

LoE-i89 Glass

Introducing LoE-i89™, our new energy-saving 4th surface coated glass. It offers more light transmittance and less reflectance than LoE-i81. And it's now available in annealed making it less expensive. Yet it still delivers a center of glass U-factor of just 0.20 when coupled with our LoE³ or LoE² glass and argon fill in a double-pane unit.

Without argon and with or without capillary tubes, the unit still delivers a U-factor of just 0.23 – perfect for high altitudes.

When LoE-i89 is used in conjunction with LoE³-366®, your windows are in compliance with ENERGY STAR guidelines across the country, including the stricter northern guidelines taking effect in 2014.

What's more, LoE-i89 is easy to clean and there's no haze to mar the view. That's our new LoE-i89, our enhanced performance glass.

Turn your double-pane windows into triple-pane performers.

There's no need to go to triple-pane windows to meet the various energy-saving guidelines. No need to invest in redesigning your windows and altering your manufacturing processes either. A double-pane IG unit with LoE-i89 can meet the guidelines.

LoE-i89 is sputtered onto the indoor lite, the #4 surface, thus reflecting escaping heat back into the room and lowering U-factors. Coupled with our LoE² or LoE³ glass and argon fill, this double-pane unit delivers performance much better than clear triple-pane – a center of glass U-factor of just 0.20 compared to 0.37 with clear triple-pane.

To surpass the U-factor performance of our LoE-i89 double-pane unit, you would need to go to a triple-pane unit with a low-E coating in each gap.

IG UNIT	U-FACTOR
Double-Pane, Clear, Air	0.48
Double-Pane w/LoE ³ -366, Argon	0.24
Double-Pane w/LoE ³ -366 and LoE-i89, Air	0.23
Double-Pane w/LoE ³ -366 and LoE-i89, Argon	0.20

7/8" IG UNIT	U-FACTOR
Triple-Pane, Clear	0.37
Triple-Pane w/LoE ³ -366, Argon	0.25
Triple-Pane w/LoE ³ -366, LoE-180, Argon	0.20
Triple-Pane w/LoE ³ -366, LoE-180, LoE-i89, Argon	0.17

Meet today's strictest energy efficiency guidelines.

With a center of glass U-factor of only 0.20 (0.23 without argon) and SHGC of just 0.25, an insulating glass unit with LoE³-366 and LoE-i89 meets the most stringent energy standards – without going to a triple-pane unit.

This allows you to offer more double-pane window options that can meet the proposed ENERGY STAR guidelines everywhere in the country.

The advantages are more than clear.

In addition to providing maximum energy efficiency in a double-pane unit, LoE-i89 offers several other customer-pleasing benefits.

Its surface is smooth, making it easier to remove label residue and clean. And perhaps most importantly, there's no haze to mar the view.

Naturally Cardinal IG units with LoE-i89 live up to the Cardinal reputation for long-range durability, delivering the industry's lowest failure rate – only 0.20% over 20 years.

Give homeowners another reason to love LoE-i89 units – include Neat® naturally clean glass on the outside. Your windows stay cleaner longer and clean easier. Finally, protect your windows in transit as well as on the job site with Preserve® protective film.

GLASS PERFORMANCE

PRODUCT	VISIBLE LIGHT TRANSMITTANCE	SOLAR HEAT GAIN COEFFICIENT	U-FACTOR (AIR / ARGON)	FADE UV	FADE ISO
Double-Pane					
LoE-180, LoE-i89	77%	0.62	0.24 / 0.21	0.27	0.61
LoE ² -272, LoE-i89	70%	0.41	0.23 / 0.20	0.16	0.53
LoE ² -270, LoE-i89	69%	0.36	0.23 / 0.20	0.14	0.51
LoE ³ -366, LoE-i89	63%	0.27	0.23 / 0.20	0.05	0.41
7/8" Triple-Pane					
LoE-180, LoE-180, LoE-i89	68%	0.50	0.21 / 0.17	0.13	0.49
LoE ² -272, LoE-180, LoE-i89	62%	0.34	0.21 / 0.17	0.08	0.43
LoE ² -270, LoE-180, LoE-i89	60%	0.30	0.21 / 0.17	0.07	0.42
LoE ³ -366, LoE-180, LoE-i89	56%	0.22	0.21 / 0.17	0.02	0.35

Definitions

Note: All values calculated using Window 6.3. (See <http://windows.lbl.gov/software/default.htm> and http://windows.lbl.gov/materials/optical_data/default.htm for more information on glass optical data and the Windows 6.3 program.)

Solar Heat Gain Coefficient – (SHGC) – The amount of solar radiation that enters a building as heat. The lower the number, the better the glazing is at preventing solar gain.

Fading Transmission – The portion of energy transmitted in a spectral region from 300 to 700 nanometers. This region includes all of the ultraviolet energy and part of the visible spectrum, and will give the best representation of relative fading rates. The lower the number, the better the glass is for reducing fading potential of carpets and interior furnishings.

U-Factor – This represents the heat flow rate through a window expressed in BTU/hr-ft²-°F, using winter night weather conditions of 0°F outside and 70°F inside. The smaller the number, the better the window system is at reducing heat loss. Cardinal actively supports and participates in The National Fenestration Rating Council (NFRC). Windows with LoE-i89 and LoE² or LoE³ that are rated and certified by the NFRC can comply with Energy Star™ requirements for most climates in the country. (See <https://www.energystar.gov/products/certified-products/detail/residential-windows-doors-and-skylights> for more information on the Energy Star windows program.)

Take your window U-factors to a new low – with LoE-i89.

LoE-i89 on the 4th surface of your windows allows you to get near triple-pane performance in a double-pane unit, and meet the toughest energy guidelines as well. Finally, LoE-i89 can be purchased in hurricane-resistant laminated glass in a variety of shapes and sizes.

To learn more about LoE-i89 and other Cardinal glass products, ask your contractor or architect.