Homeland Security
Science and Technology

Summary

U.S. Department of Homeland Security
SAVER
System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

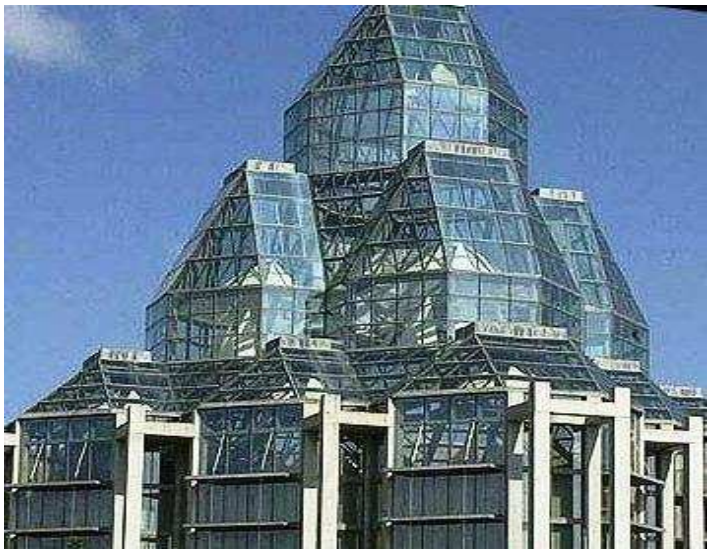
The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

To contact the SAVER Program Support Office
Telephone: 877-336-2752
E-mail: saver@dhs.gov
Visit the SAVER Web site:
https://www.rkb.us/saver

Shatter Resistant Window Film

This SAVER Summary contains information on the SPAWAR Systems Center, Shatter Resistant Window Film: Antiterrorism Standards and the Effect on Emergency Responders *special report. Additional information is available by request at* https://www.rkb.us/saver.

As a result of the increase in terror attacks against the United States, both domestic and abroad, the U.S. Government has begun to implement regulations and action plans that identify and eliminate potential infrastructure vulnerabilities. One major weakness identified is the potential for injury due to flying window fragments resulting from an explosion or any event of high-pressure airbursts. SPAWAR Systems Center Charleston has gathered information on the recent advancements in window security film technology, recent government regulations for new and renovated government facilities, recommendations by the Federal Emergency Management Agency on the design of commercial buildings, and the potential hazards associated with the use of this technology, specifically the ability of fire services to perform rescue operations in emergency situations.



Glass Design

Window glass, produced in a process called glazing, incorporates multiple panes of glass, gas fillings, and high-tech, heat-sensitive coatings. There are four types of commonly used window glazing systems: annealed glass, heat strengthened glass, fully thermally tempered glass, and polycarbonate. Of the four, annealed glass and fully thermally tempered glass are the types commonly used for most office buildings.

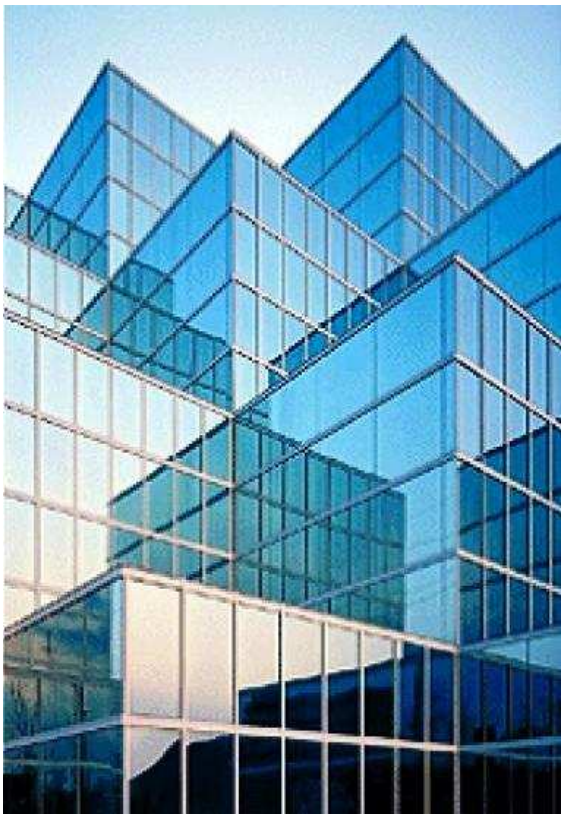
Annealed glass is of relatively low strength, and upon failure, fractures into razor sharp, dagger-shaped fragments. Fully thermally tempered glass is typically stronger than annealed glass, and when fractured, breaks into small cube-shaped fragments, but it still presents a significant health hazard. Current building codes generally require thermally tempered glass anywhere the public can physically touch the glass.

The General Services Administration (GSA) recommends that window systems be designed to mitigate the hazardous effects of flying glass during an explosion event. The GSA has identified six glazing protection levels based on how far glass fragments would enter a space and potentially injure its occupants. The GSA performance conditions correlate with levels of protection set by the Department of Defense. For further information on these protection levels see SPAWAR's full report.

Shatter resistant film, also known as fragment retention film (FRF), safety film, security film, protective film, air-blast-resistant, fragment retention film, or shatter-proof film is being used to reduce the flying glass shards shown to be a major contributor to injuries in explosive events. The film adheres to the inside of the window and helps reduce the fragmentation of the glass and the velocity of the glass fragments at failure. Because the film adheres directly to the glass it is beneficial for use on existing windows as well as new windows. The use of shatter resistant film is becoming more common.

Negative Impact of Window Film

While the threat of an explosion is the primary reason to upgrade security applications for windows, other emergency conditions need to be taken consideration when incorporating security window applications into



the design of a building. These emergency conditions include fire, earthquake, hurricane, gunfire, and forced entry. For example, if a fire occurs, how difficult will it be for firefighters to break protected windows? SPAWAR references a study performed by Hinman Consulting Engineers, Inc., and the San Jose Fire Department, and contracted by the GSA and the Department of Homeland Security, in order to address this issue.

The results of the study indicate that, although the firefighters were able to enter all the window mock-ups, using conventional firefighting tools commonly carried by firefighters throughout the U.S., ingress and egress times were affected. For the average clear times for first floor access and egress for different window types see SPAWAR's full report.

It is imperative that emergency responders be made aware of the effects that added window strength will have on emergency operations. The GSA recommends that emergency responders assume that a facility is fully equipped with some form of window protection film to mitigate any potential shortcomings during emergency operations.