

Top Tips for Considering Fire-Rated and Safety Glass

As a manufacturer and supplier of fire-rated glazing and framing products, we are continually asked which fire-rated glass is best for a particular application. Quite often, we are only given a general product rating, 60-minutes for example, and asked to provide a quote for a variety of glass sizes. Our first response is typically a request for specification details and a description of where the glass is to be installed. However, whether it is an architect or glazier, far too often the person inquiring feels that the fire-rating should be sufficient information. So let's review the key information needed in order to select the correct fire-rated glass for any given project.

Q Is radiant heat protection advisable or required by code?

A The ASTM E119 test standard applies to walls and doors rated in excess of 45-minutes. This standard stipulates a maximum average temperature rise of 250°F on the non-fire side of the test unit. Glazing and framing assemblies meeting this standard are defined as fire-resistant. What does this mean in the real world? Fire ratings of 60, 90 and 120 minutes create unique environmental problems for building occupants and firefighters. The longer the assembly is required to protect against the spread of fire, the more time the fire has to burn. Two possibilities arise. First, the fire can conceivably burn itself out without major damage. Second, the fire feeds on materials within the containment area giving rise to accelerating temperature levels that eventually overwhelm the fire resistance properties of surrounding assemblies and individual components.

Occupants attempting to escape can unknowingly run into corridors having air temperatures in excess of 250°F combined with radiant heat transmission levels capable of inflicting severe pain or even death. Firefighters entering into these types of conditions face increasing danger the longer the fire burns. That is why it is critical to match a fire-resistant glazing with 60, 90 and 120 minute requirements.

The biggest mistake we see each day is the use of non-fire resistant glazing, such as ceramics rated to 180 minutes, being specified and used in ways that create potentially catastrophic results. Fire-resistant glazing is designed to insulate against rising temperatures and the spread of radiant energy. Its use is especially important in occupancies where a great many people will be attempting to exit at one time, such as in multi-story buildings or airports; or the occupants are physically challenged, such as in the case of the elderly; or the occupants are likely to panic, such as in the case of children.

Q What are the area limitations imposed by code and product testing?

A Fire-rated glazing that cannot pass the ASTM E119 standard is defined as fire-protective. These products provide little to no insulating protection against the spread of radiant heat and are typically limited to a maximum rating application of 45-minutes. As a result, they are limited by prevailing codes to no more than 25% of a contiguous wall. Why is this? For obvious reasons, the excessive presence of this type of glazing can allow for a rapid increase in temperatures and the spontaneous ignition of a variety of materials. Every glazing and framing product has been tested to maximum sizes. These limitations always have to be considered within the context of overall sizes allowed by code.

Many fire-rated glazing manufacturers and distributors love to include photos of large expanses of glass in their advertising, giving the impression that there are no limits to the use of their particular products. Warning: the more glass you see, the less likely it is to be fire-protective; i.e. ceramic, specialty-tempered or wired glass.

Q Must the fire-rated glazing serve as a safety glazing as well?

A Fire-rating does not imply impact resistance. Wired glass is the most obvious type of fire-rated glass

that has long been misconstrued to provide an additional level of security. It has become common knowledge that the embedded wire mesh actually weakens the annealed glass surrounding it. Fortunately, there are now impact-resistant wired glass products available. In 2003, International Building Council (IBC) model codes first eliminated

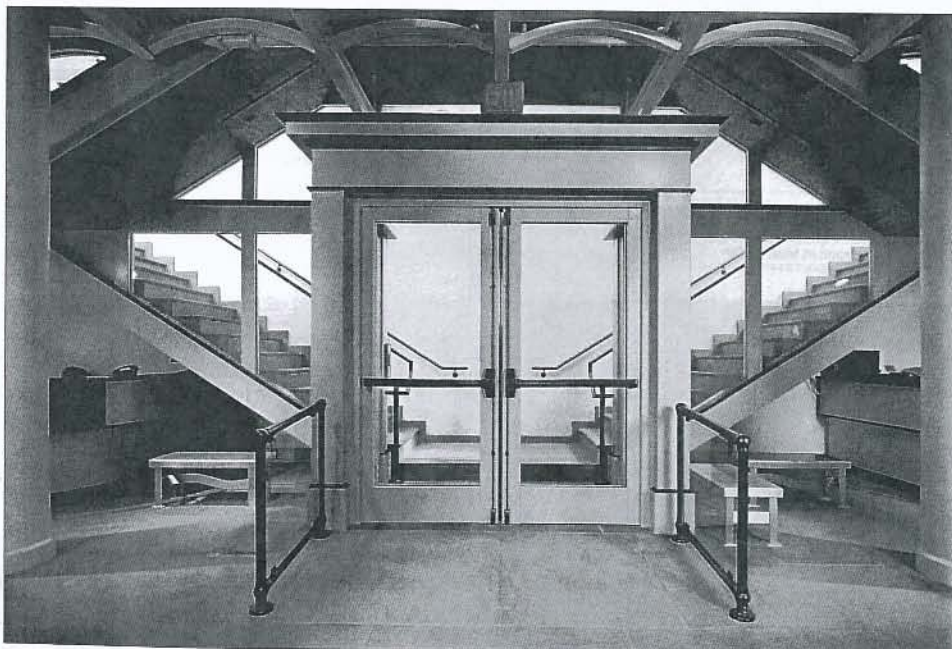
"Be warned: The more glass you see, the less likely it is to be fire protective."

the wired glass exemption from limitations placed on any type of glass being used in code-defined hazardous locations. The Consumer Product Safety Commission's (CPSC) performance guidelines are a federally mandated impact resistance standard that the IBC 2006 now requires all types of glass to meet.

Despite this clearly defined code requirement, many architects and glaziers are confused about the use of wired glass. The distinction between annealed and tempered glass is analogous to the difference between traditional polished wired glass and the new impact resistant wired glass. Both types of wired glass are allowed by code. However, there is a proper application for each product.

The same rule applies to monolithic ceramic glass since

■ A 60-min. temperature rise door assembly. Full lite glass can be used because the glazing and frame are tested to ASTM E119.

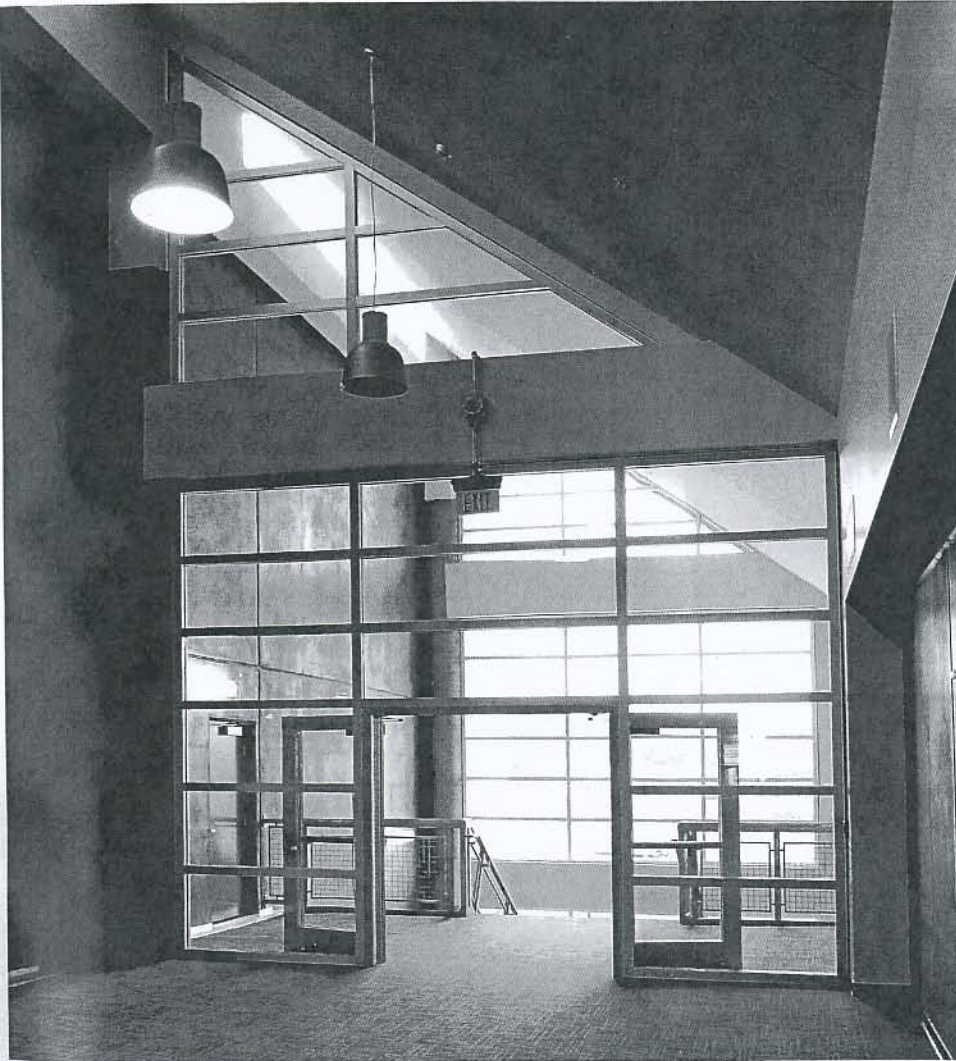


Fire-resistive glazing is designed to insulate against rising temperatures and the spread of radiant energy.

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↑ This wall assembly at California State, Fullerton, provides 2 hours of protection. Because radiant heat protection is provided by fire-resistive glazing, the entire wall of the stair enclosure can be comprised of fire-rated glass and framing.

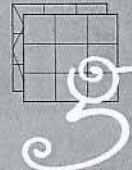
It has less impact resistance than annealed float glass. It must be filmed or laminated with an impact-resistant interlayer in order to meet code requirements. Tempered or multi-laminated fire-rated glazing typical complies with CPSC standards.

BE PREPARED

These three questions can unlock the fire-rated glazing

mystery that confuses many architects and glaziers. Don't become a victim of advertised product ratings. If you at least know whether the application requires a fire-resistive or fire-protective glazing assembly and understand the safety glazing requirements that may apply, then you are ready to discuss the benefits and advantages of particular products with a manufacturer or supplier. □

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