

Vinyl Windows & Doors

Glass & IGU Product Information



Quality, Comfort & Peace of Mind

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Starline Windows's glass manufacturer is Vitrum Glass Group. Vitrum Industries is a Certified Fabricator of PPG and Guardian glass products. Starline's has standard product offerings, as well as additional options available to meet your project specific design needs, whether aesthetics, energy performance, acoustical ratings or another specific design intent. The below information highlights our standard product offerings, as well as a few of the other options that are available. There are various other combinations available which can be reviewed on a project specific basis. Visit Vitrum Glass Group website at <http://www.vitrum.ca/> for more information.

Insulated Glass Unit (IGU) Size Limits

IGU sizes are limited by the following criteria.

1. Area
2. United Inches
3. Weight

Area

The maximum area for an individual IGU is 50 sq. ft. The overall square footage per individual IGU will depend on the thickness of glass used. Refer to the **Maximum IGU Area & United Inches Based on Glass Lite Thickness** chart (pg.2).

United inches

The maximum united inches an individual IGU can have will depend on the glass thickness. Refer to the **Maximum IGU Area & United Inches Based on Glass Lite Thickness** chart (pg.2).

How to determine United Inches:

1. Measure the width of the window in inches
2. Measure the length of the window in inches.
3. Add the width and length together for united inches.

Weight¹

The maximum overall IGU weight should not exceed ~ 225 lbs. This is in order to keep an individual overall window module size within Starline's recommended guidelines of 250 lbs. Refer to the **How to Determine the Overall Area & Weight of an IGU** section below for an example on how to calculate the overall area and weight of an individual IGU.

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How to Determine the Area & Weight of an IGU

To keep things simple when determining the IGU size use the heel dimension of the window or door. If it is a combination window that contains multiple IGU's divided by horizontal T-Bars and vertical mullions, use the heel to centerline dimensions or centerline to centerline dimensions of the window or door frame. Since the frame will be included the overall weight of 250lbs not ~225lbs noted in the above **Weight** section will be used in the example on page 2.

Once the fixed and /or combination window and /or vent style has been selected, along with the frame dimensions (width and height) and the glass thickness, a calculation can be performed to determine the area and weight of the window.

Glass thickness can play a significant factor in determining how large the window can be. The thicker the glass, the heavier the IGU. When thicker glass is selected commonly the maximum weight allowed is reached prior to the maximum area allowed. Refer to the **Typical Float Glass Weight per Thickness, mm** chart (pg.2) for weight of glass

How to Determine the Area and Weight of an IGU cont.

Typical Float Glass Weight per Thickness

GLASS LITE THICKNESS	3mm	4mm	5mm	6mm	8mm	10mm
Monolithic Glass – Weight (lb/ ft ²)	1.54	2.05	2.56	3.07	4.10	5.12
Double Glazed IGU – Weight (lb/	3.08	4.10	5.12	6.15	8.19	10.24
Triple Glazed IGU – Weight (lb/ ft ²)	4.61	6.15	7.68	9.22	12.29	15.36

Maximum IGU Area and Lineal Thickness Based on Glass Lite Thickness²

GLASS THICKNESS	MAX. IGU	MAX. UNITED INCHES (One Width + Height)
3mm	19.5 sq. ft.	< 105"
4mm	30 sq. ft.	105"-150"
5mm	41 sq. ft.	>150"-175"
6mm	50 sq. ft.	>175" +

Note: There are minimum and maximum dimensions as well as overall IGU areas to consider for different types of glass, such as annealed, tempered, laminated, spandrel, ect. Maximum dimensions are as laid out in above chart, regardless of the glass type. For all other sizing information please visit the Products tab on the Vitrum Glass Groups website at: <http://www.vitrum.ca/> for the most up to date information.

Ex.#1- Fixed Window

- Determine fixed window size - 60" wide x 84" tall. $(60" \times 84") / 144" = 35.00 \text{ ft}^2$ ✓
- Determine max. united inches.
 - Based on area, min 5mm glass required therefore max. united inches can be <150"-175" $60" + 84" = 144"$ ✓
- Determine glass weight based on 5mm $= 5.12 \text{ lbs/ft}^2$ ✓

4. Calculate overall weight

$$35 \text{ ft}^2 \times 5.12 \text{ lbs/ft}^2 = 215 \text{ lbs}$$



The above overall dimensions, square footage and weight are all ok.

Note: If a combination window is selected and all the individual IGU's use the same glass thickness, you can simply take the heel dimension of the window and treat it as a fixed window. If the IGU glass thickness vary within the combination window, you would have to calculate out the weight of the individual IGU's and total them together to ensure the overall window module is within the acceptable weight limits.

¹ Maximum weight is a guideline that considers, production capabilities, tailgate deliveries and window installer capabilities. Please consult with the window installers on a project specific basis to determine their ideal overall window weight with respects to handling and installing. Industry standard for installation typically ranges from 200 lbs. and up, dependent on site conditions, man power and equipment that will be used to assist with installation. If an overall window is greater than 300 lbs site glazing is required due to manufacturing limitations. Windows that are heavier than installers are willing to install (approximate range 200 – 300 lbs) site glazing may be an option, however it is Starline Window's recommendation that factory glazing, in a controlled environment, is utilized whenever possible.

² Glass thickness may be required to be thicker than stated in the **Maximum IGU Area & Lineal Inches Based on Glass Lite Thickness** chart above due to structural requirements, building code requirements, by-law requirements, etc. As an example: A glass thickness of 5mm may be selected based on the charts and it states 5mm glass can be used up to an IGU area that is 41 sq. ft. maximum, however structural requirements due to the buildings wind loading may require 6mm glass thickness to be used. 6mm glass is thicker than 5mm glass and weighs more, therefore the window size may need to be reduced to keep overall weight within Starline windows recommended maximum weight.

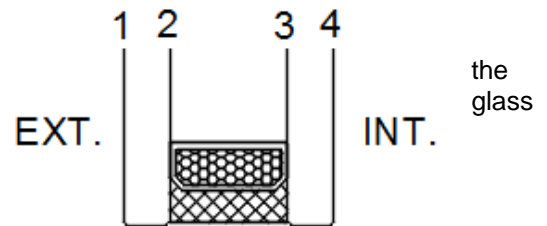
Glass Configurations

Double Glazed Available Configurations

Starline offers double glazed IGU's.

The standard double glazed IGU is comprised of the following glass make-up:

- Standard high-performance soft coat (sputtered) Low E which is applied to surface #2.
- Aluminum spacer bar with argon fill.
- Minimum glass thickness is 3mm for all vinyl products with exception of the double glazed swing door which minimum thickness is 4mm.
- All glass is tempered for sliding and swing doors.
- Dual edge seal



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Note:

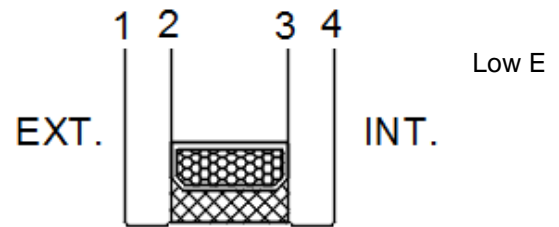
For increased thermal performance:

- A black warm edge spacer bar can be used in lieu of the aluminum spacer bar for an additional cost.
- A hard coat low E coating can be placed on surface #4 for an additional cost.
- Argon gas available in Canada only.

Monolithic Glass on the Exterior and Interior

- Various high-performance soft coat Low E coating which commonly are applied on surface #2, however some Low E coatings may be required to be applied to surface #3.
- Exterior glass is available in:

- Clear or Tinted
 - If tinted glass is used without Low E coating, the coating can be moved to surface #3.
- Annealed or Tempered



- Interior glass can be:
 - Clear
 - Annealed or Tempered
- Option for Spandrel Glass ¹, ceramic frit or opaci coat, located on Surface #2 or #4. If ceramic frit or opaci coat is located on surface #2 then a Low E coating is not available for this application. Surface #4 is recommended.

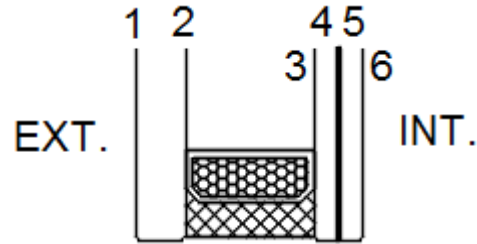
¹ **Note:** Starline's spandrel glass products are intended to be glazed against a uniform, opaque background. We do not recommend that spandrel glass be used in any application where glass can be viewed with daylight or artificial light on the opposite side. There are options for vision applications that allow varying degrees of color, light transmission and pattern to be used. These options include silkscreen ceramic frit, digital printing, colored or diffused laminated PVB or SGP or acid etched glass.

Monolithic Glass on the Exterior and Laminated Glass on the Interior

- Polyvinyl Butyral (PVB) interlayer fused between the two layers of glass on surface #4 & #5, to create laminated glass. Starline's standard interlayer thickness is 0.030".
- Various high performance soft coat Low E coating which commonly are applied on surface #2, however some Low E coatings may be required to be applied to surface #3.
- Exterior glass is available in:
 - Clear or Tinted

- If tinted glass is used without Low E coating, the Low E coating can be moved to surface #3.

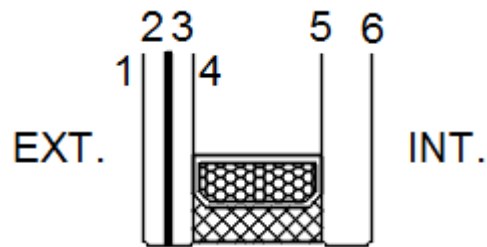
- Annealed or Tempered
- Interior glass can be:
 - Clear only
 - Annealed only
- PVB interlayer:
 - Standard is clear
 - Other options available
- Option Spandrel Glass ¹, ceramic frit or opaci coat, located on Surface #2. Low E coating is not available for this application.



Laminated Glass on the Exterior and Monolithic Glass on the Exterior

- Polyvinyl Butyral (PVB) interlayer fused between the two layers of glass on surface #2 & #3, to create laminated glass. Starline's standard interlayer thickness is 0.030".
- Various high performance soft coat Low E coating which commonly are applied on surface #5.
- Exterior glass is available in:

- Clear only
 - Annealed only
- Interior glass can be:
 - Clear only
 - Annealed or tempered



- PVB interlayer:
 - Standard is clear
 - Other options available
- Option for Spandrel Glass ¹, ceramic frit or opaci coat, located on Surface #6. Low E coating is not available for this application

¹Note: Starline's spandrel glass products are intended to be glazed against a uniform, opaque background. We do not recommend that spandrel glass be used in any application where glass can be viewed with daylight or artificial light on the opposite side. There are options for vision applications that allow varying degrees of color, light transmission and

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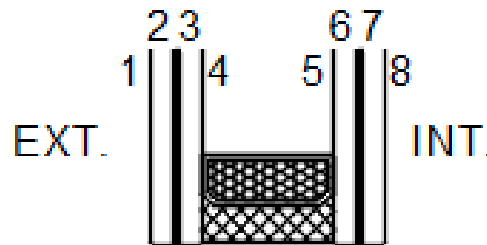
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pattern to be used. These options include silkscreen ceramic frit, digital printing, colored or diffused laminated PVB or SGP or acid etched glass.

Laminated Glass on the Exterior and the Interior

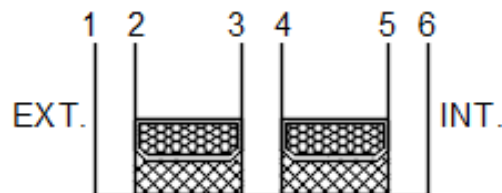
- Polyvinyl Butyral (PVB) interlayer fused between the two layers of glass on surface #2 & #3, and #6 & #7 to create a double laminated IGU. Starline's standard interlayer thickness is 0.030".
- Various high performance soft coat Low E coating which commonly are applied on surface #4 or #5.
- Exterior glass is available in:
 - Clear or Tinted
 - If tinted glass is used, the Low E must be on surface #7.
 - Annealed only
- Interior glass can be:
 - Clear only
 - Annealed only
- PVB interlayer:
 - Standard is clear
 - Other options available



Triple Glazed Available Configurations

Starline offers triple glazed IGU's for both the Emerald 7100 Series windows and Eurostar 2500 & 2501 Swing doors. The standard triple glazed IGU is comprised of the following glass make-up:

- Standard high-performance soft coat (sputtered) Low E which is applied to surface #2.
- Aluminum spacer bar with argon fill.
- Minimum glass thickness is 3mm.
- All glass is tempered for sliding and swing doors.
- Dual edge seal



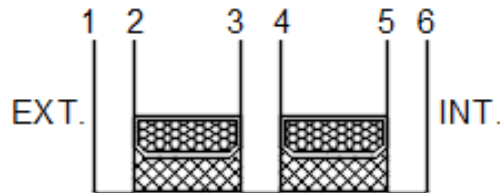
Note:

- For increased thermal performance:
 - A black warm edge spacer bar can be used in lieu of the aluminum spacer bar for an additional cost.

- A hard coat low E coating can be placed on surface #4 for an additional cost.
- Argon gas available in Canada only.
-

Monolithic Glass on the Exterior, Middle and Interior

- Various high-performance soft coat Low E coating which commonly are applied on surface #2, however some Low E coatings may be required to be applied to surface #3.
- Exterior glass is available in:
 - Clear or Tinted
 - If tinted glass is used without Low E coating, the Low E coating can be moved to surface #3.
 - Tempered
- Middle glass can be:
 - Clear only
 - Tempered
- Interior glass can be:
 - Clear
 - Tempered
- Option for Spandrel Glass ¹, ceramic frit or opaci coat, located on Surface #2 or #6. If ceramic frit or opaci coat is located on surface #2 then a Low E coating is not available for this application.



Monolithic Glass on the Exterior, Middle and Laminated Interior

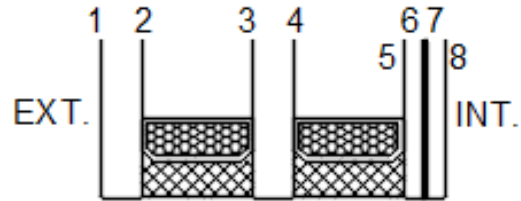
- Various high performance soft coat Low E coating which commonly are applied on surface #2, however some Low E coatings may be required to be applied to surface #3.
- Exterior glass is available in:
 - Clear or Tinted
 - If tinted glass is used without Low E coating, the Low E coating can be moved to surface #3.

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- Tempered
- Middle glass can be:
 - Clear only
 - Tempered
- Interior glass can be:
 - Clear
 - Annealed only
- Option for Spandrel Glass ¹, ceramic frit or opaci coat, located on Surface #2. Low E coating is not available for this application.



¹ **Note:** Starline's spandrel glass products are intended to be glazed against a uniform, opaque background. We do not recommend that spandrel glass be used in any application where glass can be viewed with daylight or artificial light on the opposite side. There are options for vision applications that allow varying degrees of color, light transmission and pattern to be used. These options include silkscreen ceramic frit, digital printing, colored or diffused laminated PVB or SGP or acid etched glass.

Product Series IGU Thickness

PRODUCT SERIES	OVERALL IGU THICKNESS DOUBLE GLAZED	OVERALL IGU THICKNESS TRIPLE GLAZED
EUROSTAR 2500 SERIES	15/16" (24 mm)	1 1/4" (32 mm)
ELCIPSE 6000 SERIES	3/4" (19 mm)	Not Available
EMERALD 7100 SERIES	3/4" (19 mm)	1 1/4" (32 mm)
VISTA & GRANDVIEW 8500 SERIES	3/4" (19 mm)	Not Available

NOTE: The overall IGU thickness is based on nominal dimensions. Actually, dimensions will vary slightly.

Glass Quality Requirements

As required by the Building Code, glass products used by Starline Windows Ltd. meets the AAMA/WDMA/CSA 101/I.S.2/A440-08 Standard/Specification for windows and doors as follows (per ASTM C1036, CAN/CGSB 12.2 & 12.3):

Low E Coating Quality

Glass products used by Starline Windows Inc. conform to the ASTM C1036-91 (Standard Specification for Flat Glass) Q3/Glazing Select specifications or better, ASTM C1048-92 (Standard Specification for Heat Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass) specifications using Q3 quality or better, ASTM C1379-97 (Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Glass) Kind CV specifications or better.

Visual Inspection Criteria

Glass shall be inspected in transmission and reflection at a distance of 10 feet from the observer. Utilizing a viewing angle of 90 degrees from the glass, with suitable background light (day light without direct sunlight or a range of 500 to 1000 foot lamberts). If a lighting box is used as the light source, the diffusing plate shall be parallel to and at a distance of 10 feet from the glass. Inspection should not exceed viewing of more than 5 seconds for lites up to 6 square feet, 10 seconds for lites up to 35 square feet, and 20 seconds for lites larger than 35 square feet, either in transmission or reflection. If defects are visible beyond what is allowable as listed by sizes (square feet) below using the inspection criteria, the glass may be rejected.

Allowable Defects

1. Single (individual) lites up to 6 square feet:
 - a. Scratches – viewable as stated above, must be 1 inch or less. No more than one is allowed per lite viewed at a distance of 10 feet from the observer.
 - b. Debris, Dirt, Spots – viewable as stated above, must be 1/16” or less. No more than one is allowed per lite.
 - c. Seeds, Bubbles, Knots, Stones – viewable as stated above, must be 1/16” or less. No more than one is allowed per lite.

1. Single (individual) lites up to 6 square feet cont.
 - d. No more than one total viewable defect as described above is allowed per lite.
 - e. Shells – no more than 1/4” from edge less than 1/2 the thickness of the lite. No more than one per side.
 - f. Chips – no more than 1/8” from edge. No more than one per side.
 - g. Coating – must be uniform on the lite inspected, when viewed in transmission using the inspection criteria previously stated above.
 - h. The border area is comprised of 2 inches plus 1/2” from each edge of the lite. All other area is the Central area.

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2. Single (individual) lites 6 to 35 square feet
 - a. Scratches – viewable as stated above, must be 1 inch or less. No more than two are allowed per lite and must be separated by a minimum of 24 inches viewed at a distance of 10 feet from the observer.
 - b. Debris, Dirt, Spots – viewable as stated above, must be 1/16” or less. No more than two are allowed per lite and must be separated by a minimum of 24 inches.
 - c. Seeds, Bubbles, Knots, Stones – viewable as stated above, must be 1/16” or less. No more than two are allowed per lite and must be separated by a minimum of 24 inches.
 - d. No more than two total, viewable defects as describes above as allowed per lite.
 - e. Shells – Same as for point 1.e.
 - f. Chips – Same as for point 1.f.
 - g. Coating – Same as for point 1.g.
 - h. The border area is comprised of 4 inches plus ½” from each edge of the lite. All other area is the Central area.
3. Single (individual) lites over 35 square feet
 - a. Scratches – viewable as stated above, must be 1 inch or less. No more than three are allowed per lite and must be separated by a minimum of 24 inches viewed at a distance of 10 feet from the observer.
 - b. Debris, Dirt, Spots – viewable as stated above, must be 1/16” or less. No more than three are allowed per lite and must be separated by a minimum of 24 inches.
 - c. Seeds, Bubbles, Knots, Stones – viewable as stated above, must be 1/16” or less. No more than three are allowed per lite and must be separated by a minimum of 24 inches.
 - d. No more than three total, viewable defects as describes above as allowed per lite.
 - e. Shells – Same as for point 1.e.
 - f. Chips – Same as for point 1.f.
 - g. Coating – Same as for point 1.g.
 - h. The border area is comprised of 6 inches plus ½” from each edge of the lite. All other area is the Central area.

Material & Dimensional Standards

1. Tolerance on length or width dimensions as specified in table 1 and are applicable to rectangular shapes only

TABLE 1

LENGTH OR WIDTH	SIZE TOLERANCE IN ASSEMBLED UNIT
For up to 30" (762mm)	+/- 1/16" (1.5875mm)
For 30" to 60" (762mm to 1524mm)	+ 1/8" – 1/16" (3.75mm – 1.5875mm)
For 60" to 84" (1524mm to 2133.6mm)	+ 5/32" – 1/16" (3.9688mm – 1.5875mm)

2. Overall thickness of IGU's can have variances. Refer to table 1A for acceptable variances.

TABLE 1A

OVERALL IGU THICKNESS	MINIMUM IGU THICKNESS DUE TO VARIANCE	MAXIMUM IGU THICKNESS DUE TO VARIANCE
7/16" (11.11mm)	0.41" (10.414mm)	0.49" (12.446mm)
1/2" (12.7mm)	0.48" (12.192mm)	0.55" (13.97mm)
9/16" (14.29mm)	0.54" (13.716mm)	0.63" (16.002mm)
5/8" (15.875mm)	0.6" (15.24mm)	0.7" (17.78mm)
11/16" (17.4625mm)	0.66" (16.764mm)	0.76" (19.304mm)
3/4" (19.05mm)	0.70" (17.78mm)	0.81" (20.574mm)
13/16" (20.6375mm)	0.74" (18.796mm)	0.88" (22.352mm)
7/8" (22.225mm)	0.83" (21.082mm)	0.95" (24.13mm)
15/16" (23.8125mm)	0.86" (21.844mm)	0.99" (25.146mm)
1" (25.4mm)	0.94" (23.876mm)	1.06" (26.924mm)
1 1/16" (26.9785mm)	1.00" (25.4mm)	1.12" (28.448mm)
1 1/8" (28.575mm)	1.06" (26.924mm)	1.19" (30.226mm)
1 3/16" (30.1625mm)	1.13" (28.702mm)	1.25" (31.75mm)
1 1/4" (31.75mm)	1.18" (29.972mm)	1.31" (33.274mm)

3. Primary seal must be continuous without any gaps, should not exceed beyond the inner edge of the spacer bar and must be bridged at corners.
4. Secondary seal must contain the proper mix, be continuous with no exposed spacer bar and 3/16" +/- 1/16" thick. It must be trimmed evenly at the edge and there should be no sealant on the outer surface of the unit.
5. Spacer bar must be clean and made of corrosion resistance material.
6. Desiccant in molecular sieves type and can be filled either in the two long sides or one long and one short.

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7. Sight line should not vary by more than 1/8" from corner to corner and should not vary by more than 1/16" in any 12" span. This applies only to rectangular shapes.
8. Airspace Thickness – the airspace between the glass surface of sealed double glazing shall be at least 6mm wide. The airspace between the glass surfaces of sealed triple-glazing shall be at least 6mm wide for each airspace unless otherwise specified.
9. Safety logos on both lites should be in the same corners (mirror image).

Glass Cleaning Guideline

Architectural glass products can be damaged through improper cleaning. In order to keep the glass clean and free of damage, Starline recommends the following cleaning guidelines:

Recommended Glass Cleaning Procedure

- Remove grease and film deposits with mild soap detergent (one-part detergent to 2000 parts by volume of water) followed by a clean rinsing with cold or lukewarm water.
- Remove grease and film deposits with a mild soap detergent (one-part detergent to 2000 parts by volume of water) followed by a clean rinsing with cold or lukewarm water. After washing and rinsing, the glass should be dried with a clean squeegee, airflow or a clean soft cloth.

What Not to do When Cleaning Glass

- Abrasives, alkaline salts, fluoride salt or hydrogen fluoride producing compounds, inorganic alkalines (other than ammonia), strong acids (less than pH9). Note: CGSP 2-GP-55m standard for glass cleaner sets an allowable pH range of 7.0 to 10.0 (pure water has a pH balance of 7.0).
- Water under high pressure, as this can cause leaks and damage to both the sealant in the sealed joints and the trim details on the window.
- Razor blades, scrapers, steel wool or abrasive cleaning pads.

Refer to concrete and / or masonry stains, welding splatter or other stains not removed by normal cleaning to a professional window cleaner.

Definitions

Annealed Glass

To make annealed glass, the glass gets heated up above the critical or re-crystallization temperature. Once that is complete the glass is then slowly cooled to relieve residual internal stresses introduced during manufacture.

When annealed glass is broken it will break off into large, sharp shards. This can pose safety risks. Care should be taken when choosing locations to install annealed glass. Due to this, building codes, by-laws, ect. will not permit the use of annealed glass in certain conditions and will typically specify that tempered or laminated glass be used in its place.

Argon gas

Argon is an inert, non-toxic and colourless gas that is used in lieu of air in between the panes of glass in an insulated glass unit. Argon is less conductive than air, therefore reduces heat transfer and improves energy efficiency.

Defects in Glass

An imperfection in the glass. Below is definitions of some of the defects that may occur in glass. There are a certain size and quantity of defects allowed in the glass which varies depending on the overall square footage of the glass lite. Refer to the **Allowable Defects** section of this document (pg. 7-8) for more detailed information on the allowable defects.

Bubbles

Gas inclusions in any glass. These inclusions are almost always brilliant in appearance

Chips

A mark or flaw made by the breaking off or gouging out a piece of the glass.

Debris/Dirt/Spots

A small particle of foreign matter imbedded in the surface of the glass.

Knots

A transparent area of incompletely assimilated glass having an irregular knotty or tangled appearance

Scratches

Marking or tearing caused by the movement and contact of an object across the glass surface.

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Seeds

Minute bubbles. There are both fine and course seeds. Fine seeds are generally only visible upon close inspection and usually appear as small specs. These tend to be an inherent defect even in the best quality of glass.

Shells

A mark or flaw made by the breaking off or gouging out a piece of the glass.

Spots

A small particle of foreign matter imbedded in the surface of the glass.

Stones

Any opaque or partially melted particle of rock, clay or batch ingredient imbedded in the glass.

Double Glazed IGU

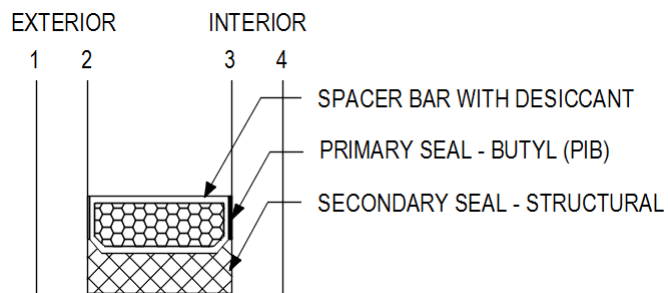
A double glazed IGU consists of two panes of glass, separated by a desiccant filled spacer bar and double edged sealed to form a complete sealed IGU. Air (or an inert gas such as argon in some cases) is trapped between the panes of glass and forms a layer of insulation helping to enhance the thermal performance of the IGU.

DUAL EDGE SEAL

Starline uses IGU's that have dual edge seal, a primary and secondary seal. The fundamental purpose of edge seal system is to provide a moisture and gas barrier as well as to provide a structural bond between two more panes of glass.

The primary seal is polyisobutylene (PIB). This seal provides the moisture and gas barrier.

The secondary seal is an elastomeric material such as polysulfide, silicone, ect. This seal ensures the structural integrity of the IGU.



primary
an IGU
barrier,
or

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Insulated Glass Unit (IGU)

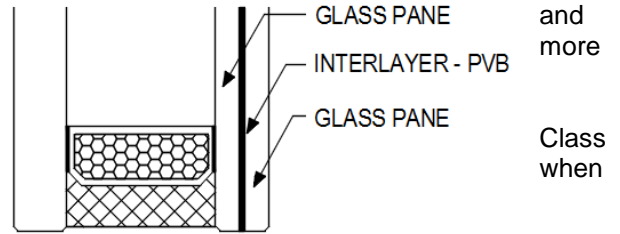
Two or more lites of glass separated by desiccant filled aluminum or warm edge spacer bar(s) and then hermetically sealed to form a dual-glazed unit with an air space between each lite. The air space may or may not be filled with an inert gas, such as argon.

Laminated Glass

Laminated glass is often used for enhanced safety and security and its acoustical properties. Laminated glass consists of two or more sheets of glass with a plastic interlayer. The interlayer is typically made of polyvinyl butyral (PVB).

In the event of breakage, the glass is bonded to the interlayer and does not shatter into shards of glass, providing a safer and secure piece of glass.

Laminated glass will provide a higher Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC) rating compared to annealed or tempered glass of the same thickness.



Low E Coating

Low-emissivity glass, commonly referred to as a Low E coating, uses a low-emittance material which is fused onto the glass surface and acts like a thermal mirror.

Emissivity is the ability of a material to radiate heat and/or light energy. When heat and/or light energy is absorbed by glass, typically from the sun or HVAC system, it is either converted away by moving air or re-radiated by the glass surface.

The purpose of the Low E coating is to reflect heat and/or light energy thus improving the U-value of the glazing.

Polyvinyl Butryal (PVB) Interlayer

Polyvinyl butryal is a resin mostly used for applications that require strong binding and optical clarity. It is tough and flexible at the same time. It is commonly used as the protective interlayer in laminated glass.

Safety Glass

A strengthened or reinforced glass that is less subject to breakage or splintering and less likely to cause injury if broken. Building codes, bylaws, etc requires glass in doors and certain locations for windows to be some type of safety glazing product, such as tempered or laminated glass.

Spacer Bar

A component placed at the perimeter of an insulated glass unit to separate the two lites of glass. Starline offers aluminum and warm edge spacer bars. Warm edge spacer bars offer a lower thermal conductance than traditional aluminium spacer bars thus providing an improvement in energy performance.

Spandrel Glass

Spandrel Glass, either opaci-coat or ceramic frit, is an opaque glass (not vision glass) commonly used to conceal structural building components such as columns, floors, HVAC systems, electrical wires, plumbing, etc., so they cannot be seen from the exterior.

In order to reduce the probability of glass breakage due to thermal stress, spandrel glass must be tempered. Spandrel panels can be used monolithically or in an IGU, depending on the application.

Vinyl Windows & Doors

Glass & IGU Product Information



Tempered Glass

Glass manufactured to withstand greater than normal forces on its surface. When it breaks, it shatters into small pieces to reduce hazard

Tinted Glass

Tinted glass products are produced by small additions of metal oxides to the float or rolled glass composition. These small additions colour the glass but do not affect the basic properties of the glass except with respects to the energy properties. Tinted glass can be heat strengthened or tempered just like regular annealed glass.

Triple Glazed IGU

A triple glazed IGU consists of three pane of glass. Each pane is separated by a desiccant filled spacer bar and double edged sealed to form a complete sealed IGU. Air (or an inert gas such as argon in some cases) is trapped between the panes of glass and forms a layer of insulation helping to enhance the thermal performance of the IGU.