



### Featuring Cardinal IG

In addition to offering Cardinal IG as the primary source of insulated glass featured in our skylights and custom over-head glazings; we offer the same high quality glass products directly to our CrystaLite Dealers.

### The Twenty Year Difference

Lost profits are unappealing to any window manufacturer, especially when due to warranty replacements caused by IG seal failure. Based on extensive research and experience, Cardinal estimates that the real cost for every glass unit a window company replaces is approximately \$200.

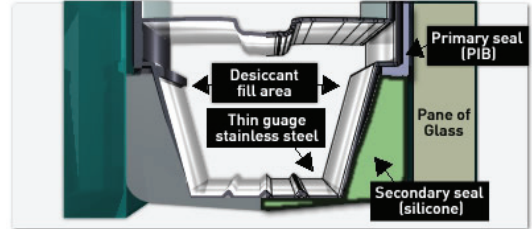
This includes hard and soft costs for replacement windows, service calls, factory overhead, business disruption, and a damaged customer faith. At \$200 per unit, how much could you and your channel partners be losing in the long run?

XL Edge insulating glass comes with the lowest failure rate in the industry - developed in part from Cardinal's 45 years of experience in manufacturing IG units, 27 of these years utilizing a dual-seal silicone system.

### Don't Let IG Failures Bite You in the Bottom Line

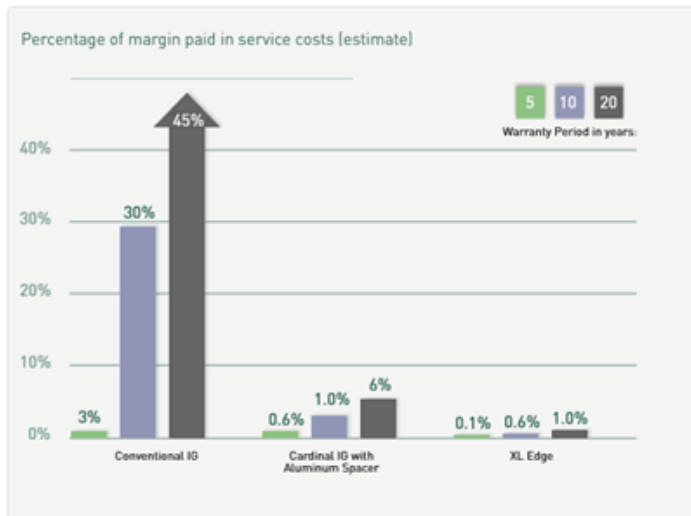
We provide a 20-year guarantee on XL Edge units because of our advanced design and fabrication; see warranty information for details. XL Edge is at the leading edge, incorporating a stainless steel spacer with airtight bent corners and a dual-seal construction of compressed polyisobutylene (PIB) and silicone. Desiccants are contained in the spacer to eliminate any potential for moisture. Argon is filled inside the IG unit, improving window U-factor. Since XL Edge is a warm-edge IG, the possibility of indoor condensation is greatly reduced.

Cardinal's superior IG construction translates into a 0.2% seal failure rate over twenty years - plainly the lowest in the industry. To compare, the well-established 1976 Sealed Insulating Glass Manufacturing Association (SIGMA) study identifies average industry IG failures of over 9% in fifteen years. Modern competitive spacer systems simply cannot match the long-term durability characteristics of XL Edge IG.



### Utilizing CrystaLite as Your Raw IG Provider, We Offer:

- Quick turn-around time on orders.
- Deliveries twice a week throughout the Washington I-5 corridor.
- Competitive pricing, as well as special pricing on large volume orders.
- Cardinal IG line of Clear and LoE products featuring Cardinal 179, 270, 272, 240, 366, and i81.
- Cardinal IG 20 Year Warranty on Annealed and Tempered IG Units using Cardinal IG XL-Edge Stainless Steel Spacer.
- Cardinal IG 10 Year Warranty on Annealed or Tempered over Laminated IG Units using standard insulated colored Aluminum Spacer.



This graph estimates the cumulative percentage of your profit margin from window sales that can be lost to service costs. Over time, conventional IG units are increasingly prone to failure. The longer the warranty period, the more your profits may be eroded by service costs.



### Skylight ratings differ from Windows

Prior to the adoption of the IBC 2003 code changes, skylights and windows were rated the same for thermal performance. Windows are still rated vertically at 90° from horizontal. The skylight rating procedure has changed however.

Skylights are now rated at 20° from horizontal. This is to simulate the real world application of the skylite installed on a roof. A skylight rated at 20° will have a higher U-Factor than if the product rated was at 90° (vertically). For this reason, the U-Factors for skylites have increased even though the thermal performance of the glass and frames being used has improved.

The ENERGY STAR standards have been adjusted to reflect the new rating procedure. Fenestration products must be retested and recertified on a 4 year cycle. CrystaLite skylites have completed this recertification process, therefore any NFRC labeling is current to the 20° rating procedure.

### Sound Transmittance

The following establishes a simplified procedure that can be followed by a building designer to make a preliminary evaluation of the minimum required glass Sound Transmission Class (STC) needed for exterior windows and/or skylights of a building subject to aircraft, highway traffic, or rail noise. These are the most commonly occurring sources of excessive exterior noise exposure.



Local building codes may regulate construction of buildings with excessive exterior noise exposure, to meet or exceed a STC rating. Unlike other fenestration value requirements, higher glass STC ratings indicated higher performing products. A STC requirement of 35 is common for construction near airports – therefore a STC rating of 35 or greater would qualify.

Theoretically, STC ratings have no upper limit in range; however, logistically there are some limitations. The entire building envelope is normally considered when addressing noise reduction. An STC of 35 would indicate a level of noise reduction such that otherwise loud noises would be reduced to a murmur. A rating of 45 begins ‘sound proofing’ where a majority of all sounds is blocked or greatly reduced. This might be a goal value of an interior wall of a home that features a high-end home theatre system in a particular room. 60 or higher provides superior ‘sound proofing,’ most sounds inaudible.

For perspective, typical interior walls in homes (2 sheets of 1/2” drywall on a wood stud frame) have an STC of about 33. Adding absorptive insulation in the wall cavity increases the STC to 36-39, depending on stud and screw spacing. Concrete and concrete block walls have STCs in the 40s and 50s for 4-8” thicknesses.

There is not a rating program available for the rating of fenestration series; however, STC ratings are known for center of glazing (COG). STC ratings for COG are typically used for windows and skylights as the glazing surface is what is exposed to excessive noise sources.

The following lists STC for COG of insulated glass units commonly used. **As always, CrystaLite is available for consultation for specific job requirements not listed here.**

### Standard Laminate Insulated Glass Units

OA Size	Outside Pane	Air Space	Inside Pane	COG STC
5/8”	1/8”	1/4”	1/8”   0.030”   1/8”	35
13/16”	3/16”	3/8”	1/8”   0.030”   1/8”	37
15/16”	3/16”	1/2”	1/8”   0.030”   1/8”	39
1”	1/4”	1/2”	1/8”   0.030”   1/8”	39

**Note:** CrystaLite standard unit skylights featuring Cardinal 272(Temp / Lam) IG units have a STC rating for COG of 35.

### Silicone Sealants for IG Units

Not all silicone sealants are safe to be used with Cardinal insulated glass (IG) units for glazing. Cardinal is one of our largest IG unit suppliers, and a leader in the glass industry. We have extended this advisory criteria to be followed for all glass units used and supplied by CrystaLite, Inc.

**Silicones containing Acetoxy will attack the sealant of the unit itself and cause failure.** Acetoxy is often listed as a base element in chemicals such as methyltriacetoxysilane. These sealants should not be used with IG units. Acetoxy-Cure has a vinegar smell that can be used to identify sealants containing this.

Neutral-Cure silicone is recommended and is commonly used. The list below contains sealants that have been tested and approved to be used with IG units. If the sealant you use and prefer is not included in this list, it may still be safe to use. Please call or email and we will verify.

### Approved Silicon Sealants

- Dow Corning 791
- GE Rapid Strength
- GE Siliglaze II
- Novagard M150
- Pecora 896

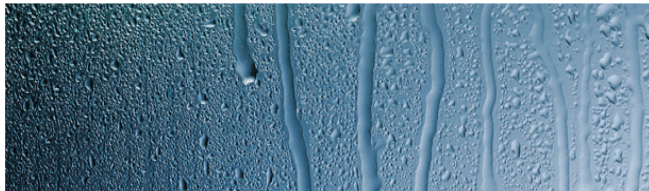
If the sealant you use and prefer is not included in this list, it may still be safe to use. Please call or email and we will verify.

### Not Recommended for use with Cardinal IG Units

- CRL Silicon Sealant #33S

## Condensation

Condensation is the visible change of water vapor in air - to a liquid state that often forms as droplets on windows, patio doors, and skylights in a home. It is important to point out that these windows, patio doors, and skylights are not the cause of condensation, but rather indicators of excess moisture in a home. Condensation on a skylight is not formed by water 'sweating' into the home; it is merely acting as a collector for the water already in your home condensing from the cooling air.



In winter months, the air temperature difference between the inside of a home and the cool outside air is much greater. Natural laws of nature state that warm air will flow towards cool air; the same basic principle that creates wind in our atmosphere. Although the technology used in manufacturing insulated glass units used in windows, patio doors, and skylights has greatly improved in recent years; these products are still less efficient than the insulated walls that make up the remainder of your home. Some heat will escape in these areas which leaves cold pockets of air near the surface.

Warm air can hold more moisture than cool air. As the air decreases in temperature near a window, patio door, or skylight it can not hold as much water vapor, thus resulting in condensation forming on your glass and/or frame. Often, condensation will form first on the metal framing of the product. In extreme conditions, condensation can form on the most efficient of vinyl or PVC frame.

### What does this mean?

Condensation is an indication that your humidity level is too high; there is too much moisture in your home. You can see this happening on your exterior glass products, but the same phenomenon occurs between the sheetrock and the studs of your walls. Particularly around nail heads, since metal is a poor insulator of temperature. Excessive moisture in your home can cause damage to your home in the form of warp, rot, and paint chipping. This is potentially dangerous when high humidity in your home aids in the formation of mildew and mold; especially when formed inside the walls. Most likely, when you have condensation on your windows, patio doors, and skylights; this is also happening in your walls.

### What causes high humidity levels?

Studies have shown that a family of four generally adds 18 gallons of water to the air in a week from daily life. Normal activities of showers, cooking, dishwashing, and even breathing release water into your air. Other common factors include gas appliances, large fish tanks, and house plants.

The problem is more common in newer built homes where the construction methods are 'tighter' than older homes which were built more breathable. Tighter built homes have far greater energy and heating efficiencies but tend to trap humidity in as well. Older homes allowed the gained water vapors to escape out, as well as the heat

### Why is condensation forming now?

Over the summer with the warmer air, your house will collect and hold moisture. You will begin to heat your home when the weather outside cools down in winter months. Your house will go through a drying out phase, which will increase the humidity in your air and the likelihood of condensation forming. This phenomenon occurs generally with rapid decrease in outside temperature in the Fall season.

### What's the solution?

There is no one solution for everyone. Often, a combination of procedures is required to manage a homes' humidity level.

- Remove or control obvious sources of moisture.
- Increase the ventilation and circulation of the interior air, including attics. Keep interior doors open.
- Vent air through windows for a short period daily.
- Open a window during showers and while cooking.
- Maintain a constant thermostat setting throughout the day; above 68° is recommended.
- Increase the air circulation of your home and allow air to pass through blinds and drapes.

When managing condensation, it is key to remember that the excess moisture that is already present in your home is the cause, and not your window, patio door, or skylight. CrystaLite skylights are constructed using the best dual-sealed insulated glass possible. We can help you select which of our products will deliver the optimal thermal properties for your installation. Condensation is a real world scenario. Our skylights are built with condensation gutters that collect running water when extreme condensation conditions occur and pass it to the outside through weep holes.

### Exterior Condensation

Conversely, exterior condensation, which forms on the outside pane of the skylight or window, typically occurs in the summer. This type of condensation can occur for several reasons; primarily because the glass temperature drops below the dew point temperature of the outside air, air with a high relative humidity.

Due to improved skylight and window design, and advances in glass technology (low-e coatings, argon gas, multi-pane) - exterior condensation is becoming a common occurrence in the NW during the mornings when dew is also on the grass.

While unsightly, exterior condensation should not concern you since it usually evaporates as the day wears on and will not affect the interior of your home. Since you cannot control the relative humidity outside your home, the only step you can take to combat exterior condensation is to warm the inside surface of the window, as this is a way to warm the outside surface. Seeing exterior condensation on those rare days should be reassurance that your skylights and windows are doing their job: keeping your heating and cooling in your home where it belongs and saving you money.