

# Milgard Architectural Manual – Glass/Grids Section

## HIGH PERFORMANCE GLASS – MILGARD’S SUNCOAT™ & SUNCOATMAX™ LOW-E

SunCoat Low-E is a transparent, low-emissivity coating applied to one side of the glass in our dual-pane windows. This microscopically thin coating filters the sun's energy in the summer and reduces heat loss in the winter, making even energy bills look better. Low-E has been a product usually recommended for cold climates. Now with our introduction of SunCoat Low-E glass, you can use this product everywhere, from the heat of Southern Nevada desert to the cold of Chicago and Alaska winters.

You can get even greater thermal performance with the addition of argon gas to our standard, dual-pane, SunCoat Low-E insulating glass. In fact, our vinyl and fiberglass insulated windows have even been recognized by ENERGY STAR® for their exceptional energy-saving qualities in your home.

### The Benefits of Milgard SunCoat Low-E Glass Are Clear

- Comes standard on all Milgard windows and doors
- Reduces heat and cooling loads
- Reduces harmful UV rays that fade carpet and furniture up to 86%
- Provides all around comfort, all year long

SunCoatMAX is also a low-emissivity coating, except it has three spectrally selective layers to filter out UV while providing a lower solar heat gain and allowing 66% visible light transmittance. What is more, SunCoatMAX provides the ultimate in fading protection. It blocks 95% of the sun's damaging ultraviolet rays - a leading cause of fading - so your furniture, carpets, curtains and wall coverings stay beautiful for years.

	Solar Heat Gain Coefficient	Ultra Violet Light Transmittance	Winter Heat Loss (U-Factor)
Clear single-pane glass	0.86	71%	1.04
Clear double-pane glass	0.76	56%	0.48
Milgard SunCoat® Low-E Glass	0.37 - 0.41*	14 - 16%*	0.30
Milgard SunCoatMAX™ Low-E Glass	0.27	5%	0.29
Ultra Violet Light Transmittance			

**NOTE:** All values calculated using Window 5.2 and represent center of glass properties. (For more information on the window program, see <http://windows.lbl.gov/software/default.htm>.) All glass is 3mm thick, and 1/2" gap width. These measurements are for comparable purposes only, your values may differ.

\* Contact your nearest Milgard location to receive the specific value.

## TINTED GLASS

Tinted glass is manufactured by the float glass process, except it has additional additive to give the tint a unique coloration.

### Benefits of Tinted Glass:

- Reduces visibility to an interior, adding privacy.
- Absorbs heat to reduce solar heat gain.
- Reduces ultraviolet light damage to interior furnishings.
- Can be tempered.

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**NOTE:** The addition of after-market applied tints or films to Milgard windows and patio doors may cause seal failure or glass breakage, and will void Milgard's full Lifetime Warranty. For complete warranty details, visit [milgard.com](http://milgard.com)

There are various tints available through Milgard to achieve the energy performance or architectural style that is desired. These tints include Solar Bronze, Solar Gray, Graylite, Solex, Evergreen and Azurlite. Please check with your Milgard Representative on availability of these and other tinted products.

## REFLECTIVE GLASS

The reflective coating is applied just like Low-E. It is either sprayed through (pyrolytic process) or applied using the vacuum deposition sputter-ing process, depending on suppliers.

### Benefits of Reflective Glass:

- Reflects light and heat with a metal oxide coating giving a mirror effect.
- Minimizes solar heat gain and ultraviolet light damage to interior furnishings.
- Adds daytime privacy.
- Can be tempered.

There are various reflective glass types available through Milgard to achieve the energy performance or architectural style that is desired. These include Solar Cool Bronze and Solar Cool Gray. Please check with your Milgard Representative on availability of these and other reflective products.

**NOTE:** Heat absorbing and heat reflective glass can only be used on the exterior lite of a glazing unit, to avoid a build-up of heat inside the airspace, which will cause thermal stress cracks or seal failure.

**NOTE:** Reflective-type glass works with the play of light. Example: During daylight hours you can't see inside a building with reflective glass, you only can see your reflection. At night, the opposite effect occurs. You can see in, but the people inside cannot see out. If you specify this type of glazing in a residential application, suggest that a spotlight be placed outside of the window. It will give the same effect as daylight.

## LAMINATED GLASS

Laminated glass is produced by permanently bonding two pieces of glass together with a tough plastic interlayer (polyvinyl butyral) under heat and pressure. Once bonded together, the lite behaves as a single piece. The interlayer is invisible when viewed through the glass; thus, the finished lite is indistinguishable from plain glass.

Most often, laminated glass is produced from annealed glass, but tempered glass can be used when special performance needs are present. The benefit of laminated glass – if it is broken, glass fragments adhere to the plastic interlayer rather than falling free and potentially causing injury. Laminated annealed glass can be cut or drilled.

Laminated glass is required in sloped glazing applications (such as skylights), that exceed any of the following conditions:

- The area of each pane (single glass) or unit (insulating glass) exceeds 16 square feet.
- The highest point of the glass is greater than 12 feet above any walking surface or other accessible area.
- The nominal thickness of each pane exceeds 3/16".

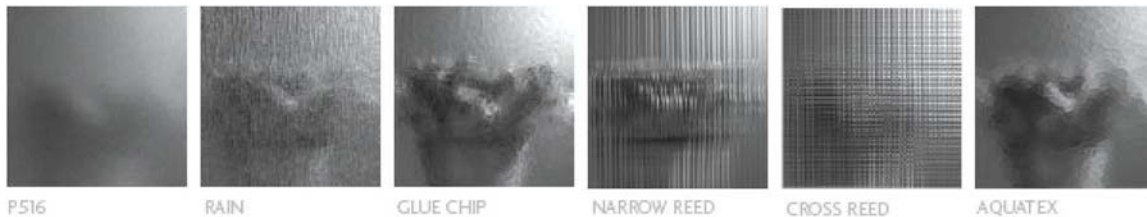
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## **Noise Reduction Benefits:**

- Laminated glass is highly effective in reducing noise, thus reducing Sound Transmission Ratings. The damping characteristics of the plastic interlayer combines with the attenuating characteristics of the air space of the insulated glass (IG) unit to maximize sound reduction.
- Example: Two lites of 1/4" laminated glass in an IG unit with a 1/2" air space provides an STC rating of 42. This compares with two pieces of plain 1/4" glass in an IG unit with a 1/2" air space, where the STC rating would be 35.
- Laminated glass eliminates 99.9% of ultraviolet rays, making it highly effective in protecting furnishings, displays, merchandise, etc.
- Standard laminated glass is 7/32" with a .030 (approx. 1/32") polyvinyl butyral interlayer.

## **OBSCURE GLASS**

To add privacy where window coverings are impractical or undesirable, we recommend obscure glass. Our obscure glass can be tempered for safety and is available in numerous styles, some of which are shown below.



## **Benefits of Obscure Glass:**

- Adds privacy where window coverings are impractical or undesirable (bathrooms, door sidelites).
- Various colors and texture patterns provide a translucent, semi-opaque effect for unique visual design applications.
- Can be tempered.

Please check with your Milgard Representative on availability of these and other obscure glass products.

## **GRIDS (DIVIDERS, GBG, MUTTONS, ETC.)**

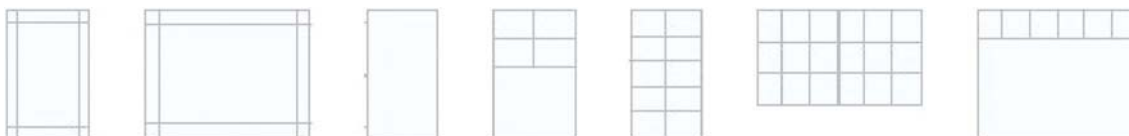
With the right choices in grids, you can really make your windows and doors stand out. Grids are available in all of our window and door product lines. Milgard's Montecito™ and Tuscany™ product lines offer a choice of either flat, sculptured or simulated divided lite (SDL) grid options. The Style Line™ product line offers flat grids as an option.



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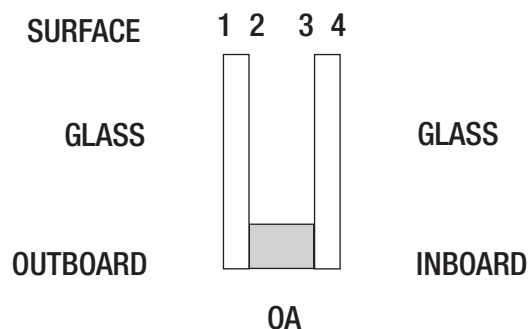
Multiple grid configurations allow nearly endless options to customize your home design. By simply altering the grid design, you can dramatically impact the home's curb appeal. Below are just a few of the many possible grid configurations.

Please check with your Milgard Representative on availability of these and other grid patterns.



## BASIC GLASS DEFINITIONS

- Lite:** Single piece of glass
- SS:** Single strength glass, 3/32" thickness
- DS:** Double strength glass, 1/8" thickness
- IG Unit:** Two or more pieces of glass separated by a hermetically (air-tight) sealed airspace, forming a construction that reduces heat transfer for improved thermal performance.
- O.A.:** The thickness, overall, of an insulated unit of glass, including both pieces of glass and the spacer bar.



## GLASS LIMITATIONS

- Up to 12 sq ft:** SS glass (3/32" thick)
- From 12 to 25 sq ft:** DS glass (1/8" thick)
- From 25 to 40 sq ft:** 3/16" glass
- Over 40 sq ft:** 1/4" glass

## R-VALUE vs. U-FACTOR:

**R-value:** Measures the insulation effectiveness of a window – its resistance to heat gain or loss. The higher the r-value, the better the insulation against heat and cold.

**U-factor:** Measures the heat gain or loss caused by differences in indoor and outdoor temperatures. The lower the u-factor, the slower the rate of heat flow, thus the better the insulating performance.