

THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

Life Safety DIGEST

FALL 2016

A Short History of High-Rise Cavity Shaftwalls

The "Outside Scoop" on Rolling Fire Doors

Expansion Joint Covers and the Need for Fire-Rating

Significant Changes to Bond Strength Requirements in the 2009-2015 IBC

Firestopping Around Sprinkler Piping



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COVER STORY

16 A Short History of High-Rise Cavity Shaftwalls

Since that first installment in the World Trade Center, gypsum shaftwall systems have become standard equipment in nearly every medium- and high-rise building to come off the drawing boards.

FEATURES:

6 THE "OUTSIDE SCOOP" ON ROLLING FIRE DOORS

By Steve Hahn

8 EXPANSION JOINT COVERS AND THE NEED FOR FIRE-RATING

By Dan Chapman

12 SIGNIFICANT CHANGES TO BOND STRENGTH REQUIREMENTS IN THE 2009-2015 IBC

By John Dalton

21 FIRESTOPPING AROUND SPRINKLER PIPING

By Ernie Schmidt

24 INSTALLING FIRESTOP SYSTEMS OR FIRE CAULK?

That's the big question....

By Aedan Gleeson & Bill McHugh

DEPARTMENTS:

4 EDITOR'S MESSAGE

28 BRIGHT IDEAS

30 CODE CORNER

33 INDUSTRY NEWS

38 INDUSTRY CALENDAR



FALL 2016



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ON THE COVER:

Interior view of elevator Cavity Shaftwall System utilizing PURPLE® shaftliner. Photo courtesy of National Gypsum Company.

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This issue of *Life Safety Digest* has an assemblage of articles that will educate you about fire-resistance-rated and smoke-resistant assemblies in buildings.

This past August, the FCIA Board of Directors met, and one key item discussed was the trend that maybe fire-resistance-rated and smoke-resistant assemblies don't get the same attention that other fire protection features in buildings might regularly get day in and day out.

If an alarm malfunctions, the command panel located in the building notifies the building engineer. Alarms are tested on a schedule. Sprinklers may have scheduled inspections of their component systems—fire pumps, water supply and a visual look at the sprinkler heads as well.

But are there documents regularly in the building that show the inventory of where the fire-resistance-rated and smoke-resistant assemblies are located? Are there documents that show the manufacturers' installation and maintenance instructions AND tested and listed systems in the building . . . for firestop systems, fire-rated doors and builders' hardware, fire and smoke dampers and fire-rated glazing? Is there an living inventory of these features of fire-resistance in the building?

What about that door that doesn't latch in the fire-resistance-rated stairwell? How about the holes in the wall close to that same stairwell? Has anyone even looked above a ceiling to see if the fire or smoke barrier has its continuity maintained . . . and no with holes penetrating it.

The International Fire Code has some strong language that requires annual inspections of fire-resistance-rated and smoke-resistant construction. Additionally, NFPA 101 and the National Building Code of Canada have sections that talk about maintaining the integrity of fire barriers, fire walls, fire partitions, smoke barriers, smoke partitions and fire separations. In fact, the requirements have been there for years, but they are not always followed.

As a firestop contractor—or barrier systems contractor—in existing buildings, consider educating your building owner and manager client that there are requirements for fire-resistance in the codes that are there to protect people and property. It's critical that our industry—fire-resistance and smoke-resistant FCIA Members and firestop contractors—take the lead in making sure the effective compartmentation in existing buildings remains just that. . . effective at saving lives and property. 🔥

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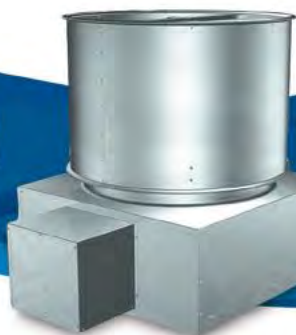
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THE "OUTSIDE SCOOP" ON ROLLING FIRE DOORS

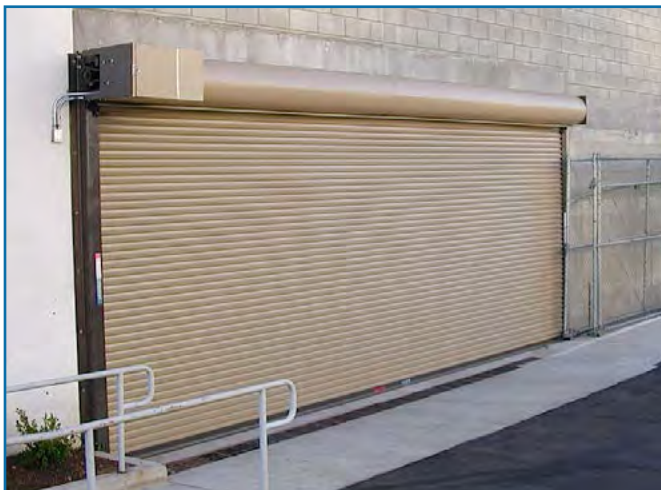
Most discussions about fire doors focus on their primary application as fire protection for openings in interior walls of buildings. But what about fire doors installed on openings in outside walls of buildings?

Rolling fire doors are sometimes found in locations such as loading docks, trash enclosures, transformer vaults, parking garage entrances or even over windows. This is usually because of an opening's proximity to a property line, projections of the same building's structure or a need to protect a building from the risk of exterior fire exposure.

When fire doors are installed on openings in outside walls, factors often taken for granted may need to be considered.

- **WINDLOAD**

Since fire doors are used primarily for the protection of interior openings, they are generally not designed specifically for windload. This may or may not be a concern on smaller size fire doors since they may be constructed similarly to common rolling doors and may still be capable of withstanding normal windload. But, many fire doors do not have windlocks, which may be necessary on larger size doors to retain the curtain in the guides when subjected to even normal windload.



Exterior mounted fire door with weather-protective covers
Lawrence Door Photo

- **AUTOMATIC CLOSING FUNCTION**

Depending on the severity of the wind pressure against the fire door curtain—and the potential to be combined with negative pressure on the building interior—the ability of a door to close automatically in a fire condition may be affected. As with most rolling doors, operability under windload may be a special consideration, and doors may need to be closed prior to a high wind event.

- **HIGH-CYCLE OPERATION**

Traditionally designed fire door operating and closing systems have a series of gears and drop-out mechanisms, which may not be ideal considering the demands of very frequent usage commonly required on a parking garage entrance or loading dock. When fire doors are required for high-cycle applications, state-of-the-art designs that utilize motor operators with an internal release and governor that eliminate the complexity of traditional systems may be a more efficient choice.

- **FUSIBLE LINKS**

When fire doors are installed on openings in outside walls, fusible links may have to be installed on the exterior of the building—depending on the location of the fire exposure or the area being protected—as determined by the Authority Having Jurisdiction (AHJ).

- **ALARM INTERFACE**

When a fire door requires automatic closing to be initiated by a fire alarm or local detectors, an alarm release device is commonly used to interface with the door. Typical alarm releases are rated for interior use only and need to be installed on the inside of the building even if the door is installed on the exterior of the building.

- **ENVIRONMENTAL ISSUES**

Rolling fire doors can be fitted with special perimeter seals to limit air infiltration. When temperatures or sound are a concern, insulated rolling fire doors can be used to provide improved thermal performance and reduce sound transmission.



Insulated fire door installed on opening in outside wall

• WEATHER PROTECTION

Per the requirements of *NFPA 80 Standard for Fire Doors and Other Opening Protectives*, when a fire door is installed on the exterior of a building, it needs to be protected from exposure to weather conditions that could ultimately affect its operation or performance. Mechanisms should be covered, or motor operators with appropriate NEMA ratings should be used and other precautions should be taken to eliminate the potential effects of corrosion or other factors that could prevent the door from closing in a fire condition.

Rolling fire doors are an effective method of exterior fire protection, but it may be advisable to consult with the manufacturer to make sure the doors being considered are suitable for all the conditions required for that application. When fire doors are exposed to the elements, they may require more frequent inspection to ensure their ability to satisfactorily perform in a fire event. And as always . . . consult with the Authority Having Jurisdiction if there is any question about what is required. 🔥

Steve Hahn is Product Manager for Lawrence Roll-Up Doors, Inc. He has been in the rolling door industry for more than 40 years, is a member of the NFPA-80 Standard for Fire Doors and Other Opening Protectives Technical Committee, serves on three UL Standards Technical Panels, and is Chair of the DASMA Rolling Door Division.



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EXPANSION JOINT COVERS AND THE NEED FOR FIRE-RATING

Expansion joints are a necessary evil in most buildings, and designers like for them to cause as little interruption to design as possible. One item that tends to get overlooked during design is the fire-rating that may be needed at the joint openings.

Expansion joints, in simplest terms, are intended to allow for movement in the structure. Movement can come in various forms—from basic thermal movement that happens on a regular basis, to seismic movement, which involves motion in multiple directions and only happens sporadically. There are a multitude of ways to cover joint openings while still allowing movement, along with options for making them fire-rated. Some of the items to consider in material selection are nominal joint size/ movement and mounting condition.

WHAT ARE THEY?

Expansion joints will run continuously through the building to allow it to be segmented into different sections for movement. Because the expansion joint goes through the building, there is a high likelihood that at some point it will break the plane of a fire-resistance-rated assembly. Expansion joint fire barriers, as they are typically called, are required to maintain the integrity of any rated assembly that has been interrupted by a breach in the fire-resistance-rated horizontal or vertical barrier.

Expansion joint fire barriers are used to close off the expansion joint when the plane of fire-resistance-rated elements is broken by the breach created to allow for independent movement of assemblies or separate non-compatible elements. Fire-rated expansion joints also prevent the loss of compartmentalization gained by implementing fire-resistance-rated horizontal and vertical assemblies such as fire barriers, smoke barriers and fire

walls. If fire-resistance-rated expansion joint systems are improperly selected, failure could allow heat and flames to utilize the joint space as a chimney, allowing the fire to quickly spread throughout the building.

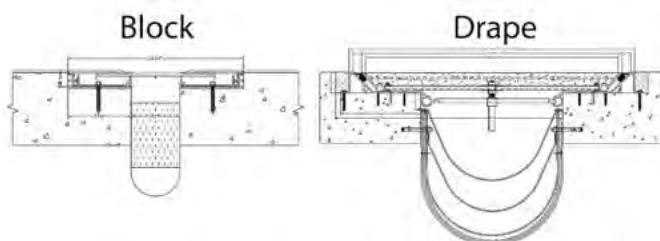
Fire-resistance-ratings are a very important part of the planning process for sizing and selecting joint covers. When an expansion joint fire barrier is introduced into the void, open area or joint—even at the closed position—there will be material occupying the space within the void, so it is important to take this into account when sizing the joint during the design process. Typically, the structural engineer, who may not be aware that there will be elements inside the nominal opening, determines the need for the joint. The space required for the barrier will depend on the style of expansion joint fire barrier being used and the joint size.

WHICH TYPE IS RIGHT?

There are two common types of fire barriers that are typically used: one is for nominal joint sizes under 4," and one is for nominal joint sizes above 4."

Typically, a joint under 4" in size will utilize an expansion joint fire barrier that, in appearance, is similar to a block of mineral wool. In this application, the block material has been tested to ensure that it will be able to withstand movement and still maintain its integrity to prevent the spread of heat and fire. The way the block material works in movement situations is by expansion and compression of the material. In most applications where a block-type fire barrier is used, it will be able to close to 50% of the nominal joint size. For example, in a system with a nominal 2" joint, the fire barrier would be able to close to 1" which would need to be accounted for when sizing the final joint.

If the joint reaches a nominal 5", a drape-type barrier should be used. This type of fire barrier appears in detail as a U shape. The U shape allows for extra material in the joint as opposed to the block-type, in which the material has to extend at maximum opening. Drape-type fire barriers can be manufactured to accommodate a greater scale of movement that could be required in a seismic area. There are also configurations of drape fire barriers that easily allow movement in directions other than compression and extension.



Block fire barrier is used in joints smaller than 4" and drape fire barrier is used for joints larger than 4".

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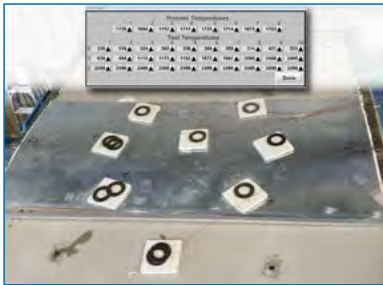
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MOVEMENT MATTERS

The allowance for a range of movement is the main factor separating fire barriers from firestops. One of the most common types of movement is thermal. This means that there may be very minimal day-to-day movement due to temperature variations. Because the fire barrier is secured into the joint, it will need to not only handle the movement, but it must also be able to withstand the fatigue from the daily motion it will experience.

Seismic movement is also a factor that needs to be considered. Seismic movement introduces multiple directions of movement and may require changes to the fire barrier to accommodate this movement. Lateral shear is another type of movement that may require alternative materials be used. Items like lateral sliders can be added to the drape to allow for the additional direction of movement. Lateral shear may also occur when smaller joints change direction, which means that the standard compression and extension changes to lateral shear for the run of joint in the other direction.

THE IMPORTANCE OF TESTING



Thermocouples are used to measure temperature in several areas to evaluate whether the fire barrier would hold up in a real life event.

Due to the different movements that expansion joint fire barriers may be subject to, testing and certification becomes very important. Before testing, the expansion joint fire barrier is extended to its maximum size and then closed to its minimum size. This process is called cycling. The standard for fire testing the expansion joint fire barriers is UL 2079, Standard for Tests for Fire-Resistance of Building Joint Systems. Test Standard UL 2079 requires that the fire barrier be cycled before being fire-tested. This standard also requires that the expansion joint fire barrier has a splice where two different lengths of material are joined together. Using the UL 2079 Standard ensures that simulated real-life conditions are employed and the fire barrier will be able to withstand not only fire, but movement as well.



Third party fire barrier testing ensures that the material has been tested in a standard manner consistent with industry standards.

After being cycled, the material is mounted either horizontally or vertically, depending on what the intended use of the expansion joint fire barriers will

be. It is then equipped with thermocouples for reading temperatures throughout the test. It is important to note that the sample that is cycled is the same sample that is fire-tested.

Expansion joint fire barrier testing should be certified through a reputable third-party certification agency, such as Underwriter Laboratories (UL). Third-party certification ensures that the material has been tested in a standard manner consistent with industry standards to result in a fire-resistance rated assembly. When conditions vary from those of the actual project, engineering judgements may be presented for consideration. These should also be from reputable sources.

When reading a listing sheet for expansion joint fire barriers from the UL Fire Resistance Directory, you will often see a requirement for a metal cover plate over the barrier. This is to match the conditions that were present during the certification testing. Typically, the metal plate is used during the test as an attachment location for the thermocouples. The furnace reaches a peak temperature of 1850°F (1010°C) for a 2-hour test, and the top of the fire-resistance-rated assembly may not exceed temperatures that would ignite cotton waste.

The test standard is meant to be a representation of actual installation. Unless an engineering judgement is available, it is crucial that field installation be exactly the same as the test installation, including use of the metal plate, even in unexposed areas. Many listings will allow for a 'teepee' or 'witch's hat' in unexposed areas; some will even allow foil. It is important to verify the requirements for the cover during selection.

The listing sheet will also dictate the requirements for the substrates in which the fire barrier is to be mounted. A typical horizontal fire test would mimic a typical floor application, while a wall test may be performed with either masonry or fire-rated gypsum wallboard. The fire barrier will only be as good as the surrounding assemblies. Therefore, if it is installed in a non-fire-resistance-rated condition, the expansion joint fire barrier would not be able to perform to its listed rating.

CONCLUSION

As you can see, this seemingly simple piece of material added to the expansion joint has many implications on life-safety as it changes the material into a fire-resistance-rated assembly that protects the breach made for independent movement or separation of adjacent assemblies. It is crucial that the proper expansion joint fire barrier be selected and special attention be paid to the third-party listing and manufacturers installation instructions to ensure the product is being used as advertised by the manufacturer. 🔥

Dan Chapman is Senior Manager—Product Marketing for Construction Specialties Expansion Joint Covers. Dan can be reached at DChapman@c-sgroup.com.

UNLIMITED?

Not when it comes to fire rated glass

Beware of advertisements urging designers to 'be unlimited' when using ceramics with 'fire ratings up to 3 hours.' The problem is that while ceramics are listed up to 3 hours, the IBC specifically limits its size and applications after 45 minutes. The code limits the use of ceramics to 100 sq. inches in 60/90/180 minute doors and ceramics cannot be used at all in 60/120 minute interior windows, sidelites and transoms regardless of whether sprinklers are employed or not.

For truly unlimited glazing, fire resistive products tested to ASTM E-119 like **SuperLite II^{XL}** must be used. **SuperLite II^{XL}** can be used up to the maximum size tested in all fire rated applications.

Here's a side by side comparison of fire protective vs. fire resistive glazing used in a 1-hour stairwell application:

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SIGNIFICANT CHANGES TO BOND STRENGTH REQUIREMENTS IN THE 2009-2015 IBC

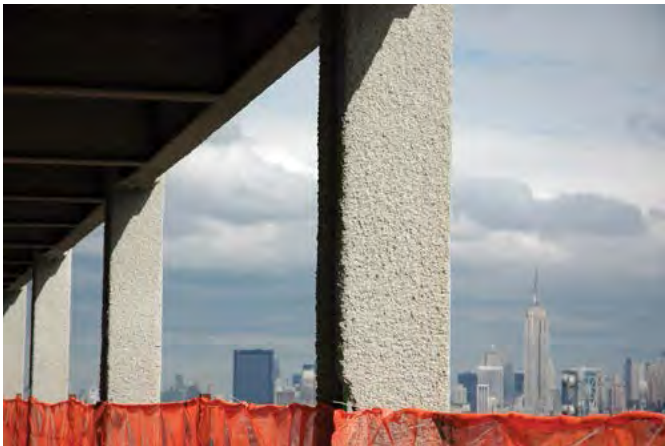


Photo courtesy of Grace / GCP Applied Technologies.

In 2009, the International Building Code (IBC) was changed to include higher bond strength requirements for Spray-Applied Fire-Resistive Materials (SFRM), which are based on the height of the building. As a consequence, this change in bond requirement impacts the selection process of SFRM's for projects being constructed that are permitted under the 2009 or later version of the IBC.

The International Building Code lists three physical properties for SFRM's. These physical properties are:

- 1) Thickness of application
- 2) Density in pounds per cubic foot
- 3) Bond strength (adhesion/cohesion)

Of these three physical properties, only bond strength has requirements specifically outlined by the IBC. In the case of thickness of application and density, the code states that these properties must meet the thickness and density requirements of the approved fire-resistance design. These properties require special inspection as required in IBC's Chapter 17 Special Inspections and Tests.

In the 2009 IBC, the bond strength requirements changed for SFRM in response to recommendations made by the International Code Council's (ICC) Ad Hoc Committee on Terrorism Resistant Buildings (TRB) proposals. The requirement for higher bond strength remains today in the 2015 IBC as well.

From about 2003 to 2009, the ICC's TRB studied the National Institute of Standards and Technology (NIST) reports on the New York City World Trade Center collapse due to the airplane attack documents. In the reports, NIST recommended an increased bond strength requirement for "High-Rise" Buildings. High-Rise buildings are defined in Chapter 2 of the 2015 IBC as "A building with an occupied floor located more than 75 feet above the lowest level of fire department vehicle access."

In the IBC, the bond strength characteristics are referenced in Chapter 17.

1705.14.1 Physical and visual tests. The *special inspections* and tests shall include the following to demonstrate compliance with the listing and the *fire-resistance rating*:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kg/m³).
- 4. Bond strength adhesion/cohesion.**
5. Condition of finished application.

[1705.14.1, 2015 IBC]

Prior to 2009, the IBC required that the bond strength of SFRM, when tested in accordance with ASTM E736, be in excess of 150 psf. In 2009, the IBC moved away from a single value for the bond strength of SFRM for all buildings and implemented bond strength requirements based on the height of the building. The IBC maintained the 150 psf bond strength requirement for buildings with a height of less than 75ft, while increasing bond strength requirements for buildings with a height of greater

than 75ft. In fact, the IBC added two new bond strength requirements by segmenting buildings in categories of 75ft. to 420ft and above 420ft.

The general requirement for bond strength of SFRM Fireproofing is specified in Chapter 17.

1705.14.6 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural members shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1705.14.6.1 through 1705.14.6.3

[1705.14.6, 2015 IBC]

The minimum bond strength for SFRM for buildings greater than 75 feet above the lowest level of fire department vehicle access is provided in the 2009 version of the IBC in Section 403 entitled **High-rise Buildings**, while the minimum bond strength of 150 psf for SFRM of buildings below 75 feet is stated in 2009's Section 1704.12.6, refers bond strength back to a table in Section 403.2.4, Minimum Bond Strength of SFRM.

These requirements are detailed in the chart and schematic below:

403.2.4 Sprayed fire-resistant materials (SFRM).

The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

[403.2.4, 2015 IBC]

Minimum Bond Strength

Height of Building ^(a)	SFRM Minimum Bond Strength ^(b)
0 to 74 Feet	150 psf
Greater than 74 feet, Up to 420 Feet	430 psf
Greater than 420 Feet	1,000 psf

- a) Above the lowest level of fire department vehicle access
b) The minimum bond strength requirement for the SFRM must be installed throughout the building.

Source: 2009 International Building Code, 403.2.4, Table 403.2.4, 1704.12.6, 1704.12.6. Editors Note: The 0-74 Feet Row has been added for easy viewing.

It must be noted that the minimum bond strength requirement for the SFRM must be installed *throughout* the entire building.

The specification community will need to consider these bond strength requirements when specifying the SFRM on any projects designed under the 2009 or later IBC. Plan reviewers also need to keep this in

mind as they review construction documents during the permitting process. This requirement is also in the 2015 IBC with no changes from the 2009 requirements.

Though there are newer code requirements that must be considered when developing criteria for bond strength in a specification, the new bond strength requirements have no impact on any other physical property criteria for the SFRM in a specification.

For example, the IBC code language has no impact on density requirements. The selection of density criteria is an independent decision to the required minimum bond strength as dictated by the 2009 IBC. Traditionally SFRM's have been divided into 3 distinct product groupings based upon their density. They were:

1. Low, standard or commercial density (15-21 pcf)—usually containing a gypsum binder
2. Medium density (22-39 pcf)—usually contains a cement and / or gypsum binder
3. High density (39 + pcf)—containing a cement binder

Historically, there is a relationship between the applied cost of SFRM and the increase in density. The cost difference is driven primarily by the applied yield of the materials. As density increases, the applied yield of the material will decrease and applied cost increases. Some have attempted to correlate bond strength with cost as well, but the same correlation does not exist.

Until recently the only way to meet the 2009-2015 IBC code requirements was to specify a medium density SFRM product. This is because the market had lacked low density products that could achieve bond strengths in excess of 430 psf. As a result, medium density products were often specified in applications where a standard density product would meet all of the requirements with the exception of bond strength.

For instance, in concealed spaces, standard density gypsum products are often used. With the change in bond strength requirements many specifiers and architects were forced to use medium density products in those concealed areas once the building had an occupied floor taller than 75ft.

This practice has created the misconception that *medium density* spray fire-resistive materials (SFRM) must be specified to meet the new building code high-rise building requirements. The key point is that the *bond strength is what's required*.

Over the last year, several low density products have been introduced to the marketplace that can achieve the required bond strength requirements for high-rise buildings. The introduction of these products has created more cost effective solutions to meeting the 2009-2015 IBC bond strength requirements from Chapter 4 and Chapter 17 of the IBC.

These new low density SFRM products typically provide higher yields, as well as faster application and coverage rates when compared with medium density products providing lower in-place cost solutions.



Illustration by Grace / GCP Applied Technologies.

Using these low density products offers significant advantages to the building owner and manager.

Prior to the bond strength requirements in the 2009 IBC, designers needed to consider several factors when selecting the appropriate SFRM for a project.

As with any building product, SFRM Fireproofing must be used where it's intended and installed to the tested and listed system

design and manufacturers installation instructions. There are also limitations to use of products that must be taken into consideration when using in various applications. The primary questions for determining the appropriate criteria for the SFRM for a project included:

- Will the SFRM be for interior applications or exterior applications?
- Will the SFRM be concealed or exposed?
- If exposed, will the SFRM be exposed to abrasion or simply exposed to view?
- If exposed to abrasion, what is the anticipated level of abrasion?
- Does the SFRM need to be damage resistant?
- Will the SFRM be exposed to high humidity?

Key to SFRM product and system design selection questions for buildings being designed in accordance with the 2009-2015 IBC, the following question must also be added:

- How tall will the building be?
 - 0-75'
 - 76'-150'
 - 150'-420'
 - 420' and higher
- If above, is the occupied floor located above the lowest level fire department access?

With the introduction of the high bond low density products, the design has more flexibility in selecting the products that meet all of their requirements versus choosing a product that meets the new bond requirements, while exceeding all of the other requirements at a higher cost. 🔥

John Dalton is Technical Service Manager, Fire Protection at GCP Applied Technologies. He can be reached john.a.dalton@gcpat.com.

EDITORS NOTE: All seven of the questions asked above by GCP's Mr. Dalton are aimed at how the SFRM products applied to a tested and listed fire-resistance design will perform during the life of the building. Watch for a series of articles on SFRM and the building's life cycle.

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Emshield DFR3
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SJS-FP-FR System Seismic
2 hour fire-rated Split Slab



A SHORT HISTORY OF HIGH-RISE CAVITY SHAFTWALLS



Interior view of elevator Cavity Shaftwall System utilizing PURPLE® shaftliner. Photo courtesy of National Gypsum Company.

THE HIGH-RISE CAVITY SHAFTWALL SYSTEM BEGAN WITH THE WORLD TRADE CENTER

On April 4, 1973, New York City Governor Nelson Rockefeller cut the ribbon on the world's two tallest buildings, proclaiming, "It's not too often we see a dream come true. Today, we have." The World Trade Center, which began as a pavilion at the 1939 World's Fair dedicated to the concept of "world peace through trade," stood 110 stories and 1,368 feet in height.

But before ground was broken to construct the World Trade Center, the team was reengineering core systems to accommodate this record-high building. The architects and engineers asked major gypsum board manufacturers to develop a gypsum-based alternative to conventional masonry elevator enclosures. Their answer would be the gypsum shaftwall system (known today as Cavity Shaftwall System). The gypsum shaftwall system utilizes gypsum board framed by metal studs and channels to enclose elevator shafts, stairwells and vertical service shafts. These shaftwalls incorporate built-in characteristics designed to withstand the positive and negative air pressure forces exerted by high-speed elevators.

ADVANTAGES OF THE CAVITY SHAFTWALL SYSTEM

In addition to maintaining structural integrity, gypsum shaftwall systems provide many benefits. They are lightweight, easy to install, weather-, sound- and fire-resistant and more economical than other types of shaftwall construction. Originally designed for and installed in the World Trade Center, gypsum shaftwalls are four to five times lighter and considerably less expensive to install than other types of enclosures. They weigh approximately 10 pounds per square foot of wall compared to 40 or 50 pounds per square foot for other types of wall systems. This is key to a project like the World Trade Center. A weight savings of this magnitude rapidly translates into major savings, especially considering the unprecedented height of this high-rise.

Further, buildings utilizing the gypsum shaftwall system require less structural steel and less extensive underground support pilings. In addition, the core of the gypsum panels in the gypsum shaftwall system contains about 21 percent water by weight, creating a fire barrier with a 2-hour rating from either side. If the shaftwall gypsum panel is exposed to fire, the water is slowly released as steam to effectively retard heat transmission. The Cavity Shaftwall System is typically installed using 1-inch-thick gypsum shaftliner panels inside a minimum 2-1/2-inch metal structural framing with an integral space to hold the panels in place on the shaft side. Metal J-track runners are placed horizontally on the top and bottom and vertically at partition ends. They also frame openings. Two layers of 5/8-inch or 1/2-inch fire-rated gypsum wallboard then fasten to the outside of the stud, creating the corridor side of the enclosure.



Photo courtesy of National Gypsum Co.

REINFORCEMENTS DEVELOP AS A RESULT OF 9/11/2001

Since that first installment in the World Trade Center, gypsum shaftwall systems have become standard equipment in nearly every medium- and high-rise building to come off the drawing boards. But the systems currently built underwent reinforcements after the deliberate destruction of the World Trade Center on September 11, 2001.

In response to 9/11 events, officials of the City of New York created Local Law 26, which was signed by Mayor Michael Bloomberg on June 24, 2004. The new law amended the Building Code and Fire Prevention Code to incorporate retroactive requirements and prospective provisions. To address stair and elevator enclosures, Local Law 26 added the new requirement of hardened shafts as components in Cavity Shaftwall Systems.

As stated, high-rise buildings with an occupied floor 75 feet or higher above lowest level of fire department access must have impact-resistant stair and elevator enclosures, constructed with impact-resistant materials. Local Law 26 mandated that high-rise office buildings, constructed pursuant to applications filed on or after July 1, 2006, be built with impact-resistant stair and elevator enclosures, and required that the Commissioner of Buildings adopt a rule establishing the technical standards for their installation. Chapter 32-05 stated that for Impact-Resistant Stair and Elevator Enclosures, a compliant wall assembly shall be substantially identical to, and shall provide an impact resistance equivalent to or exceeding the performance of one of the following:

CAVITY SHAFTWALL SYSTEM U497 2-Hour (Fire Tested Both Sides)

1. J-Track
2. C-T or C-H Stud
3. 1" Fire-Shield® Shaftliner XP®
4. 5/8" Fire-Shield® Gypsum Board
5. 5/8" Hi-Impact® XP® Gypsum Board

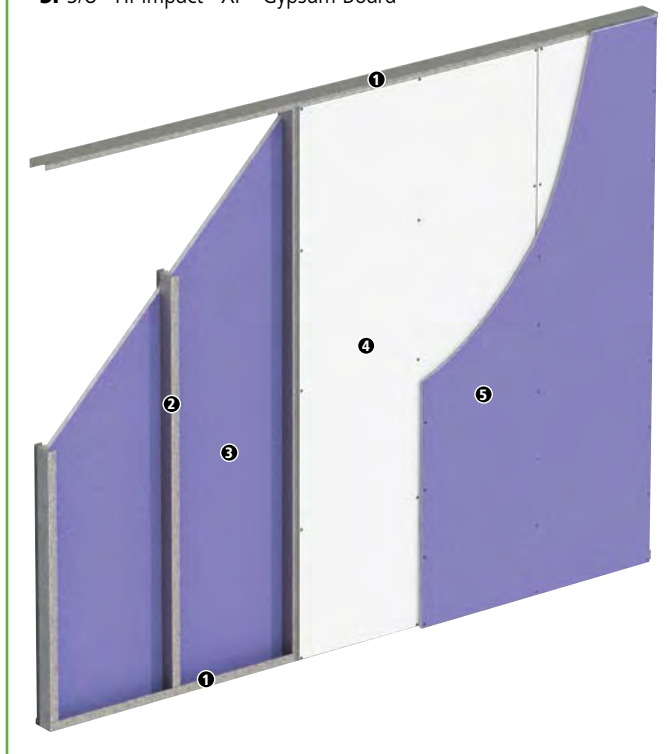


Illustration courtesy of National Gypsum Co.

STUD WALL

Materials: Impact-resistant construction board will be sheathed on the impact face of the stair or elevator enclosure wall assembly. It shall undergo testing by a laboratory acceptable to the commissioner in accordance with the requirements of ASTM C1629 (*Standard Classification for Abuse-Resistance–Non-Decorated Gypsum Panel Products & Fiberglass-Reinforced Cement Panels*). The impact face shall be considered as the exterior of the stair or elevator enclosure, on the occupied side of the building, and shall be comprised of two layers of construction boards. The construction board used as the base layer panel shall meet or exceed Classification Level 2, as measured by the method described in ASTM C1629, and the face panel shall be a minimum 5/8-inch gypsum construction board. The wall assembly shall have a minimum two-hour fire-resistance-rating as measured by the method described in ASTM E119. It shall also meet or exceed Soft Body Impact Classification Level 2 (195 ft.-lbs.) as measured by the method described in ASTM C1629.

Installation: Studs shall be minimum 3-1/2-inch depth metal studs, at least 33 mils thick (20 gauge). Vertical studs shall be spaced a maximum distance of 24 inches on center. Runners shall be securely attached at the floor and ceiling to structural element members in such a manner that provides lateral resistance in excess of the equivalent energy of Soft Body Impact Classification Level 2 of ASTM C1629. The installation of top and bottom runner tracks shall be subject to controlled inspection. Construction boards shall be attached with No. 8 self-drilling bugle-head screws, 12 inches on center maximum with a minimum depth of 5/8-inch penetration into the wall cavity. Screw attachments shall meet the requirements of ASTM C1002, *Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal*

HOW IMPACT AFFECTS A

For a Cavity Shaftwall System to be considered impact resistant, it must meet the test standards of ASTM (American Society for Testing and Materials) C1629. ASTM C1629 is the "Standard Classification for Abuse-Resistant Non-Decorated Interior Gypsum Panel Products and Fiber-Reinforced Panels."

Stair and elevator enclosures in high-rise buildings (with an occupied floor located more than 75 feet above the lowest level of fire department vehicle access) with an assigned Risk Category of III or IV and all buildings more than 420 feet in height (between the grade plane and the average roof height of the highest roof) are required to have resistance to hard- and soft-body impact.

Impact-resistant gypsum board is designed to counteract intrusion into the wall cavity. To categorize how well gypsum board resists impact, ASTM divides its classification into three levels: Level 1 through Level 3. Level 1 represents the lowest performance rating and Level 3 represents the highest performance rating achieved by testing any given property.

The shaft enclosure must meet or exceed a Soft-Body Impact Classification Level 2 (in accordance with ASTM C1629) and have a layer of impact-resistant material with a Hard-Body Impact Classification Level 3 (in accordance with ASTM C1629).

Plaster Bases. Joints between adjoining sheets of construction board shall be staggered from base layer with face panel layer.

CONCRETE AND MASONRY WALLS

Concrete or masonry walls shall satisfy the impact-resistance requirements of this section provided that the enclosure walls are anchored to structural members that provide lateral support as required by the seismic provisions of RS 10. The assembly shall be rated for two-hour resistance, as measured by the method described in ASTM E119.

OTHER WALL ASSEMBLIES (INCLUDING CAVITY SHAFTWALL SYSTEMS)

Impact Face: Boards or materials constituting the impact face of the stair or elevator enclosure assembly shall be tested by a laboratory, acceptable to the commissioner, to provide an impact resistance equivalent to gypsum panel meeting Hard Body Impact Classification Level 3 resistance (150 ft.-lbs.), as measured by ASTM C1629. When more than one layer of material is required to meet the impact-resistance requirement, such layers shall be tested in tandem.

Assembly: The wall assembly shall have a minimum two-hour fire-resistance-rating as measured by the method described in ASTM E119. The wall assembly shall meet or exceed Soft Body Impact Classification Level 2 as measured by the method described in ASTM C1629.

Installation: Wall assemblies shall be anchored to structural members in such manner that provides lateral resistance in excess of the equivalent energy of Soft Body Impact Classification Level 2 of ASTM C1629. The installation shall be subject to controlled inspection.

The International Building Code (IBC) establishes the minimum requirements for high-rise buildings in Section 403. As a result of the September 11, 2001

attacks, the International Code Council's Board of Directors appointed an Ad hoc Committee on Terrorism Resistant Buildings (TRB). The TRB was the proponent that eventually was able in the 2009 IBC to have verbiage added similar to Local Law 26. This created the IBC Section 403.2.3—pertaining to "Structural Integrity of Interior Exit Stairways and Elevator Hoistway Enclosures in High-Rise Buildings." Implemented to further protect these elements and incorporated into the IBC, the revisions state,

"For high-rise buildings of Risk Category III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet in building height, enclosures for interior exit stairways and elevator hoistway enclosures shall comply with Sections 403.2.3.1.—403.2.3.4."

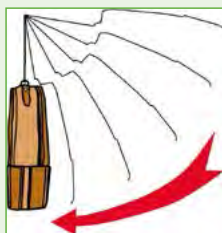
These sections echo the requirements of Local Law 26 (listed above).

THE FUTURE

The Cavity Shaftwall System has many advantages, and it is a strong, viable option for the future life and safety of high-rise buildings. New gypsum board innovations will continue to arise as proposals and testing lead to tomorrow's next breakthrough. 🔥

Mark Chapman is Senior Manager of Construction Services at National Gypsum Company. He currently oversees National Gypsum's construction services department, which provides technical support to the construction industry for NGC products, gypsum board systems and specifications. He also serves on the Gypsum Association building code and technical committee. He has been involved with the development of construction systems and in the construction field for more than 30 years. Contact Mark at mkgrmc@NationalGypsum.com or 1-800-NATIONAL.

CAVITY SHAFTWALL SYSTEM



SINGLE DROP SOFT-BODY IMPACT (modified ASTM E695)

This test measures the ability of a gypsum panel to withstand a single impact of a heavy, soft object. This test is conducted by swinging a leather bag loaded with steel pellets into the panel. When the panel breaks, the height of the drop and weight of the bag are used to calculate the foot-pound measurement required to break the panel. The test was originally developed to measure relative resistance of wall, floor, and roof construction to impact loading.

Classification Level	Soft-Body Minimum
1	90 ft.-lbs. (112 J)
2	195 ft.-lbs. (265 J)
3	300 ft.-lbs. (408 J)



HARD-BODY IMPACT (Annex A1)

This test measures the ability of a gypsum panel to withstand the impact of a hard object, such as a hammer or the heel of a boot. A panel is impacted with a 2-3/4 steel cylinder mounted to a ram. Weights are added to the ram and the panel is impacted one time. The maximum amount of impact force the panel can withstand without breaching the stud cavity is reported. This is a new test proposed by manufacturers of high-performance panels.

Classification Level	Hard-Body Minimum
1	50 ft.-lbs. (68 J)
2	100 ft.-lbs. (136 J)
3	150 ft.-lbs. (204 J)

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-Tyler Stoller, Sawtooth Caulking, Inc.



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FIRESTOPPING AROUND SPRINKLER PIPING

Firestopping service penetrations within buildings is a task we all face on a daily basis. Sprinkler piping penetrations, in most cases, are no different; however, each penetration is unique and may have to be handled differently depending on a number of variables. Here we will discuss how those variables can affect your installation and your ability to meet the intent of the code.

Within the 2012 International Building Code, penetrations are specifically discussed within Section 714. This section goes into detail on how to firestop penetrations in fire-resistance-rated horizontal assemblies, fire-resistance-rated wall assemblies and membrane penetrations in both of these assemblies. Within these fire-resistance-rated horizontal and vertical assemblies, any through-penetration must be protected with an approved through-penetration firestop system that has been installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 in. of water.

As a firestop contractor, you can find these listed systems within the UL Fire Resistance Directory, FM Approvals Guide, Intertek Building Products Directory or other directories of fire testing laboratories accredited to test and list these types of assemblies. These listed systems—plus the manufacturer's installation instructions—are your recipes for success in firestopping. They contain all the elements that are needed to provide a firestop around the sprinkler piping, and they specifically call out the variables that were mentioned earlier.

The variables that go into a listed firestop system are extremely critical to the functionality of the firestop system itself. One need consider a multitude of things, such as the type of piping—is it metallic or plastic, and more specifically, what type of metallic or plastic?



Photo courtesy of 3M Fire Protection Products.

A metallic pipe is a much simpler firestop system in most cases and may be done in what is termed a “caulk and walk” application, where only the listed and approved firestop sealant is used. A plastic pipe may need not only a certain type of sealant, but also an intumescent wrap strip and maybe even a steel retaining collar.

The type of plastic is also relevant when firestopping, especially in the case of sprinkler piping where CPVC is commonly used. One must always ensure that the firestop products that are being used around CPVC piping are compatible with the CPVC pipe itself. Many CPVC piping manufacturers' websites have links to material compatibility programs to ensure that the products have been tested and approved for use around the CPVC piping. Also, the laboratories listed systems may give guidance for what products to use around CPVC piping when there are multiple products contained for use within a single listing.

The type of assembly that is being penetrated is also another factor that must always be taken into consideration. A firestop system that can be used within a concrete floor assembly is probably not going to be installed in the same manner in a gypsum wallboard assembly.

Annular space is another critical variable that must always be considered when trying to select the appropriate firestop system. Too large an annular space may make it impossible to install a system where a caulk only solution is used. It may be necessary to use some type of backing material, whether it is polyethylene backer rod or mineral fiber insulation. Too small an annular space may make it impossible to install an intumescent wrap strip within the opening.

Is there a metallic or non-metallic sleeve installed around the sprinkler pipe? Installing a sleeve adds an element of complexity to the firestop system, as there is an additional path for heat to travel through the firestop system. The listed system that is selected will always be the guideline for making the appropriate selection for the specific application.

Membrane penetrations are a subset of the standard through-penetrations that have already been discussed; however, a membrane penetration penetrates through only one side of a fire-resistance-rated horizontal or

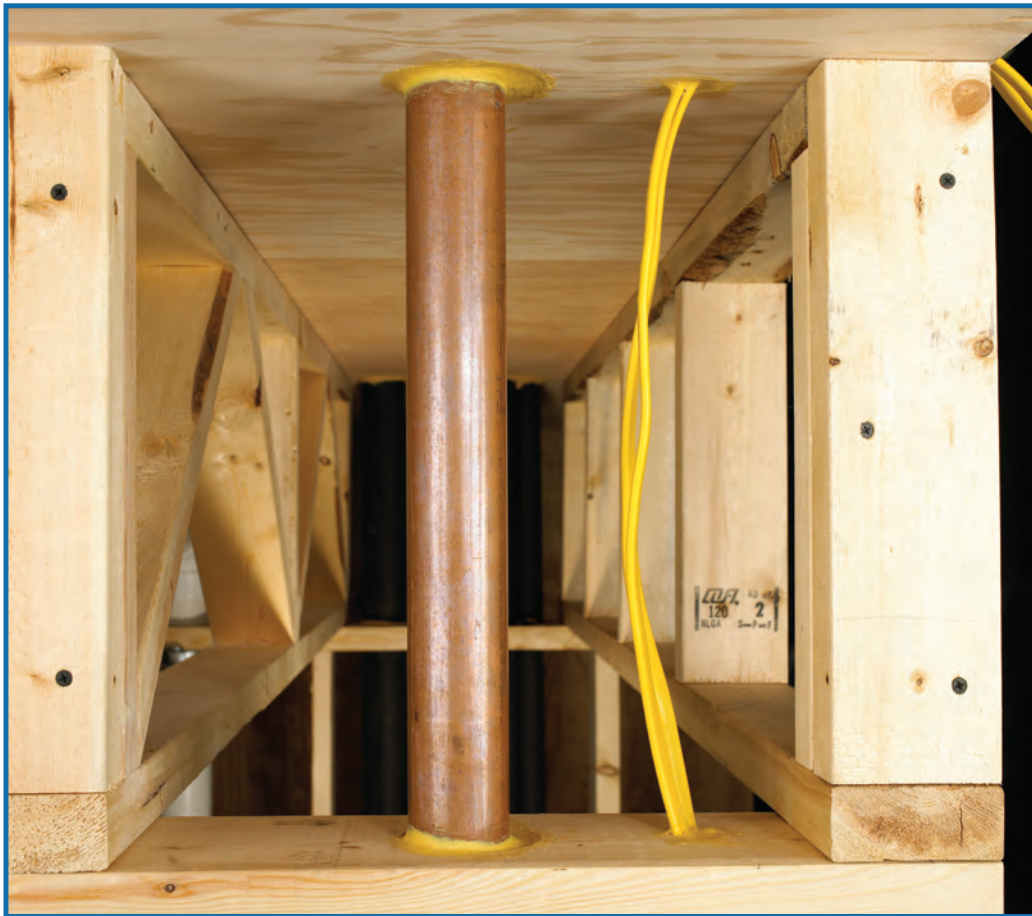


Photo courtesy of 3M Fire Protection Products.

vertical assembly. These single membrane penetrations should be tested and listed for these specific applications within a listed membrane penetration firestop system.

There is an exception allowed within the code that the annular space created by the penetration of a fire sprinkler through either a horizontal or vertical gypsum membrane, provided it is covered with a metallic escutcheon plate, does not have to be firestopped. However, if a certain air leakage rating is required with the compartment that is in question, or a specific decay rate needs to be maintained on a gaseous system, then the annular space would then have to be firestopped to meet these other criteria.

In conclusion, firestopping around fire sprinkler pipes may not be as straight forward as it first seemed. Proper care should always be taken in selecting the appropriate firestopping system for the specific application based on the unique project conditions. These listed systems and the manufacturer's installation instructions are the recipe for installation of the proper firestop system.

Please consult the International Building Code, NFPA 13 and the local Authority Having Jurisdiction (AHJ) for further details on both the requirements and installation of firestopping around sprinkler piping. 🔥

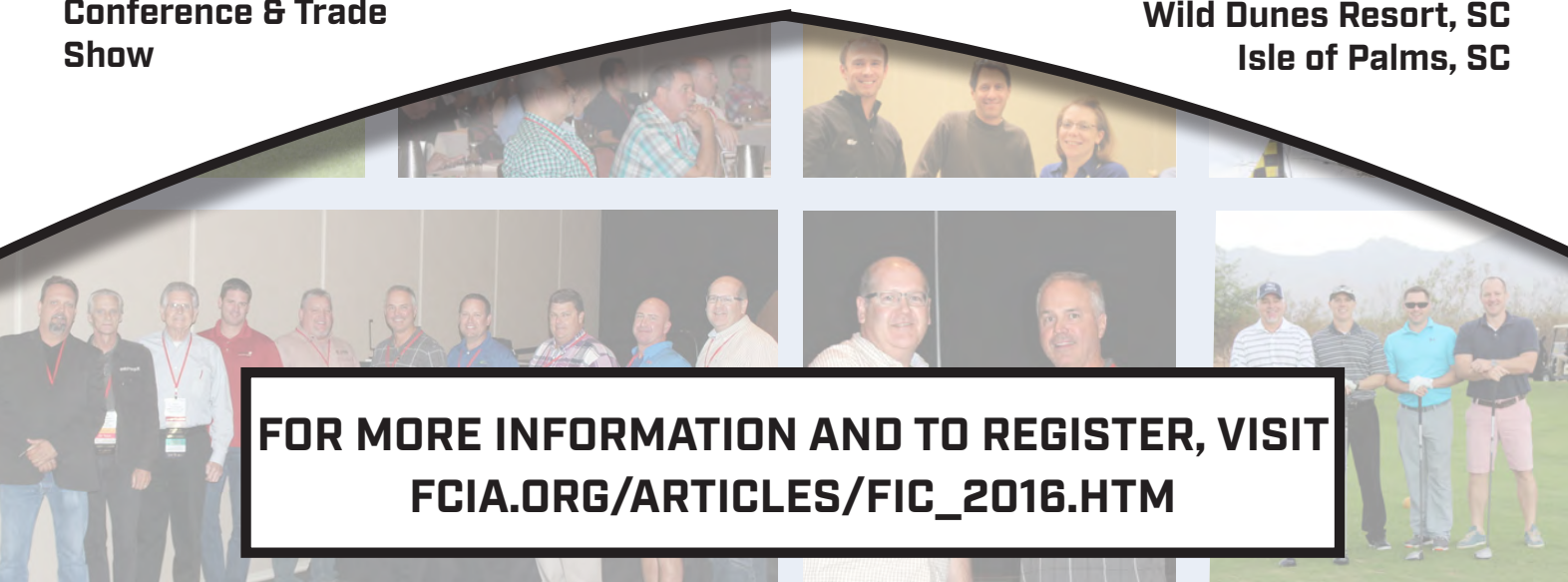
Ernie Schmidt is the Technical Service Senior Supervisor for 3M Fire Protection Products. He has worked in the 3M Fire Protection Products group for the past 13-1/2 years, was the former director of flammability testing at Omega Point Laboratories and has over 25 years' experience within the fire service field. He has earned the National Fire Protection Association designation as a Certified Fire Protection Specialist. Ernie is also a member of the UL Standard Technical Panel 1479 on fire-resistive joint and through-penetration testing, as well as a primary member of the NFPA Technical Panel on Wildland / Urban Interface.

EDITORS NOTE: See the Sidebar, "Installing Firestop Systems or Fire Caulk, that's the question," in this issue of Life Safety Digest.



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INSTALLING FIRESTOP SYSTEMS OR FIRE CAULK? THAT'S THE BIG QUESTION...

MANY HAVE HEARD ABOUT 'FIRESTOP.' WAIT, WHAT? WHAT'S FIRESTOP?

Firestop is a tested and listed SYSTEM. The SYSTEM comes from the many fire tests conducted at leading laboratories like FM Approvals, Intertek or Underwriters Laboratories. The manufacturers of these materials invest a lot of money and time ensuring that they—the materials—in fact, work for the specific application and required time, based on proven fire test procedures, such as ASTM E 814 and UL 1479 for penetrations and ASTM E 2307, ASTM E 2837, ASTM E 1966 and UL 2079 for joints.

Therefore, firestopping should be all about listed, classified firestop SYSTEMS. The SYSTEMS are an assemblage of materials—the floor or wall assembly, annular space or joint size, type, size of penetrating item and possible coverings that have been tested for a particular application, a particular hourly fire-resistance-

rating and/or smoke-resistant property. The SYSTEMS are then listed and classified by FM Approvals, Intertek or UL, and/or other credible independent third-party testing labs.

Now we come to the installation of these firestop systems, and it seems that despite the hundreds of millions of dollars invested by the manufacturers in testing, that some in the industry continue to refer to it as, “we installed the fire caulk, so the floor and wall are now rated.” Really? There’s a magic product that provides fire-ratings?

A MAGIC PRODUCT THAT FIRE RATES HOLES?

No, there is no magic product that provides fire-resistance-ratings or smoke-resistant properties. The firestop products—firestop sealants, wrap strips, collars, composite sheets, pillows, bricks, boards, mortars, silicone foams, impregnated foams—all need to be installed to the very exacting requirements of the classified and listed SYSTEM to really work. In other words, there is no such thing as “fire caulk.”

Does the worker understand that the limitations of the SYSTEMS must be followed? If not, when fire strikes, the “material,” or “fire caulk,” may not work. “If its’ red it must be okay” is not an acceptable way to firestop.

Unfortunately, materials are able to be purchased by anyone, at any place who sells it, who may or may not have limited knowledge and understanding of how they are to be installed. Those who install “fire caulk” and do not have the tested and listed systems and manufacturers installation instructions documentation, did it wrong and have met neither code nor specification requirements.

See sidebar on previous page to see our point about ‘Fire Caulk.’

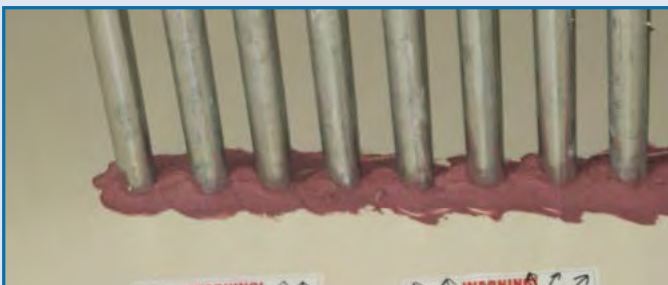
By installing firestop products to the SYSTEMS design and NOT just “fire caulking,” you can have the confidence that the integrity of the fire-resistance-rated and or smoke-resistant assemblies will be maintained.

FIRESTOP MAINTENANCE REQUIRED?

FCIA’s been promoting that firestop systems and effective compartmentation need the ‘DIIM’ of Firestopping—the Proper Design (Systems), Installation (FCIA Member,



**What if a penetrating item went into the Head of wall?
System violation. FCIA Photo**



**What if a plastic pipe was substituted later?
System Violation. FCIA Photo**



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#GREATMINDSTHINKPINK

FM 4991 Approved and UL Qualified Contractors), Inspected (to ASTM E 2174/2393 by FCIA Member Special Inspection Agencies with firestop competent employees), and Maintained—for the building life cycle.



Fire-resistance must be continuous throughout the building's life cycle. There are claims that products need no maintenance when properly installed to the tested and listed system. Who knows how to do that? The Firestop Contractor, FCIA Member, FM 4991 Approved or UL Qualified Firestop Contractor, that's who.

MAINTENANCE? YES . . .

Whether we agree with 'no maintenance ever' for a product or not, there is still a 'SYSTEM' to maintain for the building life cycle. Why? What happens when the tested and listed system gets a modification in the field that violates the system?

The product may not need 'maintenance'; however, the SYSTEM as installed may always need maintenance. For example, what happens if a conduit, fiber optic inner duct, small plastic pipe gets added to an open path device that does not have those penetrating items allowed for in the 'tested and listed system'? The firestop system may not perform as intended. Or maybe penetrating items are added at the head of wall firestop system, where the system documented by the firestop contractor at construction showed no penetrating item. Again, the firestop system may not perform as intended. In both situations, the modifications are violations to the SYSTEM.

In firestop systems, each component—fire doors and builders' hardware, fire dampers and fire-rated glazing—must be installed to the tested and listed system to keep its rating intact throughout the life of the building.

ANNUAL INSPECTION REQUIREMENTS

Therefore, inspections (surveys) need to be done annually, as required by the International Fire Code's 703.1.



IFC SECTION 703 FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. The required *fire-resistance-rating* of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling

tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with approved methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly. [703.1, 2015 International Fire Code]

Section 703.1.1 goes on to describe requirements for Fireblocking and draftstopping. In 703.1.2 Smoke barriers and smoke partitions are covered and must comply with NFPA 105. In 703.1.3, similar language exists for maintenance of fire walls, fire barriers and fire partitions in accordance with NFPA 80.

NFPA 101 also requires that maintenance take place on all fire-resistance-rated assemblies at planned intervals.

What are surveyors to inspect in existing buildings annually? An inventory of fire-resistance-rated and smoke-resistant construction has to be on-site someplace to set up the inspection. Without knowing where the fire-resistance-rated walls and floors are located, there can be no effective inspection survey performed. Additionally, without documentation about what type of firestop system was used, it is impossible to know if the continuity of fire-resistance was maintained.

EDUCATION

The FCIA, in conjunction with TJC, UL and ASHE developed the Barrier Management Symposium and has toured the ASHE regions giving a 1.5 day symposium covering all aspects of the fire-resistance-rated and smoke-resistant construction—the barrier—walls/floors, plus the features that protect the assembly—fire, smoke or fire/smoke dampers, fire-rated swinging doors with builders hardware, fire-rated rolling doors, fire-rated glazing, and of course, the penetrations and joints in the fire-resistance-rated or smoke-resistant assemblies.

CONCLUSION

Firestopping is a serious trade. All the features of the Barrier need to be installed to the tested and listed classified system to maintain the fire-resistance and smoke-resistant continuity of the wall or floor assembly.

In Firestopping, it's not about the firestop material or "fire caulk." It's about extending the fire-resistance-ratings and smoke-resistant properties of the assembly at the breaches made for service items and joints using a tried and true FIRESTOP SYSTEM.

Without the SYSTEM documentation, it's possible that someone paid for expensive caulk that might not do what's needed during a fire. 🔥

Aedan Gleeson is President, Gleeson Powers, Inc., and also a current FCIA Board Member and FCIA's 1st President. He can be reached at Aedan@GleesonPowers.com. Bill McHugh is FCIA Executive Director and can be reached at Bill@fcia.org.



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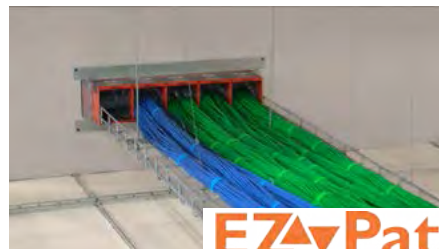
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Specified Technologies, Inc. (STI) is proud to announce the UL® Evaluation Report for firestopping products with the publication of Report No. UL ER14579-01 for the EZ-Path® Fire-Rated Pathway. The third-party Evaluation Report affirms that EZ-Path is maintenance-free because it contains no moving parts and requires no independent action to provide the fire and smoke sealing function. Therefore, it is always compliant.

The new Evaluation Report is available now for download at www.stifirestop.com or UL's Online Certifications Directory www.ul.com/database.



EZ-Path
FIRE RATED PATHWAY

FIRESTOP GOES BIM—INTRODUCING THE HILTI BUTTON FOR FIRESTOP

Introducing the Hilti Button. The new Hilti Button for Firestop automation software integrates with building information model (BIM) software platforms and automates the firestop product and UL system selection process. This eliminates the manual task of placing hundreds of firestop objects in BIM. What used to take hours of a designer's time, can now be done with the Hilti Button in just a click.

The Hilti Button automatically detects penetrations in fire-related construction and populates the appropriate firestop products and UL systems directly into BIM to save time, increase efficiency and improve quality control.

Learn more at <https://hiltibutton.us.hilti.com>



SUPERIOR PROTECTION AND PERFORMANCE IN A CURTAIN WALL SYSTEM

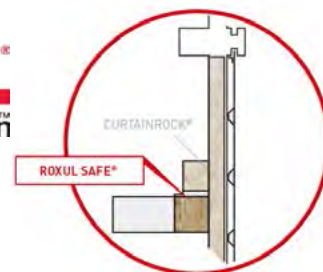
ROXUL® SAFE® and ROXUL® CURTAINROCK® work together to create a high-performance curtain wall and fire stopping system that can stand the test of time and conditions, while providing a critical line of defense in fire protection that has been UL/ULC tested and approved for perimeter fire containment.

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For more information: www.roxul.com or 1-800-265-6878

NEW GREENHECK DAMPERS PROTECT NON-CONCRETE FIRE RATED BARRIERS



Greenheck introduces the industry's first line of fire and combination fire/smoke dampers approved for installation in horizontal, non-concrete, fire rated barriers. Greenheck's DFD, FD and FSD Series dampers can now be specified for use in UL floor/ceiling design I503, which is a two-hour fire rated floor/ceiling assembly made from steel studs and gypsum board. This unique installation method greatly simplifies the difficult task designers and contractors face trying to protect duct penetrations at the top and bottom of fire-rated building shafts. Installing Greenheck's DFD, FD and FSD series dampers in a horizontal non-concrete barrier results in more usable space for the owner, more flexibility for the design professional, and greatly reduces installation time for contractors.

For more information about Greenheck products, visit www.greenheck.com or contact (715) 359-6171.

AEROCEL® EPDM INSULATION RECEIVES THROUGH-PENETRATION UL CERTIFICATIONS

Aeroflex USA's Aerocel® AC EPDM pipe insulation has been included in 12 different designs of various through penetration firestop systems typical to VRF/VRV piping installations. The UL Certifications are common installations that can be experienced in typical commercial buildings that VRF and VRV HVAC installations are most widely used in. These systems have F and T ratings up to 2 hours and 2 hours, depending on construction details. The certifications cover both masonry and typical wood or steel frame construction.

More information about Aeroflex USA's Aerocel AC EPDM flexible elastomeric insulation can be found at: <http://www.aeroflexusa.com/vrf/> 🔥

CODES AND STANDARDS NEWS

ICC'S PUBLIC COMMENT AGENDA AVAILABLE SEPT. 9.

The Public Comment Agenda and schedule for the 2016 Group B Public Comment Hearings are available at www.ICCSAFE.org. The ICC's Public Comment hearings will begin at 8:00 a.m. on Wednesday, Oct. 19, at the Kansas City Convention Center. Final changes to the codes will be decided through both in-person and online voting via ICC's cdpACCESS. Voting takes place shortly after

the conclusion of the public comment hearings. For this final vote at the hearing and through the online voting via cdpACCESS, only ICC's voting governmental members vote.



FCIA PUBLIC COMMENTS AT ICC'S PUBLIC COMMENT HEARINGS

The ICC's 'Group B' code cycle is wrapping up in October. At this hearing, the International Existing Building Code, International Energy Code, International Fire Code and other codes are developed. FCIA has two proposals that are aimed at improving the section

703.1 on Fire-Resistance-Rated and Smoke-Resistant Assembly maintenance and management.

Below are the two FCIA public comments to F113-16, a proposal put forward by the Fire Code Action Committee (FCAC) of the ICC.

F113-16 FCIA PUBLIC COMMENT—PROPONENT, BILL KOFFEL, KOFFEL ASSOCIATES, REPRESENTING FCIA

701.6 Owner's responsibility. Required The Owner shall maintain an inventory of all required fire-resistance-rated and smoke-resistant construction, and the construction included in Sections 703 through 707 and such construction shall be visually inspected by the owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be inspected by the owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

Commenters (FCIA) Reason: During the Committee Action Hearings, the FCIA proposed that the owner maintain

drawings that identify the location of the construction that is required to be inspected by this section. There was opposition to the word 'drawing' due to a concern that in some states the drawings may need to be prepared by a registered design professional. The use of the word "inventory" allows for the information to be provided in multiple formats; lists, spreadsheets, drawings or some other media that denotes where the construction is in the building. Maintaining an inventory is critical to the owner, the fire code official, and anyone who might be providing the inspection service. How do any of these parties know what needs to be inspected and documented, or that the inspections have been performed (as required by this section), if an inventory of such construction is not maintained and available?

F113-16 FCIA PUBLIC COMMENT—PROPONENT, BILL KOFFEL, KOFFEL ASSOCIATES, REPRESENTING FCIA

703.1 Maintaining protection. Materials and firestop systems used to protect membrane and through-penetrations in fire-resistance-rated construction and

construction installed to resist the passage of smoke resistant shall be maintained. The materials and firestop systems shall be securely attached to or bonded to the

construction being penetrated with no openings visible through or into the cavity of the construction. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturers installation instructions.

Commenter Reason: The proposed change coordinates the IBC for those systems for which the design number is known. If the owner cannot produce the design number, the base inspection criteria would still apply, inspecting for visible openings through the system or into the cavity.

RETIRED INDUSTRY LEADER AND LONGTIME ICC SUPPORTER HONORED

The Fire & Life Safety Section of the International Association of Fire Chiefs (IAFC) and the International Code Council (ICC) jointly presented its highest honor, the 2016 Excellence in Fire and Safety Award, to retired industry leader and longtime ICC supporter, Jim Tidwell.

The Excellence in Fire & Life Safety Award recognizes men and women each year who have dedicated themselves to saving lives and property through the development of codes, fire-prevention practices and leadership techniques.

"Jim's dedication to the profession, ICC, public safety and fire prevention made him an industry icon, and this honor reflects the lasting impact his presence has had on the profession," said Code Council Chief Executive Officer Dominic Sims. Jim is credited with the adoption of the *International Fire Code* in 42 states at the state or local level, and in Washington, D.C.

FCIA will be at the ICC's Public Comment Hearings and Annual Business Meeting, the International Accreditation Services Board of Directors Meeting and the ICC Expo working for better fire-resistance-rated and smoke-resistant construction 'DIIM.' We believe that if the building is designed and installed/built right, inspected and maintained, it will protect the building's occupants when called upon by fire or smoke. This belief has been FCIA's motivation in the code development process throughout the history of the association.

Tidwell, who retired in 2009 as Deputy Senior Vice President of Government Relations with ICC, began his tenure at the Code Council in 2003, and is credited with developing the association's fire services programs, and then helping guide the transformation of the Government Relations function into a team of experts from multiple disciplines.



CIA AT NFPA 101/5000 MEETINGS



During June's NFPA Fire Protection Features Committee Meeting, FCIA made a motion that "L" Ratings be required for smoke barriers in buildings. The motion passed at this committee level. There is still a committee vote and final action at the NFPA 2017 Annual Meeting in

Boston before it becomes a requirement. The language is similar to the International Building Code where an L Rating of <50cfm/100sf/wall area or <5cfm/penetration.

Additionally, FCIA was able also to have markings of barriers by type pass the committee. The type would be fire barrier, smoke barrier, smoke partition, etc. The Illinois State Fire Marshals Office's Catherine Stashak, FCIA and Kurt Roeper, ASSA ABLOY, worked to clarify differences between NFPA 101 and NFPA 5000, which also passed.

FCIA had support on all items from the International Firestop Council's code consultant, Tony Crimi, as well. 🔥

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INDUSTRY NEWS

FIRE TESTING LAB OPENS IN INDIA

Underwriters Laboratories, jointly with the JGI Group, India, has recently opened a state-of-the-art fire testing laboratory in Kanakapura, India. The UL Jain Fire Laboratory at JGI Global campus offers various fire suppression product testing to customers in India, the Middle East and the ASEAN regions. Additionally, the facility will offer fire safety educational programs and will support research and development activities in the region.



JGI Group will operate the facility and UL will provide technical resources contributing to training, equipment and leadership. The facility is additionally qualified under UL's Witness Test Data program, allowing JGI, under supervision from UL, to generate test data in support of UL Mark Certification. UL will further facilitate year-round training and certification programs, both web-based and offline, along with workshops for industry, academia and government agencies.

JOINT COMMISSION ELIMINATES PLANS FOR IMPROVEMENT



The Centers for Medicare & Medicaid Services (CMS) has asked the Joint Commission to make several changes to its Statement of Conditions process, and the Joint Commission will no longer consider hospital Plans for Improvement

(PFIs) starting August 1. Instead, all life safety deficiencies will need to be corrected within 60 days, although a time-limited waiver process will be available through CMS regional offices. George Mills, MBA, FASHE, CEM, CHFM, CHSP, director of engineering with the Joint Commission's Department of Engineering, announced the major changes at the ASHE Annual Conference this July.

Under the new process:

- Deficiencies will need to be corrected within 60 days of being identified unless the CMS regional office approves an extension.
- All requests for extensions will be handled by CMS regional offices. However, the Joint Commission will allow facilities to submit requests and receive a receipt to show they are in the pipeline waiting for an extension.
- The Joint Commission will not review open Plan for Improvement (PFI) items, and PFIs will not be a part of final reports.

The changes will be effective August 1. The Joint Commission is an accrediting organization that has deemed authority from CMS and must meet CMS requirements. Mills said the PFI process can still be used as an internal management process.

ASHE'S FOCUS ON COMPLIANCE

Fire and smoke barriers and their protective opening devices in hospitals and other health care facilities are key elements of the structure. They protect occupants from the products of fire and combustion and are used for the horizontal evacuation of those in compromised areas. These barriers and their protective opening devices form effective compartmentation that allows defend-in-place strategies to be safely employed.

A review of the 2014 Joint Commission survey data indicates key areas of noncompliance to Standard LS.02.01.30 in the areas of penetrations within fire and smoke barriers and fire and smoke barrier door failures.

Standard LS.02.01.10 includes many related issues, so Focus on Compliance resources available for these standards can be found on the ASHE and FCIA websites. Within the Barrier Penetrations section on the ASHE website is FCIA's DIIM Presentation.

FCIA's Barrier Management Symposiums have made a difference. Healthcare building owners and managers are understanding how to buy this specialized service. Why? Firestop Systems are much more than 'Fire Caulk.'

For specific mitigation strategies for Barrier Penetrations, visit www.ashe.org/compliance/ls_02_01_10/barrier-penetrations.shtml.

JOINT COMMISSION SURVEYORS ASK 3 NEW QUESTIONS

The Joint Commission Life Safety Surveyors are now asking three new questions before starting building tours:

- What type of firestopping is used in the facility? (This is asking what type of firestop systems are used as a part of the facilities barrier management system.)
- What is the organization's policy regarding accessing interstitial spaces and ceiling panel removal?
- Which materials are used (glutaraldehyde, orthophthalaldehyde (OPA), peracetic acid, etc.) for high-level disinfection or sterilization?

FCIA has been working with the American Society of Healthcare Engineers (ASHE) and The Joint Commission to educate facility directors, surveyors and also the industry about Firestopping and Firestop SYSTEMS.

ASHE recommends, "For more information and resources on barrier management or other compliance topics, visit ASHE's Focus on Compliance project, a collaboration with the Joint Commission. Check out this focus on compliance as it takes the reader to the method to restore fire-resistance to breaches—FCIA's Firestop DIIM Presentation."

NFPA FIRE PREVENTION WEEK COMING THIS OCTOBER

Each year, the National Fire Protection Association (NFPA) sponsors campaigns to help communities stay safe. Fire Prevention Week, the national campaign the group has officially sponsored since 1922, will kick off this October 9-15 with a week-long focus on fire prevention. This year's campaign, "Don't Wait—Check the Date! Replace Smoke Alarms Every 10 Years," represents the final year of the organization's three-year effort to educate the public about basic, but essential, elements of smoke alarm safety.

FCIA celebrates October with continued efforts to promote the 'DIIM' of Firestopping—the process that leads to proper Design, Installation, Inspection and Maintenance

of firestop systems for better reliability and protection from installed life-safety passive fire- and smoke-resistance systems. The group also believes and promotes that firestop contractors bring specialized knowledge to the life-safety firestop and effective compartmentation trades.



OSHA UPDATES EYE AND FACE PROTECTION STANDARDS IN FINAL RULE



The Occupational Safety and Health Administration has published a final rule that updates requirements for personal protective equipment for workers in construction and other industries. The final rule, which became effective April 25, 2016, reflects current national consensus standards and ensures that workers can use up-to-date eye and face protection.

The rule updates references in OSHA's Eye and Face

Protection Standards to recognize the ANSI/ISEA Z87.1-2010, Occupational and Educational Personal Eye and Face Protection Devices, while deleting the outdated 1986 edition of that same national consensus standard. OSHA is also retaining the 2003 and 1989 (R-1998) versions of the ANSI standard already referenced in its standard. In addition, the final rule updates the construction standard by deleting the 1968 version of the ANSI standard that was referenced and now includes the same three ANSI standards referenced above to ensure consistency among the agency's standards.

INTERTEK & EVALUATION REPORTS

Code acceptance has come a long way with several accredited certification agencies, like Intertek, providing a process which gives manufacturers a path to demonstrate compliance and gain approval from Authorities Having Jurisdiction (AHJs). To keep up with the evolving market, Intertek has updated **The Evolving Code Evaluation**

Process white paper, first published in 2013. Search the words in bold above to get to the link to download the white paper free from Intertek.

Intertek

INSTITUTE PARTICIPATES IN WHITE HOUSE FORUM ON SMART FINANCE FOR DISASTER RESILIENCE

The White House Council on Environmental Quality hosted a forum on innovative insurance, mortgage, tax and finance-based strategies to support pre-disaster mitigation and community resilience. The White House Forum on Smart Finance for Disaster Resilience brought together White House and Administration officials, representatives from federal, state and local government, mortgage and insurance representatives, as well as codes and standards developers and others interested in promoting mitigation. Among those participating were representatives from the National Institute of Building Sciences (NIBS).

The purpose of the event was to highlight new

investment approaches and incentive programs that are currently being deployed in communities, and to explore partnerships and opportunities to leverage additional resources in the future. These new approaches, which reflect many of the concepts covered in the white paper, **Developing Pre-Disaster Resilience Based on Public and Private Incentivization**, developed by the NIBS **Multi-hazard Mitigation Council (MMC)** and **Council on Finance, Insurance and Real Estate (CFIRE)**, include: tax credits, insurance premium reductions, resilience bonds, mortgage rate incentives and layered incentive approaches.

FCIA'S FIC GEARING UP FOR CHARLESTON



The FCIA Firestop Industry Conference & Trade Show (FIC) is ramping up and getting ready to open at Wild Dunes Resort in Isle of Palms, SC this November 8-11. FCIA's FIC 2016 is perfect for those who Design, Install, Inspect or Maintain passive fire- and smoke-resistance firestop and effective compartmentation systems.

The four-day event provides a perfect mix of engaging educational sessions, practical and real-world technical solutions, networking opportunities and interactive outings for those looking to lay the foundation for their professional success. Plus, FIC features the only Trade Show in the world focused exclusively on Firestop and Effective Compartmentation products and technical answers.

To learn more, visit www.fcia.org/articles/FIC_2016.htm.

FCIA SYMPOSIUMS EDUCATE AUDIENCES WORLDWIDE

The Firestop Contractors International Association is bringing their Firestop & Effective Compartmentation Symposia to a variety of locations around the world to educate on the key issues and best practices facing the Firestop & Effective Compartmentation industry.

Join FCIA this September 20-22 in Edmonton, AB for the FCIA Firestop & Effective Compartmentation 'DIIM' Symposium Canada. The three-day event features the FM & ULC Firestop Exams including a full day of education to prepare, as well as a day-and-a-half symposium filled with critical education sessions for industry professionals. Architects, Specifiers, Code Officials, Fire Marshals and others may attend for free. Contractors, Special Inspection Agency personnel and Manufacturers attend for a fee.

Then, FCIA leadership will head to the Middle East for a series of FCIA events. Watch for the FCIA Fire & Smoke Barrier Firestop & Effective Compartmentation 'DIIM' Symposium Doha to The Oryx Rotana in Doha, Qatar.

Interested Firestop Contractors and members of the Department of Civil Defence and Municipal Affairs, as well as Special Inspection Agency personnel, will hear from a qualified faculty presenting on topics covering the 'DIIM' of Firestopping. Those interested in pursuing the FM 4991 and UL Qualified Contractor Programs or the IAS AC 291 Accreditation program will have the opportunity to sit for FCIA Education for the Firestop Exams then write the FM and UL Firestop Exams.

After that, FCIA will travel to Le Meridien Dubai Hotel & Conference Centre for the FCIA International Building Code Firestop & Effective Compartmentation 'DIIM' Symposium Dubai. The program will spotlight sessions on Code updates, Inspection and Installation of Firestop systems and How to Maintain installed systems. The event will also facilitate the FM & UL Firestop Exams and education sessions.

For more information on upcoming FCIA programs in your area, please visit www.fcia.org/articles/events.htm.

FCIA'S WEBINAR SERIES SPARKS INTEREST

Over the past three years, FCIA's Educational Webinar Series has expanded to cover a wide-range of topics: from Firestopping to how to correctly patch gypsum wallboard, Inspection Standards to Perimeter Fire Containment Systems, and also the proper Design, Installation, Inspection and Maintenance for Fire-Resistance-Rated and Smoke-Resistant Assemblies.

With each new session, interest continues to grow, bringing together FCIA Members, Code Officials, Healthcare

and other Building Owners and Managers from hundreds of "sites" around the world for the critical education needed for improved fire- and life-safety systems. Presentation content generally lasts 1-2 hours followed by a Q&A session which can last for another hour.

Need to get Continuing Education Unit (CEU) hours? Then attend these monthly FREE sessions from FCIA. For a complete list of upcoming programs, visit www.fcia.org/articles/FCIAWebinarSeries.htm.

CAMPUS FIRE SAFETY FORUM BRINGING EDUCATION TO MESA

The Campus Fire Forum will be heading to Mesa, AZ this November 1-4 at the Hilton Phoenix/Mesa with the only national conference focused exclusively on **campus fire- and life-safety issues**. The event addresses issues that are critical to fire- and life-safety both on- and off-campus. Attendees have the opportunity to learn from experts and

interact with campus fire-safety professionals, as well as talk with exhibitors showcasing a variety of products and services. FCIA is honored to present a program at this key event. FCIA's Trade Show Booth also is front and center at the Exhibition.

ENGAGING AND INTERACTIVE EDUCATION PROGRAM SET FOR BUILDING INNOVATION 2017 CONFERENCE

The National Institute of Building Sciences (NIBS) has recently released a program schedule to engage the entire building community and foster collaboration for their Building Innovation 2017: The Institute's Fifth Annual Conference and Expo, to be held January 9-12, 2017, at the Mandarin Oriental in Washington, DC.

The Building Innovation 2017 Planning Team came up with a schedule that supports the theme of the event—*Collaborating for a High-Performance Future*—and the goals of the Institute, while providing an exciting, balanced, interactive and educational event. Educational sessions, taking place over three days of the Conference, cover a wide range of topics that are relevant to the industry as a whole and will unite the community in developing solutions for the built environment.

Plan to be where Science meets Design. Find out more at www.NIBS.org.

2016 NASFM ANNUAL CONFERENCE REVIEW

State Fire Marshals and their top deputies from around the United States gathered July 1th–21st in Albuquerque, New Mexico for the National Association of State Fire Marshals (NASFM) Annual Conference.

Attendees came together to learn the newest techniques and latest information consistent with the NASFM mission to protect human life, property and the environment from fire and related hazards, as well as to learn how to improve the efficiency and effectiveness of their operations.

During the event, the NASFM general membership re-elected Louisiana State Fire Marshal H. "Butch" Browning to serve as President, with Florida State Fire Marshal Julius Halas and Tennessee State Fire Marshal Gary West elected to serve as Vice-President and Secretary-Treasurer respectively. Vermont State Fire Marshal Michael Desrochers was elected to serve on the Board, joining Texas State Fire Marshal Chris Connealy, Maryland State Fire Marshal Brian Geraci and Indiana State Fire Marshal Jim Greeson. Bill Degnan, New Hampshire State Fire Marshal will continue to advise the Board as Immediate Past President.



State Fire Marshal-only Forum. NASFM Photo



TIM MATTOX HAS JOINED STI AS A SENIOR ENGINEERING MANAGER

Specified Technologies, Inc. (STI) recently announced the addition of Tim Mattox to their Engineering Team. Tim joins STI bringing over 22 years of real world firestop experience, starting with a firestop manufacturer and then progressing to a role as a fire test engineer for third-party test lab. Most recently, Tim worked in firestopping and air barrier. He has served as an officer for many years on the International Firestop Council (IFC) and brings with him extensive experience with fire testing, codes and standards development. Tim holds an engineering degree from Oklahoma State University.

TYMAN PLC/AMESBURYTRUTH™ ACQUIRES BILCO®

Tyman PLC, the London, England-based parent company of AmesburyTruth™, a manufacturer of window and door components for residential and commercial applications based in Edina, MN, has entered into a definitive agreement to acquire The BILCO Company. Bilco is a supplier of specialty access products for residential and commercial markets including fire-rated doors, automatic smoke vents, as well as fire and smoke curtains. The terms of the agreement became effective July 1, 2016, at which time Bilco became a wholly owned subsidiary of AmesburyTruth.

Bilco will continue to manufacture commercial and residential access products from its existing facilities. The company has a strong presence in North America and select international markets. 🔥



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*- Robert Kleimhagen, Jr., CFM,
Facilities Strategic Planning & Program Manager,
Pennsylvania Turnpike Commission*



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FCIA YEAR INDUSTRY CALENDAR

SEPTEMBER 2016

September 5-7

Oman Fire, Safety & Security Expo (OFSEC)
Muscat, Sultanate of Oman
www.muscat-expo.com

September 7-9

CSI CONSTRUCT
Austin, TX
www.constructshow.com

September 11-13

Canadian Healthcare Engineering Society (CHES) Annual Conference
Vancouver, BC
www.CHES.org

September 20-21

FCIA 'DIIM' Symposium Canada
Edmonton, AB
www.fcia.org/articles/Canada2016.htm

OCTOBER 2016

October 4-6

FCIA Fire & Smoke Barrier Firestop and Effective Compartmentation "DIIM" Symposium
Doha, Qatar
www.fcia.org

October 5-7

International Facility Managers Association (IFMA) World Workplace
San Diego, CA
www.worldworkplace.ifma.org

October 11-13

UAE Fire & Smoke Protection Symposium
Location: Dubai
www.fcia.org

October 15-25

ICC Annual Conference and Public Comment Hearings
Kansas City, MO
www.ICCSAFE.org

October 23-24

Middle East Health, Safety & Security Forum
Dubai, UAE
<http://www.hse-forum.com/>

October 25-26

ASTM E06 Meetings
Orlando, FL
www.ASTM.org

NOVEMBER 2016

November 1-3

Campus Fire Safety Forum
Mesa, AZ
www.campusfiresafety.org

November 8-11

FCIA Firestop Industry Conference & Trade Show
Isle of Palms, SC
www.FCIA.org/articles/FIC_2016.htm

November 29-Dec. 2

CONSTRUCT Canada
Toronto, CA
www.constructcanada.com

JANUARY 2017

January 22-24

Intersec
Dubai, UAE
www.intersecexpo.com

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THE ADVENTURES OF APEX THE FIRESTOPPER™

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APEX THE FIRESTOPPER
TALKS ABOUT THE "INS AND OUTS"
OF INTUMESCENT CAULK...

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ABOUT SOME PRETTY BIG IDEAS...
WELL I'M HERE TO TELL YOU THAT THE
SMALL ONES CAN BE IMPORTANT TOO!
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MC-1000 BY
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IN FOR A CLOSER
LOOK! COME ON -
FOLLOW ME!



HERE I AM BETWEEN A ROCK AND
A HARD PLACE... ACTUALLY I'M
BETWEEN A WALL AND INSULATED
PIPE! SEE HOW INSIGNIFICANT,
UNIMPORTANT, AND PASSIVE I
SEEM? THAT'S BECAUSE I'M NOT
NEEDED... YET.

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BUT AS
SOON AS FLAMES
APPEAR...



... I GAIN SUPERPOWERS AND SWELL TO COMPLETELY
FILL THE GAP LEFT BY THE BURNING INSULATION!



IT'S A TIGHT FIT...



...SO, THE FIRE STOPS HERE!®



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