

TECHNICAL SALES BULLETIN 026

25th November 2020

Optical distortion in laminated glass comprised of heat-strengthened or toughened monolithic glass substrates.

Background:

Due to distortion concerns PG Building Glass recommends that annealed glass laminates be used in lieu of heat-strengthened or toughened laminated glass unless heat treated glass is required to meet extreme conditions i.e. high windload or thermal stress conditions.

The customer should be notified about the distortion issues raised in this TSB. In addition it is recommended that a full scale mock-ups should be viewed under similar conditions that would be seen on site and approved prior to full production order being placed.

Heat Treated Monolithic Glass:

Utilizing heat treated glass (Heat-Strengthened or Toughened) in lieu of annealed glass offers added strength. Although heat treated glass has improved strength attributes and increased thermal stress resistance it has physical properties to the manufacturing process (Figure 1) Roller wave, Overall Bow, Local bow & Edge lift (or Kink). Coated performance or tinted glass products can further contribute to physical glass distortion.

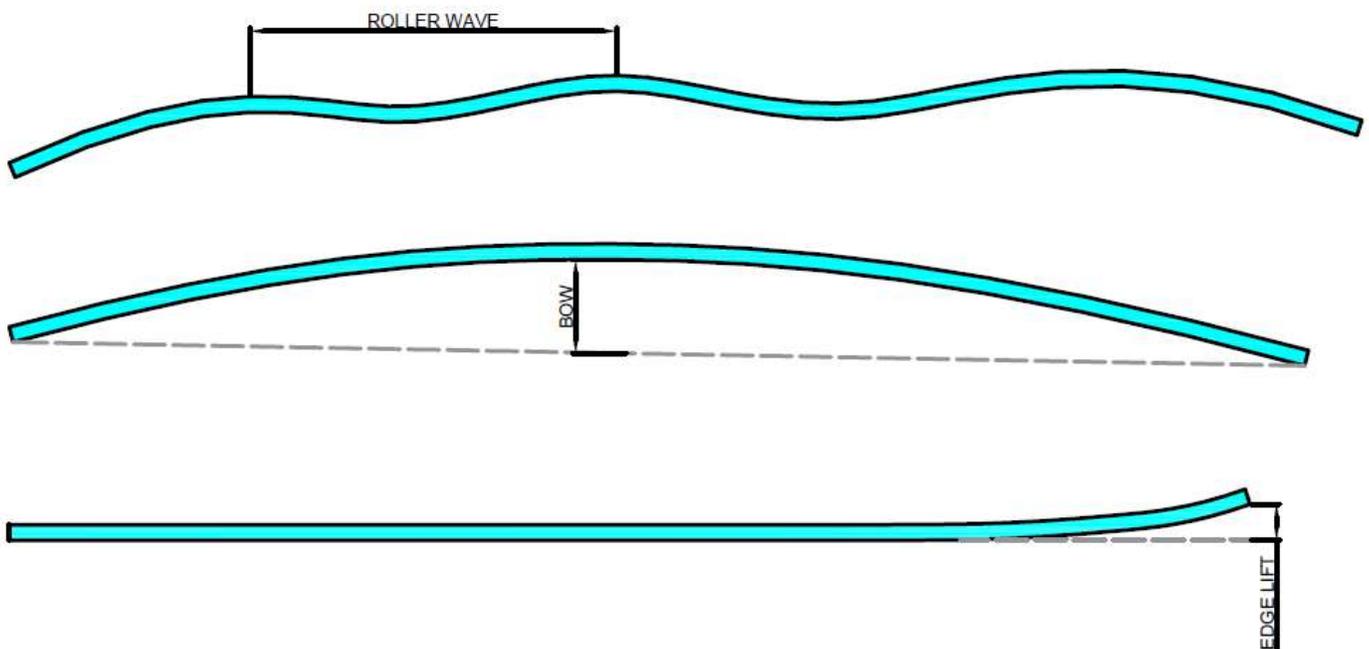


Figure 1

HEAT TREATED LAMINATED GLASS

Distortion in heat-strengthened glass when used monolithically or incorporated into insulating glass units is detectible, but seldom aesthetically objectionable. Heat-treated glass when utilised as the substrate within laminated glass, will always have some degree of distortion and can be amplified in asymmetrical make-ups.

This distortion may be significantly increased due to the lens effect of having substrates out of phase or non-parallel surfaces. (Figure 2) This lens effect can create a magnification of objects when they are viewed through the glass as well as viewing reflected images. The distance of the observer and observed object coupled with viewing angles to glass surface will increase the perceived distortion. The distortion can be evident throughout the pane.

Due to varying laminating techniques there is no standard that deals with distortion of heat treated glass that has been laminated. PG Building Glass will have in-house specifications & inspection methods that can be used to determine if glass is acceptable.

Specified bow and warp limits of monolithic, laminated or sealed insulated glass units may not adequately define, or control, the distortion that may become apparent after glazing. In addition to above that selected frame system can add to distortion.

LAMINATED GLASS COMPOSITE SHOWING VARYING LENS EFFECTS

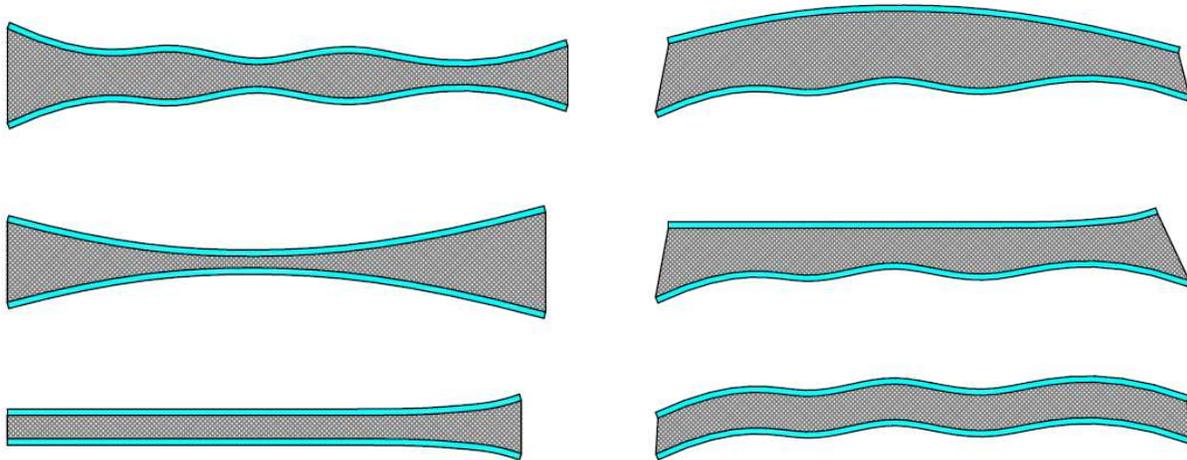


Figure 2

Below are some pictures that indicate some distortions seen on heat treated laminated glass made with heat-strengthened or toughened monolithic substrates.

