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The ABCs of Total Fire Protection and Fire-Rated Glass in Schools

by Jeff Griffiths

Stop, drop and roll ... it is a directive learned by thousands of school children. It was the 1958 fire at Chicago's Our Lady of the Angels elementary school that killed 87 children and three nuns that caused Americans to get serious about fire prevention and safety in schools.

Thanks to code changes and fire-safety education launched in the 1960s, the number of fatalities from school campus fires has dropped significantly. Still, school fires persist. (See Campus Fire Facts box.) K-12 school officials place nearly 15,000 calls a year for help in battling campus fires. While fatalities are rare, the rate of injuries from school fires is higher than in either homes or in non-residential structure fires. School property damage is estimated at over \$100 million a year.

The next step in limiting injury and damage caused by school fires is to adopt a total fire protection approach that combines active and passive fire

protection systems. Most people are aware of active fire protection measures, like fire alarms, sprinklers, and fire extinguishers that help detect and suppress fires. However, most people overlook the value of passive fire and smoke protection provided by compartmentation strategies inherent in prevailing code requirements.

Passive fire protection is reliable

For decades, the focus of fire safety has been on active fire-protection measures. These active systems must be installed and maintained in compliance with various NFPA standards and IBC model codes. Unfortunately, active systems can fail due to poor maintenance, sabotage or natural disaster. In a 2009 Campus Safety Magazine survey, 58% of K-12 officials and 53% of university officials cited system maintenance as their number one concern.

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Fire Rated Glazing allows clear view and fire resistance. SAFTI Photo

This is precisely why incorporating fire-resistance-rated and smoke-resistant compartmentalization measures is so important. Fortunately, passive fire protection, despite its name, is always at work. Compartmentation refers to the strategic use of fire-resistance-rated materials in building construction and remodeling that, when installed to the tested and listed system design, ensure the safety and safe egress of building occupants.

The components of compartmentation include walls made of gypsum, masonry, fire-resistive glazing, fire dampers, and firestop systems, fire-resistance-rated floors, and the supporting construction as well. These fire-resistance-rated building materials that become systems when installed properly, create fire barriers, firewalls, fire partitions, and smoke barriers that form compartments, or occupancy separations, that contain flames, heat and gases at the room of origin so that building occupants may exit the building safely or protect themselves when a "defend in place" strategy is used.

Perhaps the most important benefit of incorporating compartment fire protection is the fact that fire-resistance-rated systems are the best defense against dangerous radiant heat - invisible electromagnetic waves that travel at the speed of light with little resistance. When these waves strike an object, they are absorbed and their energy is converted to heat. If the object is a combustible material, a fire will start when the material's ignition temperature is reached. Radiant heat is extremely dangerous to building occupants since it can quickly reach a level that causes unbearable pain, followed rapidly by second degree burns, preventing safe egress.

Some jurisdictions allow sprinklers to provide the sole fire protection in school corridors, allowing students and faculty to be exposed to even greater risks. However, a far more reliable strategy is one that combines the benefits of both active and passive systems.

For example, by using fire-resistive glazing as part of a fire-resistance-rated wall assembly to create occupancy separations that protect people and property from radiant heat, designers can introduce day-lighting

and expanded visibility strategies into school corridors to keep them safe for egress while preserving the fire-resistance integrity of school buildings.

Until 25 years ago, architects could only select conventional fire-resistance-rated systems that use gypsum and masonry to meet the one- and two-hour fire-resistance rating wall criteria. With the advent of technologically advanced fire-resistive glazing that performs like a transparent wall, they can now incorporate clear vision in their designs while still meeting the fire and safety requirements of the code.

The bottom line: School officials can best ensure that campus fires are quickly detected, suppressed, contained, and that people can safely leave a burning building by focusing on both active and passive fire-resistance-rated compartmentation in school buildings of any type, primary through collegiate.

Jeff Griffiths is Director of Business Development at SAFTI-First. Jeff is part of a management team on a mission is to serve their customers and the general public by providing innovative fire-rated products that protect lives. 🔥



Fire Rated Glazing can be decorative. SAFTI Photo

Campus Fire Facts

- **40%** of K-12 schools, universities and hospitals have experienced one to three fires in the last three years. (Campus Safety Magazine 2009 survey)
- **36%** of K-12 schools, universities and hospitals have reported four to 20 fires in the last three years.
- Annually, there are **14,300** fires in non-adult schools (daycare through high school) resulting in 122 injuries and \$103.6 million in property damage. (FEMA, 2002)
- **A majority** of K-12 campus fires start outdoors either on school property or by wildfire. (FEMA, 2002)
- There are **750 structure fires** annually in college classrooms and adult education centers. (NFPA)
- Among the 18 million college students enrolled in 4,100 colleges and universities nationwide, 140 students have died in fires in the last nine years. (Campus Firewatch)