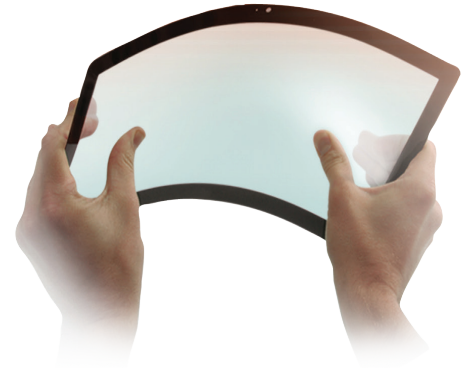


# Glass Strengthening

## Standard Glass Chemical Strengthening

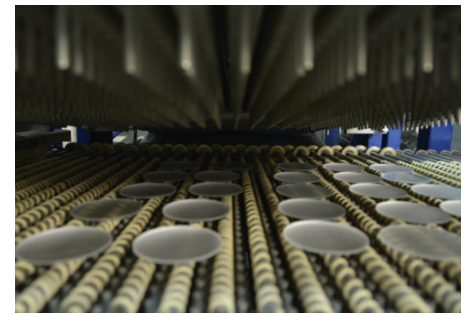
Abrisa Technologies' chemical strengthening process toughens soda-lime, float, and other borosilicate based glasses while keeping optical distortion to a minimum through a sodium and potassium ion exchange in a salt bath. Glass can be strengthened for 8, 16, or custom hours depending on the balance of hardness and bend strength desired. Popular for displays, portable devices, defense and avionics instrumentation.



- Enhanced Break & Damage Resistance
- Small mm Sizes for Sensors, Large 46" for Displays
- Best for Glass 0.1 to 3.0mm Thickness
- FSM Depth of Layer Compressive Stress Tested

## Standard Glass Heat Tempering

Tempering brings glass to its softening point of 600°C and then rapidly cools it to create high surface compression of at least 10,000 psi or 69 MPa. The process makes the glass stronger and safer than annealed or untreated glass and makes it less likely to break through thermal shock.



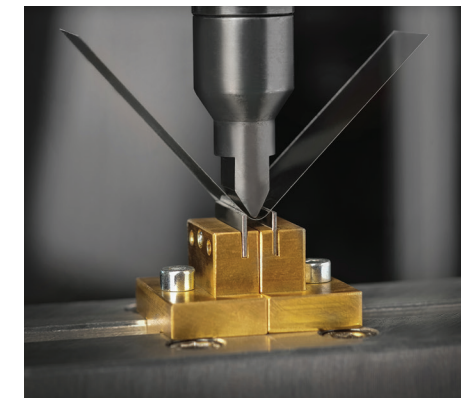
- Thicknesses from 3.0mm to 19.0mm
- Max Size of 29" x 33"
- Small Dice Part Break Pattern for Safety
- Non-Destructive GASP Polarimeter Compressive Stress Tested

Property	Heat Tempering Change	Heat Strengthening Change	Chemical Strengthening Change (8 hours)	Chemical Strengthening Change (16 hours)
Impact Resistance*	5 to 6x	N/A	3 to 4x	4 to 5x
Bending Strength*	4 to 5x	2x	3.5x	2.5 to 3x
Resistance to Temperature*	4x	2.5x	1.8 to 2.5x	1.8 to 2.5x
Vickers Hardness*	N/A	N/A	1.4x	1.4x
Maximum Temperature*	243°C	230°C	300°C	300°C
Compressive Stress at Surface	>69MPa	24MPa to 69MPa	165MPa (24kpsi)	220MPa (32kpsi)

\*Relative increase over annealed glass. 5x means 5 times greater.

## HIE™ Thin Aluminosilicate Glass Strengthening

Abrisa Technologies combines High Ion-Exchange or HIE™ chemical strengthening with high native strength aluminosilicate technology glass to produce solutions with 6-8x the strength of standard float glass. The HIE™ process and special materials afford the OEM reduced thickness to support low profile devices and reduced weight for portability while delivering protection with a high modulus of rupture and superior scratch and damage resistance.



- Asahi Dragontrail™, Corning® Gorilla® Glass 3, SCHOTT Xensation® & AS 87
- Displays, Scanners, Touchpads, Windows
- Strong, Lightweight & Thin (0.1 to 2.0mm)
- Impact, Scratch & Bend Resistant
- Resistant to Temperature Changes