



CrystaLite, Inc. : Skylight Packet

Your Clear Choice

CrystaLite skylights are structurally designed, certified, and stamped approved to meet and exceed the building codes. With our standard skylight frames and our light, medium, and heavy custom frame systems, CrystaLite can accommodate almost any overhead application.

All CrystaLite skylights internal and external frame components have welded corners to ensure strength and a water tight seal.

We offer several options in standard skylight frames; including a standard aluminum frame, an aluminum thermal-break frame; and our highly insulating PVC / Aluminum frame series. PVC / Aluminum frames exhibit exceptional condensation resistance properties, which is vital in our moist climate.

Energy Programs

As an Energy Star partner, we offer skylights that meet and exceed Energy Star criteria.

Green building practices beyond Energy Star are becoming more main stream, and skylights have a big role in green building design by allowing free, natural, daylight into a home or business. We can assist in achieving LEED credits.

All glass skylights are built with energy efficient commercial grade, dual-seal silicone, insulated glass which is optimal for any environment.

Glazing Options

CrystaLite has partnered with Cardinal IG as our primary insulated glass unit provider, to offer the highest quality glass available. Cardinal's superior quality is backed with an unmatched warranty on the insulated glass units and the lowest failure rate in the industry.



Glass skylights include advanced LoE coatings and argon gas fill. LoE is a microscopically factory applied coating which aids in insulating and by selectively blocking harmful light waves, reduces excess solar heat gain caused by direct sunlight.

Argon gas fill further increases the glass units insulating properties and is an inert gas – thus has no negative effect on the environment. A range of LoE coatings are available for selection for your advanced glazing design needs.

Glass skylights require at least a 2/12 pitched roof for installation. For flat and low pitched roofs, acrylic dome glazing is available.

Domes are available in single, double, and triple layers to meet your energy design needs. Available in clear for maximum light; bronze for reduced heat transmittance; and translucence white for optimal light diffusion.

Benefits of Low E & Argon Gas Fill

The initial cost of upgrading your CrystaLite skylights to Low E & Argon is minimal compared to the yearly savings on heating and cooling you will benefit from. Low E & Argon improves the thermal properties of a skylight, allowing it to be ENERGY STAR compliant.

If you live in a cold climate, you may cut your heating costs by as much as 40% with ENERGY STAR certified windows and skylights.

In hot climate zones, up to 30% on cooling could be saved.

Custom Skylights

CrystaLite skylights are available in our custom frame series as well, for residential home use and commercial installations. Common configurations include slope glazing, ridges, hip ridges, and pyramids. You envision it, we can design and build it.

All CrystaLite skylights feature an integrated condensation gutter which collects any moisture that may develop on the unit and is channeled to the outside of the curb via the weep hole system.

Warranty Summary

CrystaLite glass glazed skylights are warranted against manufacturer's defects for a period of (10) ten years from date of purchase.

Insulated glass units shall carry a ten year warranty against delaminating, seal failure and deterioration of low-e coatings. Where field glazed, the installer shall be responsible for glass to frame seal.

CrystaLite plastic glazed skylights are warranted against manufacturer's defects for a period of (5) five years from date of purchase.

CrystaLite tubular skylights are provided with a (25) twenty five year transferable warranty.

All Truth Hardware products, with the exception of electrical products, are warranted against defect in materials for a period of (10) ten years. Electrical hardware is provided with a (1) one year warranty.



Certifications

CrystaLite skylights are NAMI certified and NFRC rated for thermal performance; U-factor, SHGC, and VT (visible light transmittance). Skylights are NAMI certified to the NAFS Standard for air infiltration, water penetration, & structural loading; commonly referred to as 'AAMA Testing.' [AAMA/WDMA/CSA101/I.S.2/A440]

Design Loads

Design loads (downward pressure) established by certification to the NAFS Standard include a 200% safety factor. All standard glass glazed skylights are certified to 85 psf design loads. Plastic glazing certification varies depending on size and configuration.

Snow / High Loads

CrystaLite's 5842, 3962, 5830, and ES frames have been certified with high load specific glazing configurations to achieve a high design load ratings of 310 - 330 psf to comply with local code requirement for snow loading concerns. Available upon request.

Skylight Frames

We offer several options in standard skylight frames; including a standard aluminum frame, an aluminum thermal break frame; and our highly insulating PVC/Aluminum frame series. CrystaLite's primary standard skylight is our 5842 frame, capable of encompassing both insulated glass units and acrylic dome glazing for flat roofs. The 5843 frame is our production line model of our PVC frames, limited to our most common sizes and insulated glass units.

Our 5830 frame is our operable PVC skylight and is available with manual and electric opening hardware.

ES [Energy Saver] Skylight

Exceptional thermal properties while maintaining a clear view, high visible light, and great STC. **High Load glazing available.**

Cardinal LoE³ 366 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.28	0.26	0.49
T / L	0.28	0.26	0.48

5842 PVC / Alum Frame

Our most common curb mount frame featuring a PVC interior that provides an excellent thermal break. **High Load glazing available.**

Cardinal LoE² 272 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.50	0.26	0.68
T / L	0.51	0.26	0.67

5843 PVC / Alum Frame

This frame is offered with glass glazing in 2626, 2638, 2650, and 2674 models only.

Cardinal LoE² 272 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.50	0.26	0.68
T / L	0.48	0.26	0.67

3962 Aluminum Frame

Standard aluminum frame, also available as an opener. **High Load glazing available.**

Cardinal LoE² 272 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.58	0.26	0.70
T / L	0.59	0.26	0.69

3921 Alum. Thermal Break

Thermal break frame features a resin core within the interior aluminum extrusion.

Cardinal LoE² 272 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.54	0.26	0.65
T / L	0.55	0.26	0.64

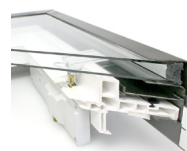
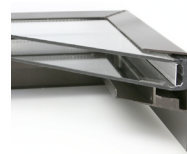
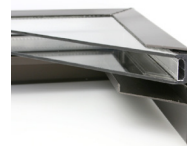
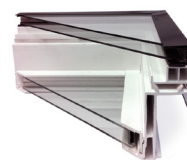
5830 PVC / Alum Venting Skylight

Our most popular venting skylight frame which features a 1-3/8" PVC leg that drops down into the light well providing a surface to mount Truth opening hardware. Designed for standard 1-1/2" thick curbs only. **High Load glazing available.**

Cardinal LoE² 272 w/ Argon Gas (standard)

Glazing	U-factor	SHGC	VT
T / T	0.51	0.37	0.63
T / L	0.51	0.36	0.62

* 2010 ENERGY STAR Compliant in North Climate Zone



Skylight Models & Sizes

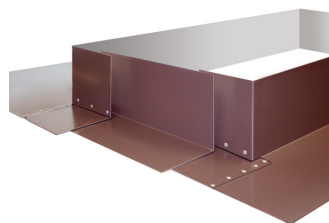
CrystaLite skylights are designed to fit over the curb like a 'lid on a shoe box.' Include flashing in curb dimensions. Custom sizes available.

Note: Size may effect frame or glazing choices.

Model	Outside Curb	Size
1838	17.5" x 37.5"	
1850	17.5" x 49.5"	
1874	17.5" x 73.5"	
2626	25.5" x 25.5"	2 x 2
2634	25.5" x 33.5"	
2638	25.5" x 37.5"	2 x 3
2650	25.5" x 49.5"	2 x 4
2662	25.5" x 61.5"	
2674	25.5" x 73.5"	2 x 6
2698	25.5" x 97.5"	
3434	33.5" x 33.5"	
3438	33.5" x 38.5"	
3450	33.5" x 49.5"	
3474	33.5" x 73.5"	
3838	37.5" x 37.5"	
3850	37.5" x 49.5"	
3862	37.5" x 61.5"	
3874	37.5" x 73.5"	
3898	37.5" x 97.5"	
5050	49.5" x 49.5"	4 x 4
5062	49.5" x 61.5"	
5074	49.5" x 73.5"	

Step Flash Kits

CrystaLite Step Flashing Kits are available for 4" and 6" high curbs. Head and Tail corners are bent, pressed riveted, and sealed to prevent any possibility of leaking. Flashing extends 13" up the slope and 6" down, which ensures full coverage.



5830 PVC / Alum Venting Skylight

Provided with Truth Manual Chain Drive as standard. Available in white or bronze. Manual openers have two variations; angle drive for use with a hand crank, and a straight drive for use with a pole. Poles come in two adjustable sizes; 4-6 foot or 6-10 foot.

Venting skylights open at the sill approximately 7 inches, varies depending on skylight size.



Wicket Screens

Screens with wickets are used when Dazon stainless spindle hardware is requested. Also, when our 3962 frame is used as an opener.



Truth Electrical Operators

Truth MARVEL Operator

Small and sleek motorized system that is simple to install, easy to operate and above all affordable. Available in white only.



Manual Chain Drive

Operated by a pole that turns the loop or a hand crank. Hand crank requires optional angle drive model manual drive. Available in white or bronze.



WLS Electric Chain Drive

Comes standard with a wall switch and rain sensor. Requires 110V at wall switch and a 24V lead to skylight well. Optional remote available. Available in white or bronze.



HS Electric Chain Drive

Complete concealed unit. Comes with remote and rain sensor standard. Requires 110V to skylight well. Optional wall switch available. Available in white or bronze.



Radio Frequency Remote

Operates any number of skylights with 9 different group settings. The remote also offers a temperature control setting.



Glass Glazing Options

Glass skylights are built with energy efficient, dual-seal silicone insulated glass units. Glass skylights include advanced low-e coatings and argon gas fill. Low-e are microscopically factory applied coatings which aids in insulating and by selectively blocking harmful light waves, reduces excess solar heat gain caused by direct sunlight.

Argon gas fill further increases the glass units insulating properties and is an inert gas – thus has no negative effect on the environment. This helps keep homes warmer in the Winter and cooler in the Summer.

Our standard glass option is Cardinal LoE 272 coating and argon gas fill which balances excellent thermal performance with exceptional light transmittance. LoE 366 delivers the ideal balance of solar control and high visibility. It provides the highest levels of year round comfort and energy savings, making it the perfect glass no matter where you live. LoE 240 The ideal solution wherever glare is a problem.

Thermal Ratings

U-factor: This represents the heat flow rate through a window expressed in BTU/hr/ft2/°F, using winter weather conditions of 0°F outside and 70°F inside. The smaller the number, the better the product is at reducing heat loss.

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

Visible Transmittance: The amount of visible light allowed passing through. The higher the number, the more light that passes through. Depending on the use, more or less light might be preferred.

Center of Glass (COG) Thermal Properties Comparison:

Glass	U-factor	SHGC	VT
Single-pane, clear	1.04	0.86	90%
Double-pane, clear	0.48	0.76	81%
Double-pane, low-e & argon	0.31	0.72	75%
LoE 240 & Argon	0.26	0.25	40%
LoE 272 & Argon	0.25	0.41	72%
LoE 366 & Argon	0.24	0.27	66%

We have numerous glass types and configurations available to us. We can assist you in proper glazing selection for your design needs.

NOTE: Center of Glass (COG) values will always be significantly better than full product NFRC rated values. COG values are measured from a single (optimal) center point whereas NFRC rated values measure the entire assembly performance. Also note that skylights are tested in a 20° orientation and on a default wooden curb, whereas windows/doors are tested vertically and inset mounted. Skylight values are therefore often seemingly less efficient due to the varied tested procedures.

Featuring Cardinal IG and XL Edge

Our primary glass provider for IG units in CrystaLite skylights and overhead glazing is Cardinal IG. Cardinal's 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.

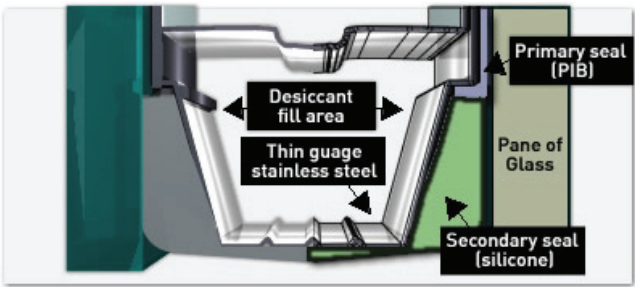
XL Edge is at the leading edge, incorporating a stainless steel spacer with airtight bent corners and a dual-seal construction of compressed polyisobutylene (PIB) and silicone. Desiccants are contained in the spacer to eliminate any potential for moisture. Since XL Edge is a warm-edge IG, the possibility 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.

Plastic Dome Glazing

Plastic skylights are made with one of three high-impact or impact resistant materials; acrylic, polycarbonate, and co-polyester. Recommended for flat roofed structures, plastic skylights are light-weight, easy to install, and natural rainfall runoff helps with self-cleaning. Plastic exhibits superior structural strength and high wind and snow load capacity.

CrystaLite's triple layer plastic dome skylights exhibit excellent ultraviolet (UV) light resistance as well as offers the same insulating qualities as standard glass skylights.



Color Options

Plastic skylights are available in three standard colors. Clear for clarity and maximum light transmission. Bronze for a clear view with reduced heat transmittance. White for privacy and reduced heat and optimum light diffusion.

Sky Blinds

Constant tension skylight shades operated with a telescoping pole inserted into a ring on the moving rail. Motorized opener also available.



Typically installed on the drywall below the skylight, as well as installed directly on to select skylight frames. Side channels eliminate light gaps and take up dimensional variations in skylight openings.

Fabric Options

Pleated Fabrics - Privacy

Reduction Properties:

Light: 20%, **Heat Gain:** 40%, **UV:** 90%



Smooth White

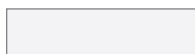


Off-White

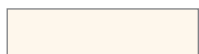
7/16" Cellular - Light Filtering

Reduction Properties:

Light: 35%, **Heat Gain:** 55%, **UV:** 90%



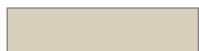
Frost



Oatmeal



Cream



Mink



Whisper

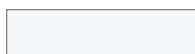


Sand

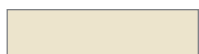
7/16" Cellular - Midnight

Reduction Properties:

Light: 99%, **Heat Gain:** 79%, **UV:** 90%



Eggshell



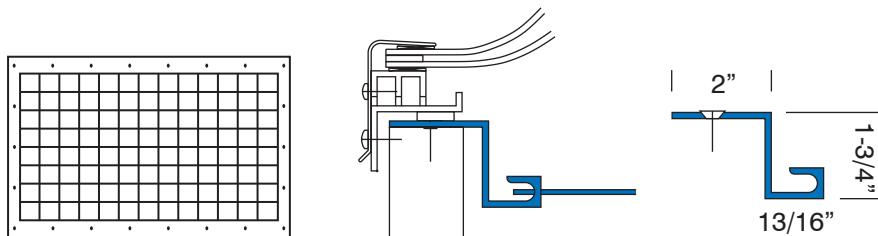
Alabaster



Fall Protection - Safety Grids

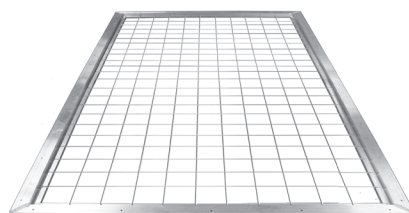
Safety Grids are available in two variations which exceed OSHA and WISHA requirements for providing fall protection; static loads of 200 lbs and 800 lbs respectively. Both Safety Grids, ELITE and DEFENSE, resisted without failure dynamic impacts of 800 lbs created by a 200 lbs heavy bag released from 48 inches; followed by holding over a HALF TON (1,038 lbs) of static load for 5 minutes. Testing was witnessed for verification by a third party accredited testing laboratory. Test report available upon request.

Safety Grids are installed on the top of the structural curb in the daylight opening which allows for retrofit installations as well as new construction. Fasteners to be installed on top face of the perimeter with recommended spacing of 6" on center.



Safety Grid ELITE

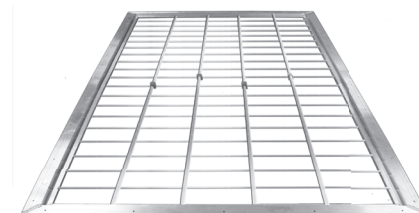
Composed of aircraft grade aluminum frame, laced with galvanized 1/8" cable. An eloquent solution to providing worker fall protection without compromising interior design.



Dynamic Load Test Resistance: 800 lbs
Static Load Test Resistance: 1,038 lbs

Safety Grid DEFENSE

Composed of aircraft grade aluminum frame and 3/8" solid bars. This fall protection grid also provides resistance against burglar break ins.



Dynamic Load Test Resistance: 800 lbs
Static Load Test Resistance: 1,038 lbs
Burglar Resistance: YES

Your Clear Choice

CrystaLite has the expertise to ensure the structural integrity that your grand vision demands.

Custom Skylights are certified by National Accreditation & Management Institute (NAMI) and rated by the National Fenestration Rating Council (NFRC) for thermal performance.

Custom Skylight structural members shall be designed for the following loads:

1. Deflections in structural members shall be limited to $L/175$ under fully loaded conditions, per ASTM E 330 at 150% of positive and negative wind load design pressures for a duration required by design wind velocity without assembly evidencing material and deflection failures or permanent deformation of structural members exceeding 0.2% of span. Compliant to International Building Code 2006, section 2405 Sloped Glazing and Skylights.
2. Air infiltration per. Air leakage shall not exceed 0.06 cfm/sq. ft. of assembly surface when tested with a pressure of 6.24 psf. Compliant to IECC 402.4 Air Leakage.
3. Water penetration per ASTM E 331. No water penetration when tested with a pressure differential of 30.0 psf. (Light Frame limited to 6.24 psf). System designed to drain migrating moisture occurring from condensation to exterior through weep drainage network. Compliant to International Building Code 2006, section 1403.2 Weather Protection.

If you are looking for a way to incorporate natural daylight in your building project, CrystaLite skylights are your clear choice.



Custom Frame Skylights

You envision it, CrystaLite designs and builds it. For residential, commercial and industrial applications, CrystaLite has designed and manufactured a wide range of custom skylights which can bring added dimensions to a building's aesthetics.

We have three basic frame weight options: light, medium, and heavy. All CrystaLite frames are structurally engineered to meet or exceed local building code requirements. Medium and heavy frames are designed to span greater distances than light frames. Light frames can be used in place of heavier frame types where supports such as rafters are in place, supplied by other.

We offer bronze and clear anodized as standard finishes. We can provide custom color match paint finishes, based on color samples provided.



Custom Sunrooms and Skywalls

CrystaLite sunrooms and skywalls have many innovative features. The flexible design allows for any pitch from 2/12 to 12/12. Welded overhead; integrated with our structural 4000 series vertical wall, makes an airtight and watertight system. An integrated condensation gutter collects any moisture that may develop on the sunroom and drains to the outside via the weep hole system. Exterior weep holes are concealed and baffled behind the snap-caps at each rafter. Santoprene® gaskets cushion and seal the glass. Fasteners are concealed behind snap-on covers.

Engineering

CrystaLite sunrooms and skywalls are structurally engineered additions to a home or business. CrystaLite sunrooms are not a pre-built do-it-yourself system, but a custom constructed and structurally engineered system. Job specific load engineering is available.

Sunrooms feature one of our structural self-spanning frames on the overhead slope. Our 4000 frame is used for the vertical wall. The overhead slope extends past the vertical wall – eliminating any potential leaking into the eave joint.



Add your personal touch.

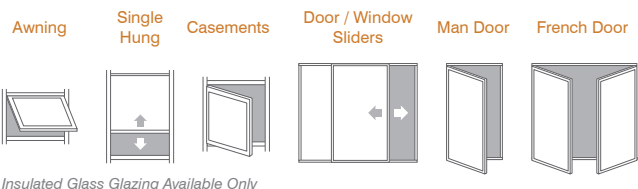
Sunroom and skywalls are built to your specifications. You select the frame finish to match, enhance, or contrast your decor. (Bronze and Clear anodized finishes are standard. Custom painted frames are also available.) You select the window and door options that fulfill your design needs. You select the ventilating system, either opening skylights and/or fan system, to best suit your needs. You select the blinds or sunshades (options from your dealer).

Standard Features

- Heavy duty extruded aluminum frame (6063 T-6).
- Thermally broken sill. Thermally improved at all other details.
- Internal hidden guttering system.
- Sill and head flashing to trim.
- Stainless steel fasteners throughout. Hidden fastening system.
- Dry glazing with Santoprene® (silicone compatible gaskets).
- Flexible head and eave design for any pitch.
- Accepts 1/8" to 1" overall glazing units.
- Completely pre-cut and drilled for quick and easy assembly.

Available Options

- Vents: awning, casements and/or single hung.
- Doors: sliding patio, hinged, or french doors.
- Exhaust fans with power louvers.
- Opener skylights in overhead.



Slope Glazing and Skylights

Answers to common code related questions.

This code commentary is provided for your convenience due to a perceived confusing text regarding acceptable materials for any overhead glazing applications.

Generally Slope Glazing and Unit Skylights are not considered a Hazardous Location. The exception would be where the skylight may be subject to human impact. Such condition may exist where the skylight is on a flat roof, the roof is accessible, and being used as patio or sundeck. In this example consideration for fall protection may be appropriate in addition to the normal code requirement for Slope Glazing and Skylights.

The intent of the code for overhead glass installations is to protect the occupants below from falling glass in the event of breakage. Because of this potential only certain types of glass or glazing materials may be used for a specific set of conditions. Certain exceptions to the general rule may apply.

When is glazing considered slope glazing or a unit skylight?

Such is defined as any installation where the glazing material is installed more than 15 degrees off vertical. See Figure 1.

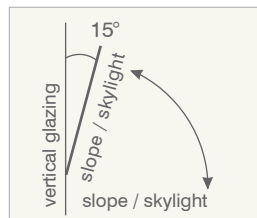


Figure 1

What types of glazing materials may be used for glazing more than 15 degrees off vertical?

Any of the following glazing materials may be used, but some glazing may be restricted under a specific set of conditions that will be discussed herein. See Conditions 1 & 2.

- Laminated Glass
- Fully Tempered Glass
- Heat-Strengthened Glass
- Wired Glass
- Approved Plastics

Why do they tell me I have to use protective screens under my skylight?

Protective screens are the general rule for any glazing that does not meet the conditions or exceptions specified in the code. However, there are many conditions and glazing types where protective screens are not required. See screen specifications.

It is easier to begin with glass, as a glazing material, that meets the entire glazing criterion. Therefore if one desires to meet the intent of the code, no matter what condition, laminated glass should be used under the following specification.

Laminated glass is supplied with an inner layer of polyvinyl butyral (PVB) or other. In order to meet all code conditions the inner layer must be a minimum of 0.030" in thickness (30 mil or 0.76mm). This statement assumes that the inner layer is not required to be thicker for structural considerations beyond the minimum requirement. In many cases the glazing will have a thicker inner layer.

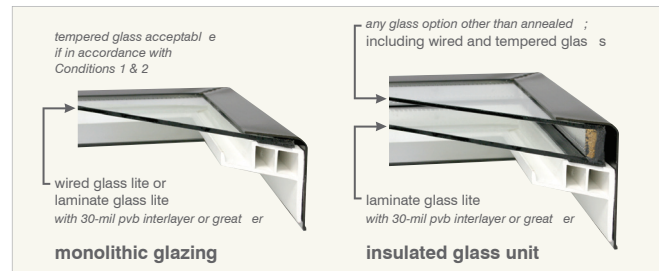


Figure 2

Therefore, laminated glass having an inner layer of 0.030" or greater meets all the requirements of the code and protective screens are not required below the glass. In such case the laminated glass may be used as single glazing or in an insulated glass unit where the laminated glass is provided in both layers or only the bottom layer in the insulated unit. See Figure 2.

I am told I can use laminated glass with an inner layer of 0.015" in a residential dwelling unit. Are there any restrictions?

When laminated glass is used with an inner layer less than 0.030" certain restrictions apply. When used in dwelling units, the laminated glass with an inner layer of 0.015" may be used as single glazing or as the bottom layer of an insulated unit providing:

If either of those conditions are exceeded you must use 0.030" laminated glass.

My building inspector tells me I need protective screens under my tempered glass skylight. I thought I could use tempered glass in my skylight without protective screens?

Like laminated glass, tempered glass is considered safety glazing. Tempered glass is used in many applications today where there may be human impact issues (hazardous locations), or where additional glass strength is required. When tempered glass is used overhead certain restrictions may apply and protective screens would not be required if such restrictions are adhered to. Tempered glass may be used residentially without protective screens when fully tempered glass is used as single glazing or as the inboard pane in multiple glazing and either of the following conditions (1 or 2) are met.

Condition 1.

The individual glass unit area **IS NOT** greater than 16 square feet.

Any point of the glass is not more than 12 feet above a walking surface or other accessible area. Figure 3.

The nominal glass thickness is not more than 3/16" and (for multiple glazing only) the other pane or panes are fully tempered, laminated or wired glass.

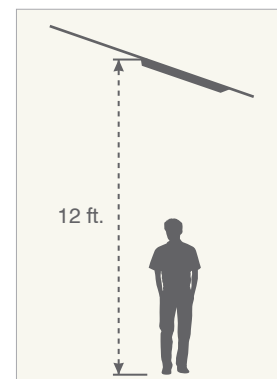


Figure 3

Condition 2.

The glass area IS greater than 16 square feet.

The glass is sloped 30 degrees or less from vertical. Figure 4.

Any point of glass is not more than 10 feet above a walking surface or other accessible area. Figure 4.

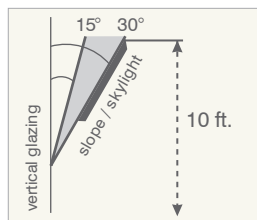


Figure 4 ■ Condition 2

The building inspector told me because I have fully tempered laminated glass as the bottom layer in a multiple layered glazing unit skylight, I need to have protective screens because my skylight is over 12 feet above the walking surface and is also larger than 16 square feet?

Sometimes this call is made because of the tempered glass being part of the inner pane. The important fact, not realized with this call, is that once any type of glass is laminated with an inner layer 0.030" or greater in thickness such makeup complies with the intent of the code. Therefore, in your case, the restrictions for tempered glass would not apply and your skylight complies with the code.

The call was incorrect.

I have been told wired glass is no longer allowed by the code for hazardous locations. Is the same true for Slope Glazing and Unit Skylights?

Wired glass is still allowed by the code, but certain restrictions may apply. Wired glass is resistant to impact and when installed overhead as a single layer glazing no additional protection is required below.

When used in multiple layered glazing overhead, certain restrictions apply. Screens are required when the inboard pane in an insulated unit is wired glass.

Is there a way to use wired glass in an insulated unit without having to use protective screens?

The answer is YES. If you use laminated glass with the proper thickness 0.030" inner layer or greater as the inboard pane, and wired glass as the outboard pane, you will not be required to provide protective screens. There are circumstances where wired glass is specified for fire considerations. In such case it is polished wire glass. See Figure 2.

Note: Wired glass is not available in CrystaLite skylights.

Why would I want to use screens anyway? They are ugly!

There may be some reason one may want to use protective screens; but generally they are avoided for reasons of cost, cleaning of the glazing surfaces, and as indicated they do not have architectural appeal. The same safety concerns can be addressed by using laminated glass which eliminates the screen requirement.

However, protective screens can be installed after a skylight or slope glazing has been installed. This can be a 'fix' when the glass used in the installation exceeds the provisions identified in the code. In this scenario, the addition of screens can be a cost effective solutions opposed to replacing the glass installed.

What if the area below the skylight is permanently protected from the potential of falling broken glass?

If such is the condition, any type of glass may be used, and protective screens would not be required.

I have a residential greenhouse plan. What kind of glass, according to code, am I required to use?

The glazing codes are no different for greenhouses if they are attached to your home or if it is being used as habitable space. If the greenhouse is detached and used specifically for the growing of plants then any glazing material may be used provided the height at the ridge is 20 ft. or less above the walking surface.

My builder told me we can use plastic for some of our skylights and slope glazing. Is plastic a "safety glazing" as required by the notes on our plans?

Generally most plastic materials used specifically for "Glazing" are approved plastics. Approved plastics are considered safety glazing. There are no requirements for protective screens when approved plastics are being used.

Is there a specific requirement for protective screens or will the insect screen on my opening skylight qualify as a protective screen?

There are specific requirements for protective screens and such should not be confused with insect screens. It is rare that an insect screen will comply as a protective screen.

Specifications : Protective screens shall :

- Be capable of supporting twice the weight of the glazing.
- Be firmly and substantially fastened to the framing members.
- Be installed within 4 inches of the glass.
- Be constructed of a noncombustible material No. 12 gauge, mesh not larger than 1" by 1".

Non-Residential

In all cases, when installed more than 15° off vertical in non-residential, glazing should have laminated glass with an inner layer of 0.030" or greater for single glazing and as the inboard layer in an insulated glass unit.

For more information, please refer to the 2006 IBC definitions of R-1, R-2, R-3, and R-4; located in Section 310.1.

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 skylight 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 skylights 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 procedures.

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

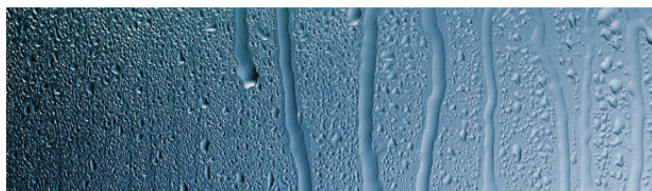
If the sealant you use and prefer is not included in this list, it may still be safe to use. Please call or email and we will verify.

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. 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 home's 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.

General Guidelines

A general rule of thumb for cleaning all CrystaLite products is to use a water solution that is the same temperature as the glazing surface with mild soap or detergents. A mild soap mix would be one that would be gentle on your hand if submerged without a protective glove. Using a dish soap such as Joy® or Palmolive® is recommended as they are effective in cutting grease yet do not contain irritants that could harm you and/or your CrystaLite product. Warm water is important because cold water may cause a sun heated glass surface to crack due to thermal shock. Avoid cleaning in the hot sun.



DO NOT USE A SCRAPER OR BLADE

It is important to avoid using any scraper and/or blade on a glazing surface such as glass, acrylic, and polycarbonate sheeting. Squeegees should be avoided for all plastic products as well. It is extremely possible that a blade will damage any UV, reflective, or solar control coating that may exist on the surface of the material. Solar protective coatings are very thin and hard to detect with the naked eye. Glass units typically have these coatings on the inside surfaces of the glass, but not always. On our polycarbonate sheeting, the UV coating is applied to an outer surface of the sheet which should be installed on the side facing the sun.

Recommended Cleaners

Products such as Windex® are safe to use, but not recommended for best results as they may leave streaks. Skylights absorb more direct sunlight and heat than vertical windows which makes it difficult to use a liquid product. We have available a Foam Glass Cleaner when a gentle soap solution alone is not effective. Automotive windshield foam cleaners are recommended as well.

For the removal of adhesive residue - Naphtha VM&P grade, Kerosene, or Isopropyl Alcohol may be used with a soft cloth. Wash immediately with soap and warm water and rinse thoroughly with clean water. Never apply such products on a hot glazing surface.

Recommended Products for Acrylic, Polycarbonates, and other Plastics

We use and recommend the use of Novus Polishes for cleaning and scratch removal of acrylic, polycarbonate, and other plastic surfaces. For more information on Novus products: www.novuspolish.com

