

Custom Glass Fabrication Capabilities

Technical Reference Document

12/11

Chemical Strengthening (Standard Soda Lime): (Standard ASTM C1422-99-2005)

The Chemical Strengthening process toughens soda lime through a sodium and potassium ion exchange in a salt bath. Glass can be strengthened from 8 to 16 hours and is often requested for toughened thin display applications. Chemical strengthening is best suited for thin soda lime sheets (under 3mm) and applications where optical distortion must be kept to a minimum. Chemically strengthened glass does not “dice” like fully heat tempered glass when broken.

Minimum Thickness:	0.30 mm [0.012”]
Maximum Thickness:	19 mm [0.75”]
Minimum Size:	25.4 mm x 25.4 mm [1” x 1”]
Maximum Size:	914.4 mm x 736.6 mm [36” x 29”]
Cosmetics:	Up to 60/40
Modulus of Rupture (MOR):	
8 hour	165 mPa [24 Kpsi]
16 hour	220 mPa [32 Kpsi]
Case Depth:	
8 hour	up to 0.1016 mm [0.004”]
16 hour	up to 0.1092 mm [0.0043”]



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Chemical Strengthening (HIE Glass):

Abrisa Technologies' High Ion Exchange or HIE glass is chemically strengthened glass that has increased strength as a result of a post-product chemical process. This process typically increases the strength of the glass by 6 to 8X that of float glass. The ion-exchange process creates a deep compression layer on the surface of the glass structure, reducing the introduction of flaws once incorporated into the end product and put into service.

Typically used for electronic display screens such as smartphones, laptop and tablet computers, mobile devices, touch screens, and more, HIE glass provides outstanding resistance to breakage, scratches and temperature fluctuations.

HIE chemically strengthened glass advantages:

- **Improved impact resistance**
- **Improved flexibility strength**
- **Improved scratch resistance**
- **Improved resistance to temperature changes**

By using a thin glass such raw material such as Corning® Gorilla® Glass, SCHOTT Xensation™ Cover glass, or AGC Dragontrail™, the end product will have improved transmission, reduced weight, and reduced mounting costs as just some of the significant advantages.

Abrisa Technologies can provide customized fabrication solutions for their HIE glass that include the application of thin film coatings, various edge treatments, custom cutting and drilling, screen printing, Bus Bars and more."

Abrisa Technologies HIE Glass offerings include:

- Thicknesses from 0.5 mm to 2.0 mm (consult factory for additional options)
- Sheet sizes* from 18.7" to 49.2" (475 mm to 1250 mm)

* These are the standard sizes that these raw materials are available in, and/or can be fabricated to. In terms of supplying a strengthened piece of glass with fabrication, screen print and coatings (value-added) manufacturing, the maximum size that Abrisa Technologies can offer is 36" x 29" (915 mm x 737 mm).

Custom thicknesses and sheet sizes may be available. Consult factory.

**Four Point Bending Test
with 9 lbf of pressure being applied
HIE glass thickness is 0.99 mm**



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Heat Tempering: (Standard ASTM C-1048-04)

Heat Tempering toughens soda lime through the controlled heating and cooling of the glass to maintain a temperature differential between the core and outer surfaces. The stressed induced compress the outer surfaces, forming a substrate substantially tougher than standard soda lime. When broken, tempered glass “dices” into many small pieces. This is typically referred to as “Safety Tempering” for it’s reduced likelihood of cutting a person in the event of a fracture.

- Horizontal Heat Tempering Furnace:**

Minimum Thickness:	3 mm [0.118”]
Maximum Thickness:	19 mm [0.75”]
Minimum Size:	76.2 mm x 76.2 mm [3” x 3”]
Maximum Size:	838.2 mm x 736.6 mm [29” x 33”]
Treatment:	Temper Kind Full Temper (FT) or Heat Strengthened (HS)

- Vertical Heat Tempering Furnace:**

Minimum Thickness:	3 mm [0.118”]
Maximum Thickness:	19 mm [0.75”]
Minimum Size:	19 mm x 19 mm [0.75” x 0.75”]
Maximum Size:	127 mm x 127 mm [5” x 5”]
Treatment:	Temper Kind Full Temper (FT) or Heat Strengthened (HS)

