



## Glossary

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**Acoustics:** The science of sound and sound control.

**Air Side:** The side of float glass that was up, or exposed to the "air", when it was manufactured. The bottom side is referred to as the "tin" side because it floated on a liquid tin bath. Coatings are applied to the air side.

**Annealed:** Raw glass with low residual stresses. This enables cutting and fabrication.

**Argon Gas:** An invisible, non-toxic gas used in insulating unit's to enhance the units insulating performance (u-value).

**Autoclave:** A vessel that employs high pressure and heat. In the glass industry, used to produce a bond between glass interlayers creating a laminated glass product.

**Bite:** The dimension by which the framing system overlaps the edge of the glazing infill.

**Blast Resistant Glass:** A laminated glazing construction commonly specified to mitigate injuries from flying glass resulting from an air-blast explosive.

**Butt Glazed:** The installation of glass products where the vertical glass edges are without structural supporting mullions.

**Butyl:** Shortened term for polyisobutylene. The primary seal of an insulating unit and key component in restricting moisture vapor transmission.

**Capillary Tube:** A small tube factory-placed into the air spacer of an insulating unit used for balancing interior and exterior pressures during transportation over higher elevations i.e. mountain ranges or air transport.

**Ceramic Frit:** An enamel applied to glass for decorative/aesthetic appearances and/or functionality such as solar control, ceramic frit is applied with a large roller for full spandrel applications or through a screen for silk-screen applications.

**Ceramic Ink:** An enamel applied to glass for decorative and aesthetic appearances and/or functionality such as solar control, ceramic ink is applied with a programmable print head for digital inkjet printing. Ceramic ink has a thinner viscosity than ceramic frit which allows it to flow through the print head.

**Coated Glass:** A general reference to any glass incorporating a reflective or low-e coating.

**Condensation:** The appearance of moisture (water vapor) on the surface of an object caused by warm moist air coming into contact with a colder object.

**Conventionally Glazed:** A framing system that captures the glazing component in the glazing channel.

**CPSC 16 CFR 1201:** Consumer Product Safety Commission's Safety Standard for Architectural Glazing Materials.

**Delamination:** An unbonded area in laminated glass between glass and PVB.

**Desiccant:** Small, extremely porous beads used to absorb moisture in the sealed air spacer of an insulating unit.

**Distortion:** Alteration of viewed images caused by variations in glass flatness or inhomogeneous portions within the glass, an inherent characteristic of heat-treated glass.

**Double Laminated Insulating Glass:** An insulating glass unit in which both the interior and exterior components are a laminated glass.

**Double Strength:** Clear 1/8" (3mm) thick float glass.

**Dual Seal:** An insulating unit with a primary seal of polyisobutylene (butyl) and a secondary seal of silicone.

**Emissivity:** The measure of a surface's ability to emit long-wave infrared radiation.

**Etch:** To alter the surface of glass with hydrofluoric acid or other caustic agents. Permanent etching of glass may

occur from alkali and other runoff from surrounding building materials.

**Float Glass:** Glass formed on a bath of molten tin. The surface in contact with the tin is known as the tin surface or tin side. The top surface is known as the atmosphere surface or air side.

**Fully Tempered Glass (FT):** Glass that has been heat-treated to have either a minimum surface compression of 10000 psi or an edge compression not less than 9700 psi in accordance with the requirements of ASTM C 1048 kind FT or meet the requirements of ANSI Z97.1 or CPSC 16 CFR 1201 safety glazing standards. Tempered glass is 4-5 times stronger than annealed glass and when broken breaks into small relatively harmless pieces.

**Glazing:** (n) A generic term used to describe an infill material such as glass. (v) The process of installing an infill material into a prepared opening in windows, door panels, partitions, etc.

**Ground Edge:** A special fabrication done to the edge of a piece of glass. It makes the edge smooth and gives it a whitish/gray appearance.

**Heat Soak:** A process of heating glass to a specific temperature for a specified time in a special oven in an attempt to find any impurities in the glass known as "nickel sulfide inclusions".

**Heat Strengthened (HS):** Glass that has been heat-treated to have a surface compression between 3500 and 7500 psi and meet the requirements for ASTM C 1048 kind HS. It is ~2-3 times the strength of annealed glass. Heat-strengthened glass is not a safety glazing material and will not meet the requirements of ANSI Z97.1 or CPSC 16 CFR 1201.

**Heat Treated:** Term used for both fully tempered glass and heat-strengthened glass.

**Hurricane Resistant Glass:** Laminated glazing tested to one or more test protocols for high velocity hurricane winds and windborne debris.

**Infrared (IR):** IR is part of the solar spectrum or sunlight that is invisible to the human eye. It has a wavelength range of ~790-3000 nanometers and has a penetrating heat effect. Short-wave IR converts to heat when it is absorbed by an object.

**Insulating Glass (IG):** Two glass components separated by a spacer and hermetically sealed. Inherently insulating glass increases a window's thermal performance.

**Insulating Laminated Glass:** An insulating glass unit in which the exterior component is a monolithic glass ply and the interior component is laminated glass.

**Interlayer:** Refers to the plastic or vinyl in a laminated unit.

**Iridescence:** Also called strain pattern or Q-lines. It is a pattern in heat treated glass not normally visible except under certain lighting conditions. It is especially visible with the use of a polarized lens. Iridescence is an inherent characteristic of heat treated glass.

**Laminated Glass:** Two or more pieces of glass bonded together by a piece of plastic/vinyl called polyvinyl butyral (PVB.) A minimum interlayer thickness of .030 (.76mm) meets the requirements of ANSI Z97.1 or CPSC 16 CFR 1201 safety glazing standards.

**Laminated Insulating Glass:** An insulating glass unit in which the exterior component is a laminated glass and the interior component is a monolithic glass ply.

**Light to Solar Gain Ratio (LSG):** The ratio is equal to the Visible Light Transmittance divided by the Solar Heat Gain Coefficient. The Department of Energy's Federal Technology Alert publication of the Federal Energy Management Program (FEMP) views an LSG of 1.25 or greater to be Green Glazing/Spectrally Selective Glazing.

**Lite:** Another term for a pane of glass. Sometimes spelled "light" in industry literature.

**Low-E:** An abbreviation for Low Emissivity coatings. They are applied to glass to reflect invisible long-wave infrared or heat. They reduce heat gain or loss in a building by redirecting the heat. In addition they typically provide greater light transmission low reflection and reduce heat transfer.

**Low iron:** A type of float glass manufactured with less iron than standard clear glass. With this reduction in iron content the greenish tint is reduced. Starphire and Optiwhite are low iron glass substrates.

**Lucor:** A powder used to separate lites of glass to prevent damage from scratching or rubbing.

**Mock-Up:** A full size sample or model of a unit normally used to judge appearance and performance.

**Monolithic:** Refers to a single lite of glass as a finished product.

**Mullion:** A horizontal or vertical member that supports and holds such items as panels, glass, sash or sections of a curtain wall.

**Negative Air:** An insulating unit wherein the two lites of glass are closer together in the center of the unit than they are at the edge. This gives the unit the appearance of being "bowed in".

**Nickel Sulfide:** An inclusion in float glass that can cause spontaneous breakage in fully tempered glass.

**Offset:** Glass unit wherein the two glass ply edges are intentionally not aligned.

**OITC Rating:** Outside-Inside Transmission Class Rating used to classify acoustic performance of glazing in exterior applications.

**Pattern Glass:** Glass with textured surface to transmit light but restrict vision.

**Polished Edge:** A special fabrication done to the edge of a piece of glass. Makes the edge smooth and gives it an extremely shiny or polished appearance.

**Polyisobutylene (PIB):** The primary seal of an insulating unit and the key component in restricting moisture vapor transmission.

**Polyurethane:** Also commonly called urethane. Used by some insulating fabricators for a secondary sealant. It is also an interlayer used in polycarbonate security products.

**Polyvinyl Butyral (PVB):** The plastic or vinyl used in the makeup of a laminated unit. The vinyl is what holds that unit together.

**Positive Air:** The opposite of negative air. In an insulating unit where the center of the unit is farther apart than around the spacer these units have a bowed out appearance.

**Pyrolytic Deposition:** A process of applying a thin metallic coating to the surface of flat glass during the float glass manufacturing process.

**R-Value:** Thermal resistance of a glazing system expressed ft<sup>2</sup>/hr/°F/BTU (m<sup>2</sup>/W/°C). The r-value is the reciprocal of the U-value. The higher the R-value, the less heat is transmitted through the glazing material.

**Reflective Glass:** See Solar Reflective Coatings

**Relative Heat Gain (RHG):** The amount of heat gained through glass taking into consideration the effects U-value and shading coefficient. The English System relative heat gain is calculated as:  $RHG = (\text{Summer U-value} \times 14^{\circ}\text{F}) + (\text{Shading Coefficient} \times 200)$ . The Metric System is calculated as:  $RHG = (\text{Summer U-value} \times 7.8^{\circ}\text{C}) + (\text{Shading Coefficient} \times 630)$ . The lower the RHG the more the glass product restricts heat gain.

**Roller wave:** The appearance of waviness sometimes seen in heat treated glass caused by the glass moving over rollers in the tempering furnace.

**Sandblast:** A surface treatment for flat glass obtained by spraying the glass with hard particles to roughen the surface. The method restricts vision while maintaining a level of light transmission.

**Setting Blocks:** Generally rectangular, cured extrusions on which the glass product bottom edge is placed to effectively support the weight of the glass. Viracon recommends that only 100% silicone setting blocks be used for all types of glazing systems.

**Shading Coefficient:** Shading coefficient is the ratio of solar heat gain through a specific type of glass that is relative to the solar heat gain through a 1/8" (3mm) ply of clear glass under identical conditions. As the shading coefficient number decreases heat gain is reduced which means a better performing product.

**Sightline:** Edge dimension of insulating glass covered by spacer.

**Silk-screen:** A process of applying a specific design or pattern to glass. The design is made by placing a screen over a piece of glass and then pressing ceramic frit by means of a large squeegee through the pores of the screen. After the frit is applied the glass goes through an infra-red oven to dry the frit and then through a tempering furnace to fire (bond) the frit to the glass permanently.

**Skylight:** A window glazed in a roof or ceiling of a building.

**Sloped Glazing:** Glass units that are glazed more than 15° off vertical.

**Solar Control Glass:** Tinted and/or coated glass that reduces the amount of solar heat gain transmitted through a glazing product.

**Solar Energy:** The sum total of the solar spectrum.

**Solar Heat Gain Coefficient (SHGC):** The portion of directly transmitted and absorbed solar energy that enters into the building's interior. The higher the SHGC the higher the heat gain.

**Solar Reflectance:** The percentage of solar energy that is reflected from the glass surface(s).

**Solar Reflective Coatings:** Coatings that reduce heat gain through higher solar reflection.

**Solar Spectrum:** The solar spectrum commonly referred to as sunlight consists of ultraviolet light (UV) visible light and infrared (IR). The energy distribution within the solar spectrum is approximately 2 percent UV 47 percent visible light and 51 percent IR.

**Solar Transmittance:** The percentage of ultraviolet visible and near infrared energy (300 - 3000 nanometers) that is transmitted through the glass.

**Spacer:** A desiccant filled frame used to separate two lites of glass in an insulating unit.

**Spandrel:** The panel(s) of a wall located between vision areas of windows which conceal structural columns

floors and shear walls.

**STC Rating:** Sound Transmission Class Rating is a single-number rating system for interior building partitions and viewing windows used to categorize acoustic performance. Its original intent was to quantify interior building partitions not exterior wall components. As a result it is not recommended for glass selection of exterior wall applications since the single-number rating was achieved under a specific set of laboratory conditions.

**Structurally Glazed:** The use of a silicone sealant on one or more sides of the insulating unit for the structural transfer of loads from the glass to its perimeter support system and retention of the glass in the opening.

**Substrate:** The raw glass or base material to which other materials or fabrication procedures are applied.

**Tin Side:** The bottom side of float glass as it was manufactured called "tin side" because float glass rides on a bath of liquid tin while it is being cooled.

**U-Value:** A measure of heat gain or heat loss through glass due to the thermal conductance and the difference in indoor and outdoor temperatures. As the u-value decreases, so does the amount of heat that is transferred through the glazing material. The lower the u-value the more restrictive the fenestration product is to heat transfer; reciprocal of r-value.

**Ultraviolet Light (UV):** The name of the invisible portion of the light spectrum with wavelengths shorter than 390 nanometers. The damaging effects on long-term UV exposure results in fabric fading and plastic deterioration.

**Vacuum (Sputtering) Deposition:** Process for applying multiple layers of metallic coatings to the surface of flat glass in a vacuum chamber.

**Visible Light Reflectance:** The percentage of light that is reflected from the glass surface(s).

**Visible Light Transmittance:** The percentage of visible light (380 - 780 nanometers) that is transmitted through the glass. (Visible light is the only portion of the solar spectrum visible to the human eye.)

**Warm Edge:** Term used to describe insulating spacer technologies that achieve better center of glass thermal performance (u-value) than a traditional aluminum spacer.

**Weeps (or Weep Holes):** Drain holes or slots in the sash or framing member to prevent accumulation of condensation and water.

**Wet Seal:** Application of an elastomeric sealant between the glass and sash to form a weather-tight seal.