DILLMEIER GLASS COMPANY

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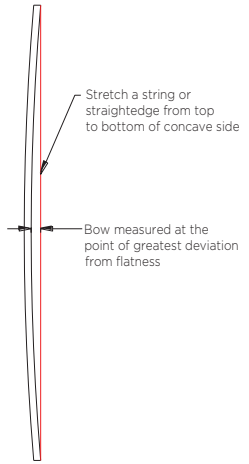
# OVERALL BOW AND WARP ALLOWANCE FOR FULLY TEMPERED AND HEAT-STRENGTHENED GLASS

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 become slightly plastic (approx. 1150º Fr. At this point the glass is rapidly cooled by blowing air evenly on both surfaces. The rapid cooling of the 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 characteristic 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 warpage tolerances shall not exceed the deviations shown to the right.

**GLASS THICKNESS IN INCHES**

| | 1/8" | 3/16" | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" |
|---|---|---|---|---|---|---|---|
| 0-20 | 1/8 | 1/8 | 5/64 | 5/64 | 3/64 | 3/64 | 3/64 |
| 20-35 | 5/32 | 5/32 | 1/8 | 5/64 | 5/64 | 5/64 | 5/64 |
| 35-47 | 13/64 | 13/64 | 5/32 | 5/64 | 5/64 | 5/64 | 5/64 |
| 47-59 | 9/32 | 9/32 | 13/64 | 11/64 | 5/64 | 5/64 | 5/64 |
| 59-71 | 23/64 | 23/64 | 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 | 43/64 | 43/64 | 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 | | | | | | | |




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

**Procedure for measuring bow**

Place glass sample in a free-standing vertical position, resting on blocks at quarter points. Identify the concave side of the glass. Stretch a string or place a straightedge from top to bottom of glass, parallel to, and within 1" of the edge on the concave side (shown in diagram). Measure the maximum deviation and compare to the allowable bow above. **(Note: Bow in NOT to be measured as the glass edge deviation relative to an adjacent lite of glass.)**