



Glass Informational Bulletin

GANNA ID 01-1107

Describing Architectural Glass Constructions

Architectural glass products used in commercial construction applications often incorporate multiple lites of glass with different colors, thicknesses, strength, coatings and other surface and edge treatments. The Glass Association of North America (GANA) recommends the following terminology and practices for describing the construction of architectural glass products to be used in windows, doors, skylights, window walls and curtain walls:

Monolithic Glass: a single lite of glass including laminated glass as defined below

Laminated Glass: an assembly of two or more plies of glass bonded together with an interlayer material

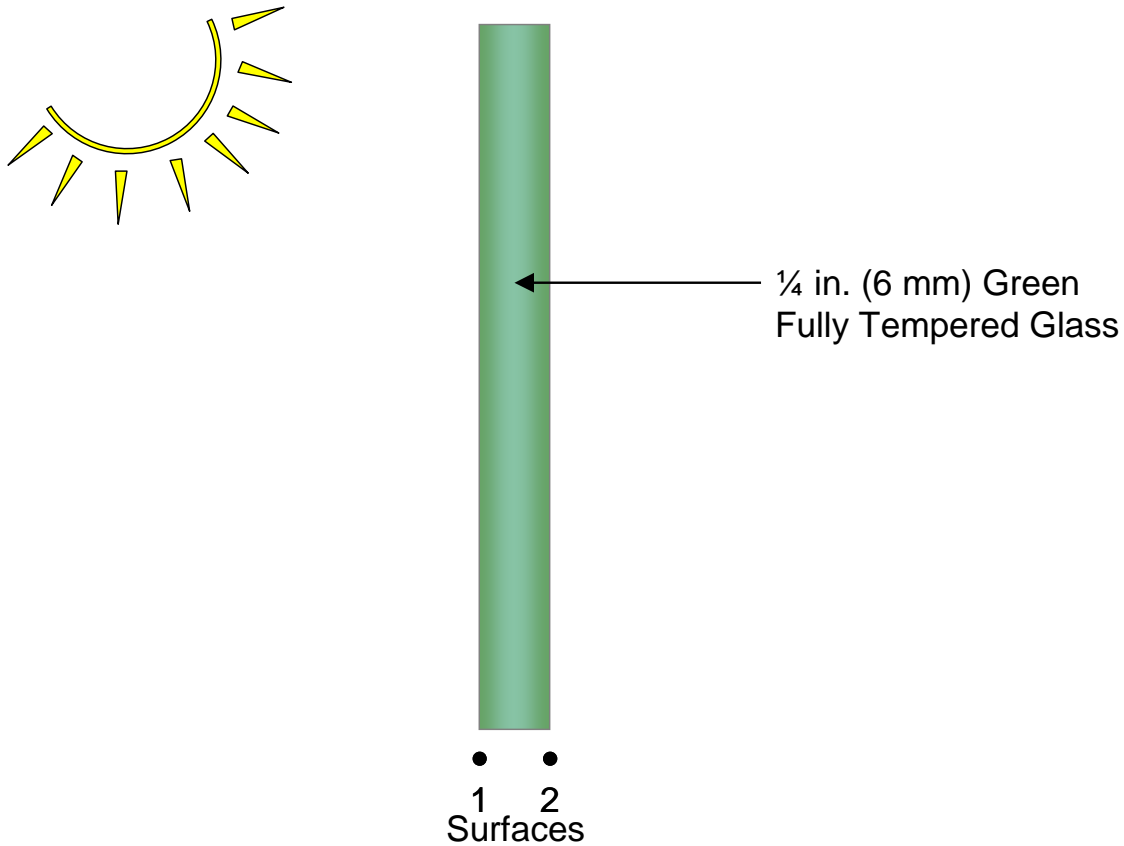
Insulating Glass: two or more lites of glass separated by a spacer(s) material incorporating a drying agent (desiccant) and hermetically sealed around the perimeter with one or more sealants.

Glass Surface Orientation / Designation: the numerical identification of a specific glass surface relative to the exterior surface of the assembly. The first surface is the exterior surface with each consecutive glass surface identified in order from exterior to interior with the last (highest number) surface being on the interior of the assembly.

The following pages provide detailed descriptions and illustrations of a number of monolithic, laminated and insulating glass constructions:

Monolithic Uncoated Glass

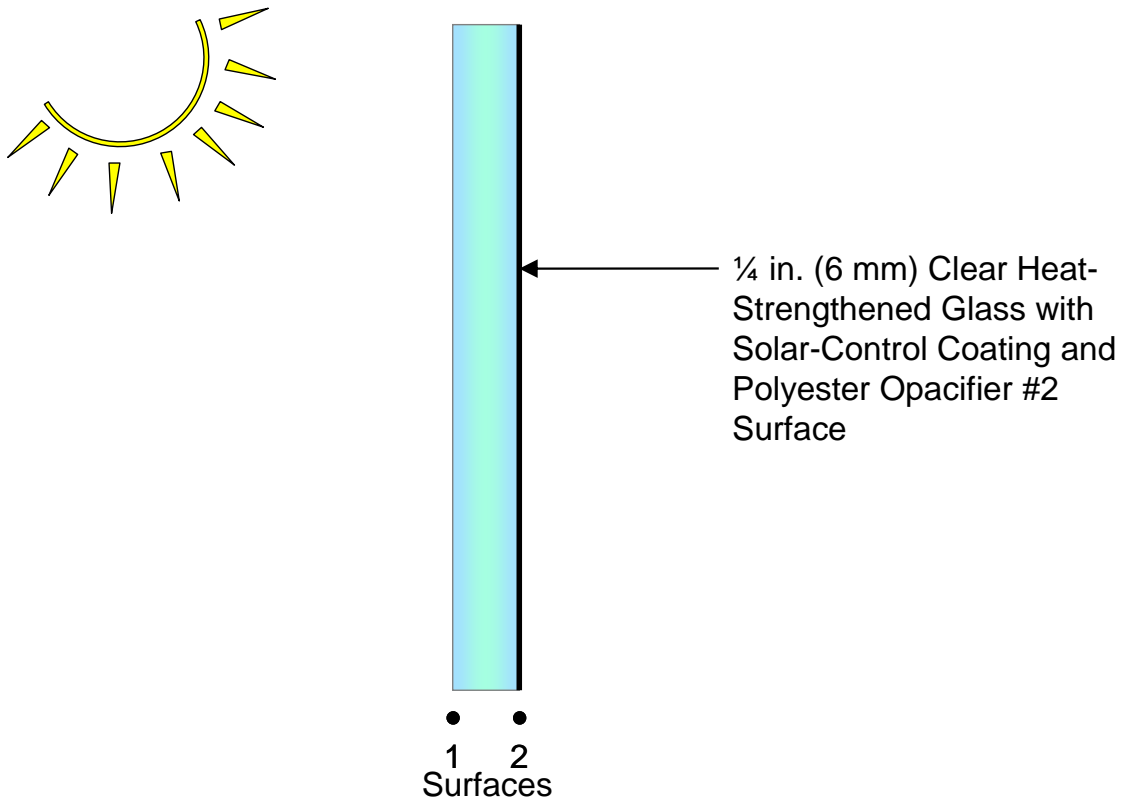
1. Glass thickness in inches and/or millimeters
2. Glass substrate (Clear, Green, Gray, Bronze, Blue, etc.)
3. Glass strength (annealed, heat-strengthened or fully tempered)
4. Edge treatment if any (seamed, flat ground, polished, etc.)



Example: 1/4 in. (6 mm) Green fully tempered glass

Monolithic Coated Glass

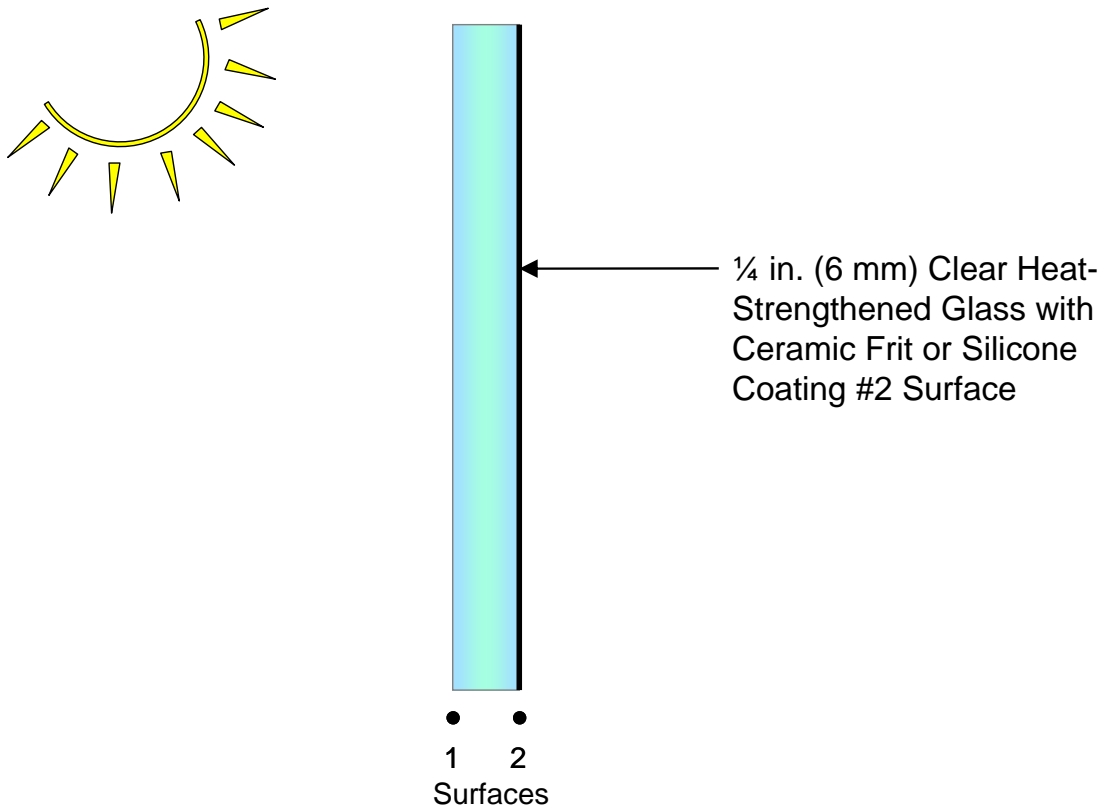
1. Glass thickness in inches and/or millimeters
2. Glass substrate (Clear, Green, Gray, Bronze, Blue, etc.)
3. Glass strength (annealed, heat-strengthened or fully tempered)
4. Manufacturer's name, coating designation & type
5. Coated surface location (glass surface number as defined in Glass Surfaces Designation)
6. Type of opacifier (if applicable for spandrel glass)
7. Edge treatment if any (seamed, flat ground, polished, etc.)



Example: 1/4 in. (6 mm) Green heat-strengthened glass with (insert Company Name, coating designation & type) coating #2 surface and polyester sheet opacifier #2 surface

Monolithic Opaque Spandrel Glass

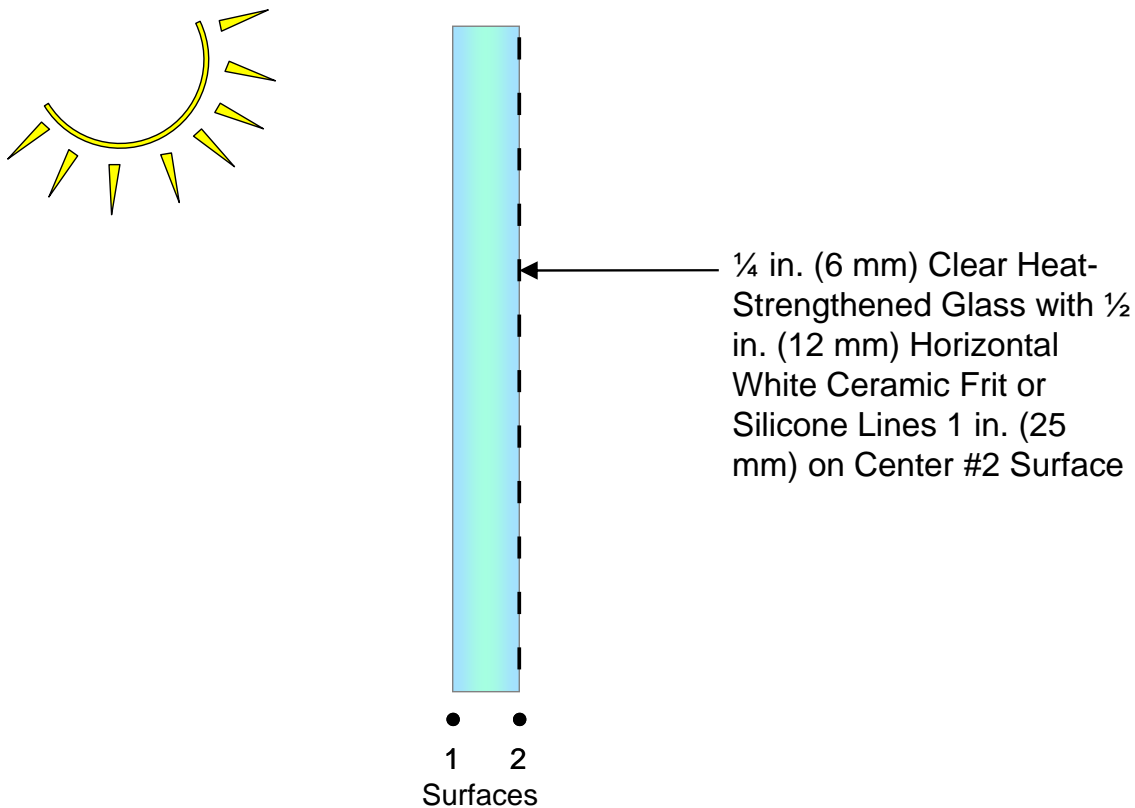
1. Glass thickness in inches and/or millimeters
2. Glass substrate (Clear – typically spandrel coatings are applied to clear glass)
3. Glass strength (heat-strengthened or fully tempered glass is required for these products)
4. Manufacturer's name, coating designation & type (ceramic frit, silicone)
5. Coated surface – ceramic frit and silicone products are designed to be on the number two surface for monolithic glass
6. Edge treatment if any (seamed, flat ground, polished, etc.)



Example: 1/4 in. (6 mm) Clear heat-strengthened glass with (insert Company Name, coating color) ceramic frit coating #2 surface

Monolithic Decorative Screen Printed Glass

1. Glass thickness in inches and/or millimeters
2. Glass substrate (Clear, Green, Gray, Blue, etc.)
3. Glass strength (heat-strengthened or fully tempered is typically required)
4. Decorative pattern description
5. Manufacturer's name, coating designation & type (ceramic frit, silicone) pattern, pattern color and distribution if applicable
5. Coated surface – ceramic frit and silicone products are designed to be on the number two surface for monolithic glass
6. Edge treatment if any (seamed, flat ground, polished, etc.)

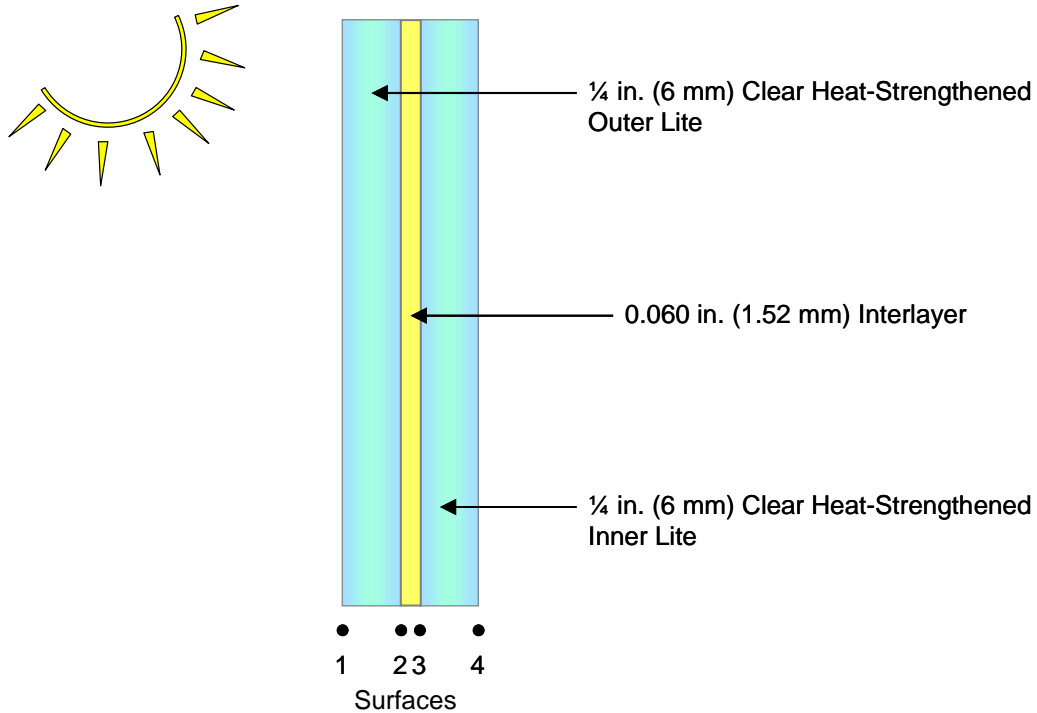


Example 1: 1/4 in. (6 mm) Clear heat-strengthened glass with (insert Company Name) 1/2 in. (12 mm) horizontal White ceramic frit lines 1 in. (25 mm) on center on the #2 surface

Example 2: 1/4 in. (6 mm) Clear heat-strengthened glass with (insert Company Name) 1/8 in. (3 mm) ceramic frit dot pattern, black, on 1/4 in. (6 mm) center, 50% coverage, on the #2 surface. Flat polished edges.

Monolithic Laminated Glass

1. Overall assembly thickness in inches and/or millimeters
2. Outer lite thickness and substrate (Clear, Green, Gray, Bronze, Blue, etc.)
3. Outer lite strength (annealed, heat-strengthened or fully tempered)
4. Interlayer thickness, type and color
6. Inner lite thickness and substrate (Clear, Green, Gray, Bronze, Blue, etc.)
7. Inner lite strength (annealed, heat-strengthened or fully tempered)
8. Edge treatment if any (seamed, flat ground, polished, etc.)

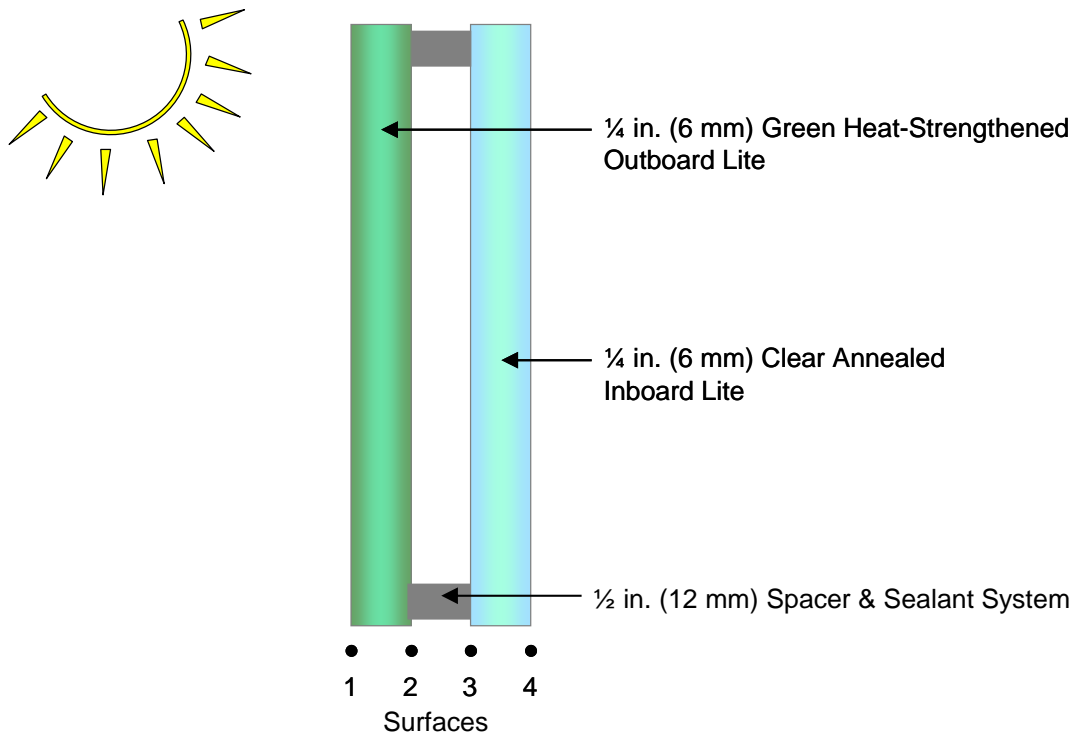


Example: 9/16 in. (14 mm) Clear laminated glass with a 1/4 in. (6 mm) Clear heat-strengthened outer lite, .060 in. (1.52 mm) (insert interlayer type and color) interlayer, 1/4 in. (6 mm) Clear heat-strengthened inner lite

Note: The description process can be continued in the order above for multi-lite laminated glass constructions.

Uncoated Insulating Glass Unit

1. Overall insulating glass unit thickness in inches and/or millimeters
2. Outboard (exterior) lite thickness in inches and/or millimeters
3. Outboard lite substrate color (Clear, Green, Gray, Bronze, Blue, etc.)
4. Outboard lite strength (annealed, heat-strengthened or fully tempered)
5. Spacer width in inches and/or millimeters and spacer material color/finish/description
6. Type of primary seal (polyisobutylene, etc.)
7. Type of secondary seal (silicone, polysulfide, polyurethane, etc.)
8. Inboard (interior) lite thickness in inches and/or millimeters
9. Inboard lite substrate color (typically Clear glass)
10. Inboard lite strength (annealed, heat-strengthened or fully tempered)

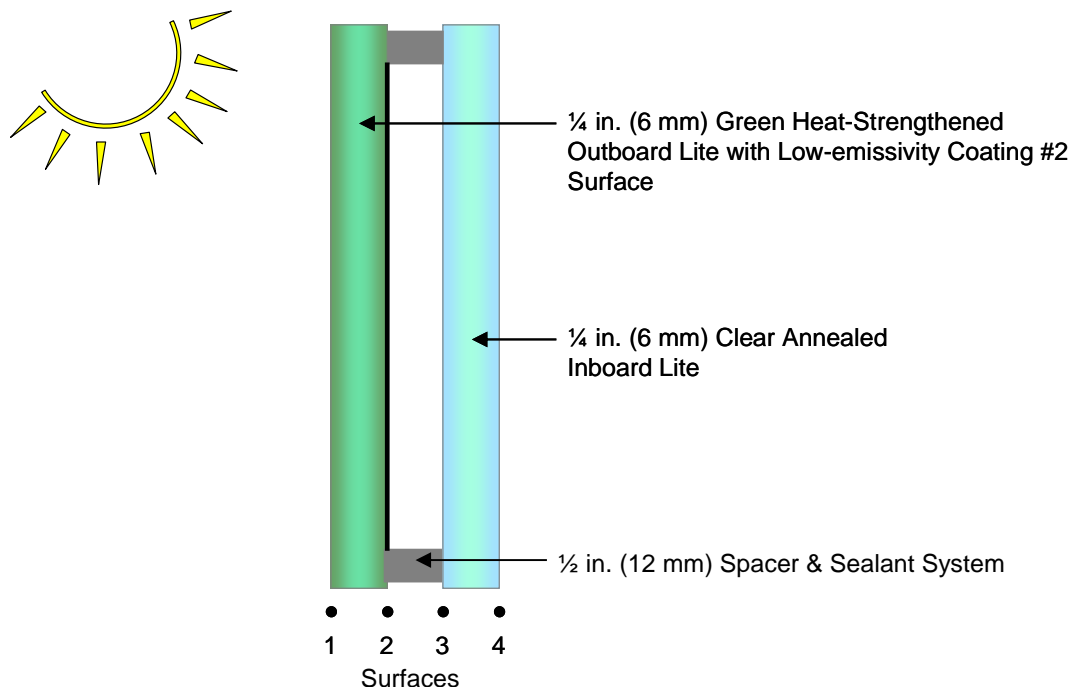


Example: 1 in. (25 mm) insulating glass unit with a 1/4 in. (6 mm) Green heat-strengthened outboard lite, 1/2 in. (12 mm) (insert type and color) spacer, (insert type) primary seal, (insert type) secondary seal and a 1/4 in. (6 mm) Clear annealed inboard lite.

Coated Insulating Glass Unit

1. Overall insulating glass unit thickness in inches and/or millimeters
2. Outboard (exterior) lite thickness in inches and/or millimeters
3. Outboard lite substrate color (Clear, Green, Gray, Bronze, Blue, etc.)
4. Outboard lite strength (annealed, heat-strengthened or fully tempered)
5. Manufacturer's name, coating designation & type (low-emissivity, solar-control, other) and coated surface i.e. #2 surface (counting from the outside in)
6. Spacer width in inches and/or millimeters and spacer material color/finish/description
7. Type of primary seal (polyisobutylene, etc.)
8. Type of secondary seal (silicone, polysulfide, polyurethane, etc.)
9. Inboard (interior) lite thickness in inches and/or millimeters
10. Inboard lite substrate color (typically Clear glass)
11. Inboard lite strength (annealed, heat-strengthened or fully tempered)

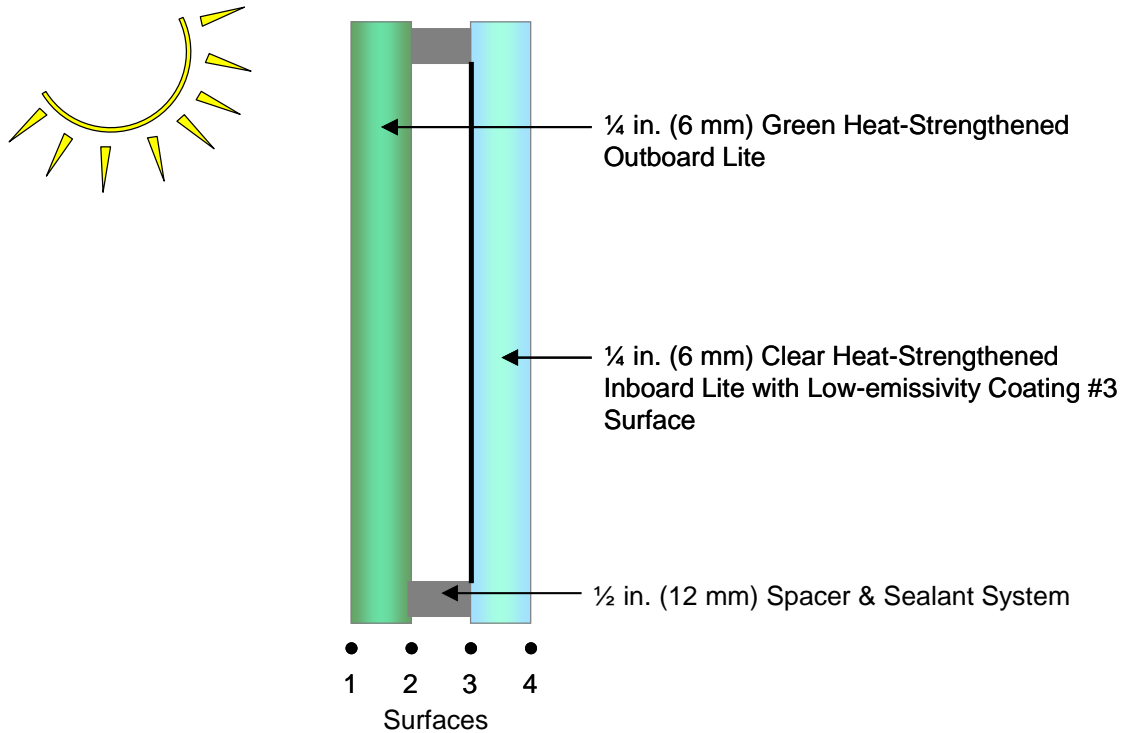
*NOTE: Architectural glass manufacturers offer a number of performance enhancing coatings that can be applied to various glass surfaces in an insulating glass unit. Manufacturers should be consulted regarding coated surface requirements. The examples below provide guidelines for description of units with coatings on various surfaces.



Example 1 – Insulating Unit with Coating on the #2 surface: 1 in. (25 mm) insulating glass unit with a ¼ in. (6 mm) Green heat-strengthened outboard lite, with a (insert Company Name & coating designation) low-emissivity coating #2 surface, ½ in. (12 mm) (insert type and color) spacer, (insert type) primary seal, (insert type) secondary seal and a ¼ mm (6 mm) Clear annealed inboard lite.

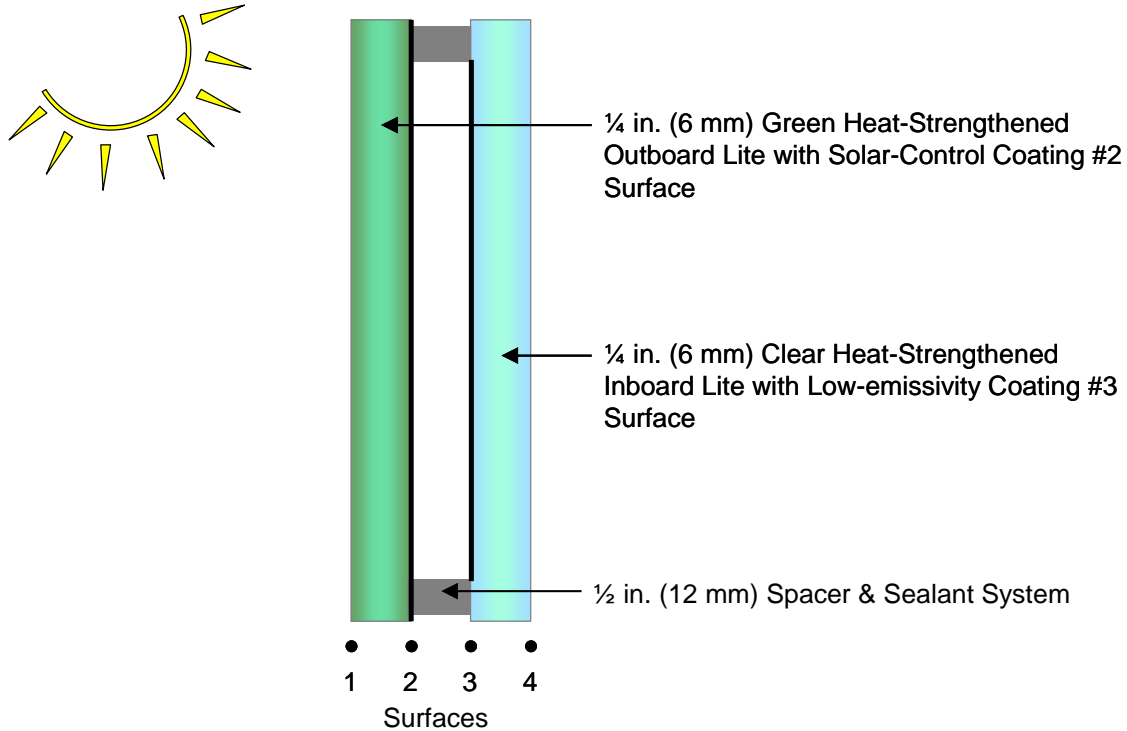
NOTE: For insulating glass units containing more than air, simply insert the type of gas after the words "...spacer gap containing..." following the dimension. For example, "...1/2 in. (12 mm) spacer gap containing argon..."

Coated Insulating Glass Unit



Example 2 – Insulating Unit with Coating on the #3 surface: 1 in. (25 mm) insulating glass unit with a ¼ in. (6 mm) Green heat-strengthened outboard lite, ½ in. (12 mm) (insert type and color) spacer, (insert type) primary seal, (insert type) secondary seal, and a ¼ in. (6 mm) Clear heat-strengthened inboard lite with (insert Company Name & coating designation) low-emissivity coating #3 surface.

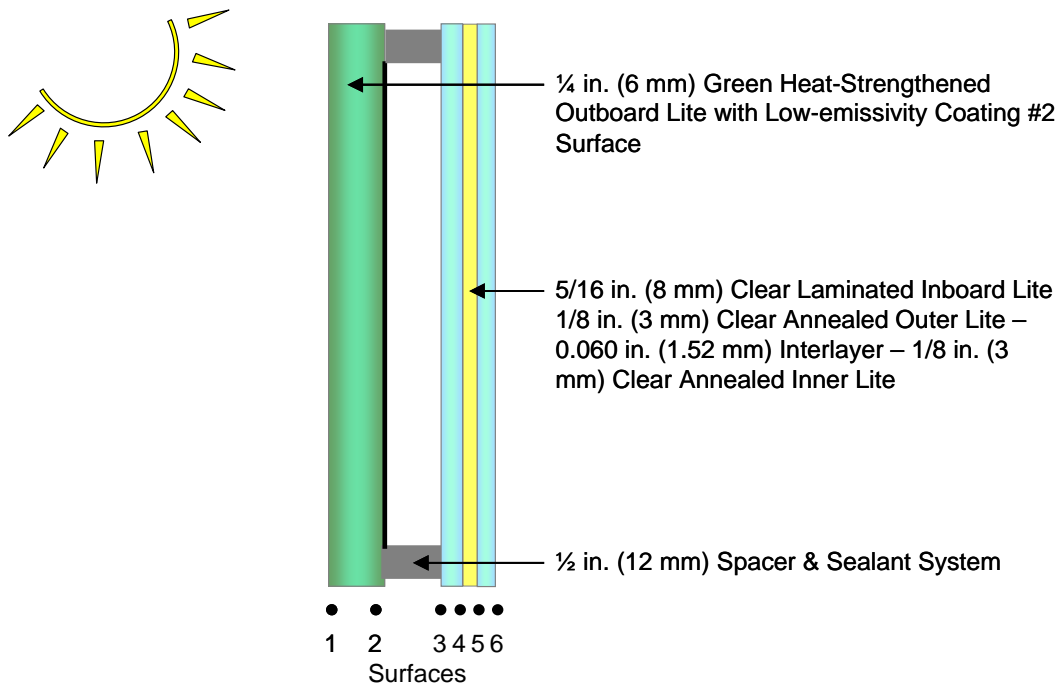
Coated Insulating Glass Unit



Example 3 – Insulating Unit with Coating on the #2 and #3 surfaces: 1 in. (25 mm) insulating glass unit with a 1/4 in. (6 mm) Green heat-strengthened outboard lite, with (insert Company Name & coating designation) solar-control coating #2 surface, 1/2 in. (12 mm) (insert type and color) spacer, (insert type) primary seal, (insert type) secondary seal, and a 1/4 in. (6 mm) Clear heat-strengthened inboard lite with (insert Company Name & coating designation) low-emissivity coating #3 surface.

Coated Insulating Glass Unit with Laminated Lite

1. Overall insulating glass unit thickness in inches and/or millimeters
2. Outboard (exterior) lite thickness in inches and/or millimeters
3. Outboard lite substrate color (Clear, Green, Gray, Bronze, Blue, etc.)
4. Outboard lite strength (annealed, heat-strengthened or fully tempered)
5. Manufacturers name, coating designation & type (low-emissivity, solar-control or other) coating and coated surface i.e. #2 surface (counting from the outside in)
6. Spacer width in inches and/or millimeters and spacer material color/finish/description
7. Type of primary seal (polyisobutylene, etc.)
8. Type of secondary seal (silicone, polysulfide, polyurethane, etc.)
9. Inboard (interior) laminated lite overall thickness and make-up
10. Outer lite thickness and substrate color (Clear, Green, Gray, Bronze, Blue, etc.)
11. Outer lite glass strength (annealed, heat-strengthened or fully tempered)
12. Interlayer thickness, type and color
13. Inner lite thickness and substrate color (Clear, Green, Gray, Bronze, Blue, etc.)
14. Inner lite glass strength (annealed, heat-strengthened or fully tempered)



Example – Insulating Unit with Coating on the #2 surface: 1-1/16 in. (27 mm) insulating glass unit with a ¼ in. (6 mm) Green heat-strengthened outboard lite, with (insert Company Name & coating designation) low-emissivity coating #2 surface, ½ in. (12 mm) (insert type and color) spacer, (insert type) primary seal, (insert type) secondary seal, and a 5/16 in. (8 mm) laminated inboard lite with 1/8 in. (3 mm) Clear annealed outer lite, .060 in. (1.52 mm) (insert type) interlayer, and 1/8 in. (3 mm) annealed inner lite.

NOTE: Product applications may also require laminated glass constructions for the outboard lite or both the outboard and inboard lites. The same detailed description process would apply.

Consult Your Glass Manufacturer / Fabricator

Many factors can affect the specific details of a glass construction for a particular application. Design and application factors that affect architectural glass construction requirements include but are not limited to:

- Safety glazing requirements
- Protective glazing requirements
- Thermal performance requirements (U-factor, Solar Heat Gain & Condensation Resistance)
- Building code requirements
- Thermal stresses
- Project design loads (wind, snow)
- Framing edge support
- Structural silicone glazing systems
- Material compatibility
- Coating edge deletion
- Spandrel glass viewing conditions

Since it is not the intent to address all design considerations or product assemblies in this informational bulletin, design professionals and specifiers should consult with glass manufacturer/fabricator regarding intended applications and requirements before completing project specifications. Additional information regarding architectural flat glass substrates is provided in the International Glazing Database maintained by the Windows and Daylighting Group at the Lawrence Berkeley National Laboratory (<http://windows.lbl.gov>).

For information on additional reference resources including the GANA *Glazing Manual*, *Laminated Glazing Reference Manual* and other Glass Informational Bulletins visit GANA website: www.glasswebsite.com.

The Glass Association of North America (GANA) has produced this Glass Informational Bulletin solely to provide general information as to the recommended way to describe the components of architectural glass constructions. The Bulletin does not purport to state that any one particular type of glass construction process or procedure should be used in all applications or even in any specific application. The user of this Bulletin has the responsibility to ensure that architectural glass constructions meet building code and other specific project requirements, GANA disclaims any responsibility for any specific results related to the use of this Bulletin, for any errors or omissions contained in the Bulletin, and for any liability for loss or damage of any kind arising out of the use of this Bulletin.

This bulletin was developed and approved by the GANA Insulating Division – Technical Committee and approved by the Insulating Division membership and GANA Board of Directors. This is the original version of the document as approved and published in November 2007.