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Life Safety DIGEST

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New Challenge**

Stopping Smoke Saves Lives

**Building a High-Rise Fireproofing
Estimate for Structural Fire Safety**



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On the Cover: Fire-resistance rated floors, walls, separate spaces for fire and life safety. - TGP Photo

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Editor's Message

High-rise occupancies use several strategies for protecting the thousands of people who can be in buildings at any one time. Fire-resistance-rated construction, compartmentation, smoke control, detection and alarms, suppression, egress systems and occupant education about how to use them.... and various sub-groups under each discipline.

All these disciplines must come together during building design. Then, the building or renovation must be built by those who specialize in each trade...to the plans and specifications, inspected by qualified inspection agencies, maintained and managed by the building owner and specialized service providers.

Read Life Safety Digest's articles on how the 2010 code cycle, on fire-resistance-rated technologies, including glazing, gypsum drywall, fire dampers, can improve fire and life safety while adding functionality. Learn about photoluminescent markings for stairwells, and more in this issue.

FCIA supports all types of fire protection, including fire-resistance-rated and smoke-resistant compartmentation – fire rated swinging and rolling doors, fire-rated glazing, fire dampers, fire-resistance-rated and smoke-resistant walls and floors – and works together to build and maintain safer buildings for all.

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Fire-Rated Glass Through the Decades

Technology enhances life safety and aesthetics

By Jeff Razwick

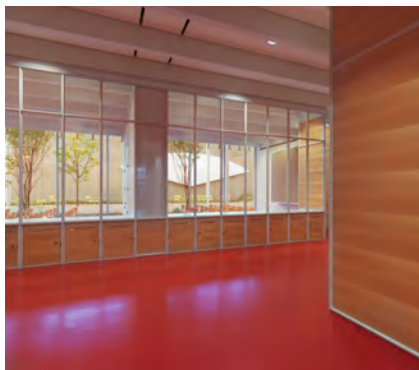
It's an understatement to say that a lot transpires in a decade. Between 2000 and 2010, we've seen the development of hybrid cars, a bionic hand, airborne wind power, mobile phone platforms and a host of other groundbreaking advancements. And, the green movement really took hold with technologies from photovoltaics to daylighting designs, and the rise of groups such as the U.S. Green Building Council. During this time, fire-rated glass has also advanced significantly.

Over the last decade, fire-rated ceramics and transparent glass wall panels have evolved into even more sophisticated, design-oriented products that better protect against the threat of flames and smoke. Featuring high-performing properties and more desirable aesthetics, they help defend against fires while functioning as integral parts of traditional and green building designs.

In high-rise and other construction, fire-rated assemblies – particularly those that are fire-resistive – can play an important part in compartmenting buildings against fire spread. Despite the promise

of paperless work environments, many people still clutter their workspaces with files, and buildings may include flammable plastics, carpets, and more, all of which can lead to rapid fire development. As a result, to provide tenants with better security and protection against fire in buildings – sprinklered or unsprinklered – some building owners and managers may choose to have more fire-resistance-rated assemblies than the code requires.

Fire-rated glazing can help provide that protection, with systems that have passed ASTM E 119 fire tests or have high hourly fire ratings to meet code and tenant demands. In addition to fire protection or resistance, advanced fire-rated glazing may also help building owners meet LEED goals by letting natural light shine into spaces that previously had no natural daylight.



Fire-rated glazing and framing must be installed to specifications for performance. TGP Photo.

Fire-rated Ceramics

For years, traditional wired glass was the only fire-rated glazing option on the market. However,

spurred by changes to the 2003 International Building Code (IBC) that eliminated the use of wired glass in educational and athletic facilities due to breakage concerns, manufacturers developed additional wireless alternatives, expanding on existing product lines.

Wireless glass ceramic is strong, able to withstand the heat of intense fires, and is able to pass the hose stream test (required for fire ratings greater than 20 minutes in the U.S., and for all fire ratings in Canada). Passing the hose stream test is critical because if hot glass fails when struck with cool water from a fire hose stream or sprinklers, flames and smoke may be able to spread quickly throughout a building. In high-rise buildings, stopping or slowing a fire's spread is especially important to the safety of occupants on higher floors.

With these performance features in mind, wireless glass ceramic opened up an entirely new way of thinking about fire-rated glazing. For the first time, architects could comply with stringent life safety codes while achieving high-end design goals, creating classrooms, gymnasiums and entryways free of distracting lines and the institutional look of wired glass.

Today's wireless ceramic is available with fire ratings up to 180 minutes, and many options meet both ASTM E2010 and ASTM E2074 requirements. As such, fire-rated glass ceramic functions as a barrier to flames and smoke. However, as it does not protect

against the transfer of radiant and conductive heat, fire-resistance-rated assemblies are required by code where a barrier to heat is needed.

Fire-rated ceramic glass is also available with options for impact-prone applications like windows, doors and sidelites. Laminated or filmed ceramic glass products can meet the highest standard of impact safety for glass – CPSC 16CFR1201 Category II – meaning they can withstand an impact similar to that of a fast moving adult. For non-impact applications, such as transoms and borrowed lites, wireless fire-rated ceramic is available with fire ratings ranging from 20 to 90 minutes. Fire-rated glass ceramics can also be incorporated into insulated glass units (IGUs) to improve energy efficiency.

More recently, manufacturers have been improving the surface quality of fire-rated ceramics in response to architects' desire for clearer visibility. Glass ceramics typically have a slight earth tone when compared to the blue-green color of standard float glass. They may also have slight surface imperfections acquired during the roll-forming or alternative production process.

To resolve this dilemma, a new manufacturing technology now creates glass ceramic with a smoother surface appearance and less visible color. Notably, Technical Glass Products' FireLite® with ultraHD™ Technology allows for fire-rated doorways and windows that resemble ordinary window glass. Such higher-clarity, fire-rated ceramics are beneficial when



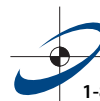
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Fire-rated glazing in corridors. - Pilkington Photo

designing large glazed areas where coloring or surface imperfections can be especially notable. Polishing the glazing on both sides can further improve aesthetics. Premium polished products are nearly distortion free, have high transmission of visible light and low reflectivity.

In cases where privacy is desired, fire-rated ceramics are available with surface patterns for translucency.

Glass Fire-Resistance-Rated Assemblies

Today, transparent glass wall panels use advanced systems to block the transfer of radiant and conductive heat. The technology incorporates multiple layers of glass with intumescent interlayers that turn to foam during a fire. Aesthetically, this allows for wireless glass with nearly the same clarity as ordinary float glass.

On the performance side, a fire could be burning on one side of the glass, yet remain cool to the touch on the other. Tested as wall assemblies and meeting both ASTM E-119 and UL 263 standards, such glass is fire-resistance-rated up to two hours, hose-stream tested and able to withstand thermal shock from the fire hose stream and sprinklers while providing high impact safety ratings. It is also available with Level III bullet resistance ratings. As such, transparent wall panels play a critical role in building compartmentation, and may be suitable for high-rise structures where fires have the potential to burst through windows and leapfrog up the building envelope.

Architects can specify transparent wall panels in conjunction with high performance fire-resistance-rated framing in floor-to-ceiling applications. This allows for expanded visibility in areas where occupant vision is needed, and also meets fire-rated wall codes. This is particularly desirable in buildings like schools, museums and healthcare centers where increased views for security and greater amounts of daylight are

beneficial. For instance, the Art Institute of Chicago's new modern wing relies on Pilkington Pyrostop® transparent wall panels and Fireframes® Aluminum Series frames to maintain sightlines of the nearby park and streetscape throughout its classrooms, while protecting against the threat of flames.

As with ceramics, transparent wall panels can be incorporated into IGUs with other glass products, including tinted, low-e, one-way mirror, reflective glass and more. The panels can also be etched or lightly sandblasted on one side without affecting the fire rating.

Beyond Traditional Fire-rated Options

Due to fire-rated performance limitations, architects were at one time restricted to specifying fire-rated glass in doors, windows, sidelites, transoms and borrowed lites. However, over the last decade, advances in manufacturing have led to fire-resistance-rated glass applications that go beyond these traditional offerings to include curtain walls and other systems.

For example, where extra daylight is desired or building designs require focal points, architects can now select from specialized offerings like fire-rated glass floors. Advanced glazed floor systems are impact-resistant and fire-rated for up to two hours and can be used as durable, non-slip walking surfaces, if desired. Depending on the system, they are available for both interior and exterior applications.

Beyond improving occupant comfort, the additional light brought in through extended areas of fire-rated glazing may help architects earn points toward LEED certifications.

Advances in technology have also led to slender fire-rated frames to accompany fire-rated glazing. When combined with the appropriate fire-rated glazing, narrow steel profile systems can provide fire ratings from 45 to 120 minutes. As a result, architects and designers can incorporate large expanses of fire-

resistance-rated glass across multiple stories. They also can select from a range of modern fire-resistance-rated framing materials, including aluminum and steel.

Conclusion

The last 10 years have brought about significant changes to the fire-rated glazing industry, from improved surface appearances to more thorough fire and life safety protection. As we look ahead, manufacturing advances will likely continue to propel fire-rated design forward. 🔥

Jeff Razwick is Vice President of Business Development for Technical Glass Products (TGP), a supplier of fire-rated glass and framing systems, and specialty architectural glazing. He writes frequently about the design and specification of glazing for institutional and commercial buildings, and chairs the Glass Association of North America's (GANA) Fire-Rated Glazing Council (FRGC). www.tgpamerica.com (800) 426-0279



Fire-rated glazing can separate spaces, as allowed by code. - TGP Photo



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ICC Clarifies that Sprinklers Cannot be Used in Testing to Determine Fire-Resistance Ratings of Glass and other Building Materials

In an important affirmation of the role of fire-resistant building materials and compartmentation in life and property safety, the International Code Council (ICC) has clarified that fire ratings for glazing and other materials must be established based on a material's own performance, without the aid of sprinklers or other fire suppression systems.

During final action code hearings in May 2010, the International Building Code (IBC) Fire Safety Committee approved code change proposal FS4-09/10, which will add a new section to the 2012 IBC as follows:

703.4 Automatic sprinklers. The fire-resistance rating of a building element, component or

assembly shall be established without the use of automatic sprinklers or any other fire suppression system being incorporated as part of the assembly tested in accordance with the fire exposure, procedures, and acceptance criteria specified in ASTM E119 or UL 263.

The hearing documents note that the change was made in response to some material manufacturers submitting "test reports to Authorities Having Jurisdiction [AHJs] with fire-resistance ratings obtained using a flow of cooling water during the fire test." This is deemed unacceptable "since the need for a fire-resistive assembly is usually required by the code to provide an inherent passive level of fire protection."

The code change Proponent, Tony Crimi, representing the International Firestop Council, pointed out that the alternative protection provisions of Section 104.11 already allow for reducing some code requirements when a cooling water flow improves an assembly's performance. The new section was designed not to remove that possibility, but rather to "prevent a manufacturer of products from claiming an inflated fire-resistance rating."

The 2012 IBC will be available for use starting in spring 2011.



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Gypsum Shaft Walls Meet A New Challenge

By Bob Grupe

Recent changes to the model building codes require alterations in the way gypsum shaftwalls are designed and installed. This is specific to any buildings that are over 420 feet in height, or defined as “high-rise buildings”. This article will analyze the development of this new code language, and how we must adapt to this change.

For years gypsum shaft walls have been used in all types of non-combustible construction, most notably, high-rise office buildings. Originally designed to enclose elevator hoistways and stair well shafts, the use of the system has expanded for use into mechanical shafts, horizontal membranes and the metal stud framing system in curtain wall assemblies.

These systems were developed to withstand fire resistance from one to four (typically two) hours, while allowing for construction from one side. These walls are considered “working walls” because they must be able to structurally resist both negative and positive pressures as induced by the passing of an elevator cab. In the case of mechanical chases they must resist what are considered sustained pressures. The assembly design has proven very versatile for over 40 years in its application, and once again, it must change.

In May 2002 the Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers (ASCE) published a report entitled **World Trade Center Building Performance Study: Data Collection, Preliminary Findings, and Recommendations**. One of the recommendations was the “use of impact-resistant enclosures around egress paths”. New York City soon followed by enacting Local Law 26. Along with many requirements intended to increase the safety in high-rise buildings was the requirement to “harden” the shafts. Following is wording used in Local Law 26:

Stair enclosures serving occupancy group E spaces (office spaces) in high rise buildings constructed pursuant to applications filed on or after July 1, 2006 shall comply with rules to be promulgated by the commissioner establishing minimum impact resistance standards.

This was an interesting and challenging time. While New York was reacting to the events of 9/11, USG was challenged as to the physical blast resistance of its wall systems. Up until this time, all blast wall designs were based on static loads around 100 psf. This was all highly



Gypsum board is used in many building types. - USG Photo

theoretical, and resolved using hand calculations. A Chicago based architect, working on a significant Chicago high-rise, strongly suggested that USG run actual physical tests. As a result, we commissioned a recognized test laboratory in Texas to run what is called “shock tube” tests on shaft wall systems. While the components of the wall assemblies were standard panels and steel framing the difference was in the detailing. The base line data that we developed was very encouraging. It gave us the foundation from which we could build strong assemblies for these critical applications.

USG began working closely with the New York Department of Buildings on defining the concept, establishing recognized test protocols and meaningful performance levels. We turned to ASTM Standard C 1629 “Standard Classification for Abuse-Resistance Nondecorated Interior Gypsum Products and Fiber-Reinforced Cement Panels”, recently approved and published, for guidance. This test method was the basis for defining “hardened” walls. The idea was that this impact resistance is from the tenant side into the shaft. What was developed in New York City led to language that was later adopted into the 2009 International Building Code, (IBC).

There are several tests included in the ASTM standard. They are meant to determine the abrasion, indentation and impact resistance of gypsum panels and systems. Impact resistance is of special interest in hardened walls. Impact resistance is established by two tests. One is designed to test the panel and the other the assembly. They are called the hard body and the soft

body. The hard body tests the panel, whereas the soft body evaluates the assembly.

The hard body test calls for a swinging ram to impact the gypsum panel. The ram is a rigid body of known weight and the distance it travels is also known. The 2 ft. by 2 ft. gypsum panel or test specimen is installed on a frame. The frame is then clamped to a test apparatus frame in such a way that the panel absorbs all of the impact energy. The energy is increased until failure is determined, which means the ram breaches the panel. A new panel is installed for each increase in impact energy. Panels, based on their resistance, are classified into three levels as shown in the table below.

Performance Requirements - Hard Body Impact	
Classification Level	Hard Body Minimum
1	50 ft-lbf
2	100 ft-lbf
3	150 ft-lbf

The soft body follows the same principles as the hard body, but the impact is on the system. A wall, in this case a shaft wall, is built into a frame. The leather bag filled with 60 lbs. of steel pellets is suspended from a long rope adjacent to the wall to form a pendulum. The bag is pulled back in an arc to reach a measured elevation above its starting point. Upon release the bag is allowed to swing along this arc until it impacts the wall. The height

of the fall is increased in 6 in. increments until failure is achieved. Failure is defined as when the bag breaches into the wall cavity or when the residual deflection after impact is half the thickness of the panel being tested. The results are tabulated and the assemblies ranked into three levels as shown below.

Performance Requirements - Soft Body Impact	
Classification Level	Soft Body Minimum
1	90 ft-lbf
2	196 ft-lbf
3	300 ft-lbf

Section 403.2.3 of the 2009 International Building Code deals with high rise construction. The relevant sections are quoted below:

403.2.3 Structural Integrity of exit enclosures and elevator hoistway enclosures. For high-rise buildings of category III or IV in accordance with Section 1604.5 and for all buildings that are more than 420 feet in building height, exit enclosures shall comply with Sections 403.2.1 through 403.2.3.4.

Section 403.2.3.1 Wall Assembly. The wall assemblies making up the exit enclosures shall meet or exceed Soft Body Impact Classification Level 2 as described in ASTM C 1629/C 1629M.

Section 403.2.3.2 Wall Assembly Materials. The face

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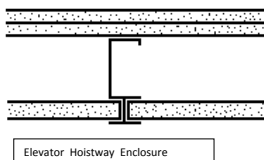
of the wall assemblies making up the exit enclosures and elevator hoistway enclosures that are not exposed to the interior of the exit enclosure or the elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which exceeds Hard Body Impact Classification 2 as measured by the test method described in ASTM C 1629/C 1629M.

2. The wall assembly shall incorporate not less than one layer of impact-resistant construction materials that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C1629 M.

3. The wall assembly shall incorporate multiple layers of any material, tested in tandem, that meet or exceed Hard Body Classification Level 3 as measured in ASTM C 1629/C 1629M.

In discussions with New York City it was determined that the third option would be applicable. That allowed contractors to complete the wall using standard 5/8 in. SHEETROCK Brand Firecode Gypsum Panel, which in turn, allowed standard gypsum panel finishing and decoration to be accomplished. For the standard elevator hoistway application we started with a 4 in. 20 gage shaftwall stud. The 20 gage thickness is preferred for abuse resistant application, and the 4 in. depth is recommended for the face wall of elevator shafts to accommodate the multitude of services that typically run in this area. Examples of services include elevator call boxes and position indicators. The 1 in. SHEETROCK Brand Liner Panel, encased in the CH stud is placed on the shaft side. The first layer installed on the tenant side is FIBEROCK Abuse-Resistant VHI (Very High Impact) Gypsum Fiber Reinforced Panel followed by a second layer of 5/8 in. Sheetrock Brand Firecode Gypsum Panel to complete the system. The combination of the FIBEROCK brand and the SHEETROCK Brand panels yielded a hard body impact resistance of 200 ft-lbs. The soft body test on this assembly gave us 900 ft-lbs resistance. As mentioned before, impact is from the tenant side into the shaft. That meant that two basic assemblies are needed; one for elevator hoistway enclosures and the other one for stairwells.



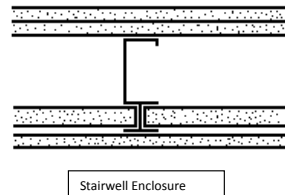
Looking at the sketch above and starting from the bottom: The first panel is 1 in SHEETROCK Brand Gypsum Liner Panel. The 20 Ga. 4 in. deep CH stud is spaced at 24 in. on center. The base layer is 5/8 in. FIBEROCK Brand VHI (Very High Impact) Abuse-



Stud spacing, fastening patterns and gypsum board type and thickness is important to complete a fire-resistance rated wall assembly. - USG Photo

Resistant Fiber Reinforced Gypsum Panel and the face layer is 5/8 in. SHEETROCK Brand Firecode Core Gypsum.

For the stairwell condition an additional layer of gypsum is required on the stair side of the wall. This is to allow for a monolithic smooth surface in the stairwell itself.



Looking at the sketch above and starting from the bottom. The first panel is 5/8 in SHEETROCK Brand Firecode Core Gypsum Panel. Then comes the 1 in. SHEETROCK Gypsum Liner Panel that is installed in conjunction to the 4 in. deep 20 ga. CH studs that are spaced 24 in. on center. The upper-most part of the wall is completed similar to the elevator enclosure condition.

Gypsum shaftwall systems have evolved over the years. There have been significant changes in the metal framing and new categories of panels have emerged, each focused on a specific performance attribute. However, the basic premise of gypsum shaft walls has remained constant. That is, two hour fire resistive partitions that can be built from one side and meet the structural needs of a "working wall". The new code language has not deterred this evolutionary process, but enhanced the walls structural performance. These walls have met the challenge by providing the higher levels of security that is needed in today's world. 🔥

Bob Grupe is Director, Architectural Services, USG. He can be reached at bgrupe@usg.com.

EDITORS NOTE: The 2012 International Building Code will have new requirements for these assemblies. For additional information and specific details of the necessary materials and methods required to satisfy IBC Section 403.2.3, please refer to the 2012 edition of the IBC when it is published by the ICC, in late 2011. To view the code proposals related to high rise stairwell and elevator hoist way shafts, visit <http://www.iccsafe.org>, code development.



Stopping Smoke Saves Lives

By Tom Edwards

The 2009 U.S.A. Fire Loss Clock According to NFPA.org

- A fire department responded to a fire every 23 seconds.
- One structure fire was reported every 66 seconds.
- One home structure fire was reported every 87 seconds
- One civilian fire injury was reported every 31 minutes.
- One civilian fire death occurred every two hours and 55 minutes.
- One outside fire was reported every 49 seconds.
- One vehicle fire was reported every 146 seconds.

Stopping smoke migration through HVAC systems is critically important in saving lives and reducing property damage in the event of a fire. Smoke inhalation deaths far outnumber deaths due to burns. Smoke inhalation deaths have dropped with the advent of improved smoke mitigation methods included in HVAC systems. In recent years, numerous new fire/smoke damper designs and fire/smoke damper accessories have been introduced that improve



FIGURE 1. An example of a curtain blade fire damper (top) and an airfoil multiple-blade smoke damper (below).
- Ruskin Co. graphic



life/safety flexibility for both the designer and the installing contractor. Proper installation, along with knowledge of current codes and standards, saves lives.

Section 101.3 (Intent) of the 2006 International Building Code states, "The purpose of this code is to establish minimum requirements to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment." First

published in IBC 2003, this section added a clause that also included "a reasonable level of safety for firefighters and other emergency responders."

According to the National Fire Protection Association (NFPA), fire deaths occurred every 175 minutes and a civilian fire injury every 31 minutes in 2009. U.S. fire departments responded to an estimated 1,348,500 fires and these fires resulted an estimated \$12.531 billion in direct property loss.¹ The number one cause of death related to fires is smoke inhalation. An estimated 50%-80% of fire deaths are the result of smoke inhalation injuries rather than burns according to a recent emedicinehealth web article². It is also estimated that smoke

inhalation is the primary cause of death in 60% to 80% of burn victims each year. Firefighters certainly are not immune to the danger (according to the NFPA, 2,865 firefighters were injured from smoke inhalation or respiratory distress in 2008), often thrusting themselves into the hazard.

By definition, inhalation injury is the aspiration of superheated gases, steam, hot liquids or noxious products of incomplete combustion that cause thermal or chemical injury to the airways and lungs. The combustion of all natural and manmade products results in the production of various chemicals, including hydrogen cyanide, aldehydes, hydrochloric acid, and acrolein producing the changes in the airway and lungs that are characteristic of inhalation injury. The injury can occur above or below the vocal cords, or in both locations at once. Injuries above the vocal cords are typically caused by inhaled heat, while those below the cords are usually caused by toxins and particulate matter. Because dry heat does not easily penetrate as far as the lower respiratory tract, true thermal damage of the lungs is rare.

The presence of inhalation injury doubles the predicted mortality rate associated with any size burn in all age groups.

Risk Factors

Once a fire reaches flashover, production of carbon monoxide and hydrogen cyanide increases, consumption of oxygen intensifies, and incapacitating conditions are induced within two minutes, possibly causing death of those exposed within 10 minutes. On Nov. 28, 1942, in one of the most infamous fires in U.S. history, patrons of the Coconut Grove nightclub in Boston were trapped inside a building whose only exit was a revolving door blocked by the bodies of more than 200 people overcome by smoke. Most of the 492 deaths that night were due to smoke inhalation, as were most of the subsequent deaths among hospitalized victims. Almost 40 years later, 84 deaths and 679 injuries resulted from smoke spreading

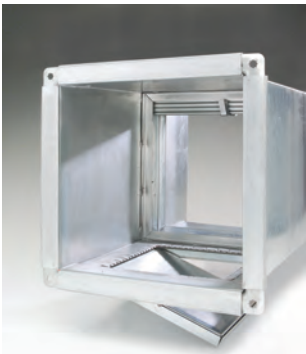


FIGURE 2. An example of a fire damper with a break-away flange connection, duct mounted smoke detector and factory installed access door.

- Ruskin Co. graphic

through seismic joints, pipe chases, and ductwork shafts in the MGM fire in Las Vegas in 1980 with the majority of deaths and injuries occurring in upper floors far from the source of the fire in the casino.

The people at the greatest risk for inhalation injury are those who are asleep when a fire starts in a building. Production of carbon monoxide deepens the sleep state, making escape less likely. Conditions that lead to changes in consciousness, such as cerebral vascular

accidents, seizures, or alcohol abuse, are also risk factors for inhalation injury.

In 2003-2006, U.S. fire departments responded to an estimated annual average of 6,650 structure fires in educational properties. These fires caused an annual average of 88 civilian fire injuries and \$90 million in direct property damage. However, there were no civilian fire deaths as a result of the fires

reported in these properties during this time period. This is in spite of the fact that over two-thirds of public assembly and educational facilities do not have sprinklers installed. Why are there so few deaths in school fires? The answer is because educational facilities meet many of the criteria for mitigating smoke inhalation and fire-related deaths. Educational buildings are occupied largely during the day, they are built of non-combustible and fire-resistant materials, egress areas are easy to access and well understood by occupants, and many zones are fire and smoke compartmentalized.

Total Fire Protection is Important

A total approach to fire and life safety includes fire-resistance-rated and smoke-resistant compartmentation, sprinklers, detection and alarms, as well as occupant education about egress and emergency procedures.

Regardless of whether a building is sprinklered or not, building codes and experts state that stopping smoke migration is important for both primary and redundancy reasons. Dr. John Klote, a fire and smoke control consultant in McLean, Va. stresses this point. "From a primary standpoint, even under successful sprinkler suppression, smoke is still generated and can travel through duct openings if not properly isolated," he said.

THE ADVENTURES OF APEX THE FIRESTOPPER

IN THIS ISSUE, WE BEGIN WITH AN ELECTRICAL OUTLET...

BUT IT'S NO ORDINARY OUTLET... IT'S FAULTY, AND IS ABOUT TO START A FIRE!!

AND FIRE NEVER TRAVELS WITHOUT HIS TWO MALEVOLENT COMPANIONS: TOXIC SMOKE & VAPORS!

FREE AT LAST!!

GASES & VAPORS

SMOKE

SPREAD OUT BOYS... TO THE CEILING! FLAMES

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LITTLE DO THEY KNOW THAT THEIR MEANS OF PROPAGATION HAS BEEN BLOCKED BY APEX!

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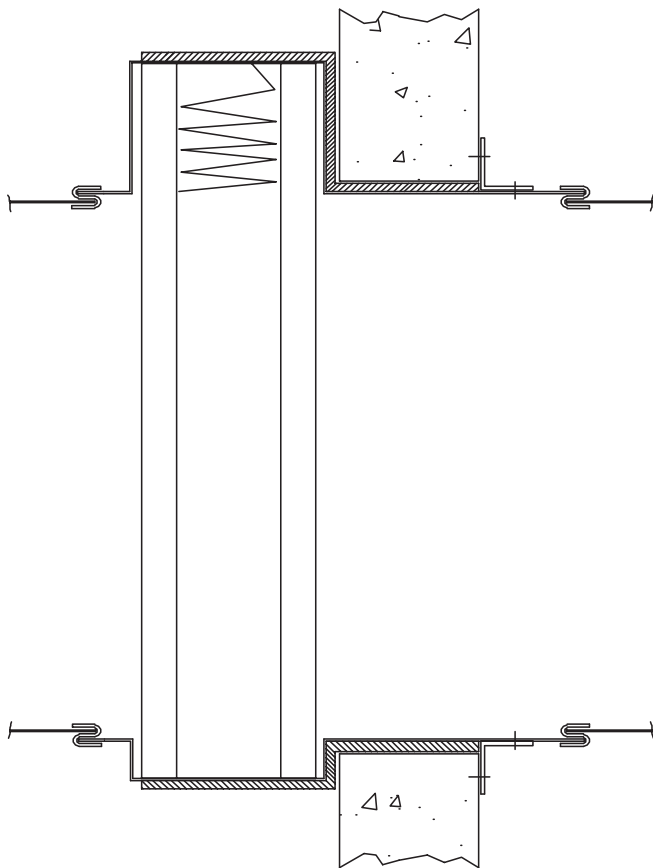


FIGURE 3. An example of a fire damper for an "out-of-the-wall" application that maximizes duct free area. - Ruskin Co. graphic

Emphasizing the importance of compartmentation, detection and alarms, and sprinklers working together, Klote further cited floods that inundated parts of Iowa in recent history. "A local fire chief (in Iowa) said that because the water system is down, you can't occupy a high-rise building," he says. "Some buildings are too vulnerable to fire without sprinkler systems. There's no backup in some designs." Vickie Lovell, a building code consultant in Margate, Fla., agrees, "Sprinkler systems must be coupled with compartmentation for optimum protection."

Fire Dampers vs. Combination Fire/Smoke Dampers

All life/safety dampers are designed to assist the mechanical designer with compartmentation needs. There is, however, a significant difference between the types of dampers utilized in these systems. Fire dampers, smoke dampers and combination fire/smoke dampers each provide different safety functions. A fire damper closes once the duct temperature reaches a high enough level to melt a fusible link. A smoke damper closes upon the detection of smoke. The codes have recognized and most engineers agree that the best method of compartmentalization is through the use of the combination fire/smoke damper. It not only closes based on high duct temperature, but also upon a detection of smoke. The combination fire/smoke damper can be provided with override controls to pressurize individual spaces and also is UL leakage-rated to stop smoke in its tracks. Fire dampers only are not UL-leakage rated. Only combination fire/smoke

dampers or stand-alone smoke dampers are leakage-rated devices.

The IBC recognizes the importance of stopping smoke by requiring combination fire/smoke dampers in all shafts penetrated by ducts or transfer openings for all building classification types. Smoke dampers are required at each point a duct or air transfer opening penetrates a corridor. Additionally, smoke-proof enclosures or pressurized stairways must be provided in buildings with a floor surface located more than 75 ft. above the ground, or 30 ft. below the level of exit. This is designed to mitigate smoke migration and smoke damage and to permit a safer exit for building occupants.

In Section 716 of the IBC, leakage ratings for smoke dampers (which include combination fire/smoke dampers) shall not be less than Class II (less than 10 cfm/sq. ft. at 1 in. static pressure). Elevated temperature ratings for this leakage class cannot be less than 250° F.

The use and proper installation of fire, smoke, and combination fire/smoke dampers in sprinkled or non-sprinkled buildings is a vital part of a properly designed life/safety system. When fire emergencies happen, the fire, smoke and combination fire/smoke dampers will help contain the fire and resulting smoke to the compartment of origin and thus minimize life and property loss while helping the firefighters extinguish the blaze.

Smoke, Fire and Combination Dampers: An Application Summary

Smoke dampers are operated by either a factory-installed electric or pneumatic actuator. They are controlled by smoke detectors and/or fire alarms. Smoke dampers are qualified under UL Standard 555S, UL Standard for Safety for Smoke Dampers, and are designed to resist the passage of air and smoke. Smoke dampers have two general applications:

- As part of a "passive smoke control system" in which they close upon detection of smoke and prevent the circulation of air and smoke through a duct, transfer, or ventilation opening.
- As part of an "engineered smoke control system" designed to control smoke migration using walls and floors as barriers to create pressure differences. Pressurizing the areas surrounding the fire prevents the spread of smoke into other areas.

Smoke dampers have the following installation requirements:

- **Location:** Smoke dampers are for use in, or adjacent to, smoke barriers. They must be installed no more than 24 in. from the smoke barrier. Of course, smoke dampers that are used to isolate air handlers are not limited to this distance requirement. NFPA 90A states that smoke dampers are to be used to isolate AHUs over 15,000 cfm.



FIGURE 4. An example of a vertical blade fire/smoke damper and actuator, which is top- or bottom-mounted at the factory.
- Ruskin Co. graphic



FIGURE 5. An example of a fire/smoke damper used in shaft applications where access is limited. - Ruskin Co. graphic

- **Sleeves and Attachment:** Smoke dampers do not necessarily have to be installed in sleeves. They can be installed directly in the duct. The manufacturer's installation instructions include the approved method for attachment and spacing of the attachment.
- **Sealing:** The joints between the damper frame and the duct must be sealed to prevent unwanted air leakage. Smoke damper leakage ratings are based on leakage through the blades and inside damper frame and not additional leakage between the damper frame and duct or sleeve.

Fire dampers are operated by a fusible device, typically a melting link. They are designed and tested to maintain the integrity of the fire-rated separation. Fire dampers are equipped with a fusible link rated for 165° F (74° C) up to 286° F (141° C), that holds the blades open until it the link melts. Upon reaching the melting point, the blades then close and stop the flame from moving into an adjoining compartment.

- **Location:** Fire dampers are installed in or near the wall or floor, at the point of duct penetration, to retain the integrity and fire rating of a wall or floor whether it is a ducted or open-plenum return application.
- **Sleeves and Attachment:** Fire dampers are required to be installed in sleeves. Lighter gauge sleeves (18 – 20 ga.) require a breakaway connection from the sleeve to the ductwork. Heavier, smaller dampers (16 ga and heavier) can be installed with a hard duct connection. The manufacturer's installation instructions include the approved method for attachment and spacing of the attachment.

- **Sealing:** The spaces between the damper frame and the duct are typically not sealed due to thermal expansion. Breakaway connections, as well as other seams, can be sealed if the manufacturer's listing includes a UL-approved sealant.

There are two types of applications for fire dampers: static and dynamic. Static fire dampers can only be applied in HVAC systems that are designed to shut down in the event of a fire. Dynamic fire dampers have been tested for closure under airflow and carry both an airflow velocity (fpm) and pressure differential rating. The minimum rating for all dynamic fire dampers is 2,000 fpm and 4.0 in. wc. The minimum ratings are based upon closure at a minimum airflow of 2,400 fpm and 4.5 in. wc.

In addition to the two applications, fire dampers are also available in two basic designs: curtain-type and multiple-blade-type. Curtain-type dampers are the most common and consist of a "curtain" held up by a fusible link. Multiple-blade dampers are similar to control dampers with "blades" located in the airstream. Multiple-blade fire dampers generally offer greater restriction to airflow than a curtain-type fire damper for the same size duct. However, multiple-blade fire dampers can be applied in situations when the system air velocities exceed the curtain-type fire damper closure ratings. Multiple-blade fire dampers have been UL tested and are dynamic rated for closure at 4,000 fpm and 8.0 in. wc.

Combination fire/smoke dampers meet the requirements of both the UL555 fire dampers and UL555S smoke dampers standards and applications requirements as described above. (NOTE: In Canada, CAN/ULC-S-112 is the test standard for Fire Dampers)

They are used in HVAC penetrations where a wall, floor, or ceiling is required to have both a fire damper and smoke damper. They close upon the detection of heat (via duct temperature) or smoke (via a smoke detector) and "seal" the opening. Unlike regular fire dampers, however, fire smoke dampers are available with electric heat release devices instead of fusible links. The electric release devices are re-settable and allow the damper to close in a controlled manner rather than slamming closed and causing pressure problems in the HVAC system.

System designers should insist upon these electric fuse links when selecting a combination fire/smoke damper. Fire/smoke dampers designed with airfoil blades perform better (less pressure drop) than others. Less pressure drop in a system means energy savings. System designers should select fire/smoke dampers that certify their performance through a third party, like the Air Movement and Control Association (AMCA). Locations, sleeve attachments and sealing of combination fire/smoke dampers follow the same criteria as fire dampers.

Increased Application Flexibility

The installation of life/safety dampers should be accomplished in accordance with the manufacturer's instructions as tested by UL, ULC in Canada or another code-compliant approval agency. Recently, many damper designs, particularly combination fire/smoke dampers (FSD's), have increased their application and installation flexibility. The number of UL tests performed on FSDs has increased dramatically to accommodate the new designs and installation methods. These designs have made it easier to select and install the right damper without creating undue burden on the engineer, contractor, and the local AHJ. Mechanical inspectors and plan review teams are being educated on these changes and are becoming increasingly aware of the paradigm shift. Again, it is important that the damper manufacturer's approved installation sheets be available for the AHJ during installation review.

Some of the important design and application changes for life/safety dampers include:

- **One-sided Angle Installation:** Until recently, all fire and combination fire/smoke dampers required mounting angles on both sides of the wall. In addition to added cost, it made it extremely difficult to install dampers in finished shaft walls. Many designs are now UL-approved to be installed with a mounting angle on one side only and either above or below the sheetrock. This installation method cuts damper installation labor time in half and applies to both rectangular and round dampers.
- **Damper to Sleeve Connections (Figure 2):** The manufacturer's installation instructions are required to show the method of attaching the damper to the sleeve and the spacing of attachments for UL-compliant breakaway connections. Newer damper designs have been tested to accommodate a cadre of various flanged connection combinations to comply with UL's breakaway requirements. This permits the contractor to use any flange type and not worry about a special connection to the damper sleeve.
- **Out-of-the-wall (Figure 3):** For years, UL damper installations were approved only if the damper blades were in the wall. Occasionally, other "hidden" items (e.g., hydronic piping, ductwork, cables, etc.) interfered with the clearance of the damper actuator. Newer designs now accommodate installation "out-of-the-wall" by an additional 8 in. The damper sleeve is wrapped with a heat-resistant material that effectively extends the wall rating to the damper.
- **Vertical-bladed Installation (Figure 4):** Another method that eliminates interference is a damper designed with vertical blades. This permits access to the actuator from below or above the damper. This installation method is

very appealing in side-by-side ducts and also reduces pressure drop on multistory supply shafts by reducing stratification.

- **Corridor Fire/Smoke Dampers (Figure 5):** Since codes require that many corridors and shafts be protected with fire/smoke dampers, designs now permit installation directly from the corridor. Dampers can be mounted and fastened directly to the wall or floor, without traditional mounting angles and can be easily accessed.
- **Underfloor Dampers:** There are installation methods now approved that eliminate the 1 ½ in. mounting angle around the perimeter of the damper. This frees 3 in. of space, which is often critical for underfloor applications. The damper height can now be maximized to minimize pressure drop.
- **Modulating and Balancing Fire/Smoke Dampers:** Fire/smoke and smoke dampers are typically two-position devices – open or closed. If air balancing or volume control is required, most often another damper was added to the system creating more pressure drop. Today, some fire/smoke and smoke dampers with new technology actuators have been tested and UL listed as an assembly for air balancing and modulating volume control applications. These dampers install just like typical fire/smoke and smoke dampers.

Summary

Stopping smoke from migrating through HVAC systems is important to save lives and to minimize property damage. Deaths due to smoke inhalation far outnumber deaths due to burns. The International Building Code (IBC) recognizes this importance and, as a result, new fire/smoke damper designs have been introduced that increase the system designer's and installer's flexibility. Be sure to consult the damper manufacturer's agency approved installation sheets (most often found on its website) as well as the local AHJ. 🔥

Tom Edwards is president of Ruskin Co. and a past chairman of the Air Movement and Control Association (AMCA). E-mail him at tomedwards@ruskin.com.

1. National Fire Protection Association (NFPA) Fire Loss in the United States During 2009
Michael J. Karter, Jr.
August 2010
2. http://www.emedicinehealth.com/smoke_inhalation/article_em.htm
Author: Christopher P Holstege, MD, Associate Professor of Emergency Medicine & Pediatrics, University of Virginia School of Medicine 10/18/2007

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Building a High-Rise Fireproofing Estimate for Structural Fire Safety

Bidding Tips for a Successful Installation!

By Jonathan Wohl and David Dal Pra

Constructing a high-rise building presents a unique set of challenges for every trade involved, including structural steel fireproofing. From fall protection to people and material movement, high-rise construction is unlike any other type of construction. Similar to all other projects, though, a good job starts with a good estimate.

The first items to review are any contract documents that may have been included in the bid package. These will detail specific project requirements such as safety programs, Owner Controlled Insurance Programs, project scheduling and insurance requirements. Any of these items can result in hidden costs that you must protect yourself against to ensure that the project is profitable.

After reviewing the project-specific requirements, it is important to carefully review the project specifications. The specs are part of the construction documents, and set contract requirements. They are a wealth of information that with important material physical properties, material requirements, material finish, systems requirements including the need for mechanical attachments, and even specific UL designs to be utilized for fire resistance ratings. All of these items can be sources of additional costs for a contractor, that can turn a winning bid into a financial nightmare if they are overlooked!

With any trade, a good estimate requires a review of the architectural plans to become acquainted with any special requirements of the project such as construction phasing, and to get a better understanding of what the project will entail. Architectural drawings show what kind of fire-resistance ratings are required for the building, as well as special areas such as corridors, stairways, shafts and fuel storage rooms that may require additional fire protection. They also show important details that can help better qualify the scope of your work. A piece of steel that is encased in concrete, or fireproofed with intumescent paint/coating or a sheetrock assembly, is a piece of steel that



does not require spray-fire-resistive-material (SFRM) fireproofing!

UL SFRM Fireproofing System Design Selection

Each piece of steel structural member has its own material thickness of fireproofing applied, which is based on a UL tested and listed fireproofing design. Careful consideration should be placed on the utilization of UL system fireproofing designs to ensure that the selected design is applicable to the type of construction.

UL designs exist for all kinds of construction conditions, but are generally separated into letter groups indicating the type of construction they cover. For example, a D series design refers to a floor assembly, and an X or Y design refers to a column design. Floor and roof assemblies are further subdivided into restrained and unrestrained conditions.

A thermally restrained condition is one where the floor or roof assembly will retain its structural integrity as the steel approaches average fire temperatures (1100° F).

The decision of whether an assembly is thermally

restrained belongs to the architect or engineer, and if a structure is not specifically mentioned to the restrained by either person, then the conditions should be assumed to be unrestrained.

Restrained assemblies usually require less fireproofing material to provide the same hourly fire resistance rating. Once the proper UL fireproofing designs have been identified, they can be used to determine how much fireproofing material is necessary to provide the desired hourly rating on any piece of steel.

System Take Off

The next step in a fireproofing estimate is the review and take-off of the structural framing plans. Each piece of steel should have been carefully taken-off to properly quantify the amount of fireproofing material necessary to perform the work. While this process can be done manually, it is time-consuming and can easily be done just as accurately with computerized digitizer software. Once the quantities of steel and the necessary thicknesses have been determined, an accurate material cost and quantity assessment can be assembled.

Throughout the bidding, be sure to stay in touch with the client you are bidding to and submit RFIs (Requests For Information) to clarify the scope of work. This information is usually shared with all bidders which, if the other bidders are paying attention, allows for the purchaser to evaluate proposals based on the same scope.

The final step in project estimating is the responsibility of the person with the most experience. The "Chief Estimator" or "The Boss," this person has the experience to apply time and motion studies, negotiate material pricing, and – based upon past performance – respect each project's unique requirements, may assign the final productivities for the project. No responsible estimator should fall into the trap of cookie cutter estimating (price/bag or unit pricing based upon dollars per square foot.) These units should only be used as a final check. Every project is different and should be treated appropriately.

Once the pricing is complete, the proposal or bid form should be completed to the best of the estimator's ability, based on the plans and specs. It may occur that when bid schedules are very tight, submission of every last item such as the labor rate sheets, or the equipment lists, etc. may not be required by the client. Most projects go through multiple rounds of bidding with follow up information allowed the next day. However, when it comes to 'publicly funded project bidding, a lump sum amount and no discrepancies on the bid forms is not unusual – and deviation is likely reason for disqualification. Be sure to include a cover sheet on your company letter head that includes clarifications, exceptions, value engineering and, of course, the price in bold letters.

Here is a check list of items that may be included in

your bid for the project. While this list is extensive, it is by no means complete. However, it is a good place to start in building your estimate:

1. Engineering Costs/Project Management
2. Mobilization/Demobilization
3. Storage/Trailers/Shanties
4. Masking Materials & Labor
5. Tarping Labor & Materials
6. Scaffolding/Man Lifts
7. Trucking/Parking/Transportation
8. Bonding Agents – Application Labor & Equipment
9. Mechanical Attachments – Application Labor & Equipment
10. Materials & Freight
11. Forklift, Pallet Jacks, Dollies
12. Placement of Materials Labor (Offload)
13. Fireproofing Crew Labor
14. Fireproofing Equipment – Pumps, Mixers, Compressors, etc.
15. Standpipes + Installation Labor
16. Water Supply – Hoses, Meters, etc.
17. Electric Panels, Pig Tails, Cables, Lighting, etc.
18. Safety (PPE) Disposable Suits, Masks, Gloves, First Aid Kits
19. "The Volley Ball Team" – Teamsters, Electricians, Plumbers, OP Engineers???
20. Environmental Controls – Heating & Ventilation
21. Special Insurance Considerations
22. Surety Bonds
23. Taxes, Capital Improvement, OCIP, CCIP, etc.
24. Allowances (ex, Patching)

In Fireproofing, just as in any other trade, the outcome of the project is set prior to the project award. By studying the plans and specifications, planning how the project would be constructed if awarded, and understanding the scope of work, success in the field can occur.

Often a part of the construction industry that is overlooked, estimating is a very important part of the building process. And, since each architectural design, project site, building team, is individually unique, the value of estimating is important to all...subcontractor, general contractor/construction manager, and building owner and manager. 🔥

Jonathan Wohl, U.L., DRI is Owner/Operator of Lawrence B. Wohl, Inc./Wohl Diversified Services. He is a board member of the National Fireproofing Contractors Association (NFCA) and BCA, and Vice President of PSFC of Greater New York. David Dal Pra, U.L., DRI is an Estimator with Lawrence B. Wohl, Inc./Wohl Diversified Services. <http://www.wohldiversified.com>.

ICC Adds Photoluminescent Exit Path Markings in Codes

Life-Saving Technologies Value Proven on 9/11 to Be Used Nationwide in Non-Residential Buildings

By James Armour

The International Code Council (ICC) has inserted a provision into the 2009 International Building Code Section 1024 and the International Fire Code Section 4604.23, requiring that all non-residential buildings, both **new and existing**, over 75 ft. in height from the lowest level of fire department access must install Photoluminescent Exit Path Markings in all enclosed emergency stairwells. This decision follows investigations showing how photoluminescent products saved the lives of thousands of building occupants on 9/11 and could save thousands more in future emergencies.

This ICC Code Final Action was the direct result of the findings of the National Institute of Standards and Technologies (NIST) investigation of the World Trade Center twin towers collapse following the terrorist attack on Sept. 11, 2001. As jurisdictions adopt the ICC 2009 Building and Fire Codes, building occupants will benefit from the installation of Photoluminescent Exit Path Markings in emergency stairwells.

Sept. 11, 2001 saw the loss of more American lives than the attack on Pearl Harbor during World War II. The City of New York reported 2,749 deaths that day; more than 1,500 of the fatalities were building occupants. The good news from that terrible day was that over 16,000 people safely evacuated the twin towers – thanks in part to the Photoluminescent Exit Path Markings.

The NIST investigation of the collapse of the World Trade Center Towers 1 and 2 also reviewed occupant behavior, egress and emergency communications (<http://wtc.nist.gov/NCSTAR1-7>). Over the course of 1,000 interviews with survivors and first responders, three key items were most often mentioned as aiding occupants in their successful evacuation:

- Co-Workers
- First Responders
- The Photoluminescent Markings in the Emergency Stairwells

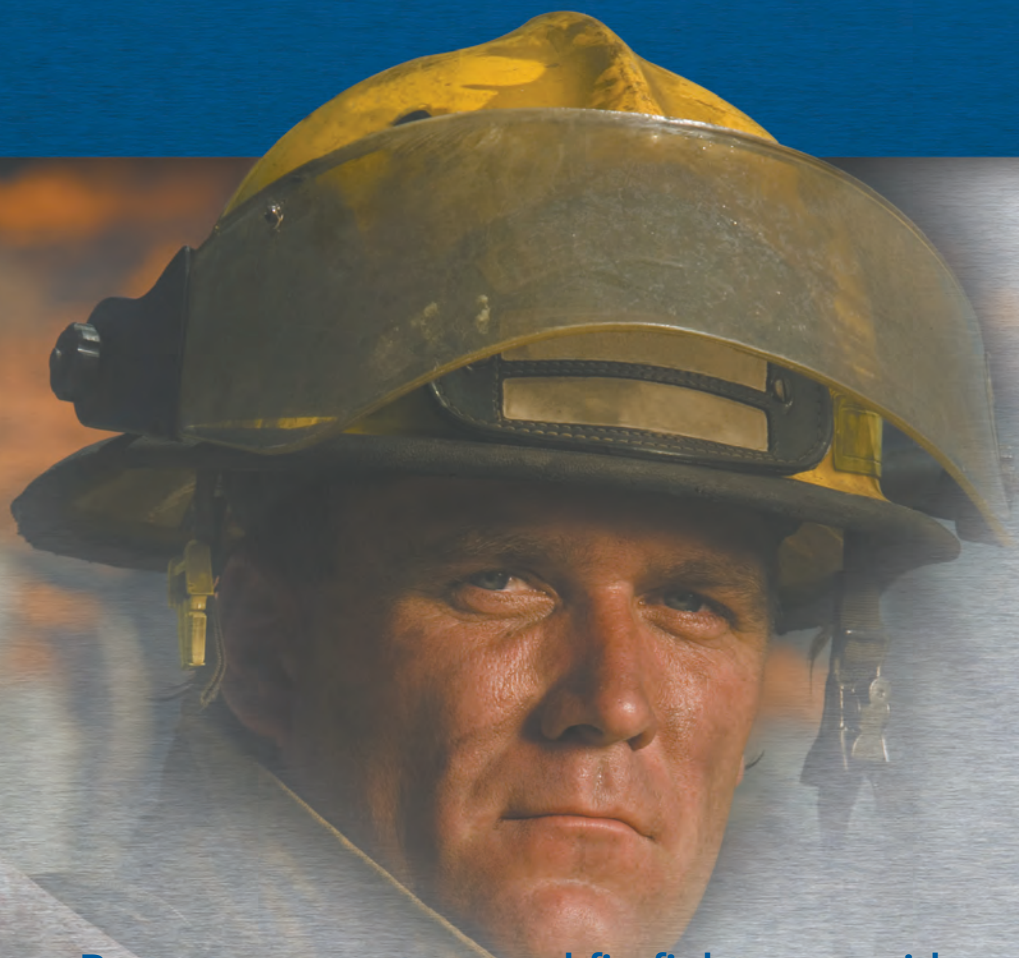
The Photoluminescent Exit Path Markings were mentioned most often by those still in the building when total power and emergency back-up power failed.

After the 1993 bombing of the World Trade Center, the Port Authority of New York and New Jersey added Photoluminescent Egress Markings to all emergency stairwells in the World Trade Center Towers 1 and 2. Although casualties in the 1993 bombing were significantly less than on 9/11, the loss of power due to the bomb blast was almost instantaneous. Because of this, it took more than six hours to totally evacuate the twin towers. Recognizing the need to improve the evacuation times, the Photoluminescent Exit Path Markings were added to improve egress rates in the event of another total power failure. This decision to install photoluminescent materials would prove to be very fortunate.

On Sept. 11, 2001, the total time lapse from the first plane impact to the second building collapse was 102 minutes. Even with the failure of the emergency back-up power systems, more than 16,000 people escaped, many in total darkness. The twin towers' Photoluminescent Exit Path Marking Systems worked -- even when the electrical lighting systems failed.

With significant technological improvements in long-lasting, glow-in-the-dark pigments and products, today's Photoluminescent Exit Path Marking Systems offer a much higher performance in brightness and length of time for visibility at a significantly lower cost. Most high-rise buildings can be retrofitted for pennies a square foot and building owners can enjoy maintenance free performance for more than 25 years if materials are properly selected and installed.

Keep [a i r] smoke-free for everybody.

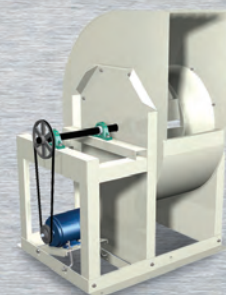


Protect occupants — and firefighters — with Greenheck emergency smoke-control products.

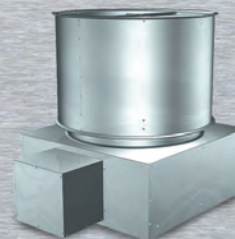
A reliable emergency smoke management system is a life-saving component of any building's design. Clearing and blocking dangerous smoke from rooms, hallways and stairwells helps occupants breathe and see during evacuation procedures — and helps to safeguard emergency crews as they go about their work.

Greenheck offers a full line of smoke-control products licensed by AMCA and listed with UL/cUL, including centrifugal and propeller rooftop upblast fans, inline propeller fans, and a complete line of smoke and fire dampers. These products can be integrated into a dedicated fire/smoke emergency system, or serve double-duty as components of your everyday ventilation system.

As the industry leader, Greenheck is able to meet whatever air movement and control challenges you face, from simple to complex. For full product specifications and more information, visit our Web site or contact your nearby Greenheck rep.



Utility Fans



Roof Mounted Exhaust Fans



Propeller Inline Fans



Smoke & Fire Smoke Dampers



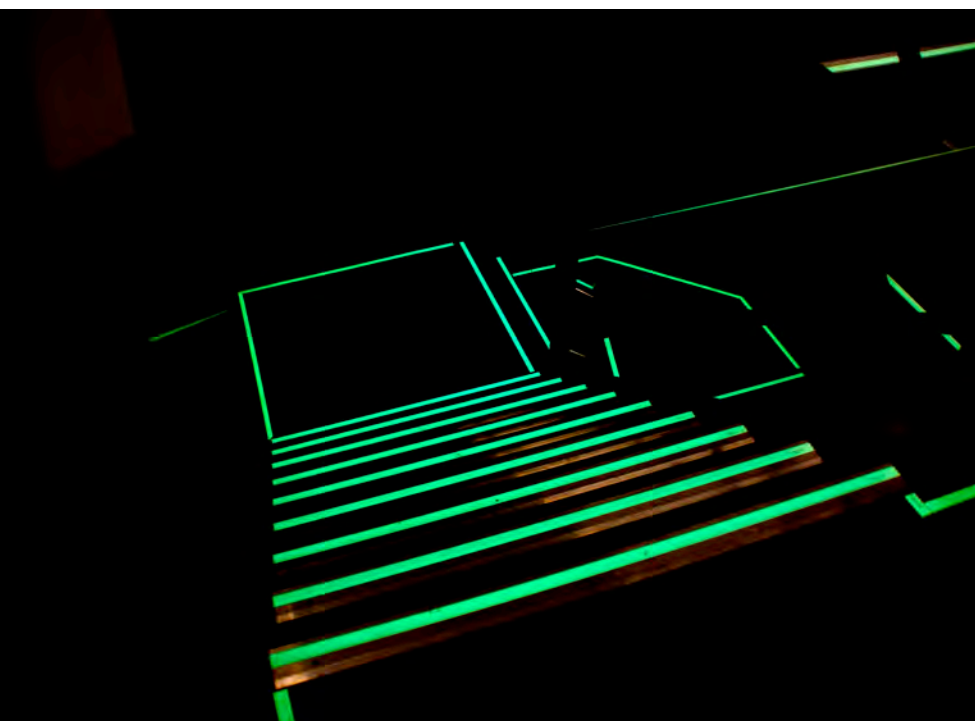
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testing laboratory to ensure that the products you buy are made of the same high-performance material that were tested originally. Getting the best quality components for Photoluminescent Systems can give greater assurance of longer life. Photoluminescent System components cost pennies per square foot and can offer over 25 years of maintenance free performance.

Many Photoluminescent Exit Path Marking Systems can be installed by the building owner's staff. But by choosing a manufacturer trained and certified installer, the building owner can be assured that the products will be installed per the manufacturer's requirements and in compliance with the building codes in your community. The use of a manufacturer's Certified Installer should come with a Material and Installation Warranty that eliminates unresolved disputes on whether the material was installed properly or whether the material failed. The warranty to the building owner should also eliminate the risk of future costs if the Authority Having Jurisdiction (AHJ) for building inspection and compliance requires any changes. Again, PL system components and installation cost pennies per square foot and can offer over 25 years of maintenance free performance.

But the most valuable benefit to using Photoluminescent Exit Path Marking Systems is the fact that they are failsafe. When the lights go out, the Photoluminescent Exit Path Markings glow in the dark -- every time -- protecting building occupants and first responders.

That consistency is why other codes now may require Photoluminescent Exit Path Markings, including the following:

- NFPA 101 Life Safety Code, Section 7.2.2.5.5. Exit Stair Path Markings All Buildings
- State of California Building Code, Chapter 10, Means of Egress requires in Group A, E, I, R-1, R-2 and R-3 Occupancies, in Exit Corridors leading to Emergency Exit stairwells

When choosing Photoluminescent Systems, look for components that have long life expectancies, high durability and are abuse-resistant. Make sure they have been tested for compliance to the 2009 International Building Code/International Fire Code and the 2009 NFPA 101 Life Safety Code for photoluminescent brightness performance. The manufacturer's products should also be listed with an accredited independent

- State of Connecticut requires in Group A, B, E, I-1, I-2, R-1 and R-2 occupancies, in Exit corridors leading to Emergency Exit stairwells
- New York City Building Code Reference Standard RS 6-1 requires in all enclosed Emergency Exit stairwells for all Non-Residential Structures.
- General Services Administration P 100, Veterans Administration, DOD requires Photoluminescent Exit Path Markings in all buildings.

Photoluminescent Exit path Marking Systems are also supported by the National Association of State Fire Marshals. Performance standards have been set by Underwriters Laboratories, UL 1994 and ASTM International, E 2072. 🔥

James Armour is President & CEO of Balco Inc., a leading manufacturer of Photoluminescent Egress Path Marking Systems, Fire Barrier products used in Seismic Expansion Joints and Life Safety products. Jim also serves as Executive Vice President of the Photoluminescent Safety Association. Jim can be contacted at jima@balousa.com.

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Industry News

Industry News

FCIA Firestop Industry Conference & Trade Show

Want to stay technically ahead of the rest? FCIA heads to Scottsdale, AZ November 8-12. At the conference, a Healthcare Infection Control and Construction expert teaches about operating in these sensitive facilities. ICC's Chapter 7 Fire Resistance and Fireproofing requirements are featured. And, Bill Koffel, Koffel and Associates look ahead to the 2015 ICC and NFPA Code Cycle with new ideas.

Additional sessions on Firestopping, Fire Doors, Fire Dampers, Fireproofing, from industry experts, and a Fire Barrier Management in Existing Healthcare Environment with Rene Jacobs, a healthcare engineer—and you'll be at the cutting edge of important topics for your business.

FM & UL Firestop Exams for potential and existing DRI's working for FM 4991 Approved, UL and ULC Qualified Contractors, and Inspectors working for those seeking IAS AC 291 Accreditation for Inspection Agencies take exams on Tuesday. To Prepare, don't forget to buy your FCIA Firestop Manual of Practice. The discount is huge. Normally \$895US, FCIA Member price is \$295US.

Visit with important vendors at the Trade Show Wednesday thru Friday. The FCIA Ray Usher Golf Tournament to raise funds for the scholarship at the University of Maryland takes place November 10, with education sessions November 10-12.

Visit <http://www.fcia.org>, for a draft agenda, and registration forms.

FCIA visits Abu Dhabi

FCIA has planned internationally since the inception of the association in 1999. The first conferences outside the US in Toronto and Montreal were well attended. FCIA's Dubai Seminar in 2009 was a huge success, and for 2010 it's on to Abu Dhabi. Over the years, FCIA has added and retained Contractors, Associates, Manufacturer Members in the UAE, Qatar, Taiwan, Spain, England, and Thailand. Visits to <http://www.fcia.org> are from worldwide locations, all year long. Look for more international sessions in 2011 and beyond from FCIA.

IAS adds reference to FCIA Firestop Manual of Practice

During the International Accreditation Services (IAS) Accreditation Committee hearing on May 14,

2010, the IAS Board approved adding a portion of the FCIA Manual of Practice as a reference document in the criteria AC291. FCIA President Randy Bosscawen travelled to represent FCIA, at his own expense, as all committee and board members.

FCIA formed relationships with ICC's IAS subsidiary, several years ago. We participated in adding qualifications for Firestop Inspectors to the Accreditation Criteria (AC), AC 291, a program similar to FM 4991 and UL's Qualified Firestop Contractor Program, but for Special Inspection Agencies (SIA). These SIA's voluntarily submit their firms for audit after an individual successfully passes the FM or UL Firestop Exam.

This is the same individual qualification that those working for firestop contractors who become approved or qualified FM & UL must pass. The result -- consulting inspection agencies, and contractor firm key personnel both pass the same rigorous exam, establishing benchmark knowledge for installation and inspection companies.

Life Safety Digest Invites Guest Writers

Want to reach Building Officials, Fire Marshals, Healthcare Engineers, General Contractors, Specifiers, Firestop and Effective Compartmentation Contractors and more? Wonder why there have not been articles on that topic you thought about? Spread the message about total fire protection, including compartmentation and structural fire resistance, smoke control, detection and alarms, sprinklers and occupant education for safety. Life Safety Digest welcomes timely articles, at bill@fcia.org.

FCIA Members attain FM 4991 Approval and UL Qualification

The FM 4991 and UL/ULC Qualified Contractor Programs are growing. Between the three programs, there are well over 90 contractor firms covering the major cities in the US, Middle East Gulf Region including the United Arab Emirates, and Canada. The United Arab Emirates leads Canada and the Middle East at this point with the most contractors approved or qualified. Below are the new FM 4991 Approved Contractors and UL or ULC Qualified Firestop Contractors, and UL Qualified Fireproofing Contractors:

New FCIA FM 4991 Approved Contractors

Fireshield, Div. G&M
Services, Hanover, MD
Firestop Insulation

Technologies, Doha, Qatar
 Firestopperzz, LLC, Gaithersburg, MD
 Metalclad Insulation Corp., Fullerton, CA
 Mid Atlantic Construction Group, Mayo, MD
 Performance Contracting, Ft. Worth, TX
 Premier Firestop, LLC, St. Louis, MO
 Rise & Shine Trading & Contracting, Doha, Qatar

New UL/ULC Qualified Firestop Contractors

Al Swiss Insulation Co.,
 LLC, Sharjah, UAE
 C.L. Downey
 Construction, Inc.,
 Durham, NC
 Adler Firestopping, LTD,
 Calgary & Edmonton, AB
 National Firestop, LTD,
 Winnipeg, MB
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Industry News

NFCA Members become UL Qualified

This program was introduced shortly after the UL Qualified Firestop Contractor Program. The Spray Fire Resistant Materials (SFRM) structural steel fireproofing contractors of the National Fireproofing Contractors Association have become approved. First was the Clayton Coatings, Inc., DBA Clayton National in 2008, with Raymond Interior Systems, in 2010. Congratulations to both firms.



FCIA at ASSE

During a recent teleconference, a statement was made that the ASSE 9000 Qualification of Firestop Installers and Inspectors around Piping may result in a restraint of trade since it mentioned workforces directly as a requirement to be qualified. Based on this new information, FCIA is evaluating participation in the ASSE Development Process. FCIA's Standards Committee has been participating in ASSE's development of the Standard for some time, starting with the ASME A 112.20.2 Standard, to which FCIA eventually objected as it appeared to limit the firestopping workforce to 4 year journeyman plumber. FCIA Members have travelled at their own expense to San Antonio and Cleveland for meetings, working with ASSE Members to resolve the issue with ASME A 112.20.2, which was transferred to ASSE, and is being rewritten as ASSE 9000.

FCIA Membership keeps growing

Due to the many positive programs, and the referrals from several FCIA Members in all categories, FCIA's Membership has grown to 265, with retention doing well too

NFPA Healthcare Summit

The conclusions of this session were that there may be a shortage of healthcare facilities in major metropolitan areas of the US, and a surplus in smaller cities. At the same time, there was concern about funding expansions in the short term, due to foundation asset value shrinkage from reduced stock market performance worldwide. Trends about the aging population, with fire and life safety strategies designed around their needs, were all part of the Summit, which was very well done.



DHI 35th Annual Conference & Exhibition

DHI's leadership continues to assemble first class programs attracting attendees to the annual conference. Education sessions on door and hardware

technology, plus fire doors, and the Fire Door Assembly Inspection (FDAI) Program continue to bring successes to the conference.

DHI's Foundation for Safety & Security

We understand that even without a code required mandate, that healthcare and educational occupancies are using inspection services by FDAI educated organizations to keep their fire rated door openings maintained and managed and operating properly. The reliability of fire doors is very important for effective compartmentation systems. DHI has committed to building reliability through inspection, and several FCIA Members have become active in this industry.



MBMA Announces new Fire Resistance Guide

The Metal Building Manufacturers Association announced a new fire resistance guide, that contains fire resistance as required in metal buildings. Visit <http://www.mbma.com> for purchase.

NCMA and FCIA Collaborate

The National Concrete Masonry Association worked with FCIA to raise the level of knowledge of concrete and masonry industry participants, and developed a new TEK-AID on Firestop Systems, in masonry construction. NCMA's Dennis Graber managed the document development. FCIA's Firestop Manual of Practice is referenced.



Intumescent Fireproofing Growth

Only a few years ago, there were few sources for intumescent fireproofing materials that were tested and listed for use protecting structural steel. Several manufacturers are now involved with recent introductions, including 3M, A/D Fireproofing, Albi, Carboline, W.R. Grace, HILTI, Isolatek, PPG and others. As in firestopping, tested and listed systems are the key to successfully protecting these steel structures.

Canada Fire Safety Association Features Firestopping

The CFSA featured a program on firestopping in Ontario Sept. 27, 2010. The session included information about CAN/UL-S-115 testing for firestop systems, the UL and ULC Qualified Firestop Contractors Program, ASTM E 2174 and ASTM E 2393 Inspection, and more. FCIA provided handouts, slides for the

program, with ULC, HILTI, and Consultant Tony Crimi presenting.

International Code Council Green Construction Code (IGCC) developing

ICC's IGCC has had several hearings, with more planned in 2010 and 2010. The Green Construction Code will be a voluntary program, but could have implications for contractors, manufacturers and distributors, as pieces will be specified for constructing buildings. The code has many more hearings to go, so speculation about final content and implications is too early to tell. Fire and life safety issues will need to be cross referenced, so watch as industries get involved. Find info at <http://www.iccsafe.org>.



working on testing and labeling to help inspectors determine that the right system has been installed. Watch the next issue of Life Safety Digest for an article on this subject.

Fire Damper Testing with Firestop Systems

Fire Damper and Firestopping manufacturers have tested systems together to optimize the fire damper angle installation, with one-side angles allowed in some cases. Check out both Greenheck and Ruskin Fire Damper testing for details. FCIA member contractors provide fire damper inspections for reliable fire damper systems.



Greenheck Graphic

Fire Rated Glazing

The US Green Building Council LEED Program adds points for bringing daylight to interior areas of buildings. Fire rated glazing can keep compartmentation working, yet allow daylighting, adding LEED Points to the building for interior daylighting. The Fire Rated Glazing Industry has been

Professional Training Yields Expert Fireproofers



Fire Rated Walls



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Code Corner

The International Code Council (ICC) Family of Codes is developed in an open process, with industry and municipal representatives participating in healthy debate about minimum requirements for buildings. Initial Code Change proposals were submitted in 2009, with Committee Hearings on them in October 2009.

At the committee hearings, building officials and industry vote as the committee on proposals. In Step II of the process, the Final Action Hearings, only governmental representatives of ICC vote. Those International Building (IBC) and Fire (IFC) Code Final Action Hearings took place in Dallas in May 2010. Building Officials, Fire Marshals, and industry representatives all come together at the hearings to debate the public comments previously submitted. The Final Action results in the next cycle of codes, the 2012 International Family of Codes.



FCIA attended the hearings along with representatives from various industries, including structural fire resistance and compartmentation components such as concrete, masonry, gypsum, fire dampers, fire doors, fire rated glazing, firestopping. The sprinkler, detection and alarms, and egress industries also attend the fire related hearings. Energy, mechanical, plumbing and other discipline hearings take place as well.

When FCIA formed, its strategic plan was to look inside its own industry first, by being sure that firestop systems installed perform when called upon by fire. How? Reliability through a systematic design systems selection, zero tolerance installation protocol implemented by approved or qualified firestop contractors, inspected by inspection agencies who understand the technical details of the industry, with the resulting completed barriers (including firestop systems) managed at planned intervals.

FCIA DIIMM - Design, Install, Inspect, Maintain and Manage, it's the DIIMM. Since embarking on the strategic initiative in 1999, and implementing through new programs and code change proposals, FCIA has been very successful. Here's a short view:

- o **D-Design** There is a proposal to be heard late October 2010 that requires firestop *systems* documentation to be reviewed by the building official prior to installation.
- o **I-Installation** FCIA co-developed, then submitted proposals requiring, FM 4991 Approved or UL Qualified Firestop Contractors, and has seen the vote at committee hearings go from 14-0 in 2005, to 8-7 in 2010, with the tie broken by the Chair. Although not successful at this hearing, specifiers continue to require FM 4991 Approved or UL Qualified Firestop Contractors in a large percentage of specifications. The ULC program is just starting to get specified. A code requirement and independent inspection (see below) will help the spec get held in the field.
- o **I-Inspection** FCIA Code Proposal S127 & S128 added ASTM E 2174 and ASTM E 2393 Inspection to Category III and IV buildings and buildings 75' and higher above fire department vehicle access in May, 2010. (See this report for more details).
- o **M-Maintain** – When pipes or joints are disturbed, firestop materials may need to be applied to maintain the system ratings. Maintenance is important for these fire-resistance rated systems. Maintaining works in conjunction with 'managing the barriers'.
- o **M-Management** In the International Fire Code, Chapter 7, over the last two cycles requirements were added, and then refined to state that all fire protection features are to receive, 'annual inspection, by owner'.

This key Maintain and Manage concept is why FCIA developed The Recommended Practice for the Survey of Firestopping in Existing Buildings, RP-S-2010.1. This gives the building owner the prerogative to either perform the inspection in house, or hire a qualified contractor or inspection agency to perform the service. That's an opportunity for the contractor that looks at the industry holistically, as 'compartmentation', providing efficiencies to the building owners and managers for maintenance and management of these important barriers. FCIA Members offer these services.

Several other concepts were debated and concepts added to the code. Read on to learn more.



ICC Ad-Hoc Committee on Terrorism Resistant Buildings (TRB)

The ICC Board of Directors formed this ad-hoc committee as a response to Item 6 of the NYC 9/11 World Trade Center Tower collapse and resulting National Institute of Standards and Technology (NIST) Reports on the World Trade Center 1, 2 and 7. There were several concepts that the ICC TRB presented over the last code cycle, with some to be covered in this issue, and others in future issues of Life Safety Digest.

The TRB focus has been on 420' High Buildings and their characteristics to protect people. As a result, the TRB ad-hoc committee looked at several issues from the NIST report and more, including stairwells (details below), improving in-place reliability of spray-fire-resistive materials, (SFRM fireproofing), sprinkler riser redundancy, protecting fire command centers, preventing structural collapse, limiting fuel storage and piping on high floors of high rise buildings, fire rated exit lobbies, performing a building risk assessment, and more.

First, stairwell remoteness was addressed. The concept was that if one stairwell was rendered unusable from a blast or other threat, the other would be still available for egress by occupants and ingress by fire service. Second, exit stair structural integrity, to protect the egress system from explosion. And, a third stairwell was proposed for entering fire service, so occupants nor firefighters are slowed by counterflow. Third, vertical exit continuity was debated to reduce occupant confusion during egress. Fourth, to address stairwell management by the fire service, video monitoring was proposed. Fifth, photoluminescent markings were proposed to make stairwell egress more obvious and intuitive.

First led by William Connolly, NJ State Architect, there were meetings and code proposals developed. After Mr. Connolly's retirement, Gary Lewis, Building Official, Summit, NJ led the group, with continued success.

In the aftermath of the World Trade Center 1, 2, and 7 tower collapses, it may seem an obvious conclusion that features to protect these structures and prevent collapse would fly through the building code development process.

However, there were many points raised from various interests about design and personal freedoms, costs created by new requirements, the reality of such

attacks on buildings reoccurring, and more.

NIST report findings that improvements for sprayed fire resistive materials were needed were part of the very first set of code proposals. The TRB committee focused on both product characteristics (density, bond strength, abrasion resistance, application and inspection for reliability and performance.

Over the next several issues of Life Safety Digest, we'll review concepts the committee reviewed, proposals, and some of the results. Below are a few for this issue:

The NIST Report specifically requested the codes organizations review in place performance of Structural Steel Fireproofing. (Sprayed Fire Resistive Materials-SFRM) in high rise buildings. In **G41-09/10**, and for the 3rd code development cycle, the TRB defended successfully that 430 pcf medium density fireproofing shall still be required on high rise buildings less than 420' in height, and 1,000 pcf high density fireproofing for buildings 420' high and higher.

This new requirement has added more robust SFRM fireproofing for greater adhesion, in place abrasion resistance and cohesive strength. This replaces the old requirement from 2003 of 150 pcf SFRM on steel. The TRB position was that increased bond strength would increase the ability of SFRM to stay adhered to steel, resist abrasion and dislodgement from building operations and other effects, and thereby perform when called upon by fire.

Another code proposal was successful increasing inspection frequencies to assure that the product installed represented the system tested by the laboratory and listed in the directory.

FCIA testified that both a qualified fireproofing contractor for installation and inspection are needed, to provide reliability and best value to the building owner during these hearings.

Increased inspection included increasing the inspection frequency, as required in Chapter 17, Special Inspections:

1704.12.51 - ...The test samples for determining the density of the sprayed fire resistive materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232m²) or portion thereof of the sprayed area in each story.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m²) of floor area or portion thereof in each story.

The cohesive/adhesive bond strength field test referenced was ASTM E 736, which tests in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.12.6.1 through

1704.12.6.3. This is even for 150pcf materials.

1704.12.6.1 Floor, roof and wall assemblies.

The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) of the sprayed area in each *story* or portion thereof.

1704.12.6.2 Structural members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m²) of floor area or portion thereof in each *story*.

1704.12.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted when the sprayed fire-resistant material is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire-resistant material has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

1704.13 Mastic and intumescent fire-resistant coatings. *Special inspections* for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be in accordance with AWCI 12-B. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*.

As part of the stairwell package of proposals, in **G44-09/10 Part I**, Video Surveillance systems in elevator lobbies and at the 5th floor of each stairwell were debated, and DISAPPROVED. The opposing testimony ranged from cameras being used to invade individual privacy to the effectiveness of the system. The TRB committee stated that surveillance brings real time information to the fire command for manpower deployment and occupant management.

As proposed and disapproved, 403.4.5 Video surveillance system. A video surveillance system installed in accordance with NFPA 731, shall be installed in each elevator lobby provided in accordance with Section 708.14.1 and at every fifth floor of each required stairway and connected to an approved, constantly attended station. The surveillance system shall not be required to provide positive visual recognition of individual persons.

G44 Part II, tried to add in chapter 5, **508.1.5**

(IBC [F] 911.1.5) Required features, that the fire command center shall comply with NFPA 72 and shall contain features such as the capability for video monitoring for video surveillance.

Although an important part of the TRB strategy to add a feature to 420' tall buildings, both parts of G44 were DISAPPROVED.

In TRB's **G40**, hardened, more robust stairwells were debated, with a 1.3PSI Blast Resistance as the benchmark. The requirement for resistance to a 1.3PSI blast was APPROVED. This proposal had much testing at the National Institute of Standards and Technology (NIST), and review with the National Institute of Building Standards (NIBS).

Originally, the proposal was for a 2psi blast. However, the code development process agreed with testing that gypsum assemblies would pass 1.3 PSI, and that would resist a blast away from the stairwell, providing safety.

It was assumed that the blast would not be in all three stairwells at once.

Proposal **G46** provided a way to delete the additional stairway when occupant egress elevators are used in high rise buildings, and was DISAPPROVED. The TRB Committee believed that the 3rd stairwell is now a required means of egress, and that it should not be traded off. Although the TRB committee supports elevators to increase emergency egress capacity, it did not agree with reducing basic stairwell egress capacity. Plus, it seemed that the elevator is only to be operational for ½ hour, and not the 1 hour required to be effective, in new construction.

In the Fire Code, F25, **508.1.5 (IBC [F] 911.1.5) Required features**. The fire command center shall comply with NFPA 72 and shall have features (below), was APPROVED.

Schematic building plans, including a Building Information Card approved by the fire department, which shall provide building statistics including address, height, width and type of construction; stairway access, designation, floors served, pressurization, standpipe availability; elevators bank designation, car numbers, and floors served; ventilation details, including HVAC zones, location of mechanical equipment rooms, and offsite emergency phone numbers; utilities, fuel oil tank locations, gas service locations, electrical service locations; fire protection systems details, including standpipe locations, valve locations, pump room locations; hazardous materials and locations; and, contact phone numbers for building engineers, managers and fire safety directors. The Building Information Card shall also indicate indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, elevator locations, firefighting equipment and fire department access

and the location fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.

In the Fire Command Center, there is now a card required with important building characteristics...sure an electronic version will be developed...and maybe amended. However, the card is it for now.

Other Fire Resistance and Egress Related Code Proposals

Means of Egress changes included **E113**, where the Glazing Industry Code Committee's Thom Zaremba supported by Bill Koffel proposal tried to add fire-resistance-rated corridors in education occupancies. Although there was support from the WA and OR Teachers Associations, and the National Teachers Association, the proposal was DISAPPROVED.

Thom Zaremba's testimony was a plea to safety for teachers who have larger class sizes to manage, lockdowns to deal with ...and more.

Testimony against the proposal included that the committee rejected this code proposal 13-0....and there are 9 reasons why this proposal should not be approved. NFPA Fire Data shows in table 6 that 'fire confined to the room of origin 98% of the time with sprinklers. And, others claimed that school lockdowns are infrequent, with exit drills more common, and that this would be an unnecessary cost to schools.

FCIA testified that there are statistics proving why these school buildings are safe, and that containing fire to the room of origin is not just the sprinkler. It's the compartmentation as well.

Consider that the average school building is 50 years old...with 28% built before 1950, and 45% between 1950 and 1969. The common element to structures built during these times is that fire resistance rated corridors, some of concrete block and gypsum, were prevalent, to form compartmentation for the structure's defense against fire, and protect children during egress and emergencies.

Excellent communications systems, detection, alarms and sprinklers have been added due to Life Safety Upgrades over the past 30 years making them safer yet.

Based on multiple technologies existing prevalently in schools, the safe building statistics are a result of all these safety features; the detection and alarms, building evacuation plans and practice, the compartmentation and the sprinkler system...and not any one item isolated from the rest.

Several code proposals on Height and Area, were DISSAPPROVED. Building officials stated, 'we put this issue to bed already' through the Code Technology Committee's study of the subject.

In proposal **G118**, FCIA submitted a proposal to deal with 2006 IBC's elimination of Occupancy Separations. Although this was APPROVED at the

Committee hearings, it was DISAPPROVED at the Final Action Hearings.

Bill Koffel, Koffel and Associates, FCIA's code consultant, stated that "this proposal brings a concept for non-separated option to the code....by taking the 2012 code back to the 2003 Occupancy Table. These are clearly not the same risks; Business and S2 Storage, Manufacturing, Business and Mercantile. Are all these occupancies really the same risk?"

Other comments included that sprinklers should provide protection, not trade off for compartmentation, and that fire hazards and fuel loads must match. Are S1 occupancies and Business same risk? Hazardous 3, 4, 5 all same risk?

During the 2006 code development cycle, there were 86 reductions and 23 increases in fire resistance with the change, meaning life safety was reduced.

Opposition comments to the proposal included, "Does this mean a strip mall must have a 2 hour rating between a dress shop and something else? And that some cells reduce safety. Plus, Footnote E goes back in meaning kitchens will have fire rated walls between them and eating areas."

Even a large building owner mentioned that they are trying to get more of a project management environment together, moving engineering closer to the shop floor. "We do not want to build a 3 hour wall between the B (business) occupancy and F1 (Factory)."

In **FS3**, a new definition for a Joint was developed, and APPROVED AS MODIFIED by the International Firestop Council. The Council made changes based on the code development committee suggestions.

JOINT. The opening ~~void created at the interface~~ in or between adjacent fire-resistance-rated assemblies ~~building elements~~ that is created due to building tolerances, or is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

This means that all joints in or between fire resistance rated assemblies, whether they move or not, are to be firestopped.

Another issue APPROVED was in **FS4**, where it was clarified that water washed glass and other fire resistance rated assemblies, must maintain the fire rating without relying on a sprinkler. The International Firestop Council submitted this proposal.

In **FS 7**, a requirement for **Marking the walls, PROTECT ALL PENETRATIONS**, with a certain stroke size and height, was APPROVED AS MODIFIED BY COMMITTEE. FCIA testified in support of Valerie Roper, whose proposal made great sense for better reading by building officials, fire marshals, and the many that work on fire resistance rated construction throughout the building life cycle.

703.6 Marking and identification. Fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located in accessible concealed floor-ceiling or attic spaces;
2. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144mm) measured horizontally along the wall or partition; and
3. Included lettering not less than 3 inches (76 mm) in height with a minimum 3/8 inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording. "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS" or other wording.

Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

Several other code proposals were heard in the Perimeter Fire Containment Systems section, including **FS 87, 88, 89, 90**. Look for further discussion on this.

Proposal **FS113** was a trade off to remove Fire Dampers from Office Occupancies, and was **DISAPPROVED**.

FS193 was **DISSAPPROVED**, so that Smoke Partitions are not equal to Smoke Barriers. In the International Building Code, the fire-resistance-rating of the smoke barrier is 1 hour, while the smoke partition has no fire resistance nor any quantified air-leakage rating.

NFPA Codes are also developed in an open process, with the difference being that all NFPA Members vote on all actions, including the final decisions. ICC's process only allows governmental members to vote at the final action hearings. NFPA's Codes are developed by committees, who participate in a consensus development process with over 7000 volunteer members participating.

The NFPA 5000 code is the building code, while NFPA 101 operates as a fire code. The NFPA Code cycle also lasts three years, and includes a code proposal submission deadline, a Report on Proposals, Report on Comments, a Tech Session preparation for issuing documents, a formal technical session, and then a process for appeals and issuance of documents.

Currently, the NFPA cycle is at the Report on Comments phase. Meetings took place in New Orleans, the week of October 5, for several chapters of ICC. Check out NFPA.org for more information.

Life Safety Digest 2010 Industry Calendar

Oct. 3 to 8

Society of Fire Protection Engineers
Annual Meeting, New Orleans

Oct. 18 to 20

Design Build Institute of America, Las Vegas

Oct. 25 to Nov. 1

ICC Annual Conference and Final Action Hearings, Charlotte
(Visit iccsafe.org for detailed schedule)

Oct. 27 to 29

International Facilities Managers
Association, Atlanta

Nov. 9 to 12

FCIA Firestop Industry Conference &
Trade Show, Scottsdale

Nov. 17 to 19

USGBC Greenbuild International
Conference, Chicago

Dec. 6

NFPA and ASME "The Use of Elevators
in Emergencies", Orlando

Jan. 18 to 21, 2011

World of Concrete, Las Vegas

Feb. 23-25, 2011

Life Safety Organization Inaugural
Meeting, Las Vegas

Save Space. Save Time. Save Lives.



FyreWrap® Elite 1.5
Duct Insulation provides fire
protection you can count on,
when it counts the most.



FyreWrap® Elite™ 1.5 Duct Insulation is ideal for the insulation of grease and HVAC duct systems in densely populated areas such as hotels, schools, restaurants, high rise condos, medical facilities, research labs, and sports arenas and stadiums. This lightweight, flexible material also saves valuable building space and minimizes labor and installation time. FyreWrap Elite 1.5 Duct Insulation offers:

- 2 hour fire-rated duct protection
- Space-saving shaft alternative for grease and HVAC ducts
- Thin, lightweight flexible blanket for faster, easier installation
- Zero clearance to combustibles
- Complies with NFPA 96, ICC and IAMPO Codes

- Solutions for building design and complex job configurations
- Offers both fire and insulation performance; made in USA

A FyreWrap product specification in several formats is available at www.arcat.com; search using keywords Unifrax, FyreWrap or www.unifrax.com. For additional information on FyreWrap Elite 1.5 or other products, certifications, code compliance, installation instructions or drawings, contact Unifrax Corporate headquarters USA at 716-278-3800.



www.unifrax.com

Abuse Resistant Drywall ?

"You can't replace an 8" concrete block with 1/2" of "abuse resistant" drywall unless you write ad copy for USG !" -Charles Ostrander
Executive Director - Masonry Advisory Council

Any School Board or Hospital Board, which allows a construction manager to sell them on the idea of a guaranteed maximum project cost, should be required to visit previously constructed "guaranteed maximum" projects. Then everyone could see the extent of damage and associated increases in necessary repair costs. They would see a fortune in investments or limited health care fund disappearing in the name of "value engineering". Schools and medical facilities should be an investment in durability and quality. Skin deep abuse resistance does not belong in these facilities. Walls should be abuse resistant and mold resistant to their cores!

THEY SHOW YOU PRETTY ADS . . .

WE'LL SHOW YOU A REAL PROJECT. . .



Was this corner abuse resistant?

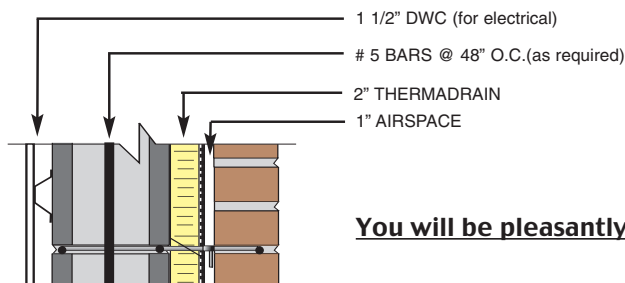


Why does this doorstop need a wood backing?

After you have been asked to value engineer out the CMU backup (supposedly for substantial initial dollar savings) and after you have properly designed a steel stud backup system with the following elements:

- Studs designed for 1/600 deflection limit.
- Double studs at windows and openings
- Dens Glas Gold exterior sheathing
- Building wrap
- Exterior closed cell rigid insulation with drainage mat
- No Batt insulation
- Special Brick ties

Also have the General Contractor bid, at the same time, the originally designed and desired wall system as follows:



You will be pleasantly suprised!



Why is there an extra wood protector (1x4) at the base of this gyp. wall & why have all the walls been repaired at desktop height?



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