SYRACUSE GLASS COMPANY

TECHNICAL TERMS

GENERAL NOTES

- Prices subject to change without notice.
- Price schedule applies for glass sizes that comply with
  - our Fabrication Glass Size Limits (see doc.)
  - our Stock Sheet Sizes (see doc.)
  - a 500 lb. weight limit per piece.
- Glass sizes rounded to next even inch for pricing.
- Please reference quote number on purchase order.
- Please review acknowledgements and notify us of any discrepancies.
- Our warranties don't cover glass breakage
- We can evaluate glass sizes for breakage under load or for excessive center of glass deflection using ASTM E 1300 software or building code charts. We do not determine specific project design loads. Without a project design load, we can provide a report on the likelihood of breakage and center-of-glass deflection values at various loads, but we don't represent that glass is suitable for a specific project.
- See our Glass Inspection Process document for glass and mirror inspection.

MONOLITHIC GLASS

- Annealed glass is **not** a safety glazing material.
- Dimensional tolerance, surface quality, inspection procedure according to ASTM C1036 Q3.
- Monolithic size tolerance for rectangles

	Size Tolerance	Standard	Tight Tolerance
Thickness	Cut Size	Edgework	Edgework
3/32" – 1/4"	+/-1/16"	+/-1/8"	+/-1/6"
3/8"	+/-3/32"	+/-3/16"	+/-1/16"-1/8"
1/2"	+/- 1/8"	+/- 1/4"	+/-1/16"-1/8"

- Dimensional tolerance for shapes evaluated on request.
- Non-standard or "tight" tolerance must be requested at time of quote **and** order (excludes shower enclosures which are fabricated to tight tolerance).
- We recommend that safety glass be used in table applications unless the glass is completely supported by the table (like a desktop).
- Stock sheets and cut size annealed glass edges are provided clean cut, unless edgework is ordered. Edge chips will not exceed allowances in ASTM C 1036 for raw glass edges (depth 1/2" of glass thickness, width - 1/2" of glass thickness or 1/4", whichever is greater, chip length – twice the chip width).
- A seamed edge is not a suitable finished edge
- Glass ordered with polished edges are provided with a flat polished profile.
- Glass and mirrors ordered with beveled edges have a ground pencil edge or glass thickness 1/8"-1/4". Glass 3/8" – 1/2" thick ordered with beveled edges will have a flat polished edge.
- Circles in 3/8" or 1/2" glass have a maximum of 42" diameter (no guarantee on edges for larger diameters).
- No beveling on laminated or acid etch glass.
- Mitered edges available on straight edges only. About 25% of the mitered edge will remain after mitering to reduce the likelihood of damage to the mitered edge.
- Holes have clean cut edges on annealed glass, seamed edges on tempered (both not suitable exposed edges). Holes with ground edges available on request (i.e. for exposed speakholes).
- Notches and cutouts have ground edges standard).
- Hole location tolerances – from hole center to dimensioned edge, or between dimensioned hole centers +/- 1/16".
- Notch location tolerances – for 1/4" and under +/- 1/16", for 3/8" and 1/2" +/- 1/8".
- Edge chips on notches and holes <1/16".

HEAT TREATED LAMINATED GLASS

- Minimum interlayer thickness .060
- Maximum size with 1/8" glass 40" x 80"
- Clear or tinted glass only – No coated glass components.

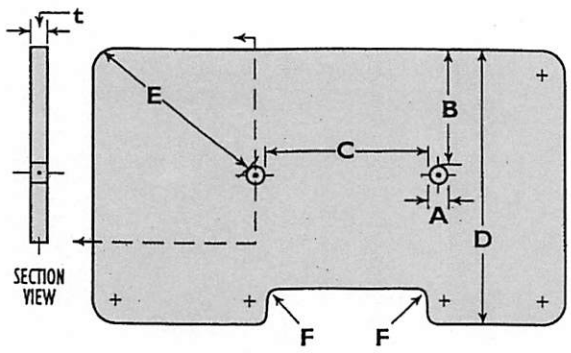
ANNEALED LAMINATED GLASS

- Laminated glass with a 030 interlayer is a CPSC 16 CFR 1201 Category II and ANSI Z97.1 Class A safety glazing material.
- Laminated glass with a .015 interlayer is a CPSC 16 CFR 1201 Category I and ANSI Z97.1 Class B safety glazing material.
- Laminated glass is supplied with a permanent logo unless ordered "NO LOGO."
- Laminated glass is supplied with clean cut edges.
- Laminated quality and size tolerances according to ASTM C 1172.
- Request quotations on laminated glass with edgework, holes, or other fabrication.

HEAT TREATED (TEMPERED OR HEAT STRENGTHENED) GLASS

- Tempered glass is a safety glazing material – CPSC 16 CFR 1201 Category II and ANSI Z97.1 Class A.
- Tempered HS glass is inspected and will comply with ASTM C 1048 (unless glass size exceeds our recommended sizes).
- Tempered glass edges are seamed unless polished edges are ordered.
- See Monolithic Glass for inspection procedures and size tolerance.
- All tempered or HS glass will have a permanent logo, unless ordered "NO LOGO."
- Hole and notch locations and sizes subject to compliance with ASTM C1048 (see Chart). Large holes and notches (greater than 1/3 of the glass small dimension) require technical review prior to acceptance.

GLASS THICKNESS (t)	1/8	3/16	1/4	3/8	1/2	3/4	GENERAL RULE
Minimum Diameter of Holes (A)	1/4"	1/4"	5/16"	7/16"	9/16"	13/16"	A ≥ t+1/16" and 1/4"
Distance from Hole Rim to Edge of Glass (B)	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	B ≥ 2t and 1/4"
Distance between Rims of Holes (C)	3/8"	3/8"	1/2"	3/4"	1"	1 1/2"	C ≥ 2t and 3/8"
Distance from Corner to Rim of Hole (E)	13/16"	1 7/32"	1 5/8"	2 7/16"	3 ¼"	4 7/8"	E ≥ 6.5 x t
Minimum Fillet Radius (F)	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	F ≥ t



- Countersink holes require technical review prior to order acceptance
- Bow and warp will comply with ASTM C1048. See Tempered Glass technical doc. for chart for allowable bow and warp tolerances.
- **Heat treating adds distortion to glass. Any requirements concerning distortion must be disclosed at time of quotation and time of order, including furnace orientation.**

- We can orient glass consistently in the furnace for consistent roller wave distortion, with roller wave parallel to sill, subject to 84" furnace width if requested at time of order.
- Heat strengthened glass recommended in applications where heat stress is a concern and where safety glazing material is not required, due to rare risk of "spontaneous breakage" in tempered glass. **Heat strengthened not a safety glazing material.**
- Heat treated glass has a "strain pattern" or "quench marks" that may be visible especially with polarized sunglasses, and when viewed at glancing angles.
- All fabrication that penetrates the glass surface must take place prior to heat treatment.
- Maximum unsupported vertical spans of glass panels retained at top and bottom should comply with GANA Heavy Glass Door Design Guide (1/4" – 5 feet, 3/8" – 8 feet, 1/2" – 10 feet) with silicone or mechanical fasteners used between panels to prevent finger pinching risk (Bldg. Code Sec. 2403.4).

OPACI-COAT 300 SPANDREL GLASS

- Spandrel orders subject to set up charge per release.
- Standard OPACI-COAT Colors: Light White, Black, Solex (Green), Evergreen, Warm Gray, Gray, Bronze, Lava Bronze, Blue.
- All Spandrel glass must be heat treated (heat strengthened or tempered).
- **All Spandrel glass - OPACI-COAT 300 or Ceramic Frit - is not suitable for use in vision areas (where viewable from inside).** Pinholes and uneven coating will be visible. Spandrel glass must be backed up by another building material.
- Order OPACI-COAT 300 or Ceramic Frit on #2 surface monolithic or #2 or #4 surface insulating. Coating is not suitable for #3 surface applications.
- OPACI-COAT 300 is applied as directed by manufacturer ICD. Light, white, pastel colors are applied at a thicker level than dark colors. No need to order "double coating." Even at the thicker level, the material is not suitable for a vision area.
- OPACI-COAT 300 is incompatible with standard neoprene setting blocks and gaskets. For #2 surface monolithic or #4 surface insulating orders we will apply a bond breaker tape that extends 2" from the edge of glass around the perimeter if requested at no charge. This is especially important with light, white, pastel colors.
- For structural glazed applications involving #4 surface OPACI-COAT 300, request edge deletion, or use ICD specified structural silicone glazing material. Specifically identify structural glazing applications at time of quote **and** order.
- Fall out protection is available for additional charge if requested at time of order.
- Light colors, particularly if ordered in multiple releases, may vary slightly in color.
- Spandrel glass will meet and be inspected in accordance with ASTM C1048 (from the exterior, after material is backed up, from 15 feet).
- Call for information on factory applied insulation.

NON-RECTANGULAR SHAPES

- Check our Shape Catalog to see if the shape can be ordered as a dimensional drawing using one of our numbered standard shapes. Dimensional accuracy, and insulating glass siteline accuracy are improved with the Shape Catalog, rather than patterns.
- Phone or fax the office and request a pattern pick up.
- Prepare the pattern with an "outside looking in" orientation.
- If possible cut the pattern to the size you need using cardboard, craft paper, or solid wood of a uniform thickness. DON'T SEND A GLASS PATTERN.
- If you must send a drawing, use a pen or fine tipped marker (not pencil) that creates a strong contrast with the background material.
- Don't write dimensions on the pattern.
- **If our standard size tolerance won't be acceptable, indicate the tolerance you need.**

- If your order is for monolithic glass, we digitize your pattern.
- If your order is for insulating glass, we evaluate it to see if we can use a standard shape before digitizing.
- We retain a digital file of digitized patterns for 6 months.
- If you would like us to retain a digital file of your pattern, we will do so on request.
- We return patterns with your order.
- Pattern charges are applied per pattern. Shape charges are applied per piece.

INSULATING GLASS

- Standard IG construction is dual seal PIB/Silicone with clear aluminum spacer and bent corners.
- Insulating glass thickness tolerance +/-1/16". Order units 1/16" under desired nominal thickness for tight glazing applications.
- IG siteline tolerance +/- 1/8" for rectangles. Siteline tolerance on shapes evaluated on request.
- **Order silicone seal for structural glazing applications and offsets.**
- **Evaluate thermal stress before selecting annealed tinted glass. Tinted (heat absorbing) glass, Low E coatings, exterior shading, tight blinds and drapes, HVAC ducts blowing air at glass surfaces can cause glass to heat unevenly and crack if the thermal stress exceeds the glass strength. See Pilkington, Guardian, PPG thermal stress calculator, or ask us to use the calculator with your input on job factors.**
- Low E coatings exhibit a haze under certain viewing conditions, not a cause for rejection (see Haze in Low-E Insulating glass Units document).
- Solar Control Low E Coatings (Guardian SN-68, Pilkington Eclipse Advantage, Solar E) are typically placed on the #2 surface. Passive Solar Low E coatings (Pilkington Energy Advantage) are typically placed on the #3 surface, but can be placed on the #2 surface to improve SHGC.
- PPG Solarcool Reflective coatings can be placed on the #1 or #2 surface.
- Low E coated glass will have a Low E label on the non-coated side of the Low E glass. The label does not have a "glaze this side in" message.
- Pilkington Eclipse Advantage (bronze, gray, etc.) coating has Low E as well as reflective (solar control) properties.
- Coated glass is inspected according to ASTM C 1376 (summarized in our Glass Inspection Process document).
- Clearly identify requirements for two-side or four-sided structural glazing units at time of quote and order, along with project design load for calculation of adequacy of secondary seal depth.
- Argon gas units must have at least a 5/16" thick spacer.
- Glaze units in framing system designed for insulating glass according to framing manufacturer instructions and industry standard glazing references like GANA Glazing Manual, especially important: a weeped glazing system and adequate (at least 4" each side) setting blocks.
- Annealed laminated units – maximum size 48" x 96".
- Insulated glass under 7" x 14" is hand washed. Interior glass surfaces will have debris, not a cause for rejection.
- Insulated glass that is ordered with dimensions that are under or over our size recommendation are not covered by our limited warranty covering seal failure, and may not comply with ASTM or Syracuse Glass Quality Standards (i.e. size tolerances, surface flaws, inspection process, siteline tolerance, etc.).

Laminated Glass Quote/Order Typical Comments

1. Quality: Will meet the requirements of ASTM C1172-19 which identifies size tolerance (including edge mismatch), allowable overall bow, and visible defects.
2. The exposed edges of heat-treated laminated glass will not have the same appearance as that of monolithic glass. All project specific aesthetic requirements needs to be addressed before glass fabrication to ensure project requirements and fabrication capabilities are aligned.
3. Compatibility: OBE is not responsible for delamination, or other issues, caused by use of incompatible materials, including sealants. Contact the interlayer suppliers for a list of interlayer compatible materials. The interlayer suppliers do not recommend embedding laminated glass into grout.
4. Technical Laminates: Any laminate in an engineered or tested system must be ordered exactly as it was identified in the approved engineering drawings/calculations, or as tested. Examples of engineered or tested systems include, but are not limited to: Glass Floors, Point-Supported, Zoo or Marine Enclosures, Hurricane Impact, Handrail/Guardrail, Blast-Resistant, and Security Glazing.
5. Ultraviolet (UV): UV performance of laminated glass is calculated per the LBNL WINDOW 7 program (current version).
6. References: Please consult the following National Glass Association (NGA) publications as applicable:
    - Laminated Glazing Reference Manual
    - FB04-03: Design Considerations for Laminated Glazing Applications
    - FB48-15: Effects of Moisture, Solvents and Other Substances on Laminated Glazing Edges
    - FB14-07: Glass Floors and Stairs
    - FB24-09: Hurricane Product Substitution
    - FB59-18: Heat-Treated Laminated Glass Exposed Edges
    - FB33-11: Use of Laminated Glass in Glass Railing Systems
    - FB23-09: Weight of Laminated Architectural Glass
    - FB32-12: Screening Out Ultraviolet Radiation with Laminated Glass