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Life Safety

DIGEST

WINTER 2020

The History of Firestopping
Insulating To Manage Three Process Challenges
in the Industrial Environment
Don't Fail Building Inspections
Maintaining Protection
-ICC and NFPA Codes Demand It

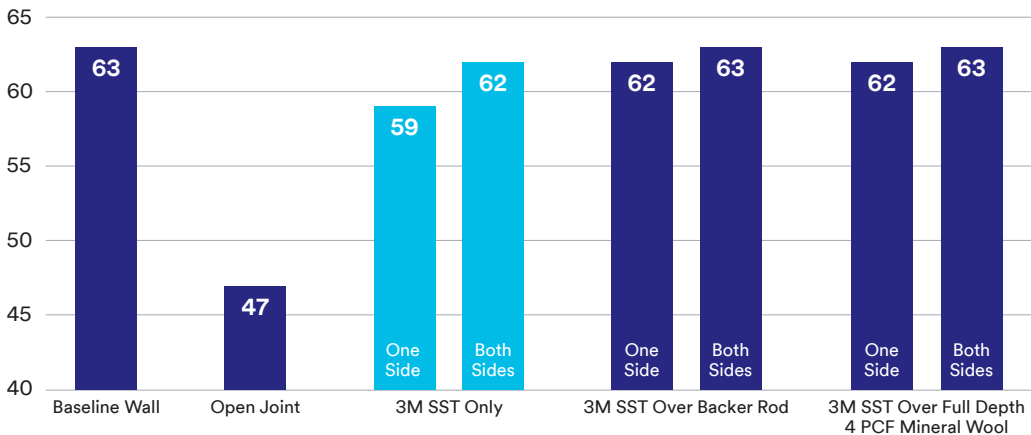


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COVER STORY

WINTER 2020

11 INSULATING TO MANAGE THREE PROCESS CHALLENGES IN THE INDUSTRIAL ENVIRONMENT

By Doug Fast, Owens Corning

From oil and gas refineries to petrochemical production facilities, there are many processes that are at the heart of industrial operations. As a network of pipes transport gases and liquids that power industrial processes, life safety is always a paramount concern.

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EDITOR'S MESSAGE

As 2020 draws to a close, the *Life Safety Digest* staff has been reflecting on all that has happened this year. Despite all the global changes to the way people live, work, and interact, we find that we really do have a lot to celebrate this year.

With all four issues of *Life Safety Digest* this year, we've had great educational content on various issues concerning fire-resistance-rated and smoke-resistant assemblies used in buildings to protect people, property, and continuity of building operations. This content has helped educate the people and companies involved in all aspects of building safety - from the 'D'esign stage all through 'M'aintaining Protection - on the importance of passive fire protection so people can work, live, and more in safer buildings worldwide.

Further promoting the mission of *Life Safety Digest*, FCIA Board President Ben Urcavich challenged those involved in fire-resistance-rated and smoke-resistant compartmentation and structural fire-resistance to spread the word that maintaining protection in existing buildings keeps people safe. While emergencies that call upon fire and smoke protection are not regular occurrences, they do happen. That's why existing buildings need to have fire-resistance-rated and smoke-resistant assemblies maintained, which is the focus of this issue.

During the life cycle of a building, installed tested and listed systems might get modified, rendering the modified system an unknown performer. When firestop products are installed to the Manufacturer's installation instructions and tested and listed system specs, the installation results in an installed firestop or fire-resistance-rated or smoke-resistant SYSTEM. When these systems are modified, they can no longer be guaranteed to perform as intended, making the maintenance of installed systems critical to fire and life safety.

In firestopping, this could be adding new penetrating items that do not match the listed system on file. For fire-dampers, maybe a conduit penetrated the annular space covered by the angles - which is not in the listing. Fire door violations such as large kick plates, attachments, incorrect fasteners, unlisted hardware on a listed fire-rated door, and holes in fire-resistance-rated assemblies that have gypsum board ceilings as a membrane all might violate the rated assembly - rendering the performance of the assembly questionable.

We hope you enjoy this issue of *Life Safety Digest* and its articles on protecting these important assemblies. While there are those that state 'it's only a wall or floor', we know our lives depend on their proper performance. We need the rest of the world to be educated to respect fire-resistance-rated and smoke-resistant assemblies just as much as we need building owners to maintain protection. Thanks for reading! 🔥

Sincerely,



William McHugh
Publisher

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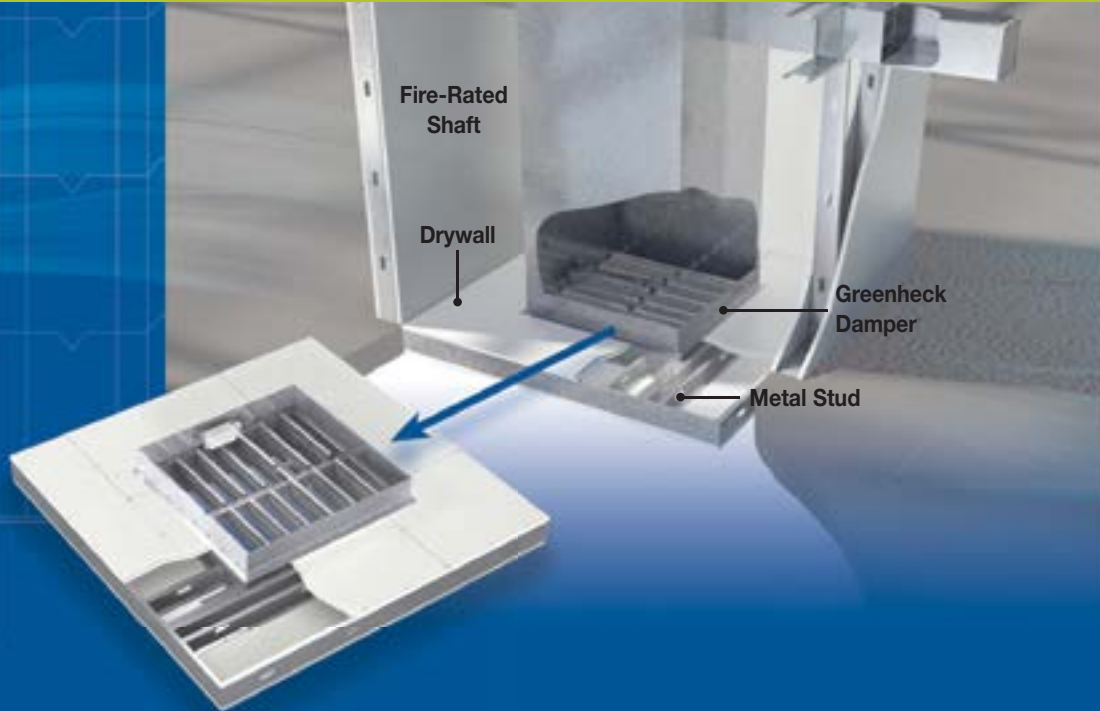
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THE HISTORY OF FIRESTOPPING

This is the first part of a two-part article which will explore the history of firestopping. To set the stage for this article, let's explore the meaning of the word firestopping. Based on the various definitions and requirements of the International Building Code (IBC) and NFPA 101, *The Life Safety Code* (LSC), the application for firestopping relates to the protection of penetrations covered in Section 714 and Chapter 8, respectively. These codes - IBC and LSC - detail the methods of protecting penetrations in or through fire-resistance-rated (FRR) building elements and assemblies. Typical penetrating items include electrical conduit, cables and outlet boxes, plumbing pipes, devices such as recessed washer supply and drain boxes, and mechanical services such as air ducts not required to be protected with dampers.

The industries supplying and installing the firestopping products have expanded the scope of the word firestopping to include the protection of other breaches within fire-resistance-rated construction, including the protection of joints and voids covered in Section 715 and Chapter 8 of the IBC and the LSC, respectively. Examples of joints and voids which are protected with firestopping include fire-resistant joint systems installed in or between fire-resistance-rated assemblies, and perimeter fire containment systems installed between the edge of a FRR floor and a non-FRR curtain wall.

This first part of the article will address the history of firestopping as it relates to the protection of penetrations. The second part of the article will address the history of firestopping as it relates to the protection of joints and voids.

Unlike the need to protect door openings, which goes back over a century, the fire protection engineering community was slow to pick up on the need to protect penetrations. The first firestopping was done for the marine industry in the 1960s. These systems were both crude and robust by today's standards. Typically, steel sleeves were mechanically secured or welded to bulkheads and steel decks, pipes or cables were passed through the sleeve, and the ends of sleeves were plugged as shown in *ILL. 1*. Not long thereafter, the nuclear power industry also began firestopping using various proprietary methods.



ILL. 1. Marine Bulkhead Firestop System. Abesco Fire Image

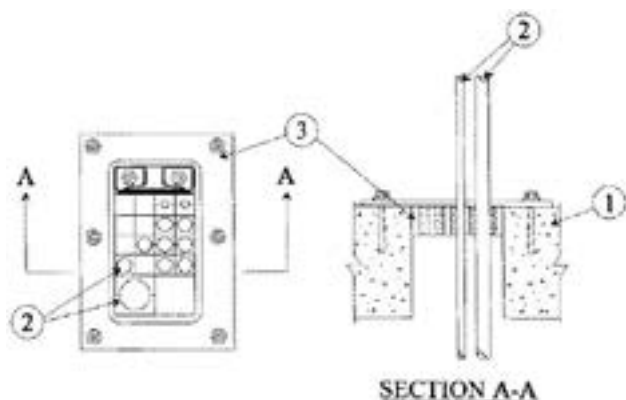
The first published code requirements relating to firestopping which were identified were contained in the 1973 Standard Building Code (SBC) published by the Southern Building Code Congress International. The SBC required

"All openings around exposed pipes or power shafting shall be filled with approved non-combustible material, or shall be closed off by close-fitting metal caps at the ceiling and floor line, and on each side of a wall or partition."

Although primitive by today's standards, the SBC did recognize the need to protect penetrations.

The Brown's Ferry Nuclear Plant fire on March 22, 1975 became the defining moment in the development of the firestopping requirements we know today. The temporary firestopping used by this facility, consisting of a foamed plastic covered with a fire-retardant coating, was a contributing factor to a near nuclear disaster. It was obvious from this fire that the fire protection community needed to develop a science-based test procedure and code requirements for protecting penetrations of FFR construction.

Shortly after the Brown's Ferry fire, Underwriters Laboratories (UL), in conjunction with several manufacturers, began developing a new test procedure at UL's Northbrook, IL test facility. The intent was to develop a test methodology which complimented the test standards for the fire-resistive performance of the basic barriers, ASTM E119, NFPA 251 and UL 263, but also accounted for the nuances of penetrations. Adaptations included, among other things, the required furnace size, the differential pressure between the furnace chamber and the lab environment, the method of measuring temperatures on the firestop systems, the use of the hose stream test in lieu of loading horizontal test samples, and the conditions of acceptance.



ILL 2. Multiple Cable Transit Firestop Device. UL Image

The first listing to this new test method was published for Nelson Electric in 1976 and covered a multiple cable transit firestop device, as shown in ILL 2. The device consisted of a steel frame mechanically secured to a wall, and elastomeric plugs sized to fit the specific cables passing through the system. The following year, UL published its first listing of a firestop system using silicone foam. By December, 1980, UL had 23 published firestop systems and four firestop device listings published in its Building Materials Directory. The majority of these early systems were intended to address the needs of the nuclear industry. As time evolved, however, the developing industry recognized the need to protect penetrations in commercial construction.

Simultaneous to the development of the test method and tested and listed systems, the code writers were developing code requirements for penetrations based on the evolving technology. The 1979 Uniform Building Code (UBC), published by the International Conference of Building Officials (ICBO), established the first performance-based requirement for protection penetrations. Keeping in mind UL had not yet published the new test method on firestopping, ICBO used a combination of performance-based requirements and a prescriptive description of the test method to describe their requirements. The UBC required

"Walls or partitions, and floors or ceilings, may be penetrated provided penetrations are firestopped using an approved material securely installed and capable of maintaining its integrity when subjected to the time-temperature curve prescribed in UBC Standard No. 43-1 (UL 263 / ASTM E119) for the specific assembly."

The UBC went on to describe requirements for the installation of outlet boxes and noncombustible pipes. The requirements for noncombustible pipes read

"Occasional noncombustible pipes may be installed within or through floors, provided they are protected so as to prevent the movement of hot flames or gases."

Ultimately, UL and ASTM published standards for fire testing firestop systems between late 1982 and early 1983. The ASTM and UL standards were identified as ASTM E814, *Standard Test Method for Fire Tests of Through-Penetration Fire Stops* and UL 1479, *Fire Tests of Through-Penetration Firestops*. Some years later, in 1991, ICBO published their version of the standard, UBC 43-6, *Fire Tests of Through-Penetration Fire Stops*. This standard was later renumbered as UBC 7-5.

With the publication of the test standards and the exponential increase in the number of tested and listed systems, the code writers now had a test method to reference in the code, as well as a reasonable number of tested and listed systems which demonstrated compliance with the code. In the early 1990s, the three legacy codes were all revised to reference the newly published test standards. As an example, the 1991 UBC required

"Penetration through walls which require protected openings (doors) and floors shall be protected by a through-penetration firestop system tested to UBC Standard 43-6 (UL 1479 / ASTM E814) having an F and T rating".

As with today's codes, there were exceptions under which the T Rating was not required.

The 1991 UBC went on to describe an exception to the above requirements for noncombustible penetrating items, which was a refined version of the requirements previously applied to all penetrating items by the 1979 UBC. That exception read

"Noncombustible penetrating items not larger than 4 in. diameter or 16 sq in. may penetrate the walls and floor, providing the annular space is filled with a material which will prevent passage of flames and hot gasses sufficient to ignite cotton waste when subjected to a UBC Standard No. 43-1 (UL 263 / ASTM E119) time-temperature curve under a min 0.01 in. water column."

This exception still exists in a very similar format in the 2021 International Building Code.

The late 1980's and 1990's brought about many evolutionary changes in the two test standards and the certification programs associated with firestop systems. Most of the changes simply refined the test procedure originally developed by UL and are significant only to the test labs; however, several changes were truly significant to the entire industry.

In 1991, UL renumbered its 500 or so published firestop systems using a new alpha-alpha-numeric numbering system. The new numbering system instantly allowed users to identify the attributes of the system based on the numbering system. It also gave UL the opportunity to standardize the language of the systems to facilitate electronic searches. This numbering system is still in place today.

Another significant development which occurred in 1993 was the inclusion of a new optional L (Leakage) Rating in UL 1479. The new L Rating quantifies the (air) leakage through the firestop system under specific pressure and temperature conditions as shown in *ILL 3*. The new L Rating was added in response to provisions in the NFPA 101 Life Safety Code requiring penetrations through smoke barriers to resist the free passage of smoke and hot gasses. Ultimately, the 2006 IBC and the 2018 LSC were revised to add quantified requirements for leakage through firestop systems in smoke barriers or any other barrier where quantified smoke-resistant properties are desired.



ILL 3. Horizontal Air Leakage Test. © 2020 UL LLC. Reprinted with permission.

The next significant development with the standards was the inclusion of requirements for environmental exposure testing of intumescent firestopping materials

in UL 1479 in August of 2000. The requirements call for subjecting separate samples of the firestopping materials to an elevated temperature of 158°F for 270 days and high humidity of 97-100% and 95°F for 180 days. After exposure, the materials are subjected to expansion pressure and expansion factor testing.



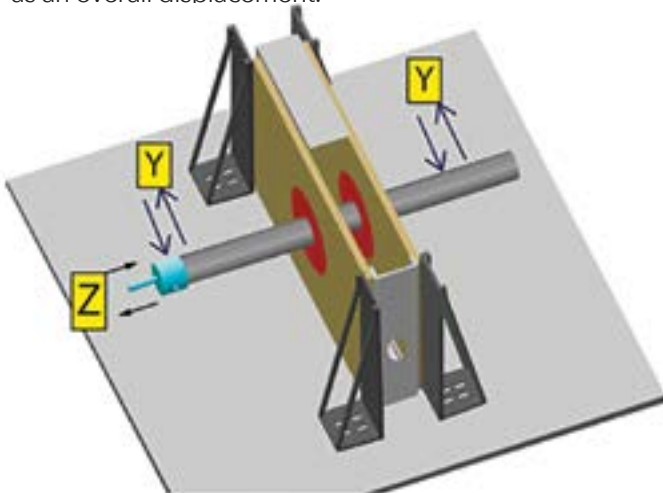
ILL 4. Water Leakage Test Vessel. UL Image

In 2005, UL was asked to consider the addition of a new optional W (Water) Rating in UL 1479. The intent of the W Rating is to demonstrate if the firestop system has the ability to prevent the passage of water and maintain its fire performance after exposure to the water. For a Class 1 rating, which is typically applied to commercial construction, the firestop system is subject to a 3 ft. water column for 72 hours as shown in *ILL 4*. During this time, the firestop system cannot permit any leakage of water. After the system is dried, it is subjected to the standard fire exposure and hose stream tests of UL 1479 where the F and T Ratings are established.

During the early development of ASTM E814 and UL 1479, the focus was on through-penetrations. The generally held consensus was that a membrane-penetration could be protected using one-half of a through-penetration. While true in some cases, it certainly is not true in all cases. For example, this is not true for systems which use a sleeve. As such, both ASTM and UL updated their standards to incorporate specific methodology for testing membrane-penetrations in vertical assemblies in 2009 and 2015, respectively. ASTM E814 includes the methodology for testing typical pipe penetrations, whereas UL 1479 includes the methodology for both pipe penetrations and outlet box penetrations.

The last significant development relating to the protection of penetrations came with the introduction of a new optional M (Movement) Rating. The M Rating relates to the ability of the firestop system to accommodate relative movement of the penetrating item with respect to the barrier penetrated. The methodology for moving the penetrating item has been incorporated into a new

ASTM Standard, ASTM E3037, *Standard Method for Measuring Relative Movement Capabilities of Through-Penetration Firestop Systems*. This standard addresses movement in the direction parallel to the supporting construction (Y dimension) and movement perpendicular to the supporting construction (Z dimension) as shown in **ILL 5**. The movement in the Y dimension is expressed as a percentage of the minimum annular space of the field installation. The movement in the Z dimension is expressed as an overall displacement.



ILL 5. Penetrant Movement Directions. ASTM Image

As Part I of this article documents, although the firestopping industry is relatively young in comparison to the other aspects of fire-resistive construction, it has developed rapidly over the last 40+ years thanks to the efforts of the manufacturers, industry trade associations, testing labs, code writers, contractors, designers, and code officials. From 1980 until today, the number of tested and listed systems has expanded from approximately 25 to well over 7000, giving designers and contractors many options for meeting their firestopping needs.

Part II of this article will address the history of the methods of protecting joints and voids, as required by Section 715 of the IBC and Chapter 8 of the LSC.

Rich Walke is the Technical Director of Creative Technology Inc., providing consulting and training services for the fire protection and code enforcement communities, including The McHugh Company and the Firestop Contractors International Association. Previously, Rich had been employed by UL for 43 years, focusing on fire-resistance-rated construction and the protection of breaches in those assemblies. During that time, Rich was involved in testing, standards development, code development, and providing technical assistance and training to architects, engineers, contractors, and code officials.

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INDUSTRIAL PROCESSES

Insulating to Manage Three Process Challenges in the Industrial Environment

From oil and gas refineries to petrochemical production facilities, there are many processes that are at the heart of industrial operations. As a network of pipes transport gases and liquids that power industrial processes, life safety is always a paramount concern.

Volatile hydrocarbons may travel next to caustics flowing adjacent to pipes containing flammable vapors, demanding the highest measures of life safety.

Beyond the risk of fire, industrial processes are also inherently noisy, presenting a noise fatigue issue for workers and neighboring facilities. Additionally, the vapors and liquids prevalent in industrial processes introduce the risk for piping and equipment problems resulting from corrosion under insulation.

This article discusses how industrial pipe insulation can defend against three common challenges in process environments.

INDUSTRIAL CHALLENGE #1: ADDRESSING FIRE AND LIFE SAFETY

Between 2011 and 2015, municipal fire departments in the U.S. responded to an estimated average of 37,910 fires at industrial or manufacturing properties each year, with annual losses from these fires estimated at 16 civilian deaths, 273 civilian injuries, and \$1.2 billion in direct property damage. 1 Fire protection system design and material specification for industrial facilities requires careful consideration due to the nature of the facility and the materials processed.

Mineral wool insulation helps support a passive approach to life safety, as it protects the pipes carrying liquids and gases across process lines without dependence on any mechanical activation to deploy. Once it is properly installed, it stays in place to support life safety, even if power is disrupted or mechanisms fail to activate.

In extreme testing conditions, mineral wool does not burn – even when exposed for 4 hours at temperatures up to 2,000°F. In the industrial setting, specifiers must keep in mind a materials' contribution to life safety, as well as its structural integrity during a fire.

Used to insulate process pipes, mineral wool insulation supports both process advantages. Its non-combustible nature allows more time for occupant egress, while supporting structural integrity by insulating assets from extreme heat.

With a piping system, adequate insulation will increase the time it takes for contents flowing through the pipe to heat up when exposed to extreme temperatures in a fire. Compared to other insulating materials that start to melt or deteriorate around 1,300°F, mineral wool insulation is fire-resistant to temperatures up to 2,000°F.

From a structural integrity perspective, industrial assets, such as a tank storing volatile contents, will heat more slowly if properly insulated. Once temperatures reach 1,000°F, a steel structure will lose about half its strength. Adding mineral wool insulation to vessels and equipment can help support structural integrity and provide fire-resistant properties.

INDUSTRIAL CHALLENGE #2: MITIGATING NOISE

Insulation brings acoustic benefits to a very noisy environment. Considering mineral wool's acoustic properties during the design stage can help mitigate industrial noise fatigue. The noise propagation path most common in industrial settings relates to sound transmission through pipes.

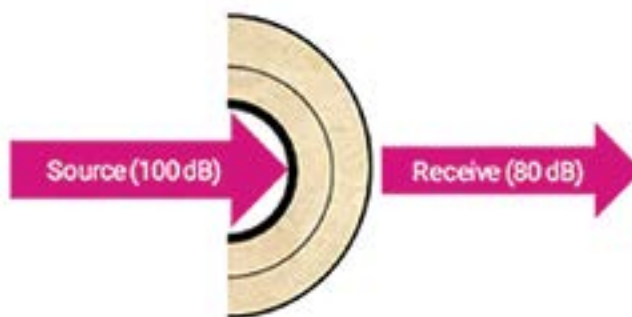


Figure 1 illustrates how pipe insulation achieves a significant reduction in sound. Owens Corning image

PIPE ACOUSTICS

ISO 15665

Two methods of meeting compliance to ISO 15665:

Prescriptive-based

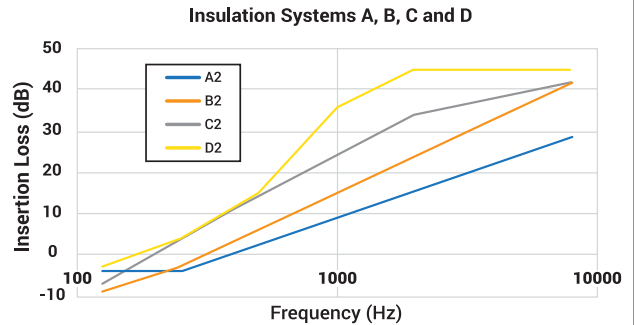
Meeting the minimum material requirements as listed by ISO 15665

CLASS	DESCRIPTION	VALUE
A	Min. thickness of porous layer	50mm
	Max. stiffness of porous layer	$2,0 \cdot 10^6 \text{ N/m}^3$
	Min. mass per unit area of metal cladding	4,5 kg/m ² (e.g. 0,6mm steel plate)
B	Min. thickness of porous layer	100mm
	Max. stiffness of porous layer	10^6 N/m^3
	Min. mass per unit area of metal cladding	6,0 kg/m ² (e.g. 0,8mm steel plate)
C	Min. thickness of porous layer	100mm
	Max. stiffness of porous layer	10^6 N/m^3
	Min. mass per unit area of metal cladding	
	For nominal pipe diameters <300mm	7,8 kg/m ² (e.g. 1,0mm steel plate)
For nominal pipe diameters > 300mm	10,0 kg/m ² (e.g. 1,3mm steel plate)	



Performance-based

Using a system tested to meet insertion loss requirements of ISO 15665



Above: ISO 15665 provides a prescriptive approach for managing insertion loss. Classes D and C tend to be the most commonly used approaches in industrial settings. Owens Corning image

Variance in pipe size affects the insulating strategy used to address noise. Insertion loss refers to sound transmission through the pipe surface and insulating system. As the range of pipes in industrial facilities may vary widely in terms of diameter, pipe size becomes part of the calculation when insulating to minimize insertion loss. Installing a combination of insulation cladding and jacketing around pipes can help manage the insertion loss that occurs as liquids and gasses flow through pipes.

Standard ISO 15665, *Acoustic insulation for pipes, valves and flanges*, provides standard guidelines for managing insertion loss based on three pipe sizes, providing a prescriptive approach to insulation and jacketing materials that can mitigate noise issues. Class A, B, C, and D relate to the performance of a material.

Class A specifies 2 inches of insulation, plus metal jacketing around pipes.

Class B specifies 4 inches of insulation, plus metal jacketing around pipes.

Class C specifies the 4 inches of insulation in Class B, plus mass-loaded vinyl under the metal jacketing.

Class D specifies mass-loaded vinyl between each layer of insulation and the outside jacketing. Developed by a global energy company, this measure is used as a prescriptive source for ultra high-performing insertion loss strategies.

Beyond the insulation thickness and jacketing metrics prescribed by ISO 15665, factors besides pipe size should be considered as well. These factors include airflow resistivity, density, and the stiffness of the insulating material; all of which will influence noise. Mineral wool manufacturers have evaluated combinations of insulating approaches to address insertion loss in varied industrial environments.

INDUSTRIAL CHALLENGE #3: PREVENTING CORROSION UNDER INSULATION (CUI)

Finally, the extreme temperatures in industrial structures place stress on equipment. Repeated shutting down of equipment and shorter process cycles - such as what occurred in 2020 when the global pandemic prompted many companies to shutter and redirect production resources - present a risk for corrosion under insulation (CUI).

This problem can arise from moisture accumulating on pipes during shut down and evaporating as equipment is heated up to operating temperature and repeatedly cooled off. As equipment cools, surface temperatures can allow liquid and vapor moisture to condense between the insulation and pipes, thereby facilitating corrosion. As equipment heats up and boils off surface moisture, corrosive materials, such as chlorides, remain on the surface. Sustained exposure results in the accumulation of contaminants and more corrosion formation. Unfortunately, CUI is often difficult to detect until an advanced problem becomes visible as a leak.

CUI is one of the biggest concerns in industrial operations, but it is particularly concerning for processes where materials flow through piping at high temperatures. The potential consequences CUI presents include reduced lifetime of the asset, increased risk of leaks, shutdowns, and potential injury risks for personnel working in production facilities.

The most prevalent cause of CUI is moisture that works its way into the insulation system. Improper installation or damaged jacketing can allow moisture to condense between the insulation and the exterior surface of the pipe. Excessive energy consumption/loss may also suggest a problem demanding inspection. Consulting



Dmitry Kalinovsky/Shutterstock.com

equipment maintenance logs can confirm the condition and performance of equipment prior to equipment being shut down.

There are a few general best practices for powering systems up following a shut-down. Facilities that produce high-risk products, such as volatile and reactive gases, should conduct more rigorous and frequent system inspections.

When periodically visually inspecting process pipes, look for signs of leakage and compromised jacketing material. Visible signs of steam, smoke, or leaking of either moisture or process products, such as refrigerants, demand further inspection. Beyond suggesting the presence of CUI, the products flowing through industrial pipes could indicate leaking or wicking into insulation, posing a potential fire risk.

Proper design of industrial piping insulation systems can help build a better fire and life safety system for industrial workers, protect the process through mitigating CUI, and provide energy savings at the same time. Specifiers should consider what insulation is used to resist thermal transmission, noise, and fire in their material selection choices in these industrial environments. Even the small details are essential to protecting life safety.

CONCLUSION

Insulating industrial pipes and developing a system for periodically checking these systems - such as routine visual inspections - can support life safety and yield additional benefits. These practices can help mitigate common challenges in the industrial environment such as noise fatigue and the risk of CUI. 🔥

Doug Fast is a professional engineer (PE) and technical leader for Owens Corning's Industrial Mineral Wool product portfolio. He has more than 20 years of experience in the insulation material industry working in product testing, technical services, and new product development. He can be reached at Doug.Fast@owenscorning.com.

Reference: 1.Campbell, R. (2018). Fires in Industrial and Manufacturing Properties. National Fire Protection Association. <https://www.nfpa.org/News-and-Research/Fire-statistics-and-reports/Fire-statistics/Fires-by-property-type/Industrial-and-manufacturing-facilities/Fires-in-US-Industrial-and-Manufacturing-Facilities>.



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DON'T FAIL BUILDING INSPECTIONS

What happens when recessed lighting installation is complete, and then it is later discovered that the openings had to be fire-resistance-rated?



CGI Image courtesy of Tenmat Inc / Thunderstorm FX

Knowledge about the regulations regarding recessed lights in fire-resistance-rated ceilings can help avoid costly mistakes and legal actions. There seems to be a great deal of confusion about what exactly fire-resistance-rating means, where it is applicable, and the solutions available to meet the building code requirements.

The widespread adoption and understanding of codes requiring continuity of fire-resistance-rated assemblies throughout the world has made this subject more and more relevant to contractors, builders, code officials, architects, building owners and managers, and homeowners. But instead of decreasing confusion over the issue, continuous changes in state Code adoption legislation and increased demand for fire-resistance-rated, code compliant products and systems have far outpaced the availability of education on the topic.

WHAT DOES FIRE-RESISTANCE-RATING ACTUALLY MEAN?

A fire-resistance-rating typically states the duration for which a building element or an assemblage of materials can withstand a standard fire-resistance exposure test. A fire-resistance-rating is usually given to an assembly consisting of various building materials that can resist the exposure of a standardized fire exposure for a set amount of time, or it may contain a variety of other criteria involving other evidence of functionality or fitness for purpose.

Fire-resistance-ratings were developed to evaluate the performance of building elements and assemblies during an intense fire exposure and can be applied to wall, floor, or roof systems, also known as horizontal assemblies.

Municipalities across the United States - through adoption of the International Building Code - require fire-resistance-rated ceilings, floor/ceilings, floors, and walls for certain commercial, industrial, institutional, residential, and other occupancies buildings.

Most of the mandatory fire-resistance-ratings for occupancies where people sleep or are not mobile occur in multi-story structures, such as apartment buildings, hospitals, or hotels. The fire-resistance-rating is used for floor/ceiling assemblies that provide separation for the levels directly above and below a residence or other space.

The 2015 version of the International Building Code addresses this issue explicitly in section 714.5.2, **Membrane Penetrations**:

714.5.2 Membrane penetrations. Penetrations of membranes that are part of a horizontal assembly shall comply with Section 714.5.1.1 or 714.5.1.2. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

In addition, this section of the code includes several exceptions. The following exception applies to listed luminaires (light fixtures). Please refer to the entire Code language and exceptions which apply to other types of membrane penetrations

Ceiling membrane penetrations by listed luminaires (light fixtures) or by luminaires protected with listed materials, which have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

To meet this membrane protection code requirement, the ceiling must serve as an unbroken, continuous fire-resistance-rated horizontal assembly for a specific period of time.

In fire-resistance-rated wallboard applications, a typical assembly might have one layer of gypsum wallboard used on the underside of a floor/ceiling assembly that has been tested in accordance with the ASTM E 119 or UL 263 requirements for the hourly fire-resistance-rated assembly. In some cases, this could be a 1-hour fire-resistance-rated assembly; however, the time requirement may be greater than 1-hour, depending on the occupancy, height, and area of the building.

For example, fire-resistance-rated assemblies in assisted living facilities, hospitals, and hotels can require a 2-hour or higher fire-resistance-rated horizontal assembly. This is very important to remember when selecting appropriate fire-resistance-rated solutions

Installing recessed fixtures in these fire-resistance-rated assemblies and still maintaining the proper fire-resistance-rating of the ceiling system can be a challenge. As soon as the contractor installing the recessed lighting fixtures cuts a breach in the ceiling to install the light fixture, the fire-resistance-rating of the ceiling assembly is compromised. If the fire-resistance-rating of the ceiling membrane is not being restored, these openings in the ceiling would allow flames and smoke to spread in the unfortunate event of

a fire into the cavity area. In order to maintain the fire-resistance-rating and meet the code requirement for the building, the horizontal assembly must somehow have its fire-resistance restored after holes have been cut for the fixtures.



CGI Image courtesy of Tenmat Inc / Thunderstorm FX

DOES IC-RATING = FIRE-RESISTANCE-RATING?

Expensive mistakes are often made when an airtight or "Insulation Contact" (IC) fixture is assumed to be fire-resistance-rated. It is important to note that IC-rating DOES NOT stand for fire-resistance-rating.

Similarly, it's a false assumption to believe that modern low-profile LED lights do not require any fire protection.

IC-rated light fixtures were designed and tested for direct contact with combustible materials, including overhead structural material and blow-in thermal insulation. Cellulose blow-in thermal insulation has an ignition temperature of over 750°F. IC-rated fixtures have a thermal switching device that is set to trip if the shell of the fixture reaches 194°F. The thermal switch on the IC-rated light ensures that the fixture will not reach a temperature high enough to catch the insulation on fire. The critical point is that "IC" only states that the fixture was constructed in such a way as to avoid *starting* a fire, whereas "fire-resistance-rating" addresses an assembly's performance *in the event a fire has started and is in progress*.

IC-rated light fixtures, as well as low-profile LED lights, by themselves do not provide fire-resistance to the breach made in the fire-resistance-rated assembly for the light fixture. In reality, they are extremely poor flame barriers. Most of them are constructed either from aluminum or light sheet metal that moves, warps, or breaks down rapidly when in direct contact with fire and will not provide fire-resistance for any length of time. In case of a fire, the fixture will break down and the fire can now easily spread to the cavity above the ceiling, then possibly to the occupied space above.



CGI Image courtesy of Tenmat Inc / Thunderstorm FX

A fire-resistance-rated barrier will help to keep the fire contained, giving the building occupants and emergency personnel additional time to evacuate the building. To meet the building code and to maintain the required fire-resistance-rating, all non-fire-resistance-rated lights need additional treatment to restore the continuity of the fire-resistance-rated assembly.

SOLVING THE PROBLEM

There are several different solutions for fire-resistance-rated ceiling membrane applications with a diverse range of prices, approvals gained from fire-testing, and complexity. A common solution is prefabricated Fire-Resistance-Rated Light Fixtures, which have a variety of proven fire-resistance testing but are also the costliest choice.

To avoid using these expensive lights, many construct boxes made from gypsum wallboard to surround the lighting fixture. This is very labor-intensive and may increase the cost of installation beyond budget limits, in addition to possibly not having a fire-resistance-rating.

Metal enclosures are also becoming an increasingly popular choice in the fire-resistance-rating dilemma. However, these are not UL-classified as a fire-resistance-rated assembly and so are not suitable for applications where fire-resistance is required.

A popular solution that is UL-classified are Fire-Resistance-Rated Light Covers. These covers are suitable for various recessed light fixture sizes and luminaires, and they comply with building code requirements for continuous fire-resistance in horizontal assemblies. The covers are widely accepted by code officials throughout the entire United States, and possibly in other countries as well. One- and two-hour Fire-Resistance-Rated Light Covers are available from a variety of manufacturers at several different price points. They are proven to act as a suitable fire-resistance-rated horizontal assembly when called upon by fire and smoke.

IN THE END

To conclude, choosing the right recessed light fixture housing to accomplish the correct fire-resistance-rating is not as easy as many designers, contractors or builders may believe. An "IC" label on a recessed light fixture does not imply that the light is also fire-resistance-rated and installing a low-profile LED downlight does not eliminate the need for proper fire protection over the ceiling opening.

Lighting professionals and consultants with experience in buildings requiring fire-resistance-rated assemblies are the best source for suitable solutions and can help contractors, builders, architects, building owners, and managers avoid costly mistakes. After all, fire-resistance-rated enclosures are critical to the continuity of fire-resistance as mandated by the building codes and fire and life safety.🔥

Marco Kristen has been involved in the fire-resistance-rated construction industry for more than a decade and is currently serving as Business Manager for North America at TENMAT Ltd. The bilingual manager has gained significant experience in leadership, discipline, and teamwork during his military service and later as a collegiate athlete, playing Division 1 Football. Marco holds both a Bachelor of Science in Management and Marketing, as well as a Master's Degree in Business with a focus in Finance and International Business from the University of Delaware. He can be reached at marco@tenmatus.com.

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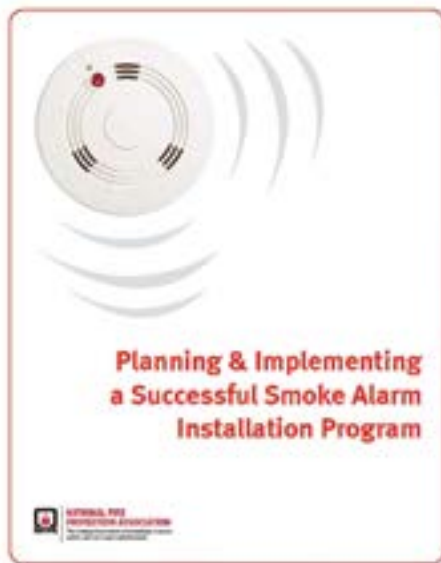
MAINTAINING PROTECTION - ICC & NFPA CODES DEMAND IT

This Article is the first in a series of articles to provide a renewed interest in maintaining protection for people, property, and structure resilience. Watch for additional articles about the protection of existing buildings in other codes worldwide in upcoming issues.

Fire-resistance-rated building elements and assemblies are a vital part of a total fire protection strategy for a building. Total fire protection requires that all built-in safety features need to work as intended. Where required, these critical assemblies need to provide protection for the building's life cycle - or lives and property are at risk.

It is critical that passive fire protection and effective compartmentation, detection and alarm systems, and sprinkler suppression systems, in conjunction with the education of building occupants and visitors, work when called upon by fire or smoke. Each of these items needs to be properly 'D'esigned, 'I'nstalled, 'I'nsppected, and 'M'aintained ('DIIM') for them to work.

The International Fire Code, NFPA 1 Fire Code, and NFPA 101 The Life Safety Code (LSC) each address maintaining protection through various means and methods.



NFPA Image



Jason Nelson by Freeimages photo



Audrey Popov/Bigstock.com image.

WHAT NEEDS TO HAVE PROTECTION MAINTAINED?

Fire-resistance-rated fire-separations, barriers, exterior walls, fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions all need to have their continuity maintained.

The building codes also set the stage for using firestopping, fire-resistance-rated (fire-resistive) joint systems, rolling or swinging fire doors, fire-rated glazing, and fire and smoke dampers to protect breaches in fire-resistance-rated construction. Likewise, these items need to be maintained based on the Fire Code requirements.

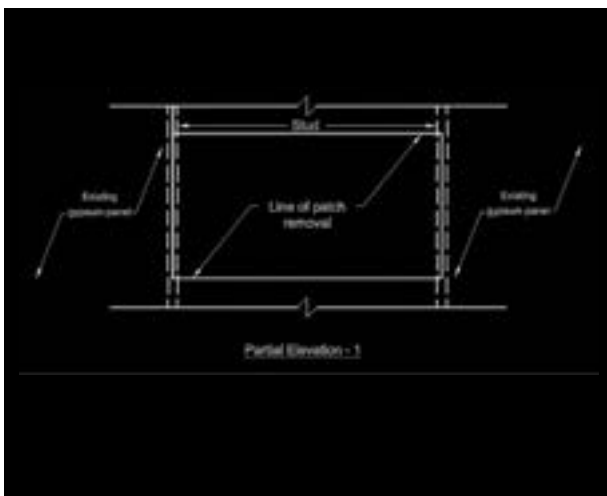


Fire-testing horizontal gypsum board. USG Photo

Beyond the need to protect breaches within fire-resistance-rated construction, the code also contains requirements for continuity around the perimeter of the construction. For example, the IBC provides a continuity clause in each fire-resistance-rated assembly section. The continuity sections even go so far as to mention joints specifically. A sample from the fire-barrier section is below:

707.5 Continuity. Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space above a suspended ceiling. Joints and voids at intersections shall comply with Sections 707.8 and 707.9. [IBC 2018, 707.5]

The point is that fire-resistance needs to be there not only once a new structure is finished, but also in an existing building in the event of a fire - when we need it most.



Patching fire-resistance-rated gypsum wallboard requires special treatment to withstand pressures from fire and the host stream part of the fire test. USG image

FIRE CODES AND MAINTAINING PROTECTION

The Fire Codes around the world communicate to existing building owners and managers the minimum requirements for protection of those that occupy, visit, sleep, and live in buildings. The Fire Codes are actually quite clear about maintaining protection, as well as who is responsible for the protection.

First, the International Fire Code (IFC) provides direction to building owners that is very specific.

International Fire Code 2018 - SECTION 701 - GENERAL

701.6 Owner's Responsibility- The owner shall maintain an inventory of all required fire-resistance-rated construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707. 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 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. [IFC 2018, 701.6]



Fire-resistance inventory includes life safety drawings, manufacturers' instructions, listings, and safety data sheets. FCIA Photo

INVENTORY

The first direction from the IFC is for the building owner and manager to keep a fire-resistance inventory. Without an inventory of items that need maintaining, consistent maintenance of the installed protection becomes impossible.



Labels or Tags make system lookup easy.
Fire Stop Technologies, Inc. Image

Many of the industry's leading organizations believe that the inventory consists of: up-to-date life safety drawings; tested and listed system designs; manufacturers' product data; installation, repair and maintenance instructions; plus, any safety data sheets for the products provided in the original construction and ongoing work. This documentation sets up the requirements for maintaining protection.

The inventory is derived from the as-built documentation assembled by the various construction disciplines that installed the fire-resistance-rated wall and floor assemblies, structural protection, firestopping, fire doors, fire-rated glazing, and fire and smoke dampers.

Division 1, Section 01-78-39 of the specifications provide the General Contractor direction to dig into the associated CSI/CSC MasterFormat divisions for specific information to provide the building owner and manager for ongoing maintenance.

The NFPA 101 The *Life Safety Code*, also has requirements for maintaining protection in existing buildings.

4.6.12.1 *Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature is required for compliance with the provisions of this Code, such device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature shall thereafter be continuously maintained in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the AHJ. [NFPA 101-2018, 4.6.12.1]*

Even Section 703.3 of the International Property Maintenance Code dictates maintaining protection of fire-resistance-rated assemblies.

703.3 Maintenance. *The required fire-resistance rating of fire-resistance-rated construction, including walls, firestops, shaft enclosures, partitions, smoke barriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and joint systems, shall be maintained. Such elements shall be visually inspected annually by the owner and repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. [IPMC 2018, 703.3, emphasis added]*

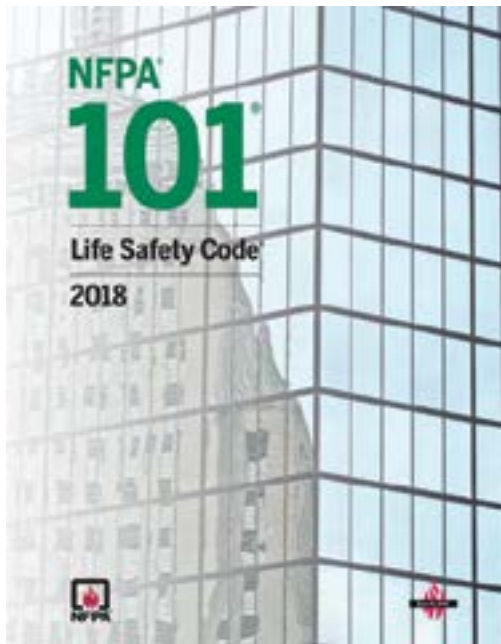


ICC Image

WHAT CONSTITUTES VISUAL INSPECTION?

Annual Visual Inspection is exactly what the name implies. Access is provided to a concealed area on an annual basis, whereupon a person who understands the complexity of fire-resistance-rated assemblies needs to visually verify if the assembly that was installed originally still exists or has been damaged, altered, breached, or penetrated.

What is needed to complete this inspection? The tested and listed system design is needed to visually verify that the existing condition reflects the original installation.



NFPA Image

WHO PROVIDES 'ANNUAL VISUAL INSPECTION'?

The IFC is very direct in providing specific actions to be done. The actions are directed at the building owner, who can use in-house building maintenance personnel or subcontract the work to Barrier Management Services (BMS) providers. Each entity - the in-house staff and BMS providers - need to prove competence, as can be seen in other sections of the code. Either way, the building owner and manager is responsible for maintaining protection.

Then, the NFPA 101 *Life Safety Code* goes further to state that a responsible person be involved in this inspection, as well as the repairs as stated:

4.6.12.5 Maintenance, inspection, and testing shall be performed under the supervision of a responsible person who shall ensure that testing, inspection, and maintenance are made at specified intervals in accordance with applicable NFPA standards or as directed by the AHJ. [NFPA 101-2018, 4.6.12.5, emphasis added]

Barrier Management Services providers are specialty contractors, similar to Specialty Firestop Installation Contractors. Lists of Barrier Management Services providers can be found in various places, such as www.FCIA.org in the Barrier Management Services Section.

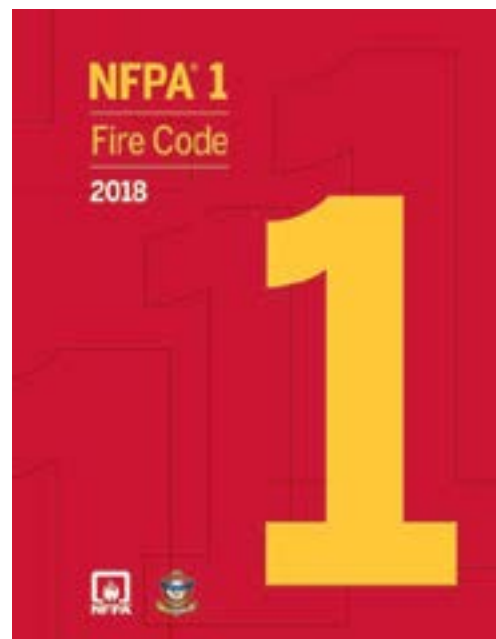
In-house staff, separate from qualified BMS provider companies, can gain responsible person status a variety of ways. One such way is by attending a Barrier Management Symposium, hosted by FCIA, ASHE, The Joint Commission, and UL or by viewing all the video content from the

BMS Symposium curriculum online. In these sessions, experts were assembled to provide generic education for healthcare facility directors and staff. Each segment is divided into the various fire-resistance and smoke-resistant disciplines, with three 20-minute sessions on each. The virtual education sessions can be accessed at www.FCIA.org or by visiting www.ASHE.org.

NFPA 1 REQUIREMENTS FOR MAINTENANCE

Consistent with NFPA 101, *Life Safety Code* and the International Fire Code, the NFPA 1 *Fire Code-2018* also provides direction to the building owner and manager to maintain protection of fire-resistance-rated and smoke-resistant assemblies in buildings:

12.3.3.1 Required fire-resistive construction, including fire barriers, fire walls, exterior walls due to location on property, fire-resistive requirements based on type of construction, draftstop partitions, and roof coverings, shall be maintained and shall be properly repaired, restored, or replaced where damaged, altered, breached, penetrated, removed, or improperly installed. [NFPA 1-2018, 12.3.3.1, emphasis added]



NFPA Image

Note the yellow highlight. The language is very similar to what is found in the International Fire Code's Section 701; but, NFPA 1 adds two more items to the list. The language referring to "removed or improperly installed" fire-resistive construction adds further direction to the building owner and manager the importance of properly maintaining and repairing, restoring, or replacing fire-resistance-rated and smoke-resistant assemblies.

Section 12.3.3.1 of NFPA 1 also adds maintaining roof coverings on buildings. Why roof coverings? It is possible that the 1871 Great Chicago Fire might have had something to do with this addition. Blowing winds carried burning embers from building to building, spreading fires from the rooftop down into the building. This was in addition to fire spread from exterior wall to exterior wall and through-openings. As a result of these fires, fire tests such as UL 790, *Standard Test Method for Fire Tests of Roof Coverings*, and ASTM E108, *Standard Test Methods for Fire Tests of Roof Coverings*, were developed.

CONCLUSION

Ask a building owner or manager, or maybe even homeowner, "Do you change the batteries or service the fire/smoke detectors at specified intervals?" YES, is the answer. Query a building owner if their property has a sprinkler suppression system operations and maintenance budget to keep the building safe, and you'll hear a resounding YES.

At a seminar presented in 2017, FCIA asked, "How many have an annual line item budget for maintaining protection provided by fire-resistance-rated and smoke-resistant building elements assemblies?" Only 1 in 5 hands went up. At the same conference in 2018, all the hands went up.

Detection and alarm systems are easily seen, recognized, and maintained. Sprinkler suppression systems are also easily seen. But passive fire protection in the form of fire-resistance-rated and smoke-resistant assemblies - al to protecting people in buildings. It is that Total Fire Protection that's needed to keep people safe for the building's useful life.🔥



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CODES AND STANDARDS NEWS

ICC CDPACCESS OPENS

The International Code Council (ICC) kicked off its 2021/2022 Code Development Cycle for the 2024 International Family of Codes a while ago with the formation and meetings of the Code Action Committees (CACs). Over the past year, the CACs met virtually to debate code

issues brought up to the various disciplines that the CACs cover. In early November, the ICC opened its CDPAccess code development platform for the public to file code development proposals. Check it out at CDPAccess.com.

ICC CACS MEET VIRTUALLY

ICC's Fire CAC, meeting virtually in Spring/Summer/Fall 2020, has finished discussing a lot of topics, but still has more work to do. Topics under discussion include Performance Based Structural Fire Design, Occupiable Rooftops for activities or restaurants, etc., revising

T-Ratings, Fire-Resistive Joints sections, and much more. Because there are crossovers to the building code from the fire code, the ICC's Building CAC has also discussed Occupiable Rooftops.

ICC ANNOUNCES VIRTUAL CODE DEVELOPMENT

The ICC announced that the 2021 Spring Committee Action Hearings (CAH) have been moved to a virtual platform instead of a face-to-face meeting due to COVID regulations and concerns for attendees and staff. The nature of the CAH process is the interactive Committee discussions, so it will be

an interesting experience to participate live at these virtual sessions. ICC has said that the Committee will be at a location with staff practicing safe social distancing for the Committee Action Hearings.

NFPA 101/5000 CODE DEVELOPMENT PROCESS

The next edition of the NFPA 101, *The Life Safety Code* and NFPA 5000, *Building Construction and Safety Code*, is the 2021 version of the publications. With the 2023 Revision Cycle open for First Draft Public inputs now, NFPA 101/5000's update process is underway.

The Second Draft Public Comment Closing date is May 31, 2022, with a report posted by Feb. 28, 2023. Then, the Notice of Intent to Make a Motion (NITMAM) closing date is March 28, 2023, which is then posted by May 9, 2023 and heard at the 2023 NFPA Technical Meeting in June 2023.

NFPA's process is a bit different than ICC's. The NFPA development process uses Public Inputs as code change proposals that are debated and voted on by Technical Committees. NFPA's Public Input closing date is June 1, 2021, with the First Draft Report posted by March 22, 2022.

FCIA participates at the NFPA Fire Protection Features Committee, which manages Chapter 8, Features of Fire Protection.



INDUSTRY NEWS

UL QFCP GROWS TO 100 LOCATIONS

UL recently announced at the FCIA-ASTM Fire-Resistance-Rated & Smoke-Resistant Assemblies & Existing Buildings Virtual Event that the number of UL Qualified Firestop Contractor Program locations worldwide has passed 100. FCIA's founding Board of Directors—and all FCIA Boards since 1998—have supported the FM 4991 Approved & UL-ULC Contractor Programs

with enthusiasm because it results in Specialty Firestop Installation Contactor companies with a quantified qualification to prove competence. The program has expanded rapidly as a result of FCIA and UL's team effort to make buildings safer through the proper 'D'esign, 'I'nstallation, 'I'nspection and 'M'aintaining Protection - or 'DIIM' - of firestopping.

FM 4991 PROGRAM CELEBRATES 20 YEARS

In November 2000, FM Approvals announced the introduction of the FM 4991 Standard for the Approval of Firestop Contractors third-party accreditation program at FCIA's Firestop Industry Conference in Boston. That first year, roughly 52 people took the FM Firestop Exam, beginning a 20-year history of the FM Approvals

accrediting Specialty Firestop Installation Contactor companies with the FM 4991, Standard for the Approval of Firestop Contractors program. With almost 100 locations worldwide being FM 4991 Approved, the program is making a global difference in fire and life safety in buildings.

UL ANNOUNCES HONORS

Recently, UL's Bruce Johnson, Regional Manager, Regulatory Services, who is active at code development at UL, was invited to join the William Henry Merrill Society under the title "Distinguished Member of Technical Staff". FCIA friends who also were honored in the past include Matt Schumann, Rich Walke, and Luke Woods, 'for significant and sustained contributions to the fulfillment

of UL's public safety mission for a safer, more secure, and more sustainable today and tomorrow'. Another friend of FCIA's, Dwayne Sloan, is a Corporate Fellow, a yet higher level in the society. Congratulations to Bruce. It is great to see people with passion for fire and life safety in buildings be recognized.

INTERNATIONAL FIRESTOP COUNCIL STATEMENT ON CPVC AND FIRESTOPPING

The International Firestop Council recently released a statement on the compatibility of firestop products with CPVC. The statement from the firestop manufacturers about firestopping and CPVC piping is in line with the following passage at the Plastic Pipe and Fittings Association's website, <https://www.ppfahome.org/page/CPVC>

*"Don't Do's For All Construction -
Do not use petroleum or solvent based sealants,
lubricants, or fire stop materials.*

As with all compatibility issues, verify compatibility with the specific manufacturers of the firestop materials that might come in contact with CPVC, as well as the CPVC Manufacturers listed at the PFFA website.

NFPA FIRE PROTECTION RESEARCH STATISTICS

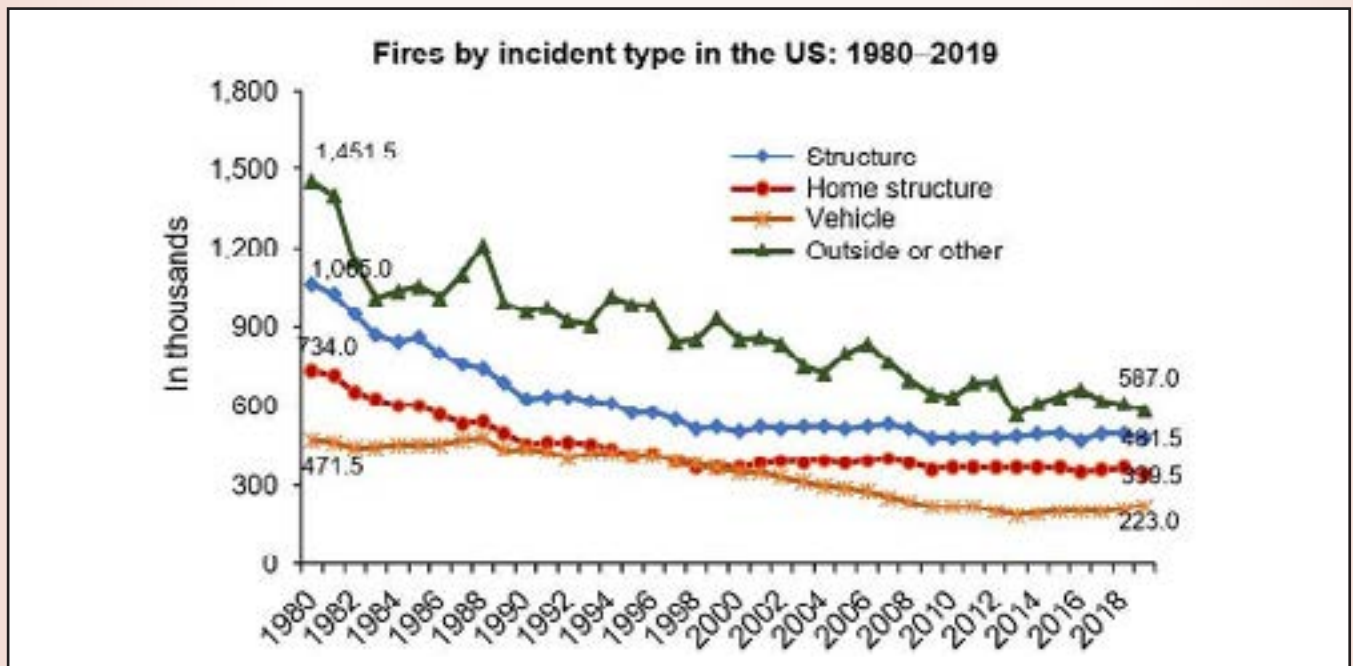
NFPA publishes statistics annually about fires in US buildings. The chart below shows fires by incident type in the US from 1980 to 2019. While the chart shows a decline in fires by incident type, there are still a lot of fires. Key findings from the 2019 data included the following information:

- Local fire departments responded to 1,291,500 fires in 2019. These fires caused roughly 3,700 civilian deaths, 16,600 civilian injuries and \$14.8 billion in property damage.
- Every 24 seconds, a fire department in the United States responds to a fire somewhere in the nation. A fire occurs in a structure at the rate of one every 65 seconds and a home fire occurs every 93 seconds.
- 75% of all fire deaths and 73 percent of all injuries were caused by home fires.

- 65% of all fire deaths resulted from fires in one- or two-family homes and 10 percent were caused by fires in apartments or other multi-family housing.
- 17% of fire deaths were caused by vehicle fires.

It is important to note that while the report seems to focus on residential fire issues, there are still fire deaths in occupancies other than one and two-family homes and apartments or multi-family housing. The stats above mean 25% of the fire deaths were in other occupancies.

These numbers show that fire-resistance-rated and smoke-resistant assemblies AND sprinkler suppression, detection and alarm systems, and the education of building occupants are all needed to keep people safe in buildings.



NFPA Chart

FCIA'S VIRTUAL & HYBRID SYMPOSIUMS/CONFERENCES

FCIA's President Ben Urcavich declared at the April Virtual FCIA Education and Committee Action Conference an initiative to help make existing buildings safer for building occupants through fire-resistance-rated and smoke-resistant assemblies that maintain protection.

As a result, many of the sessions at FCIA's Hybrid Firestop Industry Conference & Trade Show, FCIA's Virtual Symposia in Canada, as well as two programs in the Middle East, one of which was co-hosted with the

ASTM United Arab Emirates (UAE) Chapter, focused on education from the Barrier Management Symposium. At the FCIA-ASTM Program, the International Code Council, UL, FM Approvals, and Thomas Bell Wright International Consultants teamed up to present sessions on standards, installation issues, inspection, and maintaining protection of existing building firestopping and fire-resistance in the Gulf region.

GA REPAIR VIDEO TUTORIAL: REPAIRING FIRE-RESISTANCE-RATED ASSEMBLIES

The Gypsum Association has produced an animated video based on GA-225-2019 Repair of Fire-Rated Gypsum Panel Product Systems. The video describes the proper methods of repairing damage to gypsum panel systems used in fire-resistance-rated assemblies. The video also explains how to restore walls to their original

condition as they were tested in accordance with ASTM E119 or UL 263. In addition, there is a new FAQ section at the GA website that answers many common questions about fire-resistance-rated gypsum assemblies. Learn more at www.Gypsum.org.

DHI & FIRE DOOR INSPECTIONS

The Door and Hardware Institute recently published stats from a DHI Survey of Fire Door Inspection Agency employees about the occupancies where they inspect fire doors the most. It was found that the members responded by percentage of the types of facilities inspected:

- 85% Inspected Healthcare Facilities (Hospitals, Assisted Living, Nursing Homes, etc.)
- 26% Inspected Colleges and Universities
- 20% Inspected Business, Commercial, and Office Buildings
- 13% Inspected Hospitality Facilities
- 11% Inspected Assembly Occupancies, Big and Small (Casinos, Nightclubs, Restaurants, Theaters, Arenas, Museums)
- 11% Inspected Multi-family Buildings
- 9% Inspected Government and Military Facilities
- 7% Inspected Retail Buildings

It was also found that that many fire door inspection companies have experienced a reduction in healthcare fire door inspections in 2020. That's not surprising given the current pandemic situation. DHI's leadership mentioned that the diversity of occupancies receiving annual fire door inspections has been occurring as more building owners and managers become aware of the NFPA 80 requirements for annual fire door inspections. Clearly fire door inspections - and the rest of the installed fire-resistance-rated and smoke-resistant inventory to be managed - has helped keep more buildings safer for the people who occupy them.

FIRE DAMPER INSPECTIONS & RELIABILITY

Keeping the fire-resistance protection maintained in existing buildings is essential to fire and life safety. NFPA 80, *Standard for Fire Doors and Other Opening Protectives* and NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, both have requirements for inspecting the fire, smoke, or combination fire/smoke damper assemblies.

NFPA 80 states that fire-dampers be commissioned at installation, inspected at the end of the first year, then every 4 years in all occupancies except hospitals, which require inspections every 6 years. The frequencies have been agreed by the fire damper manufacturers to be appropriate to maintain reliability of the installed products. Visit www.AMCA.org for more info on servicing fire, smoke, and combination fire/smoke dampers.

2021 FCIA INDUSTRY CALENDAR

MARCH

March 29-31

Association of General Contractors
Annual Convention
Orlando, FL
www.AGC.org

APRIL

April 10-14

AWCI Annual Convention & INTEX
Expo
New Orleans
www.AWCI.org

April 20-22

International Facility Managers
Association (IFMA) Facility Fusion
Boston, MA
www.facilityfusion.ifma.org

MAY

May 9-13

FCIA ECA '21 - Education and
Committee Action Conference
Kansas City, MO/Hybrid
www.fcia.org

May 26-30

Construction Specifications Canada
Conference
Saskatoon, SK
www.CSC-DCC.ca

JUNE

June 5-9

RAIC 2021 Conference on
Architecture
Montreal, Quebec
www.raic.org

June 7-10

World of Concrete
Las Vegas, NV
www.worldofconcrete.com

June 8-10 (tentative)

FCIA FSB Firestop & Effective
Compartmentation 'DIIM'
Symposium and FM/UL Testing
Doha, Qatar
www.fcia.org

June 13-15 (tentative)

FCIA IBC Firestop & Effective
Compartmentation 'DIIM'
Symposium and FM/UL Testing
Dubai, UAE
www.fcia.org

June 16-19

AIA Conference on Architecture
Philadelphia, PA
www.conferenceonarchitecture.com

June 22-24

NFPA Conference & Expo
Las Vegas, NV
www.NFPA.org

JULY

July 18-21

BOMA International Conference &
Expo
Boston, MA
www.BOMA.org

July 19-22

NASFM Annual Conference
Stowe, VT
www.firemarshals.org

July 20-22

APPA Annual Conference and
Exhibition
Ft. Worth, TX
www.appa.org

AUGUST

August 1-4

ASHE Annual Conference and
Technical Exhibition
Anaheim, CA
www.ASHE.org

SEPTEMBER

September 19-20

ICC Annual Conference and Building
Safety & Design Expo
Pittsburgh, PA
www.ICCSAFE.org

OCTOBER

October 17-19

Canadian Healthcare Engineering
Society (CHES) Annual Conference
Halifax, NS
www.ches.org

October 20-22 (tentative)

FCIA 'DIIM' Symposium Canada
Halifax, NS
www.fcia.org

October 20-22

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

NOVEMBER

November 2-5

FCIA FIC '21 - Firestop Industry
Conference & Trade Show
San Diego, CA
www.fcia.org

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E-Wrap™ Endothermic Wrap

E-Wrap™ Endothermic Wrap is the ideal solution for fire protection of infrastructure in today's construction environment. **E-Wrap** provides up to 2 hours of protection when applied to critical infrastructure such as fire pump, signaling, elevator, and fire alarm circuits in addition to Emergency Responder Communications Enhancement Systems (ERCES) and generator fuel lines. **E-Wrap's** supple nature also make it the ideal choice for protecting large membrane penetrations like electrical panel boxes and med gas valve stations.

When protection is critical — **wrap it with E-Wrap™ Endothermic Wrap.**



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E-Wrap™ Endothermic Wrap



Now Tested for Fuel Pipe Protection to UL 1489
See UL XNKJ Category for listed System Numbers FP-3 and FP-4