High Performance Decorative Glass

by Imaging Sciences, LLC

Phrases from the First Amendment of the U.S. Constitution on DecoSHADE glass curtain wall. Inset shows view from inside looking out. S.I. Newhouse School of Public Communications, Syracuse University, Syracuse, New York

Solar Control, Privacy, Security, and One-Way Vision Graphics with One Unique Product

Imagine Glass™ Decorative Glass for the Imagination
DecoSHADE™ is laminated safety glass with a printed film interlayer that presents an opaque surface or graphic image on one side and just a tint on the opposite side, sometimes called one-way vision glass. The interlayer is permanently fused between two pieces of glass with heat, pressure, and an adhesive material.

Precise exact registration printing on the interlayer gives DecoSHADE solar control, one-way vision graphics, privacy, and security features that make it a functional option for facades, doors, windows, canopies, and other exterior glass applications.

With the correct lighting conditions, DecoSHADE can also add privacy and decorative features to interior glass applications.

Laminated glass has many desirable characteristics as a building material:

- Safety glazing—holds together when shattered to prevent injuries related to flying glass. Meets ANSI Z97.1
- Superior acoustical attributes for a quieter environment
- Penetration resistance
- 99% UV blocking helps fabrics and furnishings look new longer
- Easy care and cleaning
- Long lasting for ageless beauty

Most glass types can be incorporated:

- Annealed, tempered, or heat-strengthened
- Low-e coatings and solar control glass
- Insulated glass units improve thermal performance and energy efficiency
- Low iron for maximum clarity and trueness of color
- Bullet resistant constructions
- Various thicknesses starting at 5/16” total construction
- Edge finishing, holes, notches, and pattern cuts

DecoSHADE Glass – an Imagine Glass product by Imaging Sciences, LLC
38174 Willoughby Parkway Willoughby, OH 44094 440.975.9640  www.imaging-sciences.com
**Solar Control** - DecoSHADE reduces solar heat gain, decreasing air conditioning loads. And, DecoSHADE can be laminated with solar control glass or used with low-emissivity coatings to further improve solar control. From the interior, dark and light contrasts as well as glare are reduced, making daylit conditions more comfortable - without disturbing occupants’ view of the outdoors.

**Decorative** - Color, logos, images, text, designs, or graphics can be printed on DecoSHADE to add unique character and beauty to any project, without being seen from the inside. Metallic colors are available.

**Privacy** - The view into an area is obscured when looking at the colored or graphic side of DecoSHADE, but building occupants looking through the tinted side have a clear view of the outdoors with no distracting pattern.

**Security** - The printed film interlayer used in DecoSHADE adds 30,000 psi of tensile strength to the already superior penetration resistance of laminated glass, making it an excellent choice when deterring forced entry is a priority. With the correct specifications, DecoSHADE can protect building interiors from winds and rain associated with hurricanes. DecoSHADE can also be used in bullet resistant constructions.
DecoSHADE Performance Data Table

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<thead>
<tr>
<th></th>
<th>Transmittance</th>
<th>Reflectance</th>
<th>U-Value</th>
<th>Relative Heat Gain</th>
<th>Shading Coeff.</th>
<th>SHGC</th>
<th>LSG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Visible</td>
<td>UV</td>
<td>Solar</td>
<td>Vis-Out</td>
<td>Solar</td>
<td>Winter</td>
<td>Summer</td>
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<tr>
<td>9/16&quot; DecoSHADE SD50 Laminated Glass (1)</td>
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<td>26%</td>
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<td>&lt;1%</td>
<td>16%</td>
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<td>27%</td>
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<td>28</td>
</tr>
<tr>
<td>DecoSHADE SD50 IG 1/4&quot; SB60 (4)</td>
<td>34%</td>
<td>&lt;1%</td>
<td>16%</td>
<td>25%</td>
<td>26%</td>
<td>29</td>
<td>23</td>
</tr>
</tbody>
</table>

(1) Values based on testing by DSET Laboratories, a Division of Atlas Material Testing Technology LLC. Laminated glass consisting of two lites 1/4" low iron glass and DecoSHADE SD 50% coverage

(2) Center pane values based on LBNL Window v7.1.3.0 Glazing System Thermal and Optical Properties with DecoSHADE SD50 DSET test data. Insulated Glass unit consisting of 9/16" DecoSHADE SD50 low-iron laminated glass on the outside surface, 5/8" air space, PPG Sungate 400 on 6mm clear glass #6 surface

(3) Center pane values based on LBNL Window v7.1.3.0 Glazing System Thermal and Optical Properties with DecoSHADE SD50 DSET test data. Insulated Glass unit consisting of 9/16" DecoSHADE SD50 low-iron laminated glass on the outside surface, 1/2" air space, Guardian SN68 on 6mm clear glass #5 surface

(4) Center pane values based on LBNL Window v7.1.3.0 Glazing System Thermal and Optical Properties with DecoSHADE SD50 DSET test data. Insulated Glass unit consisting of 9/16" DecoSHADE SD50 low-iron laminated glass on the outside surface, 5/8" air space, PPG Solarban 60 on 6mm clear glass #5 surface

**ENERGY TERMS**

**Visible Light Transmittance**

The percentage of visible light (380-760 nm) that is transmitted through the glass

**Ultraviolet Light Transmittance**

The percentage of ultraviolet light (330-380 nm) that is transmitted through the glass. UV light is considered to be the energy that accounts for the majority of fading of materials and furnishings

**Solar Transmittance**

The percentage of ultraviolet, visible and near infrared energy (300-2500nm) that is transmitted through the glass

**Visible Light Reflectance**

The percentage of light that is reflected from the glass surface

**Solar Reflectance**

The percentage of solar energy that is reflected from the glass surface

**NFRC U-Value**

A measure of heat gain or loss through glass due to the differences between indoor and outdoor temperatures. The lower the U-Value, the less heat is transmitted through the glass. These are center pane values based on NFRC standard winter nighttime and summer daytime conditions.

U-values are given in the English system, BTU/(hr*ft²*°F). Metric U-values are given in W/(m²*K). To convert from English to metric, multiply the English U-value by 5.6783.

NFRC winter nighttime U-values are based on an outdoor temperature of 0°F (-18°C), an indoor temperature of 70°F (21°C) and a 12.3 mph (19.8 km/h) outdoor air velocity.

NFRC summer daytime U-values are based on an outdoor temperature of 89°F (32°C), an indoor temperature of 75°F (24°C), a 6.2 mph (10.1 km/h) outdoor air velocity and a solar intensity of 248 BTU/(hr*ft²*°F) (782 W/m²).

**Relative Heat Gain (RHG)**

The amount of heat gained through glass taking into consideration U-value and shading coefficient. Expressed in terms of BTU/hr/ft². Using the NFRC standard, relative heat gain is calculated according to the English system as follows:

\[ RHG = \text{Summer U-value} \times (14°F + \text{shading coefficient}) \times 200. \]

**Shading Coefficient**

The ratio of solar heat gain through a specific type of glass that is relative to the solar heat gain through a 1/8" (3 mm) ply of clear glass under identical conditions. As the shading coefficient number decreases, heat gain is reduced, which means a better performing product.

**Solar Heat Gain Coefficient (SHGC)**

The portion of directly transmitted and absorbed solar energy that enters into the building’s interior. The higher the SHGC, the higher the heat gain.

**Light to Solar Gain Ratio (LSG)**

The ratio of Visible Light Transmittance divided by the Solar Heat Gain Coefficient. The Department of Energy’s Federal Technology Alert publication of the Federal Energy Management Program (FEMP) views an LSG of 1.25 or greater to be Green Glazing/Spectrally Selective Glazing.

DecoSHADE is manufactured and sold under license, Contra Vision® XR™ US B1 4,925,705, US 6,267,052, or PCT/IB03/00555

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