

Cardinal LoE-i89™ Coating

Cardinal CG Company has developed a durable sputtered TCO (Transparent Conductive Oxide) coating that can be used on the roomside glass surface (surface #4 of a dual pane IG unit or surface #6 of a triple glazed unit). This coating is designated LoE-i89. LoE-i89™ enhances the U-Factor of the window by reflecting heat back into the home. In addition, this reflected heat will improve comfort in the area around the window by making occupants feel warmer. LoE-i89™ is an improvement to the previous LoE-i81® by improving light transmission in the monolithic form by approximately 8%. The patent pending LoE-i89™ coating is an Indium Tin Oxide (ITO) coating applied by the sputtering process.

LoE-i89™ coating has the following attributes:

- In an IG unit with Cardinal's LoE³-366® coating on surface #2 and the LoE-i89™ coating on surface #4, the center of glass U- Value with a 90% argon fill is 0.20 and 0.23 Btu / hr ft² F with air filling.
- An emissivity of 0.149.
- Sufficient durability so that it can be used on the roomside glass surface.
- Haze and surface roughness 4 times lower than pyrolytic TCO coatings.
- Compatibility with many glazing sealants / tapes, Cardinal Preserve Film, and labels used in the window industry. (Contact your manufacture of glazing materials for compatibility and adhesion testing.)

Other considerations for the LoE-i89™ coating:

- When used on the # 4 glass surface in a dual pane IG unit or # 6 glass surface in a triple glazed unit it will reflect roomside radiation back into the room. The roomside pane of glass will be colder than the same glass construction that does not include the LoE-i89™ coating. This will result in a slightly colder roomside pane in winter conditions with the potential of having a higher probability of roomside glass condensation in the winter. This is very dependent on the outdoor ambient temperature, indoor room temperature, and the % RH in the room.
- Standard cleaning solutions, such as a soap solution with clean water, or standard commercial cleaning products (like Windex®) can be used to clean the LoE-i89™ coating.

- Many rust removal products contain hydrofluoric acid (HF). HF containing materials, including rust removers, will attack glass and the LoE-i89™ coating causing permanent damage. These materials should not be used to clean the LoE-i89™ coating
- Abrasive cleaning products including cerium oxide, Soft Scrub®, and Bar Keepers Friend® should not be used on the LoE-i89™ coating. In addition, scratch removal should not be attempted with the LoE-i89™ coating. Buffing with the aforementioned products may cause changes in the appearance of the coating.
- As with standard non-coated glass products, razor blades or other sharp instruments should not be used when cleaning the LoE-i89™ glass surface. If a squeegee is used to clean the coated glass surface, the squeegee should not have any metal edges exposed as the metal edges could scratch the coating or glass.
- If furniture polish or similar materials are used on the wood components of the window. Care should be taken to avoid overspray onto the coated glass. If overspray does occur, the glass must be cleaned immediately.

Thermal performance with the LoE-i89™ can be found in TSB IG#5 Performance Data Comparisons.

Contact Cardinal's Technical Service department for recommendations on heat treating of LoE® products in triple pane applications.

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