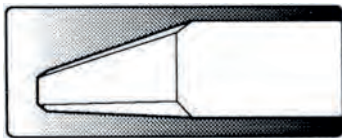


## GLASS FABRICATION SPECIFICATIONS & GUIDELINES

*From prototype to production, GLASSource can handle all your glass and mirror needs!*

*We specialize in new or custom tooling requests for those uniquely shaped products, plus we carry a complete inventory and what we don't have is just a phone call away.*

*That's hassle free service! Whatever your glass needs count on GLASSource!*



### ***Flat Polished Edge***

Available in 1/8", 3/16", 1/4", 1/2" and 3/4" glass.  
For squares, rectangles, circles and patterns.



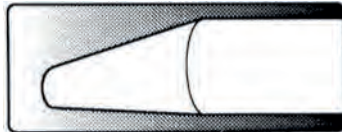
### ***Beveled Edge*** (up to 1 1/2" on patterns, up to 2" straight line).

Available in 3/16", 1/4", 3/8", 1/2" and 3/4" glass.  
For squares, rectangles, circles and patterns.



### ***Waterfall Edge***

Available in 1/2" and 3/4" glass.  
For squares, rectangles, circles and patterns.



### ***Pencil Polish Edge***

Available in 3/16", 1/4", 3/8", 1/2" and 3/4" glass.  
For squares, rectangles, circles and patterns.



### ***O.G. Edge***

Available in 1/2" and 3/4" glass.  
For squares, rectangles, circles and patterns.



### ***Mitre***

Available in 1/4", 3/8", 1/2" and 3/4" glass.  
For squares and rectangles.

**Fabrication Services...** Circle and Unique Shapes from 6 to 90 inches

Rectangle • Squares • Clipped Corners • Radius Corners • Inverted Radius Corners

Custom Beveling per Template • Holes • Tempering

*\* Capabilities vary by Product & Process;  
Restrictions are approximate.  
Please verify at the time of order. \**

## GLASS SPECIFICATIONS

Float glass is the finest glass commercially available today. It is made in a continuous ribbon close to one mile in length and according to government specifications (#DD-G-451d) contains certain flaws; such as bubbles, seeds, scratches, distortions, etc.

The specification says that if a flaw on heavy glass (3/8" or thicker) cannot be seen in normal room lighting from a distance of eleven feet then it is considered to be perfect.

*All glass has natural green tint which becomes more noticeable with thicker or larger glass.*

### Due to the Complex Nature of Patterns:

A pattern submission form is required for all patterns, to ensure accuracy and quality. See "forms" for your copy! Please see Page 3 for standard tolerance guidelines.

Glass Weight	
Thickness	Weight Per Sq. Ft.
1/4"	3.3 lbs.
3/8"	5 lbs.
1/2"	7 lbs.
3/4"	10 lbs.
1"	14 lbs.

### PLEASE NOTE:

- Shapes and Patterns may have extra setup charges.
- 3 Sq. Ft. Min. per piece.
- Requests for "no logo" taken, but not guaranteed!
- Large quantities may be eligible for discounts.  
*See your sales representative for details.*

We can make any size hole (*not listed*) over 1 1/4" diameter in hexagon, circle, oval or free form shape with ground or polished edges; *however, a CNC setup charge will be applied.*

Tempering
Min. 4" x 10" * Max. 95" x 168" Thickness 1/8" - 3/4" <i>* Restrictions as to hole fabrication and size apply. Call for details.</i>
Straight Line Beveling
Min. 2" x 2" Max. 72" x 120" Bevel Width Max. 1/2" on 1/8" Bevel Width Max. 1 1/4" on 3/16" Bevel Width Max. 1 1/2" on 1/4" or Thicker Bevel Width Max. 2" on 1/4" or Thicker (Annealed Only)
Shape Bevels
Min. 15" x 14" Max. 65" x 65"
Edgework
Flat Polish- 4" x 4" Min. 76" x 128" Max. Pencil Polish- 6" x 10" Min. 76" x 108" Max. CNC Shape Edging- 6" x 10" Min. 76" x 108" Max. Circles- Min. 12" Max. 72"
Cut-Outs
Single Plug Cut-Out (2" x 4") Double Plug Cut-Out (4" x 4") Cut-Out/Corner Notches Pass-Thru Notches CNC Cut-Outs <i>Holes, Cut-Outs &amp; Notches will have some roughness and chipping unless ordered as a "finished edge."</i>
Holes, Etc.
<i>See Tempering Hole Guide for Placement/Limitations</i> Price Varies by Glass Thickness. Sizes Available: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 3/4", 13/16", 1", 1 3/16", 1 3/8", 1 1/2", 2", 3", 4" <i>Custom Hole Sizes Available.</i> <i>Sink Cut-Outs any size or shape also available on a custom order basis.</i>
V-Groove / Plate Groove / Finger Pulls
Per Quote

## GLASSOURCE STANDARD TOLERANCE GUIDE

### HOLE AND NOTCH LOCATION TOLERANCES-

For Dimensions of Hole Center from Specified Edge +/- 1/16"

For Dimensions Hole Center to Center +/- 1/16"

Chips and Flakes Will Not Exceed 3/32"

Notch Dimensions for Glass 1/4" and Under +/- 1/16"

Notch Dimensions for 3/8" and 1/2" +/- 1/8"

<u>MONOLITHIC GLASS SIZE TOLERANCES</u>	CLEAN CUT	EDGEWORK STANDARD	EDGEWORK TIGHT
THICKNESS			
3/32" – 1/4"	+/- 1/16"	+/- 1/8"	+/- 1/16"
3/8"	+/- 3/32"	+/- 3/16	+1/16" – 1/8"
1/2"	+/- 1/8"	+/- 1/4"	+1/16" – 1/8"
3/4"	+/- 3/16"	+/- 3/8"	+1/8" – 3/16"

Tight edgework is only on shower door panels and parts submitted with dxf files, or if parts were ordered for hold tight tolerance which incurs a nominal fee. Hold Tolerance must specify the tolerance requested and is subject to engineering feasibility and special quote request.

### TOLERANCES ON HOLE DIAMETER

Nominal hole diameter $\phi$ (mm)	Tolerances (mm)	Nominal hole diameter $\phi$ (inches)	Tolerances (fraction)
$4 \leq \phi \leq 20$	$\pm 1.0$	$5/32 \leq \phi \leq 13/16$	( $> 1/16$ )
$20 < \phi \leq 100$	$\pm 2.0$	$13/16 < \phi \leq 3 15/16$	(< 1/16)
$100 < \phi$ submit request			

### OVERALL BOW AND WARP ALLOWANCE FOR FULLY TEMPERED AND HEAT-STRENGTHENED GLASS

Heat treating architectural glass, to produce either fully tempered or heat-strengthened glass, is a process in which the glass is uniformly heated in a furnace to a temperature at which the glass becomes slightly plastic (approx. 1150 deg F). At this point the glass is rapidly cooled by blowing air uniformly onto both surfaces. The rapid cooling of the two surfaces followed by the relatively slower cooling of the core locks the core in a constant state of tension and the surfaces in a residual state of compression. It is this effect that gives fully tempered glass its safety glazing characteristics and strength, and allows both tempered and heat-strengthened glass to resist thermal stresses better than annealed glass.

Also due to this effect, heat treated glasses are not as flat as annealed glasses. The deviation for flatness depends on such factors as glass thickness, width, length, and other variables. Overall bow and warp tolerances shall not exceed the deviations shown below:

Edge Dimension in Inches	Glass Thickness in Inches						
	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"
0-20	1/8	1/8	3/32	3/32	3/64	3/64	3/64
20-35	5/32	5/32	1/8	3/32	3/32	3/32	3/32
35-47	13/64	13/64	5/32	3/32	3/32	3/32	3/32
47-59	9/32	9/32	13/64	11/64	3/32	3/32	3/32
59-71	11/32	11/32	9/32	13/64	5/32	5/32	5/32
71-83	15/32	15/32	11/32	1/4	13/64	13/64	13/64
83-94	9/16	9/16	15/32	9/32	13/64	13/64	13/64
94-106	11/16	11/16	9/16	11/32	9/32	9/32	9/32
106-118	3/4	3/4	43/64	15/32	25/64	25/64	25/64
118-130			3/4	9/16	15/32	15/32	15/32
130-146			53/64	43/64	35/64	35/64	35/64
146-158			15/16	3/4	43/64	43/64	43/64
>158 Consult Factory							

Co

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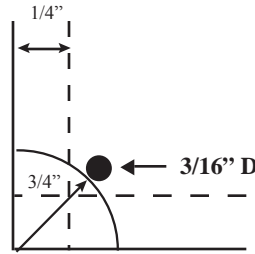
Unusually narrow glass panels, strips, or odd shapes can have an effect that may cause greater bow or warp than indicated above. Consult factory for bow and warp tolerance for such items.

Version 3.1.12 holebownotchtolerance

## Guide for Tempering Holes

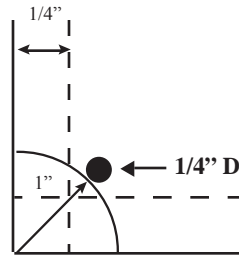
### 3/16" Glass

3/16" Hole Minimum  
 1/4" Edge of Glass / Edge of Hole Min.  
 3/4" Corner of Glass / Edge of Hole Min.



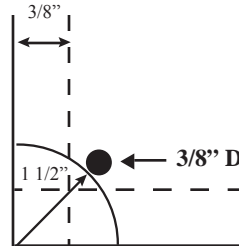
### 1/4" Glass

1/4" Hole Minimum  
 1/4" Edge of Glass / Edge of Hole Min.  
 1" Corner of Glass / Edge of Hole Min.



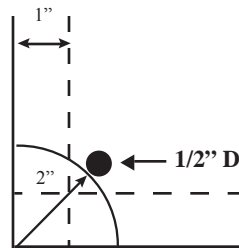
### 3/8" Glass

3/8" Hole Minimum  
 3/8" Edge of Glass / Edge of Hole Min.  
 1 1/2" Corner of Glass / Edge of Hole Min.



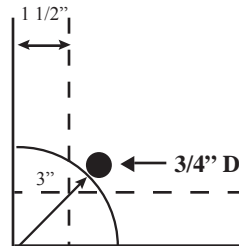
### 1/2" Glass

1/2" Hole Minimum  
 1" Edge of Glass / Edge of Hole Min.  
 2" Corner of Glass / Edge of Hole Min.



### 3/4" Glass

3/4" Hole Minimum  
 1 1/2" Edge of Glass / Edge of Hole Min.  
 3" Corner of Glass / Edge of Hole Min.



### Tempering Size Restrictions

Minimum Size:  
 4" x 10"  
 Maximum Size:  
 96" x 130"  
 Thickness:  
 1/8" - 3/4"

### Maxium Size for Delivery

\* 83" x 100"  
 \*\* 60" x 120"

**\*\*\*Restrictions as to hole fabrication and size apply. Call for details.**

**\*If your short edge exceeds 83" and long exceeds 100", then we are unable to deliver.**

*Any specifications under this size is within tolerance for delivery.*

**\*\*If your short edge exceeds 60" and long exceeds 120", then we are unable to deliver.**

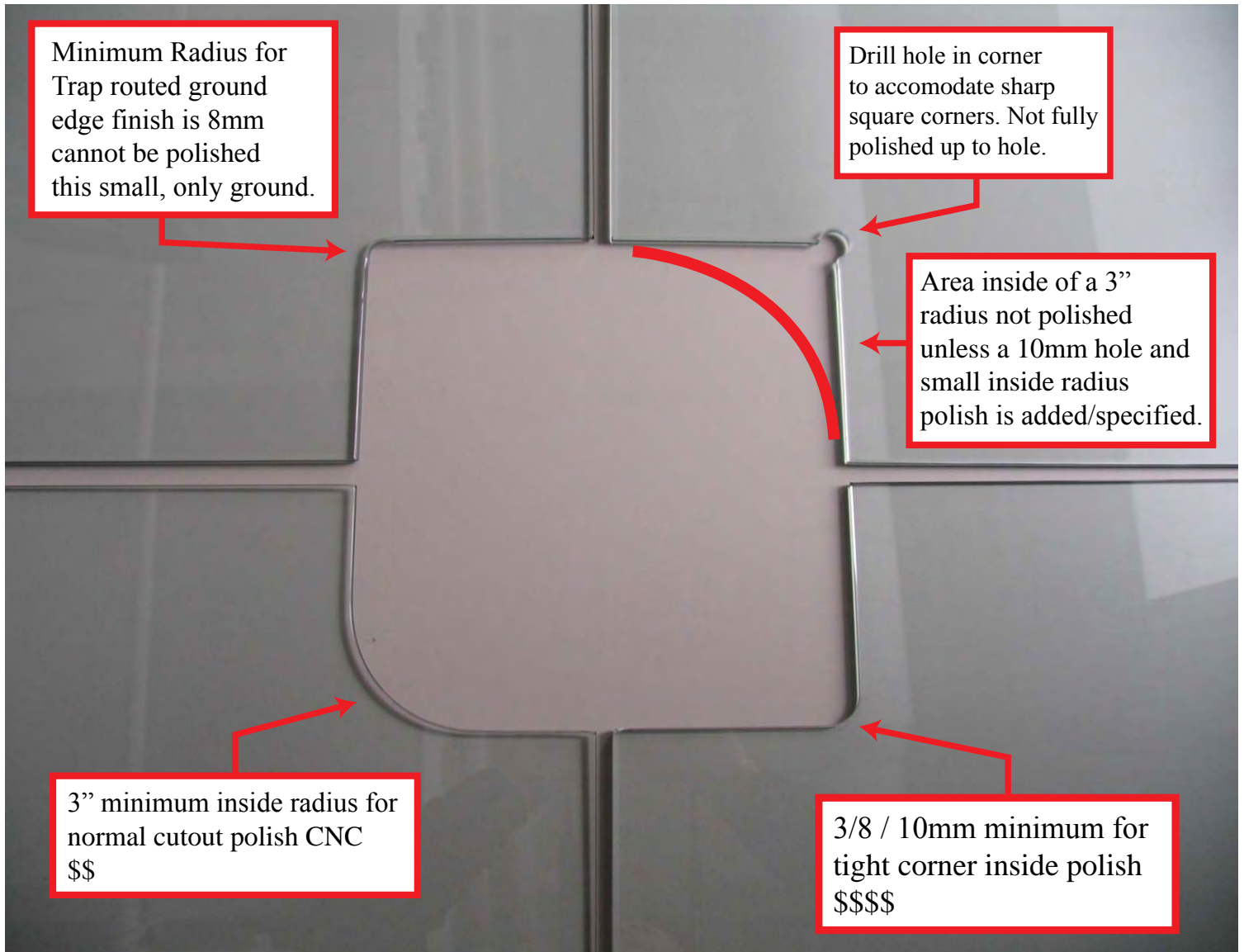
*Any specifications under this size is within tolerance for delivery.*

**\*\*\*Other limitations may also apply due to available glass sizes and process limitations based on the fabrication required. Email or call for confirmation.**





## Sample of Inside Corner Cutouts & Limitations



## GLASSource Tempered Safety Glass Products

*In order for tempered glass to meet federal specifications certain guidelines must be met; including but not limited to holes, sizes, location, inside/outside corner, corner radius, glass thickness limitations, and edgework types. See [www.GLASSource.net](http://www.GLASSource.net) for a full explanation of tempered specifications and limitations.*

LIMITED EXPRESS WARRANTIES – GLASSource warrants to its original purchaser only, subject to the following conditions and restrictions for the period of time set forth for each product:

TEMPERED GLASS – GLASSource warrants for a period of ten years from the date of GLASSource’s sale that its tempered glass will meet, at the time of sale, specifications as defined by ASTM Standards Specification for heat Treated Glass C 1048-90, Kind FT, Condition A and ANSI Z97.1-2004, CPSC 16 CFR 1201 Category II.

CAUTION: GLASSource tempered glass must not be modified or receive any fabrication such as grinding, drilling, sand blasting, etc., subsequent to tempering. Such modification or additional fabrication may seriously weaken the glass or impair its tempered characteristics and also **VOIDS** any GLASSource warranty provisions.

It is recommended that tempered glass not be exposed to temperatures at or in excess of 400 degrees F for any sustained period of time. Such exposure can result in loss of temper, causing glass to fail to meet the above specifications and may further result in glass breakage.

- 1) EXPRESS WARRANTIES– GLASSource hereinafter warrants its products to its original purchaser only, subject to the following conditions and restrictions for the period of time set forth for each product.
  - a) FULLY TEMPERED GLASS – GLASSource warrants that it is fully tempered as defined by Federal Specification ASTM C 1048-90 ANSI Z97.1-2004 and CPSC 16 CFR 1201 Category II.
  - b) This warranty shall be void under any of the following circumstances: If the glazing installation does not conform to the industry standards according to GANA/FGMA glazing manual; If the material has been abused or has not been stored and/or installed in a good workmanlike manner; or if the material is installed outside of the continental limits of the United States.
- 2) LIMIT ON REMEDIES IN THE EVENT OF FAILURE – In the event any GLASSource product fails to perform as warranted. GLASSource’s sole responsibility and PURCHASER’S sole and exclusive remedy under any warranty, contract, negligence or other claim of liability shall be limited to a refund of GLASSource original selling price or, at GLASSource option, replacement of the product without charge F.O.B. the shipping point nearest the product’s installation. In no event shall GLASSource be liable for: cost incurred in the removal of failed products, the installation of replacement products, or for any incidental or consequential damages incurred as non-personal injury losses. In the event a product is warranted, only for the remainder of the warranty period applicable to original product will remain.
- 3) UNWARRANTED PRODUCTS - The only products covered by GLASSource warranties are set forth in Part 1 above. Products not expressly warranted by GLASSource (including glass breakage), are not covered by any warranty, either express or implied.
- 4) DISCLAIMER OR IMPLIED WARRANTIES FOR ALL GLASSource PRODUCTS – GLASSource disclaims all implied warranties, including the implied warranties of merchantability of fitness for a particular purpose. No distributor, GLASSource representative, agent or employee has the authority to alter or change a GLASSource product warranty either orally or in writing.
- 5) NON-WAIVER – Waiver by GLASSource of a breach of any of the terms and conditions of this sale shall not be construed as a waiver of any other breach.
- 6) ADDITIONAL INFORMATION – If you wish to obtain additional information or resolve questions concerning interpretation of any warranties of GLASSource, please contact us.