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LAMINATED GLASS DOES NOT POSE SIGNIFICANT RISK DURING FIRE

Background:

Laminated glass, consisting of a polyvinyl butyral interlayer sandwiched between two pieces of glass bonded under heat and pressure, is used in architectural glass products, and in automotive and aircraft windshields. Solutia Inc., the leading manufacturer of interlayers for the glass industry, is the producer of Saflex® and Vanceva™ brands of polyvinyl butyral (PVB) interlayer. PVB interlayer is an extremely tough, resilient plastic film that provides safety, security, structural, solar, and acoustical benefits, all without being seen.

Laminated glass has performance properties that add value to architectural structures, automobiles and aircraft. It effectively reduces solar heat gain for energy control, reduces fading inside buildings for extended material life and reduces sound transmittance in acoustically engineered structures. It also provides a transparent, yet resistant barrier that can help protect against windborne debris missiles, ballistic assault or forced entry attack. Laminated glass tends to remain integral when broken, thereby reducing the likelihood of glass-related injury due to flying or falling glass and it helps maintain the integrity of the building making it easier and faster to "get up and running" after a damaging event.

Laminated Glass and Fire Protection:

The ability of laminated glass to resist penetration and remain in the opening does not pose a significant risk to inhabitants during a fire, according to fire officials and some recent government sponsored egress tests¹.

"We use windows as a last resort in rescue operations because open windows feed oxygen to a fire and often times when utilized, windows do more harm than good because they have a tendency to blow out when punctured under pressure," said Reginald Penny, president of the Fire Marshall's Association of North America and Chief and District Commander for the Palm Beach County Fire Department. "Windows are only to be used as a secondary means of escape according to standard building code requirements."

In some severe cases it may be necessary for a fire fighter to enter through a window. If a building is fitted with laminated glass, fire fighters can penetrate the glass with a common fire ax or a fire hook. Penny feels that "if firefighters can cut a car in half to rescue its occupants, then they can cut through a piece of glass without a problem." This has been demonstrated in recent tests directed by Hinman Consulting Engineers Inc. through General Services Administration funding and conducted by the San Jose Fire Department on various bomb blast protective window systems. Bomb blast protective window systems often utilize laminated glass in single and insulating glass units.

In reviewing the findings from the Hinman/GSA report the average time to clear untreated annealed glass from the opening is a total of 24 seconds. Laminated glass in either single lite structures or incorporated as the inboard lite of an insulating glass unit took between 15 and 29 seconds to clear. In some cases, the time to clear the laminate is actually shorter than that to clear a piece of untreated glass, while in other cases it took 5 seconds longer.

One excerpt from the test report is as follows: "The laminated, single-paned window panes became a flexible mass when broken... This allowed the firefighter to use the weight of the tool to push the entire unit out of the framing system rather than requiring them to chop around the entire window perimeter... This tended to decrease the time for venting and clearing of the windows."

Further discussion from Penny on the after affects of breaking out windows indicates the potential of adding to an already dangerous situation: "We really don't like to break windows because the sharp glass shards that remain can cause injury and cut through fire hoses," Penny said. "Windows are removed as a last resort because there is too much room for error and injury."

Another finding from the Hinman/GSA report indicates that laminated glass may alleviate some of the risk of injury after glass break out - "...lamination tend(s) to hold glass shards together, which can allow firefighters to more easily move the glass away from the operational area and may decrease the likelihood of injuries associated with stepping on glass shards (slip, trip, and fall type injuries). It can also reduce the hazard from falling glass to those working outside the building."

"If a resident must leave a burning building through a window, typically they open the window to escape. "Normally, it is not somebody's first response to break a window," said Mike Forgy of the International Association of Fire Chiefs.

1. Hirano, W, General Services Administration, and Stone, H. Hinman Consulting Inc., *Forcible Entry Demonstrations Air-Blast Resistant Window Systems*, July 10, 2003.

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