



The PVB is always in the thickness of .38 mm And/or the multiple of .38 mm. So the basic nomenclature of laminated glass is XY.Z where X & Y are the thickness of the 2 panes of glass a3 Z is the thickness of the PVB.



Benefits

- 1. Safety:** Ordinary window glass is brittle, breaking into long sharp pieces which can cause serious injuries. The principal feature of Laminated safety glass is that the interlayer absorbs the energy impact and hence resists penetration. Although the glass may break, the glass fragments remain firmly bonded to the interlayer, minimizing the risk of injuries.
- 2. Security:** Burglars often try to break windows to get inside the house or a building and here the laminated glass plays an important role in resisting their intrusion. Even if the glass breaks the interlayer continues to safeguard the building until the glass is replaced.
- 3. Sound Reduction:** Noise gains easiest entry to homes and buildings through windows and doors. Laminated glass proves an excellent barrier to noise, it has better Sound Transmission Loss as compared to glass of similar thickness in the frequency of 125 Hz to 4000 Hz. Also it eliminates the coincidence dip that is associated with the monolithic glass because of the viscoelastic property of the interlayer material.
- 4. Solar Energy Control:** While natural light is important for us too much sunlight can also mean too much heat gain inside the building. Laminated glass when used in combination with reflective glass, tinted glass or low e glass provides excellent reduction in the Solar Gains as well as reduction of sound transmission through the window.
- 5. UV Control:** The major cause of deterioration and fading of furnishings and pictures is the chemical reaction caused by short-wavelength UV radiation. UV absorbing additives in the interlayer in laminated glass can screen out almost all these damaging rays.
- 6. Protection from weather and natural disasters:** If broken, laminated glass remains in its frame, preventing interior damage while reducing flying glass protects people both indoors and outdoors. Areas subjected to heavy winds and rain such as hurricanes or cyclones, buildings often need extra protection. Flying debris carried by these winds can shatter the glass and injure people. Laminated glass can be designed to remain intact and in its frame. Buildings that are situated in areas subjected to heavy winds and rains such as hurrican and cyclones, often need extra protection.
- 7. Durability:** Laminated glass is durable, it maintains its color and its strength for a very long time.
- 8. Low visual distortion:** Laminated Glass is usually glazed in an annealed form, avoiding the distortion caused by roller waves in the tempered and heat strengthened glass. So the facades having laminated glass have sharp reflected images and fewer distortion.

Production process:

Step 1: First the glass is cut to size from the available stock in accordance to the order given by the client.

Step 2: Then the glass is safely transported from the glass storage rack to the laminated glass line using the feeding device. The glass is then positioned onto the table and

conveyed via roller table to the washing machine.

Wider gaps between individual panes are automatically reduced to a small safety distance before the glass reaches the washing machine.

Step 3: Glass panes of a thickness between 2 and 19 mm are cleaned and dried by varying speeds.

Automatic scanning of glass thickness and coated glass sensors allow accurate positioning of the cleaning brushes. Different bristle diameters are used for the process which ensure a proper cleaning of the glass using deionised water.



Step 4: Once the glass is cleaned by washing and subsequently dried, it is then transported to the clean room where the PVB is stored. In the clean room a perfectly coordinated air conditioning system regulates both temperature and relative humidity of the PVB film rolls. Also the environment is kept dust free so as to ensure that no dirt particles stick to PVB or Glass which may result in delamination.



From outside it looks like the room shown in the figure above.



The cleaned glass enters the positioning station, where the longitudinal and transverse sides of the panes are aligned with repeatable accuracy according to their respective geometry.

The transfer unit, equipped with impression-free suction cups, lifts the positioned glass panes. Non-occupied cups are closed automatically. The transfer unit transports the glass via precise linear guides to the assembly position.

From a choice of different PVB film coils, the suitable one is selected and handed over to the operating personnel.

The next pane is then placed on top, accurately aligned, and the sandwich is assembled. Then the operator releases the sandwich so that it moves over to the nip rollers where

the laminated glass is pressed to remove any air bubbles and heated to soften the PVB.

Step 5: After leaving the nip zone, the glass package is conveyed to the exit and then is transported to an auto-clave cart.

The nipped glass enters the autoclave where the final clear laminated glass state is achieved by a specific cycle of pressure (8-10 bar) and heat (100 to 150 degree).

Properties of Laminated Glass .

Float Glass in different thickness is basically used in the form of clear, tinted, reflective, tempered and heat strengthened glass. The PVB exhibits an extraordinary resistance in terms of UV transmission but does not reduce the visible light in the light spectrum.

- PVB thickness --0.38mm, 0.76mm, 1.14mm, 1.52mm
- PVB colors --Clear, white, gray, purple, blue, green, yellow, orange, red
- Refractive Index -- 1.48
- Visible Light Transmittance, Clear -- 89%
- Shading Coefficient, Clear -- 0.92
- UV Screening, up to 380 nm -- 99%
- Tensile Strength -- 3220 psi
- Tensile Elongation -- 205% (JIS K6771)
- Specific Gravity -- 1.07
- Specific Heat -- 0.47 Btu/lb°F
- Thermal Conductivity (K value) -- 0.12 Btu/(ft2hr°F)
- Coefficient of Thermal Expansion -- 2.6 x 10-4 in./in.°F
- Emissivity -- 0.9

Specification & Sizes of AIS Laminated Glass

AIS Laminated Glass			
Thickness	Max Size (mm)	Min size (mm)	Remarks
4mm+4mm	2440x 1830	300 x 300	Can be cut to shorter size if annealed after lamination
5mm+ 5mm	2440 x 3660	300 x 300	Can be cut to shorter size if annealed after lamination
6mm+ 6mm	2440 x 3660	300 x 300	Can be cut to shorter size if annealed after lamination
8mm+8mm	2440 x 3660	300 x 300	Can be cut to shorter size if annealed after lamination
10mm+10mm	2440 x 3660	300 x 300	Can be cut to shorter size if annealed after lamination
12mm +12mm	2440 x 3660	300 x 300	Can be cut to shorter size if annealed after lamination
- Maximum thickness of glass can be 24mm (E.g. 12+12 or 8+15, etc)			
- Minimum thickness of PVB for heat strengthened or tempered lamination is 1.14mm (3 inter layers)			