



#8 – VERTICAL GLASS WIND LOAD, DEFLECTION AND GLASS SIZES

Section 2404 of the Building Code of NYS – 2007 details the process for designing glass to resist wind loads. Glazing firmly supported on all four edges is permitted to be designed by these provisions. Where the glass is not firmly supported on all four edges, analysis or test data ensuring safe performance for the specific installation must be prepared by a registered design professional.

Wind loads are determined in section 1609 for components and cladding. The glass wind load is determined, subject to exceptions, through evaluation of:

- basic wind speed – Upstate is primarily a 90 mph region, but areas of the Hudson Valley are a special wind region, and the New York City metropolitan area and Long Island are in 100, 110, and 120 mph regions. The 120 mph region, and within 1 mile of the ocean in the 110 mph region is a wind-borne debris region.
- surrounding terrain – the code has three classifications – urban, suburban, wooded, or open terrain, or open water exposure
- building roof height
- the importance of the facility – four classes from barns to fire stations
- the location of the glass on the building – glass in the roof or wall corners is subject to more wind load than glass in the center of the wall, and
- the size of the glass area exposed to the wind.

The glass wind load is best calculated by the design professional. I like Section 8800 specifications that have the psf wind loads all calculated. I get concerned when I see Specified Design Wind Loads = “30 psf or greater if required by code” or “as indicated” (and no indications) “but not less than wind loads applicable to this project as required by ASCE 7”.

We're happy to use the charts or our software to evaluate glass sizes under wind loads, but we aren't qualified to determine the wind load for the project.

Glass thickness and sizes for specified wind loads can be evaluated by using the charts for each glass thickness in section 2404. The intersection of the lines from the lesser glass dimension on the vertical axis and the greater dimension on the horizontal axis indicates the load that monolithic annealed glass can meet.

The monolithic annealed glass result can be multiplied by the factors in table 2404.1 to calculate the load that additional glass types of the same thickness can meet (i.e. heat strengthened glass, tempered glass, insulating glass, etc.).

The charts also contain a 3/4" center-of-glass deflection line. Syracuse Glass Company recommends, in accordance with glass industry practice, that center of glass deflection in excess of 3/4" be avoided. Glass of the same thickness, whether annealed, tempered or laminated deflects at the same rate. While selecting tempered or insulating glass may meet the design load, if center of glass deflection exceeds 3/4", Syracuse Glass Company recommends using smaller glass sizes or thicker glass.

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Here's an example using the 1/4" glass chart to evaluate a glass size of 60 x 100 on a 20 psf glass design load project. You can see that annealed glass meets the load, and tempering or tempered insulating dramatically increases load capacity, using the strength factors in table 2404.1. But 60 x 100 is right on the 3/4" deflection line. If a larger size is needed move on to the 3/8" glass chart. If insulating glass is needed to conform to the energy code, the thicker glass will create thicker insulating glass, and perhaps rule out storefront framing in favor of curtainwall.

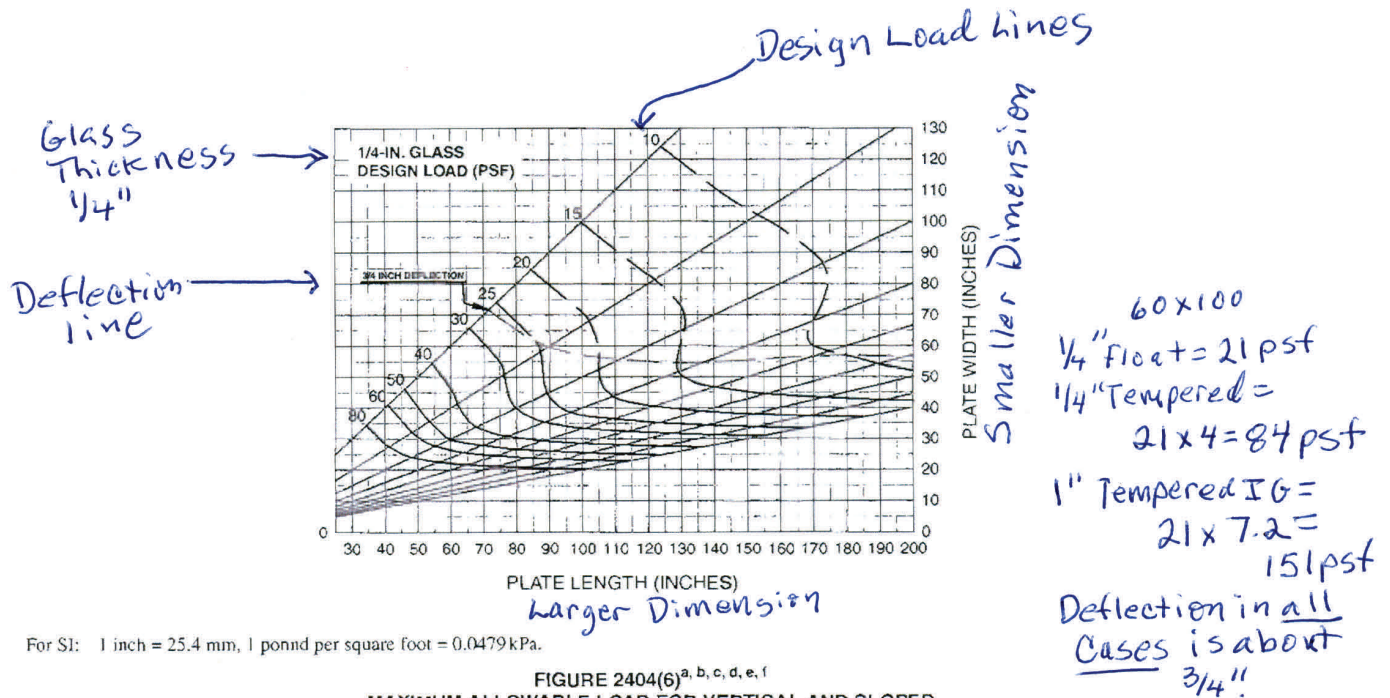


FIGURE 2404(6)^{a, b, c, d, e, f}
 MAXIMUM ALLOWABLE LOAD FOR VERTICAL AND SLOPED
 RECTANGULAR GLASS SUPPORTED ON ALL EDGES

glass deflection over 3/4" not recommended.

USE THICKER GLASS.

TEMPERING DOES NOT DECREASE DEFLECTION.