

Glass Windload Tables

The attached IG glass strength tables are to assist customers with glass selection to meet a given windload. Windloads are given as a DP or design pressure rating, usually in units of pounds per square foot (psf). A DP80 rating means that the glass is required to resist a lateral wind force of 80 psf.

ASSUMPTIONS

The attached tables are based on the governing standard for glass strength, ASTM E 1300 -04, "Standard Practice for Determining the Minimum Thickness and Type of Glass Required to Resist a Specified Load" which assumes a load duration of 3 seconds and a breakage potential of 8/1000 at design windload. In addition, the table values reflect manufacturing and safe handling limits. As a result, some glass sizes may meet ASTM E 1300 for a given windload but not be acceptable due to these safety and manufacturing concerns. Note that these tables are incorporated into Cardinal's electronic order system and glass orders placed with Cardinal will automatically be bumped to a thicker glass if it does not meet the requirements indicated in these tables.

LOAD DURATION

As noted above, the attached tables are based on a 3 second load duration as given in ASTM E 1300 -04. Prior to the 2002 version of this standard, all loading was performed at a 60 second load duration. Glass is a material that experiences what is known as "static fatigue". This means that the longer the load is applied the weaker the glass is. In the late 1990's design windloads, as determined by ASCE 7, were adjusted to new weathering data and were seen to increase. However, this new weathering data was at a gust wind of 3 seconds in duration. Accordingly, the ASTM E 1300 charts were adjusted in 2002 to reflect this change in duration from 60 seconds to 3 seconds. This change to a 3 second load duration is now incorporated into the International Building Code (IBC) and the International Residential Code (IRC). Use of the attached tables assures that glass is being selected according to requirements in these model codes.

USING THE TABLES

The user of the attached tables needs to first know the DP rating required. Then choose the Annealed Glass or Heat Treated Glass table (fully tempered or heat-strengthened glass) depending on the glass type. Determine the square footage and Aspect Ratio. The Aspect Ratio is just the long dimension divided by the short dimension. In the table, find the glass thickness which is less or equal to the square footage listed under the appropriate column for DP and Aspect Ratio.

Example: A 24" x 48" (8sq. ft.) IG unit with annealed 3.0mm glass will meet a DP60 design pressure rating.

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Insulating Glass Size Limits

Annealed Glass

Maximum Area in square footage

Glass Thickness (mm)	DP80		DP60		DP50		DP40		DP30		Maximum Length (Inches)
	Aspect Ratio less than or equal to 2	Aspect Ratio greater than 2	Aspect Ratio less than or equal to 2	Aspect Ratio greater than 2	Aspect Ratio less than or equal to 2	Aspect Ratio greater than 2	Aspect Ratio less than or equal to 2	Aspect Ratio greater than 2	Aspect Ratio less than or equal to 2	Aspect Ratio greater than 2	
2.2	4	3	7	5	9	6	10 ⁵	8	10 ⁵	10 ⁵	72
3.0	7	6	11	8	15	10	15 ⁵	13	15 ⁵	15 ⁵	82
3.9	10	9	16	13	21	15	24 ⁵	20	24 ⁵	24 ⁵	90
4.7	14	13	20	18	27	21	33 ⁵	27	33 ⁵	33 ⁵	140
5.7	18	18	27	24	35	29	45	37	50 ⁵	50	144

Heat Treated Glass

Maximum Area in square footage

Glass Thickness (mm)	DP80		DP60		DP50		DP40		DP30		Maximum Length (Inches)
	HS/HS	FT/FT	HS/HS	FT/FT	HS/HS	FT/FT	HS/HS	FT/FT	HS/HS	FT/FT	
2.2	8	NA	15 ⁴	NA	15 ⁴	N/A	15 ⁵	N/A	15 ⁵	N/A	72
3.0	13	20 ⁴	20 ⁴	20 ⁴	20 ⁵	20 ⁵	20 ⁵	20 ⁵	20 ⁵	20 ⁵	84
3.9	20	30 ⁴	30 ⁴	30 ⁴	30 ⁵	30 ⁵	30 ⁵	30 ⁵	30 ⁵	30 ⁵	96
4.7	27	50 ⁵	37	50 ⁵	50 ⁵	50 ⁵	50 ⁵	50 ⁵	50 ⁵	50 ⁵	140
5.7	37	60 ⁵	60 ⁵	60 ⁵	60 ⁵	60 ⁵	60 ⁵	60 ⁵	60 ⁵	60 ⁵	144

Notes:

1. Limitations are based on Windload, Manufacturing, and Safe Handling Limits.
2. The ASTM Standard E 1300-02 "Standard Practice for Determining the Minimum Thickness and Type of Glass Required to Resist a Specified Load", was used for determining the DP design allowance.
3. Limits shown do not apply to IG units fabricated with mismatched glass.
4. Limitations on square footage are based on design pressure and the maximum length factors. Both factors must be considered. The maximum length tolerance cannot be exceeded regardless of the square footage. For example an IG unit with 3mm HS glass cannot have a length longer than 84 inches regardless of the square footage. Exceeding the maximum length tolerance could result in design pressures less than the value shown.
5. Limitation based on safe handling & manufacturing tolerances.
6. DP Rating - Design Pressure in pounds/sq. ft.

