sup>-7</sup> / °C	38
Glass Transformation Point	°C	720
Strain/Softening Point	°C	950
Optical Properties		
Refractive Index	Nd	1.52
Electrical Properties		
Bulk/Volume Resistivity	Log (Ω • cm)	13.6
Dielectric Constant	At 0.001 GHz RT	5.5
	At 10 GHz RT	5.5
Dissipation Factor	At 0.001 GHz RT	0.002
	At 10 GHz RT	0.006
Chemical Properties		
Acid Resistance (HF 5% at 25°C, 20 min.)	Mg/cm <sup>2</sup>	3.1

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## Transmission Curves



## Options

### Coatings:

- Custom V-Coat, Multi-band, Broadband AR
- AR Coatings to MIL-C-14806 A
- ITO/IMITO for EMI Shielding, Heater, LC Devices
- Custom SWP, LWP, Bandpass, UV & NIR Blocker
- Broad/Narrowband Scanning Mirror Coatings
- Deposition onto Filters, Silicon & Other Materials
- Autoclavable, Bio or Chemically Compatible

### Substrates:

- **Fabrication to Shape & Size**
  - Cut & Seam or Circle Ground to Size & Shape
  - Precision CNC - Holes, Bevels, Steps, Notches
- **Damage Resistant Substrates**
  - HIE™ Aluminosilicates
  - AGC Dragontrail™
  - Corning® Gorilla®
  - SCHOTT AS 87
  - Chemically Strengthened Soda Lime Float
- **Low Expansion Chemically Resistant Substrates**
  - SCHOTT Borofloat® 33
- **Ultra Thin and Wafer Substrates**
  - AGC EN-A1
  - Corning® 0211 & Eagle XG®
  - SCHOTT AF32, D263® & AS 87
- **Other**
  - Applied Films & Tints
  - Gasket Application
  - Edge Treatment/Blackening

### Easy-to-Clean & Anti-Fog Solutions:

- Oleo/Hydrophobic Options
- ITO Heater, HTAF Anti-Fog Solutions

### Graphics & Bus Bars:

- Color Matched Epoxy Ink
- Non-Conductive Ink
- High Temperature Frit Ink
- Deadfront Ink - Partially Transmissive
- Infrared IR Transmitting Ink
- Silver Epoxy, Silver Frit, CrNiAu Bus Bars