

Saflex



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Designing with Saflex HP Interlayer

Saflex HP Protective Interlayer

Saflex has developed a new interlayer option for impactresistant glazing specifically targeted for the hurricane market called *Saflex HP*. *Saflex HP* is a high performance, all polyvinyl butyral (PVB) product that when properly laminated provides excellent performance in hurricane simulation tests.

Saflex HP is an all PVB product. The industry has for over 60 years looked to PVB-based products to deliver good serviceability, durability, performance and longterm reliability. The processing of this material is well known to laminators and glazing contractors alike. *Saflex HP* provides not only wind-borne debris protection but also delivers safety from human impact, security against forced entry, acoustical damping, solar control options and UV screening capabilities.

Saflex HP was developed based on the market demand for a reliable, effective and competitively priced hurricane product for large missile, large area glazing. Through years of testing in research and development programs related to hurricane protection, the practical limits of our standard *Saflex* products were defined, and an outline of product requirements for exceeding these limits was determined. Based on these studies it was determined that in order to be effective, an all PVB interlayer would have to have increased rigidity, reduced deflection and be able to be integrally attached to any common frame design. These findings led to the design and development of *Saflex HP*, a new interlayer from Solutia Inc. that is able to respond to the impact of a 4 kg, 5 x 10 cm (9 lbs., 2 in. x 4 in.) missile travelling at 15 m/sec (50 ft.) per second and work integrally with the frame during cyclical load to deliver successful glazing systems having large glass areas.

Component Approval for Dade County, Florida

The component approval is issued through Dade County in the form of a Notice of Acceptance (NOA). This NOA mandates that the interlayer product be identified in laminated glass. Solutia Inc. has been granted a Component NOA for *Saflex HP* interlayer (99-1227.02). Solutia Inc. provides this number to qualified laminators for authorized use in the labeling of laminated glass with *Saflex HP*. The window manufacturing partners of these laminators are also provided a copy of the NOA for use in their application for certification of glazing systems using laminated glass with *Saflex HP*.

The labeling requirements for glazing utilized in Dade County are specific and outlined on the notices of acceptance (NOA) that have been granted to Solutia. Solutia Inc. provides this NOA to laminators that utilize *Saflex* interlayer in the production of laminated glass. To be in compliance with this NOA, a permanent label with the manufacturer's name, the phrase "MDCA *Saflex HP*" and all appropriate safety code information must appear on the glass.

Through continuous improvement and new product development, Solutia Inc. has been granted several component product approvals through Dade County. To ensure the utilization of the proper product for each application, contact your local *Saflex* representative. For more information on the "Plastic Checklist," contact Dade County at 303-375-2901 or visit their Web site at www.miamidade.gov/buildingcode.

Performance and Limitations

Saflex HP is combined with a minimum of two pieces of glass to form a "glass-to-glass" impact-resistant laminated glazing system. It provides passive protection to openings 24 hours a day, 365 days a year. The "glass-to-glass" system is virtually maintenance free and delivers the same scratch resistance as standard glass products. Laminated glass with *Saflex* HP interlayer at 2.54 mm (0.100 in.) is capable of resisting the large missile (4 kg, 5 x 10 cm [9 lbs., 2 in. x 4 in.] timber) impact when fired from an air cannon at 15 m/sec ([50 ft. per second] 55 kph [34 mph]).

Laminated glass containing *Saflex* HP interlayer at a 2.54 mm (0.100 in.) thickness has been demonstrated to perform well in hurricane testing in sizes greater than 3.5 sq m (35 sq. ft.) of glass surface area when the design cyclical load of the system is subjected to greater than 3.8 kPa (80 psf). The majority of applications for *Saflex* HP are large glass area, high-pressure design load buildings that will require the use of strengthened glass products. The overall thickness of *Saflex* HP, as used for hurricane applications, and the high-performance properties of this interlayer make it particularly well suited for any strengthened glass application. Systems have been successfully tested with *Saflex* HP product using both large and small glass areas with both high and low pressure. In most cases, the frame flexibility and anchoring materials of the glass to the frame have proved to be the limiting factors in performance.

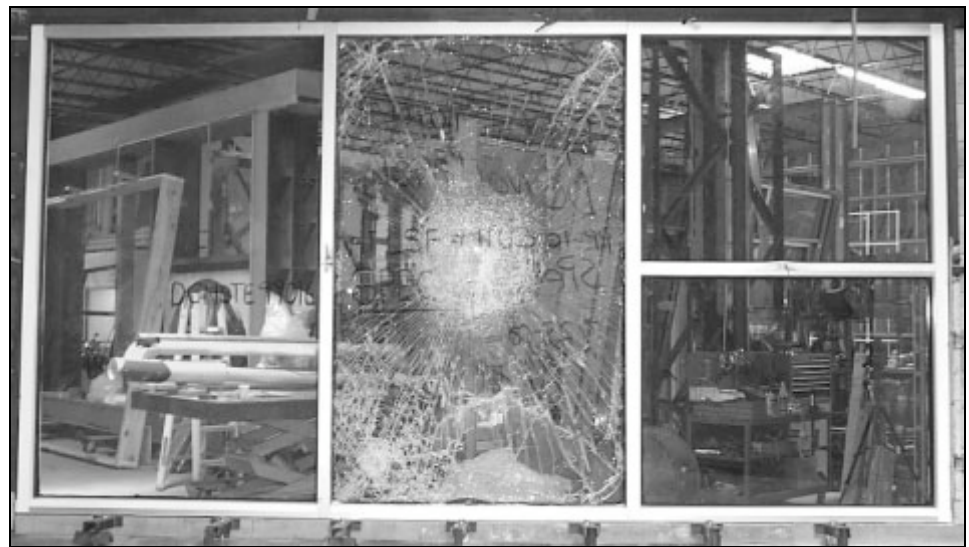
Saflex HP can also be fabricated using tinted PVB interlayers to achieve a vast array of color options in impact-resistant glazing. Utilizing color provides a unique design option, additional solar control benefits and can help meet certain restrictive visible transmission codes along coastlines. *Saflex* HP can also be combined with coated glasses to provide additional solar and energy control. (Note: Always check with the laminator regarding coating compatibility with interlayers, sealants and cleaners.)

Saflex HP can also be utilized for small missile applications in the recommended 2.54 mm (0.100 in.) thickness. There have been no discernable size limitations or special glazing techniques needed when utilizing laminated glass for small missile protection. The sacrificial ply concept has been widely accepted for the design of small missile protection and can be utilized with *Saflex* HP. The laminate is typically asymmetrical. The outermost glass ply is a thin 3-5 mm (1/8-3/16 in.) lite that is laminated with 2.29 mm (0.090 in.) *Saflex* to the "inside" or "back" lite that is thicker 6-10 mm (1/4-3/8 in.), normally strengthened and capable of withstanding the structural windload requirements. During the test, the outermost lite breaks, the interlayer "absorbs" the impact of the debris, and the inboard lite remains unbroken.

The glass used in the production of laminates with *Saflex* interlayers for either commercial or residential glazing applications should be designed to withstand the appropriate windload using the engineering methods and glass strength charts acceptable by the county in which the building will be erected. The recommended glass bite for hurricane applications is typically a minimum of 12 mm (1/2 in.).

Retrofit Applications

Saflex HP has demonstrated an ability to be used in hurricane retrofit applications on the interior of buildings.



Kawneer IR500 System – Certified with *Saflex* HP.

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