

Altitude limits for insulated glass

When a sealed insulated glass unit is constructed at low altitude, then installed at a higher altitude, the glass panes bow out because of atmospheric pressure. In extreme situations, the unit can fracture or the sealant can rupture, causing permanent damage.

The remedy would require a capillary tube addition. These tubes are used to equalize the atmospheric pressure in the insulated glass airspace and are installed by the manufacturer, without sacrificing the seal integrity.

There are two distinct scenarios for altitude limits, ship-through and installation as shown in the charts below.

WA MT ND MN OR Denver Lafayette Boulder ID Klamath Rexburg Broomfield Falls Altamont Idaho Falls Thornton WI SD Ammon Northglenn Burley Westminster Reno Blackfoot Pocatello Arvada MI Spanish Springs Sparks Wheat Ridge Susanville Chubbuck WY Lakewood Sun Valley Elko North Smithfield Englewood Logan 🐸 Logan Littleton IA Truckee Spring NE Creek Laramie Carson City NV Loveland South Heber Fort Collins Orem City Steamboat Longmont Brighton IN Lake Gardnerville Provo Springs Tahoe Grand IL Ranchos Greeley UT Junction Commerce City Salt Lake City Centennia Aurora Brigham City CO Parker Castle Rock CA Pleasant View Cedar City Divide KS Fountain North Ogden MO Colorado' West Valley City Pueblo KY Springs West Jordan Farmington Española Flagstaff Chino Big Bear City Rio TN Gallup Los Álamos Valley Rancho Sedona Las Vegas OK Prescott (Albuquerque-Santa Fe South-Sandia Prescott Payson AR Valley Clovis Valley AZ Sho Low Los Lunas Portales NM Alamogordo MS AL Sierra Vista Deming Horizon City Douglas TX LA

Ship-through Altitude Limit Chart (in feet)

In this situation the glass is exposed to a relatively short duration pressure change as it is shipped over a mountain pass. If the glass is framed, it is free to flex and will return to its shape at a lower elevation. However, if the glass units are in immediate contact with one another there is concern as the centers may rub during expansion.

Shortest dimension	Glass thickness						
(inches)	2.2 mm	3.0 mm	3.9 mm	5.7 mm			
12	6,000	6,000	5,000	4,000			
16	7,000	7,000	6,000	4,000			
18	8,000	7,000	7,000	4,000			
20	9,000	8,000	7,000	5,000			
24	10,000	9,000	8,000	6,000			
30	10,000	10,000	10,000	8,000			
36	10,000	10,000	10,000	10,000			
42	10,000	10,000	10,000	10,000			
48	10,000	10,000	10,000	10,000			

Example: 3.0 mm glass insulated glass with a size of 17"x54". Round down to 16" as the shortest dimesion and read across to 3.0 mm glass. Ship through limit is 7,000 ft.

Installation Altitude Limit Chart (in feet)

This chart assumes a worst-case combination: summer conditions, weathered glass and a long duration load. The long duration load reduces the strength of the glass by over 50 percent as compared to typical windload strength calculations.

Shortest	Glass thickness								
dimension	2.2 mm	2.2 mm 3.0		3.9	mm	5.7 mm			
(inches)	Annealed	Annealed	Tempered	Annealed	Tempered	Annealed	Tempered		
12	4,000	5,000	5,000	4,000	4,000	4,000	4,000		
16	5,000	5,000	7,000	5,000	5,000	4,000	4,000		
18	6,000	5,000	8,000	5,000	6,000	4,000	4,000		
20	7,000	6,000	9,000	5,000	7,000	4,000	4,000		
24	8,000	7,000	10,000	6,000	8,000	5,000	5,000		
30	10,000	9,000	10,000	7,000	10,000	6,000	7,000		
36	10,000	10,000	10,000	9,000	10,000	7,000	9,000		
42	10,000	10,000	10,000	10,000	10,000	9,000	10,000		
48	10,000	10,000	10,000	10,000	10,000	10,000	10,000		

Example: 3.0 mm tempered insulated glass with a glass size of 19"x36". Round down to 18" as the shortest dimesion and read across to 3.0 mm glass. Installation limit is 8,000 ft.

Cities over 4,000 feet above sea level with populations of 10,000 or more



Revised 10/29/19 N:\Departments\SalesEstimating\Altitude Limit Chart