



Annealed or Float Glass

Annealed glass is the basic flat glass product that is the first result of the float process. It is the common glass that tends to break into large, jagged shards. It is used in some end products -- often in double-glazed windows, for example. It is also the starting material that is turned into more advanced products through further processing such as laminating, toughening, coating, etc.

The float glass process is renowned for flatness and optical clarity. It is available in clear, toned, high performance toned, ultra clear low iron glass and Low E pyrolytic coated.

Insulating Glass or Double Glazing

Two or more panels of glass are bonded to a perimeter spacer, either a metal or thermoplastic spacer, (TPS). Either air or argon gas fills the space between the glass panes. Their primary benefit is insulation and solar control. Most types of glass can be incorporated into an insulating glass unit.

Toughened Glass

Toughened glass is treated to be far more resistant to breakage than simple annealed glass, and to break in a more predictable way when it does break, thus providing a major safety advantage in almost all of its applications.

Toughened glass is made from annealed glass treated with a thermal tempering process. A sheet of annealed glass is heated to above its "annealing point" of 600 °C; its surfaces are then rapidly cooled while the inner portion of the glass remains hotter. The different cooling rates between the surface and the inside of the glass produces different physical properties, resulting in compressive stresses in the surface balanced by tensile stresses in the body of the glass.

These counteracting stresses give toughened glass its increased mechanical resistance to breakage, and are also, when it does break, what cause it to produce regular, small, typically square fragments rather than long, dangerous shards that are far more likely to lead to injuries. Toughened glass also has an increased resistance to breakage as a result of stresses caused by different temperatures within a pane.

Toughened glass has extremely broad application. Glass portions of building façades, glass sliding doors and partitions in houses and offices, and many other products typically use toughened glass. Products made from toughened glass often also incorporate other technologies.

Laminated Glass

Laminated glass is made of two or more layers of glass with one or more "interlayers" of polymeric material bonded between the glass layers.

Laminated glass is produced using one of two methods: Poly Vinyl Butyral (PVB) laminated glass is produced using heat and pressure to sandwich a thin layer of PVB between layers of glass. On occasion, other polymers such as Ethyl Vinyl Acetate (EVA) or Polyurethane (PU) are used. This is the most common method.

For special applications, Cast in Place (CIP) laminated glass is made by pouring a resin into the space between two sheets of glass that are held parallel and very close to each other.

Laminated glass offers many advantages. Safety and security are the best-known of these -- rather than shattering on impact, laminated glass is held together by the interlayer, reducing the safety hazard associated with shattered glass fragments, as well as, to some degree, the security risks associated with easy penetration. But the interlayer also provides a way to apply several other technologies and benefits, such as colouring, sound dampening, resistance to fire, ultraviolet filtering, and other technologies that can be embedded in or with the interlayer.

Laminated glass is used extensively in building and housing products and in the automotive and transport industries. Most building façades and most car windscreens, for example, are made with laminated glass, usually with other technologies also incorporated.

Coated Glass

Surface coatings can be applied to glass to modify its appearance and give it many of the advanced characteristics and functions available in today's flat glass products, such as low maintenance, special reflection/transmission/absorption properties, scratch resistance, corrosion resistance, etc.

Coatings are usually applied by controlled exposure of the glass surface to vapours, which bind to the glass forming a permanent coating. The coating process can be applied while the glass is still in the float line with the glass still warm, producing what is known as "hard-coated" glass.

Alternatively, in the "off-line" or "vacuum" coating process, the vapour is applied to the cold glass surface in a vacuum vessel.

Coated glasses can be toughened, laminated or incorporated into an insulating glass unit.

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Security Glass

Glass that is designed to resist physical attack, ballistic and bomb blasts. These products are specialist laminates that use multiple layers of glass and rigid interlayers depending on the resistance required.

Screen Printed Glass

Uses ceramic paint that is screen printed and permanently fused to the toughened glass surface.

Mirrored Glass

To produce mirrored glass, a metal coating is applied to one side of the glass. The coating is generally made of silver, aluminium, gold or chrome. For simple mirrored glass, a fully reflective metal coating is applied and then sealed with a protective layer. It can also include a vinyl backing for safety.

To produce "one-way" mirrors, a much thinner metal coating is used, with no additional sealing or otherwise opaque layer.

Mirrored glass is gaining a more prominent place in architecture, for important functional reasons as well as for the aesthetic effect.

Patterned Glass

Patterned glass is flat glass whose surfaces display a regular pattern. The most common method for producing patterned glass is to pass heated glass (usually just after it exits the furnace where it is made) between rollers whose surfaces contain the negative relief of the desired pattern(s).

Patterned glass is mostly used in internal decoration and internal architecture. Today, it is typically used for functional reasons, where light but not transparency is desired, and the patterns are accordingly subtle. However, it has also at times been fashionable as a design feature in itself, in such cases often displaying more prominent patterns.

Self Cleaning Glass

Used for exteriors. The glass incorporates a pyrolytic coating that dissolves dirt (photo active) and sheds water (hydrophilic) using natural UV light and rain.

