New products and concepts in laminated glass

Glasslam, specialized in glass technology, has developed a special system for the production of laminated glass. Glasslam’s high-tech polymer interlayer enables the manufacture of laminated glass for a wide range of applications, such as different kinds of safety glazing, bullet resistant glass, bent glass, sound and solar energy control glass and decorative glass. The US company supplies the resins, pigments, and films to produce the vast range of Glasslam products, and provides technical knowhow to glass and window manufacturers.

Introduction

Glasslam NGI Inc. of the United States was founded in 1984 by a management team with over 50 years’ combined experience in the glazing industry.

Since then, the company has steadily grown into an international organization with four locations: Florida in the United States, Sheerness in Kent, United Kingdom, Hong Kong, China and São Paulo, Brazil.

With over four hundred fabricators worldwide in over forty countries, Glasslam guarantees efficient production, cost effectiveness, and quality standards by offering full technical backup to both fabricators and specifiers. Glasslam’s system has been proven to perform well in any kind of climatic environment.
Product line overview

The Glasslam system is a high-tech, chemically cured polyester polymer which chemically bonds to the glass and cures to a strong, flexible, crystal-clear interlayer. Using this state-of-the-art technology allows all types of glass to be laminated, giving the Glasslam system a very large range of laminated glass products. Patterned glass such as reeded, fluted, art and antique glass can be laminated to all safety glass standards (clear or coloured). Glasslam also makes very small laminated glass products (e.g. instrument panels), or, on the other hand, extremely large ones, available in any combination of glass thickness or type.

Glasslam laminated glass is produced by pumping or pouring a chemically cured, three-component liquid resin between two sheets of glass. This production process (similar to float glass production) gives a perfectly clear and flat laminate. The three-component resin provides a much better adhesion to the glass. One of the three components is silicone-based, therefore giving complete compatibility to silicone glazing systems; this prevents the edge delamination associated with other laminated glass products. The firm’s vast range of products is known as Glasslam, the name of the company itself.

Architectural laminates

Laminated glass produced with the Glasslam system offers all of the safety glazing features of the US Consumer Product Safety Commission and the Architectural Glazing Safety criteria in all model building codes. Therefore, by using Glasslam laminated glass, the building owner can be assured a safe, strong product that meets all safety glazing specifications, and will not yellow or delaminate over time. Manufactured with annealed, heat-strengthened, or tempered glass, Glasslam architectural glass can be of any shape or thickness. The roofing of the structure in Pontiac Marina, Singapore is composed of architectural laminates produced with the Glasslam system.

Security and bullet resistant glass

With the continuous increase in crime, security is the number one priority. Glasslam can be produced in eight different levels of bullet resistant glass (measured using the UL 752 test requirements). Due to its qualities, Glasslam products provide security protection against forced entry, and, where required, against escape. Security products made with the Glasslam system are ideal for storefronts, jewellery displays, banks, prisons, auto security and zoos. Glasslam’s security and bullet resistant glass was also used for the Shell petrol station in Pontiac Marina, Singapore.
The recent rise in terrorist bombings has also led building owners to look for protection from the glass debris caused by such explosions. Today, Glasslam’s (patent pending) blast resistant glazing system, which mechanically attaches the glass to the frame, ensures that the entire glass sheet does not come out upon failure of the glazing sealant.

**Sound control**

The Glasslam interlayer has proven to be a very effective method of sound reduction. In the lower frequency range (road traffic, large machinery, aircraft, etc.), Glasslam has shown very high sound-deadening results and still offers the safety and security of laminated glass. The glass parts of the Miami International Airport in Miami, Florida, US are made with the Glasslam sound control interlayer.

**UV protection**

While blocking nearly all of the sun’s damaging UV radiation, the Glasslam interlayer provides an environment that favours plant growth. The tough, clear, flexible interlayer by Glasslam filters out UV radiation up to 99.9 per cent, therefore preventing the fading of furniture, carpets and store displays. The windows of the Westin Hotel in San Salvador, El Salvador, are made with Glasslam’s UV protection glass.

**Solar energy control**

Using an infinite combination of glass types together with various Glasslam interlayers allows maximum control over such factors as solar heat gain, emissivity, convection and light transmittance. Whether the project calls for reflective coatings, clear, coloured or opaque laminates, its system is a very effective method of controlling the thermal performance of any building design.

Laminated glass produced with the Glasslam system also offers optimum control of the...
structure’s solar performance. Coloured interlayers made with Glasslam pigments can be used to reduce the amount of visible light transmittance. By increasing the concentration of a given pigment, an even lower transmission may be reached.

**Safety-Plus® hurricane resistant glazing**

In a quest for making homes and offices less vulnerable to hurricanes and glazing failure, Glasslam has developed Safety-Plus®, a hurricane-resistant glazing solution for the new South Florida Building Codes.

Manufacturers of PET films and laminates are always looking for the best way to protect buildings and lives with hurricane-resistant glazing. They all agree that it is very important for the glass to remain in the frame. There is absolutely no point in holding the glass together if the whole glass comes out. The large piece of glass could be a lethal threat to whatever or whoever it hits, leaving the building vulnerable to the full force of the hurricane.

Glasslam looked at this problem and came to the conclusion that PET filmed glass and commonly glazed laminated glass could come out in its entirety without some kind of mechanical hold to the glazing frame. PET films are commonly applied to existing buildings as a quick, economical way of offering some hurricane resistance. The film is generally cut to the inside (sight-line) of the glazing frame. If the glass is exposed to extreme pressure (as in the case of a hurricane), the film would tend to hold the glass sheet together, rather than hold the entire sheet in its frame. This could increase the size of the propelled glass and cause more damage than if small shards of glass were to be expelled.

If conventionally glazed by using gaskets, silicone, etc. to hold the glazing to the frame, laminated glass could have the same problem as the PET films. It is well known that some types of laminated glass tend to show edge delamination after 2-5 years when exposed to silicone or moisture. If the laminated glass had edge delamination, it could cause a serious problem and come out in one piece if a hurricane occurred.

Glasslam developed Safety-Plus® to overcome these problems. There is a three-ply interlayer, with the middle layer, a heavy-duty PET film, cushioned on both sides by the Glasslam interlayer. The PET film is left longer than the glass size and mechanically held into the glazing frame. If, after years of exposure, the laminate should show any delamination, it would still perform the task it was designed for by holding into the frame and protecting the building and people.

Safety-Plus® provides the security and strength of a polyester ply composite panel and the durability of glass on both exposed surfaces. It can be produced to meet the needs of any project: hurricane resistant windows, skylights, entry doors, sliding patio doors, storefronts, and security and blast resistant glazing.

Safety-Plus® is available in any colour, from clear, grey, green, or blue to any custom colour necessary to fit a specific application.

Furthermore, no special methods are needed for cleaning Safety-Plus® and, as with all Glasslam products, it is warranted for a ten-year period.

Safety-Plus® was used for the Oceanfront condominium in Freeport, Bahamas.

Oceanfront Condominium, Freeport, Bahamas
Decorative and coloured laminates

Any colour of laminated glass is possible with the Glasslam system. In a private residence in Long Island, New York, US, blue cracked ice glass was used for a staircase. Many standard and custom colours are available, either transparent, light diffusing or fully opaque. The pigments used in the Glasslam system are very stable and have been employed in high UV areas (such as Florida) for over a decade without adverse results. Due to this feature, safety art glass can be produced and laminated to any other glass surface, with any colour or interlayer.

Another option available to the designer from Glasslam is Sand-Seal, a coating which is applied to sand-blasted glass. Sand-Seal eliminates the problems associated with cleaning sand-blasted glass by encasing the design within the laminate. Sand-Seal is also ideal for laminated door panels, side lights, table tops, shower doors, partitions and privacy screens, as well as balconies. As a standard, Sand-Seal comes in translucent white, but a whole range of colours are available to produce a stained glass effect. A three dimensional effect can be produced by sand-blasting both pieces of the glass to be laminated. Together with these colour capabilities, Glasslam creates endless possibilities for laminated art glass (once thought to be impossible to laminate).

Bent laminated glass

With the company’s state-of-the-art technology, bent glass of any size, shape and radius can be laminated to meet safety standards and performance requirements. Bent laminated glass products manufactured with the Glasslam system are used in such applications as car windscreens, bus and train windows, solarium windows, store fronts, stair rails, balustrades, windows, revolving doors,
and display cabinets. Working together with Glasslam fabricators to produce the finest quality, distortionless curved glass has allowed designers the opportunity to fully use their skills in using bent laminated glass.

With all the combinations of products produced with the Glasslam system, the aesthetic value of bent laminated glass can be combined with the safety features of the strong crystal-clear polymer interlayer. An example of a construction in bent, laminated and insulating glass is a conservatory in Arkansas, US. True curve radiuses and s-bends, top hats, j-bends and even the once thought impossible 90-degree bend can easily be laminated with the Glasslam system.

Quality control

Glasslam is a high-quality polyester polymer available for laminated glass. Quality control tests are made to ensure that the high standards that have been achieved be met continuously with every new batch of resin.

Conservatory, Arkansas, US

*President
Glasslam - USA