



Tempered Glass Technical Information

Holes and Notches – This chart should be used to determine minimum sizes and placement of holes and notches in tempered or heat strengthened glass:

Glass Thickness (t)	1/8	3/16	1/4	3/8	1/2	3/4	General Rule
Minimum Diameter of Holes	1/4"	1/4"	5/16"	7/16"	9/16"	13/16	$A \geq t + 1/16"$ and $1/4"$
Distance from Hole Rim to Edge of Glass	1/4	3/8	1/2	3/4	1	1 1/2	$B \geq 2t$ and $1/4"$
Distance between Rims of Holes	3/8	3/8	1/2	3/4	1	1 1/2	$C \geq 2t$ and $3/8"$
Distance from Corner to Rim of Hole	13/16	1 7/32	1 5/8	2 7/16	3 1/4	4 7/8	$E \geq 6.5 \times t$
Minimum Fillet Radius	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	$F \geq t$

Hole and Notch Location Tolerances

- For dimensions of hole center from specified edge +/- 1/16"
- For dimensions between hole centers +/- 1/16"
- Chips and flakes will not exceed 1/16"
- Notch dimensions for glass 1/4" and under +/- 1/16"
- Notch dimensions for 3/8" and 1/2" +/- 1/8"

Monolithic Glass Size Tolerances

Thickness	Clean Cut	Edgework Standard	Edgework Tight
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"

- Bath and shower enclosures and all glass entrances are fabricated to Tight Tolerance. All other applications are fabricated to Standard Tolerances unless specified "Tight Tolerance" at the time of quotation and order. Extra charges may apply.
- Shapes fabricated to Standard Tolerance, unless "Tight Tolerance" is requested and a full-sized hardboard pattern or .dxf/.bdf file is submitted. Paper patterns fabricated to Standard Tolerance only.



Contract Glass Service, Inc.

Tempered Glass Bow and Warp Tolerances

Edge Dimensions	Glass Thickness				
	1/8"	3/16"	1/4"	3/8"	1/2"
0-20"	1/8	1/8	5/64	5/64	5/64
> 20" - 35"	5/32	5/32	1/8	5/64	5/64
> 35" - 47"	13/64	13/64	5/32	5/64	5/64
> 47" - 59"	9/32	9/32	13/64	13/64	5/64
> 59" - 71"	23/64	11/32	9/32	13/64	5/32
> 71" - 83"	15/32	15/32	11/32	15/64	13/64
> 83" - 94"		17/32	15/32	9/32	13/64
> 94" - 106"		21/32	17/32	11/32	9/32
> 106" - 118"		3/4	21/32	15/32	3/8
> 118" - 130"			3/4	9/16	15/32
> 130" - 144"			13/16	21/32	17/32

- This chart lists bow allowed over entire dimension. Localize warp will not exceed 1/16" over any 12" span.

Tempered Size Range – A 9" diagonal is the minimum to 60" x 120" maximum.

Edge Treatment – Tempered and Heat Strengthened Glass has seamed edges unless ordered with polished edges. The seamed edge is not a suitable exposed finished edge.

Logos – Tempered and Heat Strengthened Glass is permanently marked with the logo unless ordered with "NO LOGO".

Distortion – Heat treating adds distortion to glass products. All requirements for distortion, roller wave, consistent furnace orientation, or distortion measurement must be disclosed at quotation and order.

Strain Pattern – Tempered or HS glass contains a strain pattern or "Quench Marks" that appear as areas of shadows in a pattern corresponding to the location of the air nozzles in the tempering furnace quench section. This condition becomes more visible:

- Under certain lighting conditions, like polarized sunlight
- When the glass is viewed at glancing angles
- With tinted glass, especially when multiple lites are combined in laminated and insulating constructions.

The strain pattern is NOT considered a defect in tempered or HS glass by industry standards.

Spontaneous Breakage – Tempered glass is subject to rare spontaneous breakage, where the glass will break for no apparent reason. This is not due to faulty tempering process.

Fabrication – All fabrication that penetrates the glass surface (ie. Holes, notches, cutting) must take place prior to tempering or heat strengthening.