THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

Life Safety DIGEST

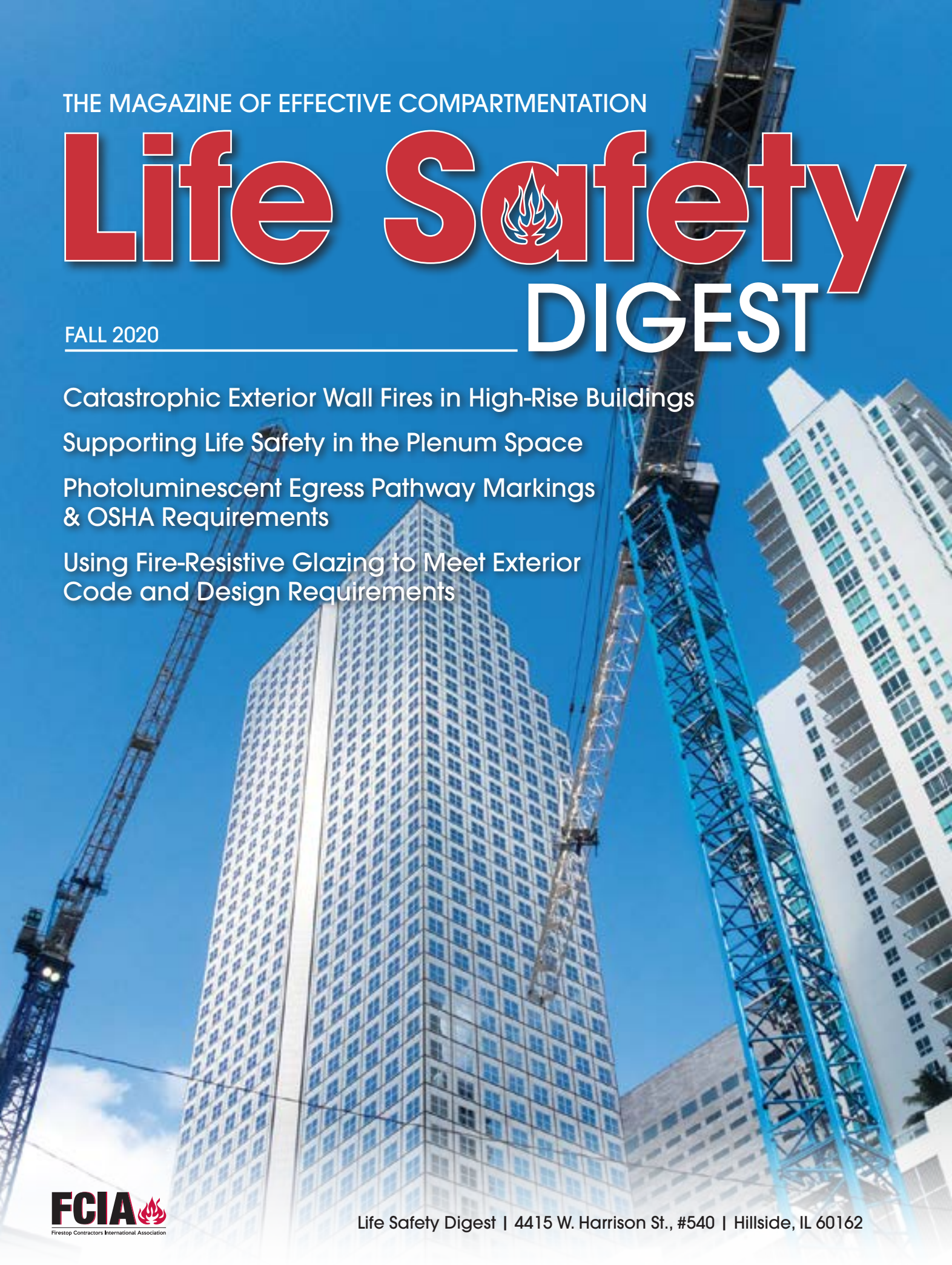
FALL 2020

Catastrophic Exterior Wall Fires in High-Rise Buildings

Supporting Life Safety in the Plenum Space

Photoluminescent Egress Pathway Markings & OSHA Requirements

Using Fire-Resistive Glazing to Meet Exterior Code and Design Requirements



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LIFE SAFETY DIGEST

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EDITOR'S MESSAGE

15 years ago, *Life Safety Digest* was started as a way to educate the construction industry, those who regulate it, and those who design, install, inspect, and maintain the built-environment about the importance of fire-resistance-rated and smoke-resistant building elements and assemblies.

At the time, firestopping was a lesser known industry. Specifications were evolving. Installation of firestop systems to the tested and listed system design and manufacturer installation instructions by a Specialty Firestop Installation Contractor was viewed by many as unnecessary. Inspection was inconsistent because those inspecting installed systems did not really know what they should be looking for – correct versus incorrect installations – in their inspection. And maintenance/management of these systems was not a priority.

And, It was not just firestopping that was the issue. There was no real place to get educational articles to key people in this industry. That's where *Life Safety Digest* came in. FCIA's 2005 Board of Directors set in motion directives to create a new publication to educate about fire-resistance-rated and smoke-resistant building elements and assemblies. Through relevant articles, *Life Safety Digest* has helped bridge the gap between education and understanding for these critical life safety systems in firestopping, structural fire-resistance, and effective compartmentation.

Because of this, combined with the important work of the FCIA and other groups advocating for the passive fire protection industry, a lot has changed in the last 15 years. And while we're proud of how far we've come, we know we have a long way to go. That's why the purpose of *Life Safety Digest* remains the same as it did on day 1: educate the world about the importance of properly designed, installed, inspected, and maintained firestop systems, structural fire-resistance, and effective compartmentation.

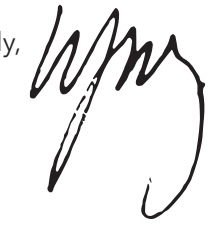
This issue of *Life Safety Digest* focuses on high-rise buildings and some of the key components of firestopping and effective compartmentation that apply. Please do pass on this issue and check out the archives at www.FCIA.org. Education and spreading the word of the importance of the proper 'DIIM' of firestopping improves fire and life safety systems in buildings and will make buildings safer – our main goal as an industry – association – magazine.

You'll find an article addressing the combustible piping in the plenum space and why it's critical that this unseen, and often forgotten, area of the building is properly addressed. There are also articles on how the fire-resistance-rated glazing industry is connecting the dots between code requirements and the end-users' desire for aesthetic beauty and natural light, on photoluminescent markings, and also an extensive industry news/code corner about firestopping, fire-resistance in standards, codes, and more.

We, at *Life Safety Digest*, are committed to our mission because we know fire-resistance-rated and smoke-resistant systems installed in accordance with the listings and manufacturer's instructions save lives.

And, thank you for your continued support of *Life Safety Digest* and your personal commitment to improving fire and life safety systems in buildings. Together we can continue to effect change.

Sincerely,



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WRITTEN BY **DWAYNE E. SLOAN**

CATASTROPHIC EXTERIOR WALL FIRES IN HIGHRISE BUILDINGS

Horrific fires involving the exterior walls of high-rise buildings have fueled debate over how to best mitigate rapid-fire progression on building exteriors. These fires represent a global challenge that begs for a solution.

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Recent exterior wall fires involving high-rise buildings have fueled discussion and debate over how to mitigate rapid-fire progression on exterior wall that are clad with various construction materials. To better understand the exterior wall flammability issue and move towards solutions this article will:

- Discuss the factors that influence building construction related to these types of fires
- Provide an understanding of certain fire tests that are sometimes misconstrued as suitable for the evaluation of exterior walls
- Examine the importance of selecting tests for specific regions, codes, and regulations.

The article will also cover UL's third-party certification approach that can be used to identify exterior wall assemblies that have successfully complied with required test methods. This information can hopefully be useful in preventing future exterior wall fires of these types.

In October 2019, the long-awaited Grenfell Tower Inquiry Phase 1 Report was released. The Grenfell Tower inquiry is a public investigation independently examining the circumstances surrounding the fire at Grenfell Tower that occurred on June 14, 2017. According to the inquiry report a fire broke out on the fourth floor of the 24-story housing flat in North Kensington, London, and spread to the building exterior. It quickly raced up the building exterior, ultimately resulting in 72 deaths. The report can be viewed at https://www.grenfelltowerinquiry.org.uk/phase-1-report.

CONSTRUCTION CONSIDERATIONS

There are several factors influencing exterior wall construction today. First, due to the fast pace of today's construction and the need for less costly, easier to install designs, new materials are constantly being introduced into the marketplace. The combination of new and existing products creates an expansive list of exterior wall components options for designers and builders. The material combinations and their means of installation must be evaluated appropriately to determine whether they are suitable for use as a complete assembly. Fire testing has demonstrated that the testing individual materials does not always result in a reliable determination of fire performance once multiple materials are combined into an exterior wall system. It is only through fire testing of the complete wall assembly that an accurate assessment of fire performances can be made.

Another challenge is the growing attention to building envelope performance such as thermal performance, air leakage, permeability, water infiltration, etc. In some areas, this is even driven by local codes and regulations. The result is insulation products with higher thermal properties and increased use of air barriers and vapor barriers. Consequently, these new wall constructions also require testing and evaluation for their conformance to the appropriate exterior wall fire requirements as a complete unit.

Another building construction factor is the increased use of exterior veneer materials that are aesthetically pleasing, but lack evidence of compliance with codes or regulations for fire safety. Around the globe, especially since the Grenfell tragedy, there has been a strong focus on the challenges associated with non-fire-retardant metal composite panel construction, which is versatile and aesthetically pleasing, but does not always perform well when subjected to certain exterior wall fire tests.

HOLISTIC FIRE SAFETY APPROACH

Many building professionals, fire protection experts and design professionals are aware that taking a holistic approach to fire protection within buildings is ideal. This includes choosing materials that have been assessed for their reaction-to-fire properties (to slow the spread of fire), and considering detection and alarm, fire suppression and compartmentalization. However, there is not always a clear understanding of which fire tests or protection approaches should be used for exterior wall fires.

For example, there have been discussions in some areas about relaxing requirements for exterior wall testing if the interior of the building is protected by sprinklers. For an exterior wall fire originating external to the building, it should be understood that the interior sprinkler system is not designed to protect the building's exterior surface, so significant fire and smoke damage could still occur to the structure.

SELECTING AN APPROPRIATE FIRE TEST

Another misconception is that the large-scale fire test conducted in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials (ASTM E 119) which is used to establish hourly fire resistance ratings should be challenging enough to examine fire growth for an exterior wall assembly. This test method is useful for evaluating building assemblies for limiting the spread of flame between building compartments (utilizing walls and/or horizontal assemblies) or protecting structural steel members such as beams and columns. However, it is not intended to evaluate fire progression extending to the outside of an exterior wall assembly, which was an important factor in the Grenfell Tower and other recent high-rise fires, such as:

Monte Carlo Hotel, Las Vegas Nevada - 2008

Mermoz Tower, France - 2012

Lacrosse Building, Melbourne Australia - 2014

Torch Tower, Dubai UAE – 2015

Address Downtown Hotel, Dubai UAE - 2015

Grenfell Tower, London England - 2017

Torch Tower, Dubai UAE – 2017

NFPA 285 test

Tests such as the NFPA 285 multi-story apparatus fire test are specifically designed to evaluate the ability of an exterior wall system to prevent an interior contents fire to leapfrog up the outside of an exterior wall system.

INTERNATIONAL EXTERIOR WALL TEST CONSIDERATIONS

In recognition of the importance of establishing the most representative test, there are various standards groups around the world focusing on exterior wall test methodologies. The good news is that the issue of flammability of exterior walls is being addressed seriously, and many jurisdictions are updating or creating new codes and performance standards. The challenge is that there are several different methods being implemented in different countries and regions that may not have the exact same scope or deliver the same outcomes. It is important to understand the methods used to qualify a product or system to ensure it is suitable for use in exterior wall construction.

Many of these prominent full-scale exterior wall fire test methods are already embedded into codes and regulations. For example, the International Building Code (IBC) and NFPA 5000 make reference to NFPA 285 for buildings of Types I, II, III and IV over 40 feet in height and buildings employing foamed plastics in the exterior wall. Table 1 lists some of the test methods and the countries where they are typically enforced. This is not intended to be a comprehensive list, as there are other methods under development.

Table 1 – Exterior Wall Test Methods

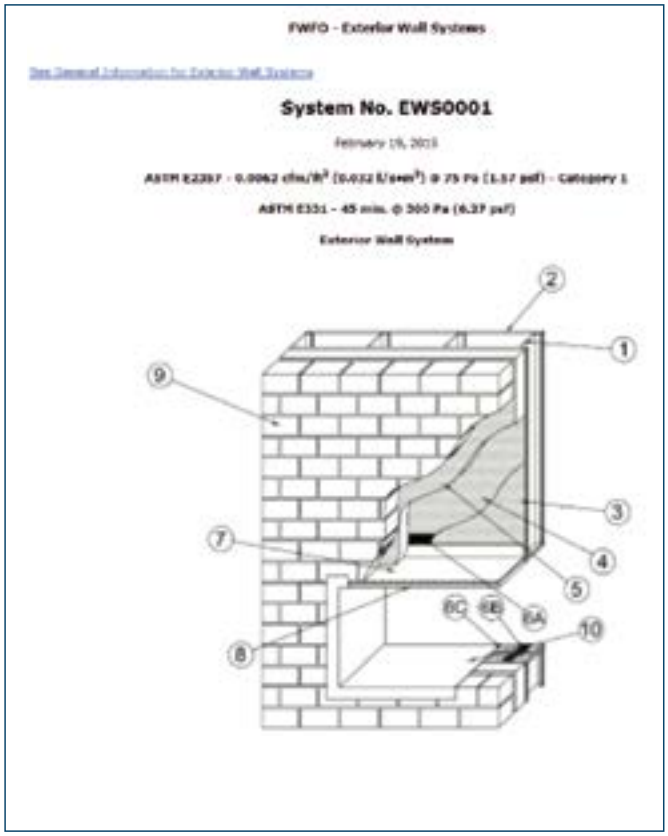
Test Method	Country	Fire Source[11]
NFPA 285[1]	US, UAE	Gas burner; up to 40 kW/m² @ 1 m height above the opening
BS 8414-1[2]	UK, UAE	Wood crib; Approximately 75 kW/m² @ 1 m height above the opening
ISO 13875-2[3]	International	Propane; 55 kW/m² @ 0.6 m height above the opening
AS 5113[4]	Australia	Based on ISO 13875-2 or BS-8414-1
JSA JIS A1310[5]	Japan	Based on ISO 13875-2
LEPIR II[6]	France	600 kg wood crib
SP Fire 105[7]	Sweden / Denmark	60 liters of heptane
CAN/ULC S134[8]	Canada	Gas burner; 45 kW/m² @ 0.5 m height above the window
FM 4880[9]	International	340 kg wood crib; no opening

CERTIFICATION APPROACH

Historically, the acceptance of wall systems utilizing non-combustible materials involved a fairly complex review of building code requirements, test reports covering individual components, engineering analysis and manufacturer's installation instructions. With the increased demand and availability of combustible insulation products, combustible water barriers and façade veneers coupled with the occurrence of several catastrophic exterior wall fires on high-rise buildings, fire prevention requires a robust fire testing and certification program for wall assembly systems is to determine that installed systems comply with the most current model codes and standards.

The Grenfell Inquiry Phase 1 Report states, *"The widespread use of combustible rainscreen cladding panels and insulation on the exterior of buildings and the introduction of new kinds of building materials in external walls may have increased the risk of similar fires, but improvements in the regulations relating to fire safety and the requirements for testing and certification of materials, which will be a particular focus of attention in Phase 2, should be capable of mitigating that risk in the future."*

UL developed a certification approach to simplify the review process and ensure compliance with NFPA 285 by providing a public database that illustrates complete wall system designs and details how individual components are evaluated as part of a system. This approach meets the immediate needs of manufacturers, architects, specifiers and code officials by providing an available, no cost, accessible and up-to-date method of determining compliance with a code. The illustrated designs within the UL certification reflect the precise details of a compliant assembly and are readily available to architects, fire safety experts and code authorities.



UL Online Product iQ Certification – Example of Compliant NFPA 285 Exterior Wall System

For an exterior wall system to receive NFPA 285 certification from UL, it must be tested using the specific construction details provided in a manufacturer's instructions. If a system is in compliance, a drawing of the exterior wall system and description of critical construction components are documented in the UL certification information. Critical components used in the tested system are specifically identified and will also bear the UL Mark. All certified wall systems and components are now published in the Product iQ™ online database in the categories Exterior Wall Systems (FWFO) and Exterior Wall System Components (FWFX). Examples of wall system components available through Product iQ include, but are not limited to, various types of insulation products (including foamed plastic), water resistive barriers, air resistive barriers, laminates, sheathing and composite panels.

OUTREACH

UL recently partnered with International Association of Firefighters (IAFF) to develop a new demonstration and training video. The video will help educate the fire service on the fire behavior associated with these types of fire events and provide them with a better understanding of the test method NFPA 285. This video can be viewed at **IAFF - UL Video Exterior Walls.**

There is continuing global focus on the challenges associated with rapid fire spread on exterior walls. As UL strives to better understand the impacting factors, and the appropriate tests and certification approaches that can be used to evaluate these assemblies, we can move to offering solutions that will raise the level of fire safety for all.

For more information regarding this topic contact Dwayne Sloan at Dwayne.E.Sloan@ul.com.

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Dwayne E. Sloan, Technical Director. Dwayne can be reached at Dwayne.E.Sloan@ul.com

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WRITTEN BY **DICK GEBHART**

SUPPORTING LIFE SAFETY IN THE PLENUM SPACE

Life safety professionals know better than anyone else the fallacy in the statement "out of sight, out of mind." Within commercial buildings and institutional spaces, the plenum space is a prime example of why out-of-sight spaces should always be on the minds of those charged with managing life safety.

Simply defined, the plenum is a separate area that facilitates air circulation between the structural ceiling (horizontal assembly) and a room's drop-down ceiling. Plenum spaces can also be located under an elevated floor. Some common examples of structures where plenums exist include office buildings, hospital/healthcare buildings, schools, and data centers. In such environments, plenums typically provide space for the mechanical pipes, cables, and wires connecting voice and data systems, HVAC equipment, IT networks, and various communications systems throughout a building.

The behind-the-scenes plenum space is home to combustible materials, including pipes, cables and wires that may yield toxic fumes and smoke. As plenum areas are rich storehouses of materials that can help a fire propagate and play a role in the exchange of air throughout a space, they demand careful attention when specifying any material installed in the space or adjacent assemblies. Below, we look at how a historic fire in a plenum area led to changes in fire safety practices. Then we turn our attention to how changes in the mechanical code relate to insulation installed over plastic pipes in plenum areas.

THE PLENUM AND HISTORIC FIRES

Sadly, history – including tragic fires – has set precedents for the development of codes and testing methods to support life safety in the plenum area. Prior to the tragic events of September 11, 2001, a fire ignited in the north tower of the World Trade Center in February 1975. Fortunately, the 1975 fire occurred in the middle of the night, avoiding large losses of life. A subsequent report led to changes in fire safety codes.

In the fire's aftermath, a report was issued by The New York Board of Fire Underwriters Bureau of Fire Prevention and Public Relations. Some conclusions of the report noted exposed polyethylene and polyvinyl chloride cable insulation and plastic back panel blocks burned so readily that all combustible materials, including fire-retardant paneling, were destroyed. Reports noted high temperatures in the plenum radiated enough heat to melt plastic phones and char desktop papers. The report noted,

"Cables passing from one closet to another closet on the same floor pass through the plenum above the hung ceiling. The exposed cable is combustible and constitutes a hazard because fire will be drawn into the plenum and the insulation will intensify the fire at this point."

This report from nearly a half-century ago was just one factor helping to spur an evolution in fire safety practices related to the plenum area. It helped inform listing agencies, such as Underwriters Laboratories (UL), to develop reproducible tests based on standards to assess safety in the plenum space. As a result, codes have evolved, along with multiple changes to the International Building Code and International Mechanical Code. As plenums are often home to networks of piping connecting various mechanical or sprinkler systems – and comprised of PVC and other combustible materials – mechanical systems housed in this area demand special attention.*

The plenum area hosts pipes, as well as networks and ducts of varying sizes and configurations. iStock.com/Andaleks3 photo

CODES AND NON-COMBUSTIBLES IN THE PLENUM SPACE

Section 602.2.1 of the 2012, 2015, and 2018 International Mechanical Code applies to materials used within plenums – including mechanical pipes. The section specifies that materials shall be noncombustible and shall be listed and labeled with a flame spread index not more than 25 and a smoke developed index not more than 50 when tested in accordance with ASTM E84 or UL 723. An exception – Exception #5 – applies for combustibles fully enclosed within one of the following: 5.3 Material listed and labeled for installation within a plenum.

ASTM E84 *Standard Test Method for Surface Burning of Building Materials* or UL 723 *Standard for Test for Surface Burning Characteristics of Building Materials* are 'reaction to fire' test standards. They measure the flame spread and amount of smoke produced by the materials used – not hourly fire-resistance.

Hourly fire-resistance ratings are determined when building elements or assemblies are tested in accordance with ASTM E 119 *Standard Test Methods for Fire Tests of Building Construction and Materials* or UL 263 *Standard Fire Tests of Building Construction and Materials,* the test standards that provide fire-resistance ratings. These are completely different test methods from the ASTM E84 and UL 723 test methods. ASTM E199 and UL 263 measure hourly fire-resistance, whereas ASTM E84 and UL 723 measure reaction to fire.

Any installed materials – including insulation or plenum wrap – should be in full compliance with a listing organization, such as UL, and its requirements for covering materials on the insulated plastic pipe assembly as mandated by the building code, at a minimum.

While life safety will always be the first priority when specifying materials in the plenum area, other factors also influence material choice. These attributes include a material's ease of installation on the job site and its maintenance profile. Because plenum areas can be challenging to access, it is important that pipe insulation be lightweight, the appropriate width for ease of handling, and stays sealed once it is installed.

CONSIDER THE PURPOSE OF THE FACILITY HOUSING THE PLENUM

Insulation installed in areas adjacent to the plenum's mechanical systems – for example, wall assemblies – should complement the purpose of the building and the occupants served. Hospitals and other health care buildings may house non-ambulatory or very young/old occupants who could experience difficulty evacuating a building in the event of fire. High-rise occupancies are another building type that has occupants and plenum spaces with areas that need protection. The non-combustible nature of mineral wool insulation in such settings makes it a practical choice for supporting life safety.

Beyond rigorous performance requirements set forth by testing standards, an insulating material's surface also comes into play – even in plenum environments that are typically not visible. Building owners' interest in surfaces that can be wiped down means an insulating material's jacketing should also be considered. A polymer jacketing surface can be easily wiped down, not only maintaining the material's appearance, but also complementing maintenance efforts throughout the facility.

Finally, sound may be another consideration, albeit unrelated to fire concerns. Plenums are often located above drop ceilings, creating conditions where noise can flow unobstructed into other parts of the building. Again, mineral wool insulation installed in assemblies around the plenum area can help mitigate flanking noise in the plenum area.

As plenum areas can be challenging to access, it is important that materials such as insulation jacketing stay sealed. Lukassek/Shutterstock.com photo

While code compliance will drive material selection in the plenum, other factors can influence the choice of material used to insulate pipes, as well as neighboring areas. Considering the nature of the space and purpose of the building, as well as a material's handling profile, can help meet the performance and safety requirements of the plenum environment. While plenums may be out of sight, they should never be out of mind when it comes to supporting life safety.

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Dick Gebhart serves as Technical Manager North American Technical Insulation at Owens Corning. Dick has more than 43 years' experience with Owens Corning. His experience includes fire testing of insulation products, as well as physical property testing of air handling, commercial, and industrial products, along with technical field support. He is based in Granville, Ohio. He can be reached at richard.gebhart@owenscorning.com.

*Editor's note: While the author addresses how a historic fire and the increased use of insulation installed over PVC and various plastics in the plenum space related to changes in the mechanical code, a separate body of codes governs electrical wiring and cables in the plenum area.

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WRITTEN BY **TONY GAMBLE**

PHOTOLUMINESCENT EGRESS PATHWAY MARKINGS (PL) & OSHA REQUIREMENTS

After the 1993 New York City World Trade Center bombing, photoluminescent markings were installed in egress stairwells to provide a lit pathway on the floor and railings in the event of a power loss. Thanks to the photoluminescent markings many people were saved during the World Trade Center attacks in 2001 because the egress system still had an obvious and intuitive path for people to use.

From the USA National Institute of Standards and Technology World Trade Center report, NIST WTC 1-7 Executive Summary:

The most commonly mentioned forms of aid were assistance from coworkers and emergency responders and the photoluminescent markings in stairwells. [NIST NCSTAR 1-7, WTC Investigation]

As a result, the International Code Council's (ICC) Ad hoc Committee on Terrorism Resistant Buildings proposed adding a requirement for these markings in high-rise buildings in the 2009 version of the International Fire Code. The ICC's Membership approved the proposal, and it still exists in the fire code today.

The definition for a high-rise building from Chapter 2 of the 2018 International Fire Code (IFC), is:

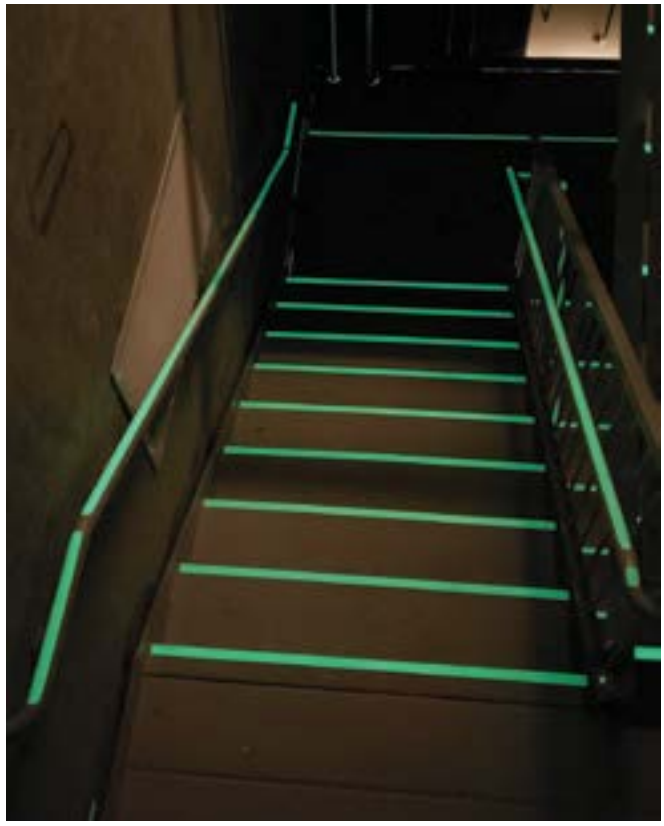
> ***HIGH-RISE BUILDING.*** *A building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access. [IFC 2018, Ch 2, 202)*

Then, the Photoluminescent and Self-Luminous material is defined in Chapter 2 of both the IFC and IBC.

> **PHOTOLUMINESCENT**. Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed. [IBC 2018, 2020]

Photoluminescent materials are tested in accordance with UL 1994, Standard for Luminous Egress Path Marking Systems or ASTM E2072, Standard Specification for Photoluminescent (Phosphorescent) Safety Markings.

> **SELF-LUMINOUS**. Illuminated by a self-contained power source, other than batteries, and operated independently of external power sources. [IBC 2018, 202]



Apex Luminous Image

According to the International Fire Code, Photoluminescent and Self-Luminous markings need to be tested in accordance with UL 1994 or ASTM E2072. Both the Photoluminescent and Self-Luminous definitions are repeated verbatim in the UL 1994 Standard.

The differences between the two technologies is that Photoluminescent technologies use materials which absorb energy protons which light up providing the 'glow'. Self-Luminous materials use tritium for their 'glow'. Both have advantages and disadvantages – for each type of technology - which is not the subject of this article.

The first reference to Self-Luminous/ Photoluminescent markings in the International Fire Code (IFC) deals with the need to reduce the lighting power in certain situations, like theaters:

In section 1013.5 of the IFC, Internally Illuminated Exit Signs are described. In Section 1013.6, external illumination is described. 1013.5 has references to electric power or Self luminous/Photoluminescent materials that are listed and labeled in accordance with UL Standard 924. All of these materials are to be installed in accordance with the manufacturer's installation instructions, as stated below.

1013.5 Internally illuminated exit signs. Electrically powered, *self-luminous and photoluminescent* exit signs shall be *listed* and *labeled* in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Chapter 27. Exit signs shall be illuminated at all times. [2018 IFC, 1013.5]

The International Fire Code, in section 1025, states that 'Luminous Egress Path Markings' are required – setting the stage for an obvious and intuitive egress system:

1025.1 General. Approved luminous egress path markings delineating the exit path shall be provided in high-rise buildings of Group A, B, E, I-1, M or R-1 occupancies in accordance with this section.

Exception: Luminous egress path markings shall not be required on the level of exit discharge in lobbies that serve as part of the exit path in accordance with Section 1028.1, Exception 1. [IFC 2018, 1025]

The Groups refer to A-Assembly, B-Business, E-Educational, I-Institutional, (I-1 is assisted living and rehabilitation centers), M-Mercantile, (stores), and R1-Residential (hotels/motels).

Then, markings within exit components are described in 1025.2:

1025.2 Markings within exit components. Egress path markings shall be provided in interior exit stairways, interior exit ramps and exit passageways, in accordance with Sections 1025.2.1 through 1025.2.6. [IBC 2018]

For steps, landings, handrails, and perimeter demarcation lines described in 1025.2.1, 1025.2.2, 1025.2.3, 1025.2.4, there is specific language that outlines the method for marking the stairs. And, 1025.2.5 discusses obstacles, 1025.2.6, doors within the exit path, while 1025.3, covers the uniformity of the applied products.

Then, in the International Building Code (IBC) High Rise Section, direction is provided for new construction, sending the code user to Chapter 10, Means of Egress section in the IBC.

403.5.5 Luminous egress path markings. Luminous egress path markings shall be provided in accordance with Section 1025. [IBC 2018 403.5.5]

Further requirements are provided for when self-luminous and photoluminescent egress path markings are used in the rest of the section on Self-luminous and photoluminescent materials.

1025.4 Self-luminous and photoluminescent. Luminous egress path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not be limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either of the following standards:

1. *UL 1994.*
2. *ASTM E2072, except that the charging source shall be 1 footcandle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 milicandelas per square meter at 10 minutes and 5 milicandelas per square meter after 90 minutes. [2018 IBC & IFC 1025.4]*

In addition, the IFC Chapter 10 sections address obstacles in the way of the egress path.

1025.2.5 Obstacles. Obstacles at or below 6 feet 6 inches (1981 mm) in height and projecting more than 4 inches (102 mm) into the egress path shall be outlined with markings not less than 1 inch (25 mm) in width comprised of a pattern of alternating equal bands, of luminous material and black, with the alternating bands not more than 2 inches (51 mm) thick and angled at 45 degrees (0.79 rad). Obstacles shall include, but are not limited to, standpipes, hose cabinets, wall projections and restricted height areas. However, such markings shall not conceal any required information or indicators including but not limited to instructions to occupants for the use of standpipes.

Exception: The minimum width of 1 inch (25 mm) shall not apply to markings listed in accordance with UL 1994. [IFC 2018, 1025.2.5]

In 1025.5, the illumination requirements are listed for Photoluminescent exit path markings.

1025.5 Illumination. Where photoluminescent exit path markings are installed, they shall be provided with not less than 1 footcandle (11 lux) of illumination for not less than 60 minutes prior to periods when the building is occupied andcontinuously during occupancy. [IFC 2018, 1025.4]

The IFC is a retroactive code. This means that those buildings located where the code requires luminous egress path markings in existing buildings – during an alteration that triggers the requirement – should be retrofitted with photoluminescent or self-luminous

markings to comply with the written code. The IFC provides options – powered or Photoluminescent/Self-Luminous – allowing building owners and managers to choose which they prefer in existing buildings.

The justification for the addition of luminous egress path markings in the IFC was based on research by the late Dr. Guylene Proulx, a leading researcher who was based at the National Research Council of Canada. Dr. Proulx, and others on the World Trade Center (WTC) research team at the National Institute of Standards and Technology (NIST) showed that luminous egress path markings such as photoluminescent path markings provided an obvious and intuitive "way out" for people in buildings – thereby helping increase the egress speed in buildings.

NIST WTC 1-7 Executive Summary:

The most commonly mentioned forms of aid were assistance from coworkers and emergency responders and the photoluminescent markings in stairwells. [NIST NCSTAR 1-7, WTC Investigation]

10.3.7 Excerpt: For occupants who were helped by building features, 33 percent of survivors in WTC 1 and 17 percent of those in WTC 2 reported that they were helped by photoluminescent markings. The discrepancy between towers may be due to the fact that lights were lost in WTC 1 after WTC 2 collapsed, thereby demonstrating the usefulness of the photoluminescent qualities. Additionally, occupants who used elevators in WTC 2 would not have observed the photoluminescent paint. [NIST NCSTAR 1-7, WTC Investigation]

Dr. Proulx also was an author of the '*Guide for the Installation of Photoluminescent Exit Stairway Markings in Buildings*' document published and funded by the National Research Council of Canada and Public Works and Government Services Canada.

Up to this point, egress code requirements for high rise buildings assumed that the building would be evacuated floor by floor. In most instances, in a building with a full suppression system, only the floor where the fire is located, and the floor immediately above and below would be evacuated.

Acts of terrorism and accidental incidents like a power failure have made it necessary to consider design for full-building evacuation that is as rapid as possible and with congestion in the emergency stairwells. This is where the obvious and intuitive nature of an egress path comes into play. With a lot of people in a closed space in an area they are not that familiar with, an obvious path makes their egress that much easier.

When it comes to egress from buildings during an emergency, the Occupational Health and Safety Administration (OSHA) has a statement that is basically charging language for the complete Occupational Safety and Health Act of 1970. While it does not make Photoluminescent or Self-Luminous Markings mandatory, it is important to remember there is a General Duty Clause applicable to employers and employees.

The General Duty Clause, Section 5(a)(1), of the Occupational, Safety & Heath Act of 1970 states:

(a) Each employer

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

(2) Shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, ad orders issued pursuant to this Act, which are applicable to his own actions and conduct.

[Section 5(a)(1, 2,) 5(b) of the Occupational Safety and Health Act of 1970]

An egress system is one of those items that provides protection from recognized hazards. If an employee of a company in a building cannot get out of a building safely, it could be considered a recognized hazard.

This does not mean that the OSHA General Duty Clause mandates that Photoluminescent or Self-Luminous Markings be added to egress systems in buildings. However, it does state that the employer provide a safe workplace to employees.

While codes and OSHA safety standards might or might not mandate certain protections or might be unclear, the protection of people is important when it comes to hazardous situations.

That is why a photoluminescent or self-luminous marking system in appropriate code recommended locations makes good safety sense for building owners - and the employers and employees - that may have to use the egress system when a hazardous situation occurs.

Tony Gamble, President/EH&S Director for APEX Luminous since 2010 and APEX Firestop since 2001. APEX Luminous furnishes and installs Luminous Egress Path Markings. APEX Firestop furnishes and installs Firestop Systems. Apex Firestop has been a FCIA Contractor Member since 2003. Tony can be reached at tgamble@apexfirestop.com/tgamble@apexluminous.com

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2018 International Building Code, International Code Council

2018 International Fire Code, International Code Council

OSHA.gov Website - https://www.osha.gov/laws-regs/oshact/section5-duties

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WRITTEN BY **DIANA SAN DIEGO**

USING FIRE-RESISTIVE GLAZING TO MEET EXTERIOR CODE AND DESIGN REQUIREMENTS

Fire-resistance-rated glazing fulfills the designer's goals of having unobstructed views and natural light. In densely populated cities like New York, Chicago, San Francisco, or Boston, where buildings are typically high-rises in close proximity to one another, code compliance to lot line requirements becomes another issue.

Determining when fire-resistance-rated requirements apply, the type of fire-resistance-rated glazing allowed, how much fire-resistance-rated glazing can be used, and what happens when sprinklers are installed are just some of the factors that designers have to consider.

LOT LINE REQUIREMENTS

The fire-resistance rating for exterior walls is based on construction type, occupancy, and fire separation distance as defined in Chapter 6 of the International Building Code (IBC). These fire-resistance requirements range from no required rating to 3-hours fire-resistance. Exterior walls generally have a fire-resistance-rating based solely on interior occupancy use and structural requirements.

However, exterior walls that are 10 feet or less from the property line are required to have a fire-resistance-rating based on the proximity to adjacent buildings and interior occupancy conditions. The 2009 IBC increased this distance from five to 10 feet.

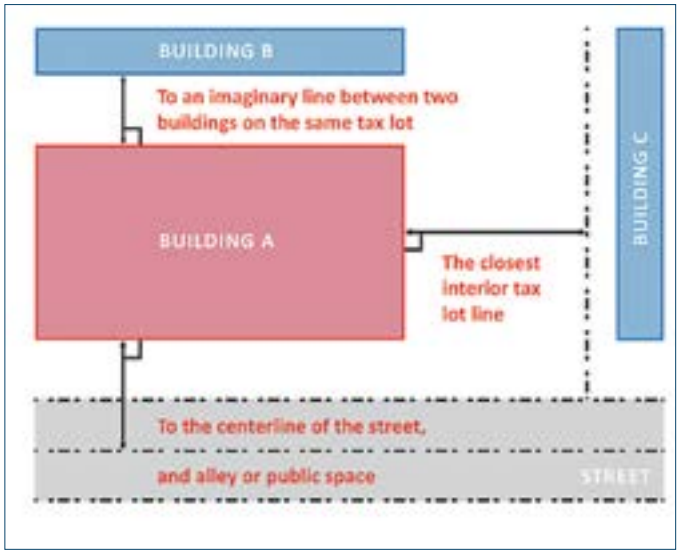
An exterior wall may or may not be allowed to have openings depending on the fire separation distance. Chapter 2 of the IBC defines fire separation distance.

Fire Separation Distance. The distance measured from the building face to one of the following:

- *The closest interior lot line.*
- *To the centerline of a street, an alley or public way.*
- *To an imaginary line between two buildings on the lot.*

The distance shall be measured at right angles from the face of the wall. [IBC 2018 202]

Once the fire separation distance has been established, Table 705.8 in the IBC lays out the percentage of protected and unprotected openings and size limits allowed in exterior walls. When allowed, the codes distinguish between openings that are "unprotected" (UP-no fire-rating), with (S) or without sprinklers (NS), and "protected (P)" (such as fire protective glazing in openings tested to NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies / UL 9, Standard for Fire Tests of Window Assemblies):



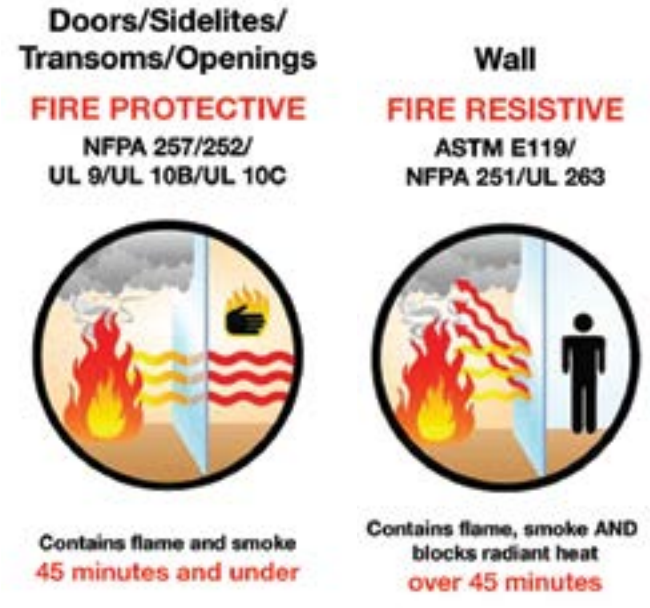
Determining fire separation distance in lot line applications. SAFTI FIRST image.

- *UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.*
- *UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.*
- *P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.*

Fire protective glass, like 45-minute ceramic or specialty fire protective glazing tested to NFPA 257/ UL 9, are either limited in size or prohibited altogether depending on the fire separation distance. Generally speaking, as the fire separation distance increases, the allowable opening area and the percentage of allowable fire protective openings increases.

However, these limitations do not apply to fire-resistance-rated glazing tested to the more stringent ASTM E-119 *Standard Test Methods for Fire Tests of Building Construction and Materials / UL 263, Standard for Fire Tests of Building Construction and Materials,* which requires limiting the temperature rise to less than 250˚ F above ambient on the non-fire side of the assembly. Designers can use fire-resistance-rated glazing in areas where exterior openings are not permitted or limited in size by IBC's Table 705.8. By using fire-resistance-rated glazing, designers don't have to sacrifice expansive clear views and abundant natural light in order to meet code requirements.

In addition to meeting lot line requirements in the code, advancements in fire-resistance-rated glazing technology have paved the way for exterior fire-resistance-rated glazing applications that go beyond typical punched openings and into fully engineered, multi-functional curtain wall systems. These advanced fire-resistance-rated glazing systems can perform like the rest of the materials building envelope, and can even be designed to match the aesthetic of adjacent non-rated glazing system.



Two types of fire rated glazing recognized in the IBC: Fire Protective vs Fire-Resistance-Rated Glazing.
SAFTI FIRST image.

DYNAMIC CURTAIN WALL TESTING

Static curtain wall testing performed in a chamber is one way to determine a product's ability to prevent air and water from entering the building. However, the information from this test is limited. This is why dynamic curtain wall testing designed to duplicate real-world conditions is preferred by owners, architects, and building envelope consultants.

The 1-hour fire-resistance-rated curtain wall at The Kensington in Boston successfully passed dynamic curtain wall testing.
SAFTI FIRST photo.

Today's advanced fire-resistance-rated curtain wall systems are tested to AAMA 501.1, *Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure,* ASTM E284, *Standard Terminology of Appearance,* and ASTM E331, *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.* In addition to air and water testing, these systems are also tested to AAMA 501.4, *Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts,* ASTM E330, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.* These tests provide interstory vertical displacement, thermal cycling, and condensation evaluation.

THERMAL PERFORMANCE

Occupant comfort is a key factor when selecting glazing products for the building envelope. While glass gives the benefit of natural daylight, controlling heat and glare are important considerations as well. Today's advanced fire-resistance-rated glass products can easily incorporate low-e or any energy performance glazing. Designers can also find both fire-protective and -resistance-rated glass and framing components in the NFRC CMAST database, enabling them to simulate the U-factor, Solar Heat Gain Coefficient (SHGC), and Visual Light Transmission (VLT) of exterior fire-protection and fire-resistance-rated glazing assemblies.

MULTI-TASKING PROTECTION AGAINST OTHER THREATS

Advanced fire-resistance-rated glazing systems can multi-task to provide additional protection against various environmental and man-made threats. Fire-resistance-rated glazing manufacturers have tested and listed systems that also meet:

- Florida Product Approval, Texas Department of Insurance and UL certifications for hurricane;
- Up to UL 752, *Standard for Bullet-Resisting Equipment* Level 8 for ballistic resistance;
- US Department of Defense (DOD) Minimum Antiterrorism Standards for blast;
- ASTM F-1915, *Test Method for Glazing*, Grade 1-4 for forced entry.

With the architectural community pushing the limits of what fire-resistance-rated glass can do, manufacturers will continue to respond with innovative products that fulfill their design and performance needs.

CASE STUDY: THE WAREHOUSE ON 520 W 20TH STREET IN NEW YORK, NY

Architect: Morris Adjmi Architects
Glazing Contractor: Vision Walls

The view of New York City from this floating glass-and-steel aerie on the city's West Side couldn't be more majestic. In the near-distance reigns the Empire State Building and the fabled NYC skyline. Closer in, the growing architectural wonderland of Chelsea. Below, the strolling paradise of the High Line. Imagine this crazy-beautiful view being walled-over to meet code requirements for fire-resistance at this location.

The Warehouse at 520 West 20th Street is the latest architectural pearl on a string of them along the High Line from Morris Adjmi Architects. The firm's portfolio of adaptive reuse projects reveals a sensitive hand at fusing historic integrity with contemporary design and materials. 520 West 20th Street is a classic example, essentially a stacked massing of new atop old in a beguiling vision.

The seemingly suspended new three-story steel addition is poised above an old 60,000-square-foot, four-story brick warehouse. The family-owned building is being reimagined as an 85,000-square-foot, seven-story mixed-use center, ideal for a corporate tenant.

The upper tier features floor-to-ceiling glass panels. As obvious as that transparency seems, it didn't come without a knotty complication: The extreme proximity to neighboring buildings mandated 2-hour fire-rated exterior wall on the building's flanks. Spanning the new addition with an 11-foot-tall glass ribbon seemed like a dim possibility.

The 2-hour fire-resistance-rated exterior glass walls at The Warehouse on 520 W 20th Street have the largest tested and listed individual panel sizes for fire-resistance-rated glazing in the USA. SAFTI FIRST photo.

At that time, the designers thought that they would have to break up the 2-hour fire glass walls into smaller lites with lots of mullions to maintain their views. That is when they came across a newly tested and listed, 2-hour fire-resistance-rated product that would meet their size requirements. This means 520 West 20th Street will be the nation's largest single panel installation of fire-resistive glass.

These oversized, USA-made, 2-hour fire-resistance-rated glazing panels, tested in accordance with ASTM E-119/UL 263, satisfied the building code requirement for lot line applications. Lucas Posada, Morris Adjmi's lead architect on the project, remembers the feeling well. "It was amazing. The windows are custom-designed to just what we needed." Each 2-hour fire-resistance-rated glazing panel measured 11 ft. tall and 5 ft. wide, which matched the dimensions the designers needed. The inclusion of low-iron glass in the fire-resistance-rated glazing units also ensured superior clarity and aesthetic continuity with the adjacent non-rated windows. High performance, energy efficient glazing with an argon fill was also added to the makeup for thermal properties and occupant comfort.

The result is a beautiful, elegant, light-filled space with expansive views that met all the code, performance, and aesthetic requirements of this landmark project.

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CODES AND STANDARDS NEWS

ICC'S 2021 CODE DEVELOPMENT

The International Code Council's 2021 Code Development Process (CDP) hearings have finished. ICC staff have been hard at work assembling the many successful code development proposals into the 2021 International Family of Codes (I-Codes; Building, Fire, etc.). The new 2021 versions of the I-Codes will be ready for purchase sometime in October 2020.

Stay tuned to *Life Safety Digest* for an update on new items once we see the new codes!

ICC'S 2024 CODE DEVELOPMENT

While the 2021 code is not yet published, ICC has started its 2024 CDP. The ICC Board of Directors appointed several Code Action Committees – aka CAC's – to provide a deeper discussion into topics that are difficult to fully explore in 2-minute soundbites at the code development hearings. Of interest to readers are the Building and Fire CAC's.

FCIA and other fire-resistance organizations including firestop, a coalition of the fire-rated glazing manufacturers, firestop manufacturers, Air Movement and Control Association, American Iron and Steel Institute, National Fireproofing Contractors Association, National Redi Mix Concrete Association, Fire Safe North America, International Firestop Council, and many others participate in the Fire CAC (aka FCAC) and Building CAC (aka BCAC) actions.

Discussions include: performance-based structural design that focused on structural fire-resistance and NOT effective compartmentation; occupied roofs where firestopping and structural fire-resistance is usually a question; the issue of T-Ratings required for firestopping, but not concrete or grout; and, clarifying Section 715 on Joints and Voids. More on this later in this update.

There are several more topics of interest being discussed at the CAC's, including Exterior Wall Penetrations where Firestopping occurs and where fire-resistance-rated Joints and Voids are needed. Adding the ASTM E2837, *Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies* and T-Ratings for Firestopping AND Concrete, Grout or Mortar are a few topics under discussion in the firestop industry.

Fire Wall Requirements, Fire-Resistance-Rated Corridors, Fire Protection Ratings – Shutters in Floor Openings, Occupied Roofs, and Performance Based Structural Fire Design – ASCE 7-16, Occupied Roofs are all things being studied by the ICC's FCAC.

In the Occupied Roofs discussions, the group is discussing how to regulate items that are put on the roof for various reasons. Plastic plants, picnic benches, and other items sometimes are put on the roof assembly for occupant enjoyment, but these items might not be regulated properly to comply with the International Building Code requirements for wind-resistance and fire issues, including fuel load. Fire-resistance-rating requirements for occupied roofs and how to deal with penetrations were also part of the program.

The Performance Based Design discussion is going on as well. There is currently a discussion between members of the FCAC working group and some interested parties regarding adding a reference to the ASCE 7-16 Appendix CE, *Performance-Based Design Procedures for Fire Effects on Structures* document in the scope of the IBC's Chapter 7, *Fire and Smoke Protection Features*. Not all in the FCAC working group agree on the addition.

The proposal would offer performance-based structural fire design procedures in ASCE/SEI 7 as an option in the scope of Chapter 7. This is an alternative to using the prescriptive method to determine fire-

resistance through furnace testing in accordance with ASTM 119, *Standard Test Methods for Fire Tests of Building Construction and Materials* and UL 263 *Standard for Fire Tests of Building Construction*, which includes listings from the various directories that list fire-resistance designs. In the proposal, the compartmentation fire-resistance would be in accordance with the current prescriptive fire-resistance directory tested and listed system designs.

There are many discussions going on at ICC – and throughout the construction industry – about the 2024 Code Development Cycle. *Life Safety Digest* compliments the great talent working through key code development discussions towards safe building through fire-resistance-rated and smoke-resistant assemblies. Each organization has invested resources, including talent, to help make buildings safer through participation in standards and code development.

Look for more reports on this topic as the fall code development season rolls into code proposals, due in early January 2021.

FIRE-RESISTANCE-RATED AND SMOKE-RESISTANCE & EXISTING BUILDINGS

Key items kept in the 2021 International Fire Code included the requirement that the building owner and manager have an inventory of their fire-resistance in the building. As a result, specifiers have started using Section 01-78-39 – Project Record Documents – to communicate to general contractors through the construction documents that both the listings and the manufacturer's installation instructions are needed for all the fire and smoke protection features.

The 2018 International Fire Code's Chapter 7 was broken into several sections to reflect the importance of each individual discipline in fire-resistance. Breaches made in fire-resistance-rated assemblies are made to provide holes for penetrating items such as pipes, ducts, fire dampers, and even joints and voids. All of these breaches need to be protected continuously, meaning for the life of the building. The building owner and manager is critical to maintaining fire-resistance-rated and smoke-resistant assemblies.

Another new item added to the 2021 International Fire Code included a section in Chapter 7 on structural fire-resistance for Spray Fire-Resistive Materials, Intumescent Fire Resistive Materials.

To learn more about the importance of maintaining fire-resistance in existing high-rise (and other occupancy) buildings, check out Life Safety Digest's Winter 2018 Article, "Fire Code Requirements and Inventory", https://fcia.org/wp-content/uploads/LIFESD_WINTER18_v2_001.pdf.

NON-FIRE RATED DOORS, NFPA 80 & NFPA 101

When it comes to installation and inspection of fire-doors, the 2018 NFPA 101, *The Life Safety Code* references NFPA 80, *Standard for Fire Doors and Other Opening Protectives*. NFPA 101 – 2018 has a statement requiring that a fire-resistive element or assembly, when obvious to the public, needs to be inspected and maintained as if it were still fire-resistance-rated.

In the 2018 NFPA 101, it states:

4.6.12.1 Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, fire-resistiveconstruction, 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. Maintenance shall be provided in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the authority having jurisdiction. [NFPA 101-2018, 4.6.12.1]

In the 2021 version of NFPA 101, there was a change made to NOT have NFPA 80 mandated inspections of fire doors that are no longer part of a fire-resistance-rated assembly.

4.6.12.4 Where a door or door frame that is not required to be fire protection-rated is equipped with a fire protection listing label, the door and the door frame shall not be required to meet NFPA 80. [NFPA 101-2021]. As reported by IDigHardware.com's blog on fire-doors, this new statement in 4.6.12.4 is not in effect until such time that a jurisdiction adopts the 2021 version of NFPA 101, *The Life Safety Code*. Thanks, Lori Greene, for all your work on fire and life safety and the material for this section of the Code Corner.

NEW 2019 CHICAGO BUILDING CODE

Chicago's building community had a big makeover of its building and energy codes in 2019. With an effort launched by Chicago's Department of Buildings and then-Mayor Rahm Emmanuel, architects, engineers, city agencies, and industry all came together and edited the 2018 International Building Code into the new Chicago Building Code. The process moved rapidly and took about 4 months to complete and was then adopted by Chicago's City Council for implementation in August 2020. The new 2019 Chicago Building Code, Energy Conservation Code, Building Rehabilitation Code, along with the administrative provisions that keep the codes moving, were key parts of this initiative. The new Chicago codes are available at ICCSafe.org's bookstore.

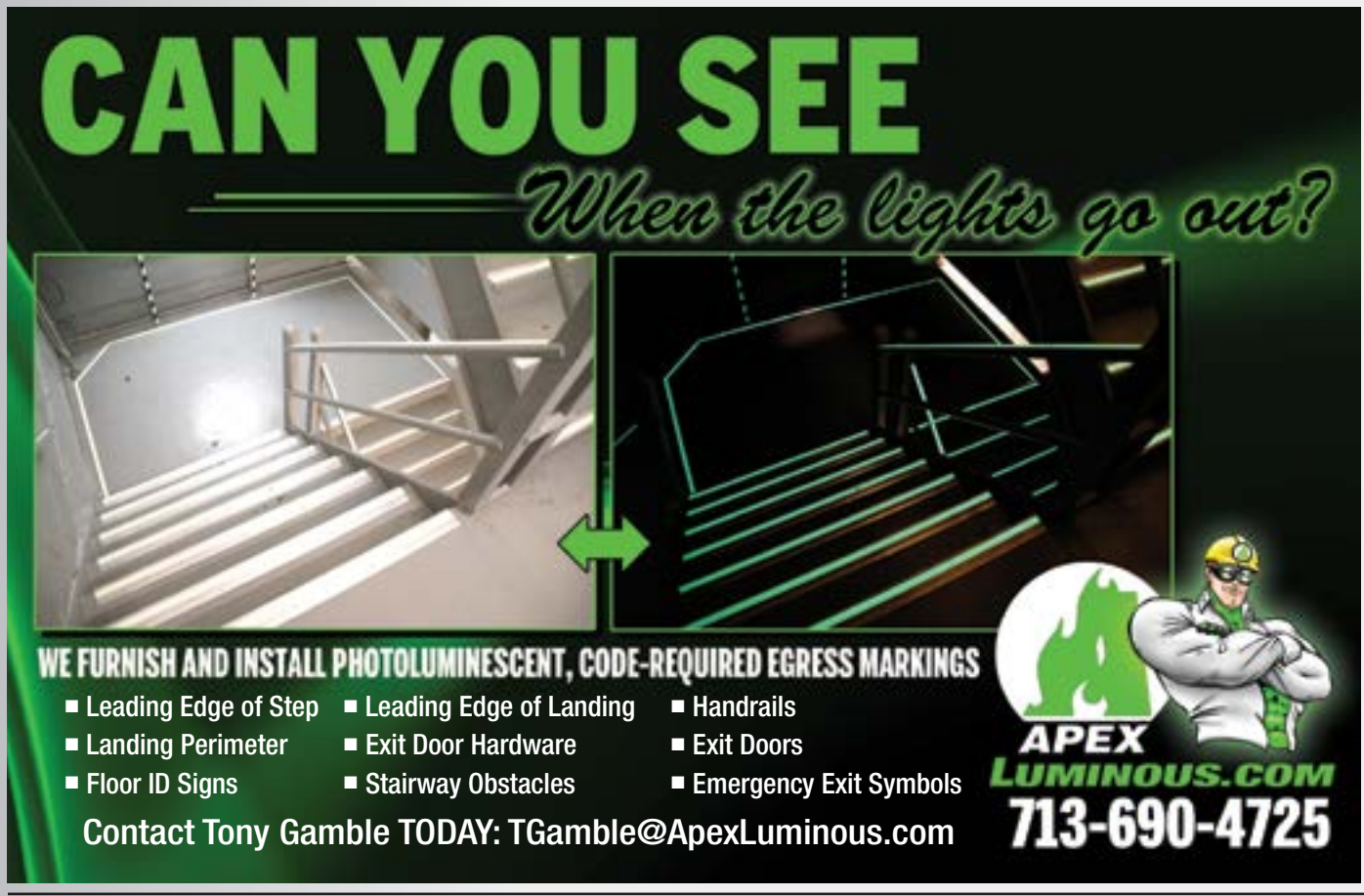
CHICAGO'S CODE – A UNIQUE SECTION

A unique part of the new Chicago Building Code is that there is a requirement mandating minimum 1-hour fire-resistance-rated exit passageways in schools.

1024.3 Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than a 1-hour fire-resistance rating, and not less than that required for any connecting interior exit stairway or ramp. Exit passageways shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. [CBC 2019 1024.3]

Chicago's memory is quite long. Many still commemorate the Our Lady of the Angels fire in 1958, where smoke and fire spread in a multi-story school building quickly, claiming nearly 100 lives. Services have been held at the Holy Innocents Shrine, Hillside, IL on several Dec. 1 anniversary dates, as reported by the Chicago Tribune. To keep students safe, insist on fire-resistance-rated exit passageways in schools.

Chicago Tribune Historical Photo.



INDUSTRY NEWS

PHOTOLUMINESCENT MARKINGS & OSHA

Photoluminescent Markings are required in high-rise buildings. In the International Building Code, high-rise buildings are defined as:

HIGH-RISE BUILDING.
A building with an occupied floor located more than 75 feet (22 860 mm) above thelowest level of fire department vehicle access. [2018 IBC, 202]

But did you know that the USA Occupational Safety and Health Administration (OSHA) Standard 1910.35-39 mentions "self-luminous" (photoluminescent-PL) markings? This is mentioned in one of the two codes referenced in the OSHA standard 1910.35, for egress systems in buildings higher than 75' tall. That's OSHA, not the building or fire code. OSHA is totally different than the building or fire codes, as it can be enforceable by OSHA's team of inspectors. And, the section 1935.10.35-39 is a bit vague. Check out the article in this issue of *Life Safety Digest* to learn more.

FIRE DAMPERS & LIFE SAFETY

Fire-resistance-rated assemblies are an amazing engineering accomplishment. They have been used successfully in buildings for a long time. Even today, there are new innovations being introduced in the industry constantly.

For fire dampers, 'out of wall' installations, remote inspection, and other new ideas have helped make these dampers better. The key to them working correctly is in the installation in accordance with the manufacturer's instructions, which incorporates the tested and listed system design. The manufacturer's instructions are shipped in every container.

Then, continuous inspection and maintenance of these key components is integral to ensuring their performance should it be called upon due to smoke or fire. According to the Air Movement and Control Association (AMCA), the National Fire Protection Association's *NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives* states that each damper shall be tested and inspected one (1) year after installation. The test and inspection frequency shall then be every four (4) years, except in hospitals, where the frequency shall be every six (6) years.

UL'S CERTIFICATE USED FREQUENTLY

FCIA's Accreditation Committee & UL-ULC's Qualified Firestop Contractor Program Manager, Ruben Sandoval, Jr., collaborated to develop the UL Master Certificate of Compliance. This program is a compliment to the UL-ULC Qualified Firestop Contractor Program.

The Certificate is issued to the UL-ULC Qualified Firestop Contractor after a successful firestop contractor audit at the specific jobsite where the certificate will be issued. Certificates are then provided to the building owners and manager for their 'Fire-Resistance Inventory' and are renewable after an annual audit. This helps prove to authorities having jurisdiction that the annual visual inspection by the owner (or owner's agent) is being conducted and records of the inspection are kept.

FM APPROVALS

FM Approvals' Jill Norcott reports the FM 4991, *Standard for the Approval of Firestop Contractors* continues to have interest from Specialty Firestop Installation Contractors worldwide. Over the last year, FM 4991 Approved contractors were added in the far east, middle east, and of course, North America.

FCIA provides webinars so Designated Responsible Individuals (DRI's) can stay up to date with their required continuing education. FM Approvals is also evaluating submittals of continuing education on a case-by-case basis for those that need to renew their DRI status. FM 4991 Approved Contractors can communicate directly with FM Approvals for more info.

SPECS & FM, UL-ULC CONTRACTORS, SPECIAL INSPECTION

FCIA's Accreditation and Marketing Committee commissioned a study by Dodge Data Analytics to understand the acceptance of the FM 4991, *Standard for the Approval of Firestop Contractors* and UL-ULC's Qualified Firestop Contractor Program in North America.

Did you know that from 2016-2019 an FM 4991 or UL-ULC Qualified Firestop Contractor was specified about 50% of the time for projects valued at $10,000,000 - 25,000,000 USD and 62% for projects valued at greater than $100,000,000 USD?

Of projects valued greater than $10,000,000 USD, the type of building where the FM 4991 Approved and UL-ULC Qualified Firestop Contractors were specified, included religious, printing, office, transportation, government, healthcare, recreation, distribution, and manufacturing buildings. The owner-type included private, municipalities, state, federal, and military entities.

The FM 4991 Approved and UL-ULC Qualified Firestop Contractor Programs are clearly gaining steam in specifications. While it's true that not all specs are held, the law of averages shows that the more it is specified, the more likely it is that a FM 4991 Approved or UL-ULC Qualified Firestop Contractor is hired to install the firestopping. These Specialty Firestop Installation Contractors have procedures in place to assure that firestopping is installed to the tested and listed firestop system design and manufacturer's installation instructions.

FCIA was the code proponent of the successful proposal in the 2009 International Building Code Development Cycle for the 2012 International Building Code (IBC). The IBC continues to require firestop special inspection. Specifications have responded, and in the 2016-2019-time frame, between 63-80% of education, office, manufacturing, recreation, healthcare, parking, multifamily, government, dormitories, and hotels had special inspection for firestopping required. There are some buildings that would be excluded because they do not meet the 'high-rise' or criterial in Table 1604.5 of the IBC.

In Canada, Special Inspection is not required by the National Building Code of Canada for firestopping, nor fireproofing. However, firestop inspection is specified 26% in Canada. In addition, the FM 4991 or ULC Qualified Firestop Contractor Programs are specified about 13%, while FCIA Member in Good Standing appeared in Canadian specifications about 5% of the time.

Based on this research, it is clear to see that the FM & UL-ULC Programs and Special Inspection are making a difference in building safety. Thanks Aideen Doneski and the FCIA Accreditation/Marketing Committees for the research.

NFCA'S HANDBOOK OF ACCEPTED FIREPROOFING KNOWLEDGE

NFCA recently developed a Handbook of Accepted Fireproofing Knowledge. This new document has had great reviews so far. Even though it is only a few months old, the NFCA Technical and Education Committee has met several times already to start work on additional chapters to write and edit for the document. Watch www.NFCA-online.org and the FCIA newsletter for updates.

NEW UL QUALIFIED SFRM FIREPROOFING CONTRACTOR PROGRAM

The recently relaunched UL Qualified SFRM Contractor Program has generated a lot of interest. UL's Ruben Sandoval and NFCA's office report increased conversations taking place about the program. The NFCA Contractor Accreditation Program (CAP) is a requirement to get started on UL qualification. NFCA CAP Accredited Contractors who have a valid DRI on staff are ready to build their management system and start the process to get UL Qualified. Email info@nfca-online.org to learn more and get started.

FCIA & LABELLING FIRESTOPPING

While the ASTM meetings have been cancelled, work keeps moving forward on the ASTM Inspection Standards and Fire Test Standards. FCIA's Standards Committee developed a Recommended Professional Practice for identifying installed firestop systems in buildings. This document is being used as a starting point for the new consensus standard being developed at ASTM. As this standard comes to life, it will be submitted to the code development organizations. Watch for more as this develops.

LISTING DIRECTORIES & FIREPROOFING

Fire-testing laboratories have invested in ways to make searching for tested and listed fire-resistance systems designs simpler than the old method – paging through a paper directory. UL has its database online at www.ProductiQ.com; FM Approvals uses www.ApprovalGuide.com for a repository; while other labs use their own search engines.

Firestopping manufacturers have also created their own search engines to make it easier to find their company's tested and listed systems designs. In the fireproofing industry, this is a new development for manufacturers.

In the fireproofing industry, several manufacturers offer samples of their designs and static system selectors. GCP Applied Technologies recently created an interactive tool for selecting their GCP UL fire-resistance-rated building element and assembly designs.

"Architects and specifiers can determine the appropriate UL designs to include in the project specification, while contractors can use the tool to identify the optimum designs for bidding and application", states Michael Sheahen, VP, Specialty Building Materials, Americas, at GCP. Visit https://gcpat.com/en/solutions/products/zmonokote-fireproofing for more info.

FCIA INDUSTRY CALENDAR

SEPTEMBER

September 20-22 CANCELLED
Canadian Healthcare Engineering Society (CHES) Annual Conference
Halifax, NS
www.ches.org

September 23-25 RESCHEDULED
FCIA 'DIIM' Symposium Canada
Virtual Event
Halifax, NS
www.fcia.org

September 30-October 2 RESCHEDULED
International Facility Managers Association (IFMA) World Workplace
Chicago, IL
www.worldworkplace.ifma.org

September 30-October 2
FCIA 'DIIM' Symposium Canada
Virtual Event
www.fcia.org

OCTOBER

October 5-7
ASHE Conference and Expo
Virtual Event
www.ashe.org

October 7-9
CSI CONSTRUCT Expo
Virtual Event
www.constructshow.com

October 11-12 CANCELLED
ICC Annual Conference and Building Safety & Design Expo
St. Louis, MO
www.ICCSAFE.org

October 27-30
FCIA FIC '20 – Firestop Industry Conference & Trade Show
San Antonio, TX
www.fcia.org

NOVEMBER

November 8-10
FCIA Symposium Middle East
Virtual Event
www.fcia.org

DECEMBER

December 9-11
International Facility Managers Association (IFMA) World Workplace
Grapevine, TX
www.worldworkplace.ifma.org

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