SOLARINNOVATIONS®
ARCHITECTURAL GLAZING SYSTEMS

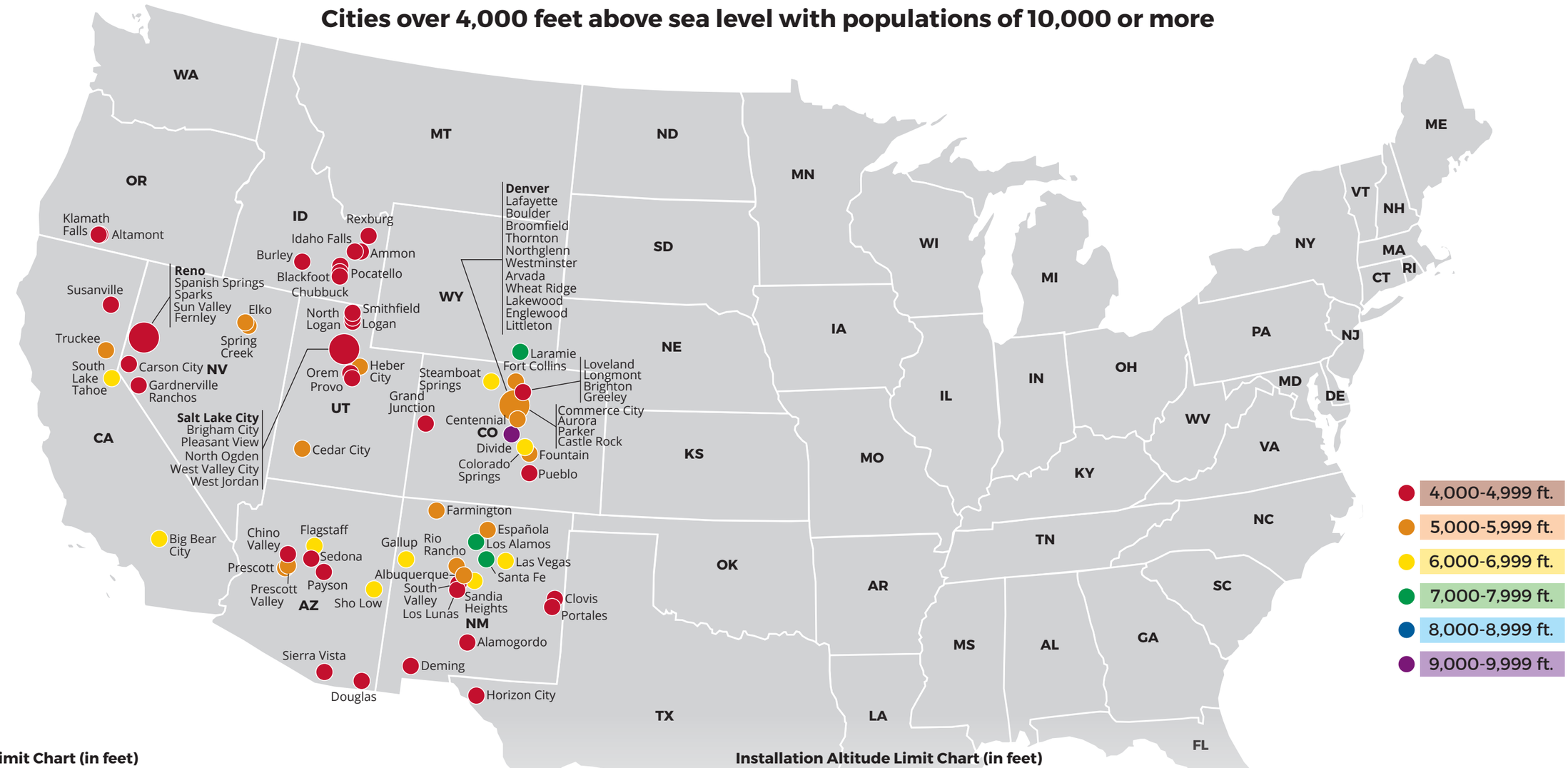
Altitude limits for insulated glass

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.

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



- 4,000-4,999 ft.
- 5,000-5,999 ft.
- 6,000-6,999 ft.
- 7,000-7,999 ft.
- 8,000-8,999 ft.
- 9,000-9,999 ft.

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 (inches)	Glass thickness			
	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 dimension (inches)	Glass thickness						
	2.2 mm	3.0 mm		3.9 mm		5.7 mm	
	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.

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