Low Reflection and Non-Glare Glass Solutions

Displays • Touch Panels • 2D-3D Scanners • Image Sensors

Abrisa Technologies offers an expanded range of standard stock non-glare (NG), anti-reflection (AR) and anti-reflection coated non-glare (NG/AR) glass and custom solutions, ready to be fabricated to your exact specifications. The display designer and integrator now have 3 options from which to choose to best suit their needs for reduced reflection and glare, throughput efficiency for display brightness, and for maintaining image quality.

Ready-to-Fabricate Sheet Sizes Up To: 78” x 46”

Standard Non-Glare (NG) Soda Lime Glass
- 60 Gloss (Thicknesses 1.1, 1.9, 3.0mm)
- 90 Gloss (Thicknesses 1.1, 1.9, 3.0mm)
- 120 Gloss (Thicknesses 1.1, 1.9, 3.0mm)

Options for Non-Glare (NG) Glass
- 1 or 2 Sides NG
- Additional Values from 60 to 130 Gloss
- Anti-Reflection Coating, 1 or 2 Sides
- Low Iron, Low Sparkle
- HIE™ Aluminosilicate

AR Coated Sheet Sizes Up To 126” x 88”
- R < 0.5% Photopic (Thicknesses 0.7 to 3.0mm)

Options for Anti-Reflection (AR) Glass
- 1 or 2 Sides AR
- Oleophobic/Hydrophobic
- Low Expansion – SCHOTT Borofloat®
- Non-Alkaline – Corning® Eagle XG®
- Thin Glass – SCHOTT D263®, AGC EN-A1
- HIE™ Aluminosilicate - SCHOTT AS 87, Corning® Gorilla® Glass, AGC Dragontrail™

Throughput Efficiency - Transmission

Bare Glass, >4% Reflection
AR Coated Glass, <0.5% Reflection

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Abrisa Technologies 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 (AIG) located in Santa Paula, CA and ZC&R Coatings for Optics (ZC&R) located 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 high-quality Total Solutions are in use in a variety of industries and markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors and imaging, Photonics, Medical/Dental, Life Science Analytics and more.

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Benefits of Non-Glare (NG) Anti-Reflection (AR) Glass and NG/AR Glass

Anti-Reflection (AR) coated glass helps diminish surface reflections while increasing light throughput or brightness of the viewed image over moderate wavelength and angular ranges. Standard AR coated glass is not diffusive and is therefore able to maintain the highest levels of image resolution and clarity.

Non-glare (NG) glass is etched to produce uniform and evenly diffusive surfaces that disperse reflected light, preventing glare even at extreme angles. The lower the gloss level, the more diffusive the surface and the less glare but with some sacrifice of resolution and throughput efficiency of the viewed image. Anti-reflection coated NG glass (NG/AR) combines a bit of both; improvement of throughput efficiency, reduction in photopic specular reflectance of NG glass alone and retention of diffusive surfaces for reduced glare over large angles. Abrisa Technologies offers all 3 options and custom solutions to fit your needs.

Comparison of Non-Glare (NG) and Anti-Reflection (AR) Glass

<table>
<thead>
<tr>
<th>Performance Feature</th>
<th>Non-Glare Soda Lime Glass</th>
<th>AR Coated Non-Glare Soda Lime</th>
<th>AR Coated Soda Lime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput</td>
<td>Reduced throughput</td>
<td>Moderate throughput</td>
<td>✓ Enhanced throughput</td>
</tr>
<tr>
<td>Viewing Angle</td>
<td>✓ Large angle 0 - 60º</td>
<td>Good 0 - 30º, moderate 45º</td>
<td>Good 0 - 30º, custom for 0-50º</td>
</tr>
<tr>
<td>Refractance per Side</td>
<td>Typical 6 - 8% for 1 side NG</td>
<td>Typical 0.25 - 0.75% for 1 side NG</td>
<td>Ravg &lt; 0.5%</td>
</tr>
<tr>
<td>Spectral Usage Range</td>
<td>✓ Photopic and 340 - 1800nm</td>
<td>Photopic and 425 - 900nm</td>
<td>Photopic, 425 - 725nm and custom</td>
</tr>
<tr>
<td>Clarity and Resolution</td>
<td>Clarity trade-off by gloss level</td>
<td>Some trade-off by gloss level</td>
<td>✓ Retains clarity and resolution</td>
</tr>
<tr>
<td>Ghosting</td>
<td>✓ Minimizes ghosting seen</td>
<td>✓ Minimizes ghosting seen</td>
<td>Ghosting limited by % reflection</td>
</tr>
<tr>
<td>Touch Glide</td>
<td>✓ Enhances &quot;glide&quot; response</td>
<td>✓ Enhances &quot;glide&quot; response</td>
<td>Similar to uncoated glass</td>
</tr>
<tr>
<td>Material Availability</td>
<td>Soda lime, low iron, low sparkle</td>
<td>Soda lime, low iron, low sparkle</td>
<td>On soda lime, low iron, low sparkle custom coating available</td>
</tr>
<tr>
<td>Strengthening</td>
<td>Chemical strengthening and heat tempering</td>
<td>Chemical strengthening and heat tempering before coating</td>
<td>✓ Specially HIE™ chemical strengthening and tempering before coating</td>
</tr>
</tbody>
</table>

Image Comparison of Various Non-Glare (NG) Solutions

Gloss 120 Level - No AR  
Gloss 90 Level - No AR  
Gloss 60 Level - No AR

Photopic Specular Reflectance for AR, NG and NG/AR Soda Lime Glass