THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

Life Safety DIGEST

SPRING 2019

Innovation in Fire-Rated Temperature-Rise Glass Doors

Fire Codes, Fire Resistance and Smoke Resistant Assemblies & Compliance

MasterFormat

Specifying Appropriate IFRM Thickness

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COVER STORY

7 INNOVATIONS IN FIRE-RATED TEMPERATURE-RISE GLASS DOORS

By Diana San Diego

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SPRING 2019

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University of Wisconsin School of Business Learning Commons, Madison, WI. SAFTIFirst Photo.

EDITOR'S MESSAGE

This issue of *Life Safety Digest* focuses on Fire-Resistance-Rated and Smoke-Resistant Assemblies in educational occupancies, including key specification items that are related to the new 2018 International Fire Code requirement. The new requirement states that the Building Owner and Manager needs to have an Inventory of Fire-Resistance-Rated and Smoke-Resistant Assemblies.

To help educate Building Owners and Managers on how to meet that 'Inventory' requirement, an article on the specifications required to build the Inventory is coupled with an article on 'Operations and Maintenance Manuals' for fire-resistance. Additionally, the cover article on fire-resistance-rated glazing talks about technologies used for this relatively new discipline.

At a FCIA Firestop Industry Conference and Trade Show, former South Carolina State Fire Marshal Bert Polk presented an idea for AHJ's for existing buildings to use with Building Owners and Managers – a certificate stating that the Building Owner complies with the Fire Codes.

In the Industry News is information about the City of Chicago's efforts to adapt the International Building Code (IBC), customized by many working groups and the City's fine staff. A key thing that exists in Chicago that's not in the IBC is fire-resistance-rated corridors in education occupancies. Chicago's Public Schools see this as an important item for student and teacher safety.

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Thank you for your continued support of FCIA and *Life Safety Digest*.


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WRITTEN BY **DIANA SAN DIEGO**

INNOVATIONS IN FIRE-RATED TEMPERATURE-RISE GLASS DOORS

Fire protective and fire-resistance-rated glazing have a big role to provide in schools. They provide clear view for areas of the building that need to be monitored and not hidden behind a wall. They bring natural light into areas where it might not have been before, helping to create a more stimulating classroom environment.

These 9-ft high 60-minute fire-resistance-rated temperature-rise pair doors matches the height of the adjacent 1-hour butt-glazed wall at the University of Wisconsin School of Business Learning Commons in Madison, WI. This eliminates the need to add a transom to the door assembly, which appealed to the architect. SAFTIFirst Photo.

Fire-rated glazing products and assemblies have come a long way in the past 30 years. Newer technologies have grown the usage of fire protective glazing in doors and fire-resistance-rated glazing as complete wall, transom, sidelites adjacent to fire doors, fire windows, and fire door assemblies.

There are two types of fire-rated glazing available in today's market for educational occupancies: fire-resistance-rated and fire-protection-rated glazing. All fire-resistance-rated glazing passes the fire-resistance testing for a time period, as well as a hose stream test and a temperature-rise test. This fire-resistance-rated glazing is tested to the same standard as a wall.

Fire-protection-rated glazing can be tested with or without the hose stream test. That's why it is more limited in its use.

Hard to believe, but there was once a time when adding a small piece of wire or ceramic glass in a fire-rated door was considered new - or even innovative - because it allowed for vision, as well as fire protection. Fast-forward to today where the International Building Code (IBC) has imposed significant limitations to wire, ceramics and all fire-protective glazing used in doors rated with over 45-minute ratings.

With 80% of the states adopting the 2012 and 2015 IBC, this size limitation – eliminating use of fire-protective glass in large-size 60-90-minute temperature-rise doors- becomes more pronounced because the Code limits their size to 100 sq. inches *regardless* of whether or not the building is fully sprinklered. With designers and building occupants demanding maximum views in their fire doors, the glazing products used in these doors have had to evolve as well to meet the code requirements.

Increasing transparency with the help of fire-protective-rated glazing is easy to accomplish in 20- and 45-minute doors, where the door is expected to only compartmentalize smoke and fire. However, in 60- and 90-minute doors that are required to compartmentalize smoke, fire and limit the heat transfer on the non-fire (unexposed) side of the assembly, this is more challenging. Known as temperature-rise doors, these doors carry a temperature-rise rating, in addition to the hourly fire-resistance-rating.

Temperature-rise ratings for fire doors are either 250 degrees F, 450 degrees F or 650 degrees F, indicating the maximum rise above ambient temperature on the non-fire (unexposed) side of the door measured during the first 30-minutes of the fire-resistance endurance test. When testing doors in accordance with standards UL 10C, *Standard for Positive Pressure Fire Tests of Door Assemblies* and NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, thermocouples are placed on specific points on the door:

> **UL 10C Section 6.2.** *Unexposed surface temperatures shall be taken at no less than three points, with a minimum of one thermocouple each in 16-ft^2 (1.5 m^2) area of the door. Thermocouples shall not be placed over reinforcements extending through the door, over the glass panels, or nearer than 12 in. (305 mm) from the edge of the door.*

NFPA 252 Section 4.3.1.1. *Thermocouples shall not be located over reinforcements extending through the door, over vision panels, or within 305 mm (12 in.) of the edge of the door.*

Fire-resistance-rated temperature-rise doors rated 60-90-minutes are typically made of steel with an opaque, insulating core to limit heat transfer. Where glazing is incorporated, it is usually a fire-protective product that is limited to 100 sq. inches. The size helps to limit the passage of heat through the glass as part of the door. Typically, wire or ceramic glazing in limited sizes have been used due to their stability and capability to withstand the hose stream test in this small size even though these products have no ability to block radiant heat, required for fire-resistance-rated assemblies.

Adding glazing in excess of 100 sq. inches to 60-90-minute fire-resistance-rated temperature-rise doors was impossible until the introduction of fire-resistive glazing tested to ASTM E119, *Standard Test Methods of Fire Tests of Building Construction and Materials*, UL 263, *Standard for Fire Tests of Construction and Materials*, and/or NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction Materials*. The ASTM E119 and UL 263 Standards are quite similar and considered equal by the IBC. While the NFPA 251 Standard is available on NFPA's website, it is no longer maintained. ASTM E119 is maintained by ASTM International and UL 263 by UL, the Standards Development Organizations.

Fire-resistance-rated glazing is capable of limiting the temperature-rise on the non-fire side to less than 250 degrees F above ambient. While temperature-rise doors are not exactly new, having full-vision door lites incorporated in the door assembly is relatively new, and is still considered a niche or specialty product. There are many door Manufacturers that offer opaque temperature-rise doors or doors with a 100 sq. inch vision lite as a commodity product. In contrast, there are only a handful of Manufacturers that offer fire-resistance-rated temperature-rise doors with full-vision glazing because of the unique challenges that it can present.

SIZE AND WEIGHT CONSIDERATIONS – AND DESIGN OPPORTUNITIES

The obvious challenge is the thickness and weight of using fire-resistive glazing. There are 2 options available in the market today that meet the ASTM E119/UL 263/NFPA 251 requirement – one is a tempered fire-resistive unit and the other is an annealed multi-laminate product.

For 60-minutes, the tempered fire-resistive units are at 1-1/8" / 9 lbs. per square foot, while the annealed multi-laminates start at 7/8" / approx. 11 lbs. per square foot. At 90-minute ratings, the tempered fire-resistive units are at 1-1/2" / 12 lbs. per square foot, while annealed multi-laminates start at 1-7/16" / approx. 18 lbs. per square foot. For example, if a full-vision assembly is desired in a 3 ft. wide x 7 ft. high 90-minute temperature-rise door, the weight of the glass can be over 200 lbs. If the frame, door and hardware are not properly engineered and tested with these weights, it will be an issue.

90-minute fire-resistance-rated temperature-rise pair doors with a clear anodized finish at Harvard Business School's Klarman Hall in Boston, MA. SAFTIFirst Photo.

Using a fire-rated glass and framing Manufacturer that offers fully listed and labeled glazed door assemblies is critical at these higher fire-resistance-ratings. Today, 60-90-minute fire-resistance-rated temperature-rise doors are available up to 10 ft. high, with multiple fire-rated hardware options and finishes. The technology on fire-rated doors has improved so much so in the last 10 years that hardware Manufacturers are offering more fire-rated hardware options to accommodate the size and weight that these doors may impose, without necessarily compromising on design.

90-minute fire-resistance-rated temperature-rise pair doors with stainless steel finish at City University of New York (CUNY) School of Law in Long Island City, NY. SAFTIFIrst Photo.

90-minute fire-resistance-rated temperature-rise pair doors with custom brass cladding at University of California at Berkeley Doe Library in Berkley, CA. SAFTIFIrst Photo.

Before, steel temperature-rise doors with a painted finish were the only available choices. Today, though, designers can choose between anodized finishes, stainless steel, wood veneer, brass, and more. All of these developments allow designers to have a clear-view door with sleek and elegant aesthetics, while meeting the temperature-rise requirements of the project.

MULTI-TASKING DOOR ASSEMBLIES

In addition to aesthetics, full-vision fire-resistance-rated glass doors have also evolved to perform multiple functions in one assembly. This is especially important in educational occupancies where there is quantification of impact-resistance needed for use suitability. Today, the IBC requires that all glazing, fire-rated and non-fire-rated, in doors, sidelites, and hazardous locations must meet either CPSC Cat. I (150-ft. lbs.) impact for glass panel sizes under 1,296 sq. in. or Cat. II (400 ft. lbs.) impact for glass panel sizes over 1,296 sq. in.

For example, there are fire-resistance-rated temperature-rise doors that provide hurricane performance as well. Other than meeting fire-resistance-rating and temperature-rise requirements up to 90-minutes, these doors are tested to Consumer Product Safety Council's testing for a Category Rating. In addition, there has been testing to The Testing Application Standard (TAS) 201, *Impact Test*, TAS 202, *Criteria for Testing Impact & Nonimpact Resistant Building Envelope Components using Uniform Static Air Pressure*, and TAS 203, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*, for High-Velocity Hurricane Zone (HVHZ) requirements for Florida Product Approvals.

There are more test standards used for Florida's requirements including:

- ASTM E283, *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen* (Air Infiltration Leakage)
- ASTM E331, *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference* or ASTM E547, *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference*, and TAS 202 *Criteria for Testing Impact & Nonimpact Resistant Building Envelope Components using Uniform Static Air Pressure* (for Water Penetration)
- ASTM E330, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference* and TAS 202 for Uniform Static Air Pressure
- AAMA 1302.5-76 *Voluntary Specifications for Forced-Entry-Resistant Aluminum Prime Windows* and 1303.5-76, *Voluntary Specifications for Forced-Entry-Resistant Aluminum Sliding Glass Doors* (for Forced Entry)
- Florida Building Code (FBC) 1626.2 requires, TAS 201 & 203 for Large Missile Impact & Cyclic Wind Pressure Loading

90-minute fire-resistance-rated temperature-rise pair doors with wood veneer finish at Reid Hospital in Richmond, VA SAFTIFirst Photo.

Texas Department of Insurance (TDI) Approvals include proof that the products:

- Satisfy TDI's criteria for fire-protection from windborne debris in both the Inland I and Seaward zones.
- Passed impact criteria of Missile Level D in ASTM E1996, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*.

UL offers testing for the following Certifications:

- TAS 201
- TAS 202
- TAS 203
- ASTM E330
- ASTM E1886, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*
- ASTM E1996
- ANSI/SDI A250.13, *Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies for Protection of Building Envelopes* (Not applicable for FEMA 320/361 or ICC-500 Shelters) (SDI is the Steel Door Institute)

Fire-resistance-rated temperature-rise doors up to 90-minutes with ballistic performance are also available. Today, there are full-vision fire-rated doors that meet UL 752 Level 1, 2 and 3. Higher ballistic ratings can be engineered depending on the requirement. In those cases, it is best to consult with the Manufacturer early in the project phase.

60-minute fire-resistance-rated temperature-rise and ballistic-rated pair doors for a private office in San Francisco, CA. SAFTIFIrst Photo.

90-minute, fire-resistance-rated temperature-rise and hurricane-rated pair doors at the Las Olas Beach Club in Ft. Lauderdale, FL. SAFTIFIrst Photo.

Other additional performance options include forced entry, acoustic, privacy, and more. For those Architects, Specifiers, Building Owners and Managers looking to exercise their creativity, decorative options on the glass and the door are also available.

Indeed, fire-resistance-rated temperature-rise glass doors have come a long way. As Designers and Building Owners continue to demand better performance and aesthetics, fire-resistance-rated glass and framing Manufacturers will continue to offer innovative products that can meet or exceed their expectations while maintaining full code compliance. As always, check the listings and verify that the product has testing of these specialty doors for a trouble-free project and doors that will perform as the environment demands.

Diana San Diego is Vice President of Marketing at SAFTIFirst. She can be reached at DianaS@safti.com

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FIRE CODES, FIRE-RESISTANCE AND SMOKE-RESISTANT ASSEMBLIES & COMPLIANCE

Building Owners and Managers spend good money to construct buildings. Whether it's $100,000 or $100,000,000, there's a lot of investment in the building's assemblies and features.

Many structural and building elements, including fire-resistance-rated and smoke-resistant assemblies, are part of that cost of construction. For Building Owners and Managers, there has been much education about maintaining critical parts of the building, including sprinklers, detection and alarm systems, keeping egress clear, educating building occupants about the fire exits, roofs, landscape, and more.

Single and multiple pipe cable penetrations treated might or might not be compliant. The documentation or 'Inventory' is needed to be sure. FCIA Photo

However, it seems that the investment in the originally constructed fire-resistance-rated and smoke-resistant assemblies is hidden from view, and many don't know it's there and must be maintained to the code that is in effect for the structure. That's a problem.

At the FCIA Firestop Industry Conference & Trade Show in 2016, then South Carolina State Fire Marshal Bert Polk addressed the FCIA audience about a very important part of the building's fire- and life-safety package – fire-resistance-rated and smoke-resistant assemblies and their features – firestopping, fire doors, fire and smoke dampers, and fire-rated glazing.

Presented was a document developed in recognition of the limited resources of AHJs when it comes to inspecting existing buildings. In order to understand the document, it's important to appreciate the situation. First, AHJ's don't have many personnel available funded by the citizens to conduct the many required "specialty" inspections in existing buildings.

Second, the responsibility for code compliance – for fire-resistance and other features - for any building lies with the Building Owner and Manager and/or the occupant of the building.

The grey penetrating item was added to the annular space where a cast iron penetrating item exists. Compliance without a collar? FCIA Photo

Is this kickplate code compliant? Pardoe Photo

Based on these two key points, Bert submitted the following document that can be a tool used by AHJ's to assure compliance. The current Fire Code edition for any location can be substituted in the text of the document that is below. **(on the next page)**

Local AHJs may require "additional documentation" when it comes to fire-resistance. **NOTE:** FCIA worked with the Fire Code Action Committee at ICC to add that the Building Owner needs to have an 'Inventory' of Fire-Resistance – the assembly and features such as fire doors, firestopping, fire and smoke dampers, and fire-rated glazing– for the building.

The document Mr. Polk developed requires the Building Owner/occupant to sign-off that they address fire-safety, including fire-resistance-rated and smoke-resistant assemblies and features, on an annual basis. This annual visual inspection is required by the International Fire Code and has been for about a decade. The requirement to maintain the fire-resistance-rated

Does the door close and latch? Pardoe Photo

assemblies and features has been in the codes for decades and is in all fire and related codes including NFPA 1, *The Fire Code*, and NFPA 101, *The Life Safety Code*.

FCIA believes Mr. Polk's document can help AHJ's and Building Owners and Managers comply with Fire Code Requirements for maintaining fire-resistance-rated assemblies and features. More important, it can – and will - result in a safer building for all.

Bert Polk is the Fire Training Director at St. Petersburg College. The Fire Training Program entails credit, non-credit, and in-service training for local fire departments and students pursuing degree studies or firefighter certification. This article, compiled by Life Safety Digest Staff, is based on Bert's presentation at the FCIA Firestop Industry Conference in Charleston, SC, 2016.

Statement of Compliance
IFC Chapter 7 - Fire-Resistive-Rated Construction
Facility Name: _____
Facility Address: _____
I,_____ ,as owner or authorized representative of the facility noted above, in accordance with 20XX International Fire Code (IFC) Section [2015 703.1; 2018 701.6], have verified that all fire resistance-rated and smoke-resistant assemblies and features in the facility have been identified and that an inspection, including all accessible concealed space locations, has been performed, noting deficiencies in the fire-resistance-rated and smoke-resistant assemblies and features. The deficiencies have been properly repaired, restored, or replaced where damaged, altered, breached, or penetrated. Proper approved materials and methods have been used for the repair, restoration, and replacement of fire-resistance-rated assemblies and features. A list of deficiencies noted and corrections made will be provided upon request.

Additionally, I verify the smoke barrier doors and dampers have been inspected and maintained in accordance with NFPA 105 and fire barrier doors and dampers have been inspected and maintained in accordance with NFPA 80. Additional documentation of such inspections and maintenance will be provided upon request.

If you, as owner or authorized representative, determine that deficiencies in fire-resistance rated assemblies and features are too severe to be corrected immediately, you may submit a proposal for corrective actions which will include a time-line for estimating costs, soliciting bids, hiring contractors, and performing the work.

Please mark one:
_____ All deficiencies identified have been corrected with approved materials and methods.
_____ Proposal for Corrective Action will be completed and submitted to OSFM by _____ .

Date: _____

Signed: _____

Title: _____

REFERENCED CODE SECTIONS:

INTERNATIONAL FIRE CODE 2015 SECTION 703 - FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. The required *fire-resistance-rating* of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason shall be protected with *approved* methods capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

703.1.1 Fireblocking and draftstopping. Required *fireblocking* and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

703.1.2 Smoke barriers and smoke partitions. Required *smoke barriers* and smoke partitions shall be maintained to prevent the passage of smoke. Openings protected with *approved* smoke barrier doors or smoke dampers shall be maintained in accordance with NFPA 105.

703.1.3 Fire walls, fire barriers and fire partitions. Required *fire walls, fire barriers* and *fire partitions* shall be maintained to prevent the passage of fire. Openings protected with approved doors or fire dampers shall be maintained in accordance with NFPA 80.

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.

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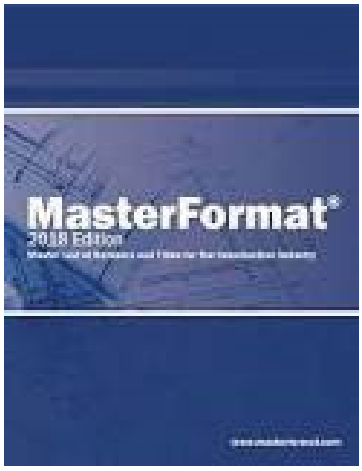

The Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC) partnered to develop the 'MasterFormat' numbering system for project manuals, or 'specs'.

DIVISION 1

This numbering system has Divisions that organize the work results. Division 1 is the general requirement section of MasterFormat. Division 1 is also where direction needs to be communicated. The communication directs the Contractor (General Contractor) to get the required 'inventory of fire-resistance-rated and smoke-resistant assemblies' communicated from the Installers (Sub-Contractors) of wallboard, concrete and concrete block, SFRM/IFRM fireproofing, firestop, fire and smoke dampers, fire-rated glazing - to the Building Owner and Manager.

The requirement for a fire-resistance-rated and smoke-resistant assembly 'inventory' – and the features - including firestopping, fire and smoke dampers, and fire doors. Fire-rated glazing is 'occupancy neutral'. That means the requirement includes educational structures from pre-school to university facilities – and all other occupancies where the assemblies are used.

To serve the Building Owner and Manager's needs for the building life-cycle, in Division 1, the Specifier needs to reference back to the appropriate specification sections the requirements for building the fire-resistance documentation ('inventory'). This then needs to be communicated from the Construction Team to the Building Owner and Manager so the assemblies can be managed.

SPECIFIC SPEC SECTIONS

Here are the sections to reference from MasterFormat Division 1 – 01-78-39, *Project Record Documents,* and the corresponding sections from the International Fire Code that require 'inventory' for easy reference:

- IFC 702 – Structural Elements, Components, Assemblies
  - Fire-Resistance-Rated Wall Assemblies
    - 09-21-00 – Plaster and Gypsum Board Assemblies
      - GA225 – Patching Fire-Resistance Gypsum Board
      - Patch to original assembly
    - 04-20-00 – Unit Masonry
      - Patch to original assembly or equivalent thicknesses of material needed to meet the required ratings
  - Fire-Resistance-Rated Horizontal Assemblies
    - 03-00-00 – Concrete
      - Patch to original assembly or equivalent thicknesses of material needed to meet the required ratings
    - 06-00-00 – Wood
      - Repair according to instructions
  - Structural SFRM/IFRM – 07-81-00
    - Patch to Manufacturers' installation instructions & listings
  - IFC 703–Penetrations & 704 Joints, Voids-07-84-00
    - Patch to Listing, Manufacturers' instructions
  - IFC 705 –Door and Window Openings
    - Repair to NFPA 80, listing, Manufacturers' installation instructions
    - Doors and Frames – 08-10-00
    - Hardware – 08-70-00
    - Glazing – 08-80-00
  - IFC 706–Duct and Air Transfer Openings–23-30-00
    - Repair to NFPA 80, listing, Manufacturers' installation instructions
    - Fire Dampers – 23-33-13.16
    - Smoke Dampers – 23-33-13.39 *(continued pg.18)*

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GATHERING FIRE-RESISTANCE INVENTORY

Building Owners and Managers that have not been provided the fire-resistance documents needed to build their 'inventory', assemble it on their own. In NFPA 1, *The Fire Code*, it states that the Building Owner and Manager are responsible for compliance even if the original Contractor installed products wrong. That makes assembling the fire-resistance documentation 'inventory' critical to knowing and maintaining the structure's fire-resistance-rated and smoke-resistant assemblies.

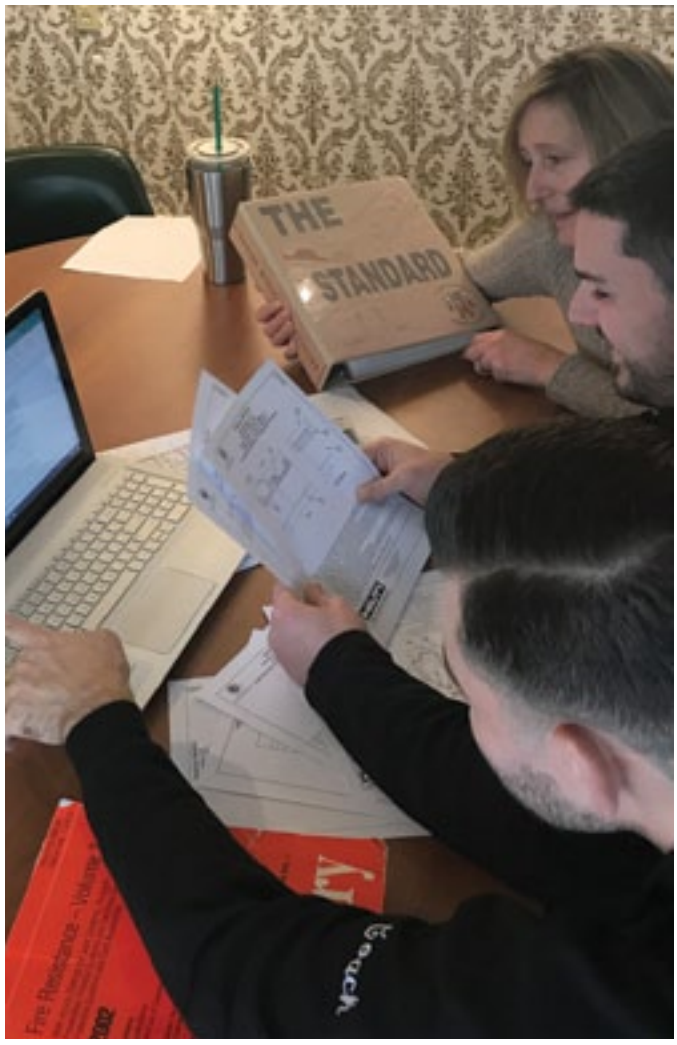
Where there are no fire-resistance documents available, but there are life-safety or architectural drawings in-house, there is a good foundation to build from to assemble the features 'inventory' for those building it. The drawings likely contain the fire-resistance-ratings and locations for the wall and horizontal assemblies in the structure.

The FM Approval Guide, Intertek or UL Fire-Resistance Directories can be used to document the assemblies. Where they are not known, skilled personnel can 'back into' the assembly listing numbers from the directories. Those knowledgeable about the assemblies and the listings might be able to build the 'inventory' based on the features in place labels, which refer to documentation in directories or Manufacturers' installation instructions. In the absence of any documentation, it's a 'start-over' procedure.

Once gathered, the fire-resistance 'inventory' must be stored. The 'inventory' can be either paper files or electronic methods. Many Firestop Contractors and Barrier Management Services Contractors offer electronic fire-resistance 'inventory' programs to their clients for managing, maintaining, and reporting the visual inspections made to comply with the International Fire Code, NFPA 1, and NFPA 101. Records of repairs are also to prove to the authorities that fire-resistance-rated and smoke-resistant assemblies are ready to protect occupants at any time. It's key for continuous service of this important discipline to keep the building safe.

According to industry experts, the best place to get this required 'inventory' documentation process started is at new construction – in section 01-78-00, **Closeout Submittals.**

This 01-78-00 section is where operations and maintenance manuals, project record documents (01-78-39), and general requirements are described, thereby creating the Facility Director's 'inventory' for maintaining the fire-resistance-rated and/or smoke-resistant assemblies.



Gathering Fire-Resistance Inventory. Gleeson Powers Photo

The Project Record Documents are the fire-resistance 'inventory'. *Section 01-78-23.13, Operation Data, and 01-78-23.16, Maintenance Data* provide the sections where communication to the Building Owner and Manager from the Subcontractor (Installer) through the General Contractor (Contractor) is accomplished as well.

It is critical that this section reference back to the individual specification sections and describe how repairs are to be performed, along with a maintenance schedule. Don't forget, lives depend on getting this right.

Watch for more on this subject in future issues of Life Safety Digest.

WRITTEN BY **BOB GLENDENNING**

SPECIFYING APPROPRIATE INTUMESCENT FIRE-RESISTIVE MATERIAL (IFRM) THICKNESSES SAY "NO" TO EXTRAPOLATED DATA

In educational occupancies, from primary and secondary schools to colleges and universities, fire-resistance-rated building elements (beams and columns) and assemblies (horizontal and roofs) are sometimes required by the building codes.

Intumescent coatings, also known as Intumescent Fire-Resistive Materials (IFRMs), help to buy time for building occupants and first responders during a fire by reducing the rate of heat transfer to the building's structural steel. Slowing that rate is critically important, as structural steel exposed to fire heat conditions and under a weighted load can quickly lose strength in a fire, causing sagging and potentially broken connections to columns that could lead to a progressive collapse. Such conditions are what brought down 7 World Trade Center (7 WTC) during the September 11 attacks in 2001. The building was not hit by the airliners that struck 1 WTC and 2 WTC. Rather, fiery debris from those structures broke windows and started fires in 7 WTC. These fires then spread in a circular fashion on each open plan floor, leapfrogging level to level, which eventually caused the connections to break and the building to progressively collapse.

IFRMs help Building Owners and Managers avoid these types of catastrophic losses by providing the steel with critical structural fire-resistance. When exposed to fire, the coatings react chemically, forming a char that expands with heat exposure **(Figure 1**). The char will swell to about 50 times the dry film thickness (DFT) of the IFRM material – to a 5-cm (2-inch) maximum thickness. This intumescing char/insulation reduces the rate of heat transfer to the structural steel, giving responders time to work to contain and extinguish a fire.

These IFRM products, when proven through fire-testing (**Figure 2)**, provide a theoretical amount of time that the coated steel will resist the heat from fire before reaching its critical failure temperature where the steel becomes 'plastic like'. Known as the fire-resistance-rating, that amount of time is based on the applied DFT of the IFRM coatings, which will vary to achieve a specific rating based on the size, weight and heat exposure of each structural steel building element or assembly.

To determine appropriate specified fire-resistance-ratings for buildings, Engineers, Architects and other responsible parties should follow two important standards. Underwriters Laboratories (UL, LLC) maintains the "Fire Tests of Building Construction and Materials" Standard (ANSI/UL 263). In addition, ASTM manages the similar "*Standard Test Methods for Fire Tests of Building Construction and Materials*" standard (ASTM E119). Both the UL 263 and ASTM E119 Standards are included in the International Building Code and other codes.

Figure 1. IFRMs applied to steel (left) form a thick char and swell to about 50 times their dry film thickness (DFT) in a fire (right). The char reduces the rate of heat transfer to the steel.

Sherwin Williams Photos

Figure 2. Controlled fire-tests are required to determine the fire-resistance-rating for various size steel sections treated with IFRMs.

Sherwin Williams Photos

Fire-testing based on the UL 263 and ASTM E119 Standards helps to prove that the specified IFRM coating thicknesses for structural steel building elements and/or assemblies will provide the required fire-resistance. Various testing laboratories publish such results, with UL's listings available in its new UL Product iQ resource. However, the tests listed do not include every possible size of structural building element, leaving gaps in the available fire-tested configuration data – particularly for very small and very large steel sections. These gaps present challenges for specifying proper IFRM DFT's.

In cases where UL test data – listings – are not available for a particular size of structural steel section, some IFRM fireproofing suppliers will make recommendations for IFRM coating product thicknesses based on extrapolated data from other fire-tests.

However, UL has stated that it's not safe to make assumptions – extrapolations of data – about an IFRM's thickness and its performance in actual fire conditions. In fact, UL published its strongest language yet against the use of extrapolated data in its October 2018 "Best Practice Guide for Passive Fire Protection for Structural Steelwork," stating:

> "Extrapolated thicknesses that are beyond the scope of the published UL design without additional supporting test data are not considered acceptable. Additionally, extrapolated material thicknesses that are beyond the published UL design are not recognized by UL and are considered outside the scope of the UL Certification."

This article will explain why it is potentially dangerous to extrapolate IFRM coating thicknesses beyond the maximum values listed by standards organizations.

EXTRAPOLATION DANGERS REVEALED

Generally speaking, a small, lightweight steel section will need a higher IFRM dry film thickness to achieve the desired fire-resistance-rating compared to a larger, heavier section. However, the steel section's heat exposure also influences the required IFRM coating DFT, as some steel sections have full exposure to fire, while others are protected on one or more face.

The required IFRM thickness is most accurately based on the steel section's W/D ratio – the ratio of its weight (W) to its total square area that would be in contact with fire (D).

UL's data provides IFRM DFT guidelines based on numerous W/D ratios for numerous steel section sizes – but not all. The listed sizes have been tested in a lab and not an actual building fire, which is why UL discourages extrapolating data for untested section sizes. For example, underestimating the IFRM thickness on an untested steel section could result in that section not having a sufficient coating DFT to achieve the desired fire-resistance. In addition, overestimating the IFRM thickness could result in the protective IFRM coating delaminating due to excess intumesced insulating char weight and exposing the steel directly to fire, as noted in UL's October 2018 guide:

> "In extreme cases, adding extra thickness may actually result in a situation where the intumescent foam is unable to support its own weight, meaning delamination or excess cracking may occur and a poorer level of fire performance may be achieved. In the worst case, it could lead to NO fire protection being provided."

Due to these potential hazards, Specifiers are advised to not rely on extrapolated data and instead work with an IFRM coatings Supplier to find a safe, workable alternative.

EXTRAPOLATION DANGERS EXPLAINED

Each steel section in UL's database is assigned a "section factor," which helps determine the required IFRM coating DFT to meet various fire-resistance-ratings. It is a ratio (expressed as W/D or A/P) that will differ based on the style of the steel section and its exposure to fire. The ratio W/D relates to I-beam (or W-profile) sections, and the ratio A/P refers to hollow structural sections (HSS), such as cylindrical (pipe) columns, using the following variables:

- **W:** Weight of the section (in pounds/foot)
- **A:** Cross-sectional area of all sides of the HSS (in inches)
- **D and P:** Heated perimeter of the section (in inches); i.e., the total square area in contact with fire (any steel in contact with another surface will have some inherent fire-resistance due to the heat sink provided by the surrounding surface)

The reasons UL's dataset lacks entries on the lower and upper ends of steel member sizes are two-fold: either a Manufacturer of IFRM products has not paid UL to test those sizes, or it has determined they are not able to be protected using IFRMs. Both are sound reasons for not extrapolating IFRM DFT data beyond the published limits. Yet, UL has offered some flexibility.

UL now considers the following scenarios to be acceptable for specifying IFRM thicknesses for any size steel sections between its published lower and upper limits:

- Using the minimum listed coating DFT for a specific beam size (specific W/D) on a larger steel section (greater W/D) that has a greater heat sink than the listed steel section

- Substituting a steel member for a heavier weight (greater W/D) section using the same specified IFRM coating thickness

To avoid the dangers of the IFRM being applied too thick and delaminating from steel during a fire, UL lists the following scenarios as not acceptable:

- Using a coating DFT specified for a larger steel section to cover a smaller steel section that has a lower W/D than is listed

- Substituting a steel member for a lighter weight (lower W/D) section using the same specified coating thicknes

Figures 3 and 4 demonstrate these points, showing that a Specifier could select any point on or below the blue lines and within the green areas to specify the IFRM DFT for a two-hour fire-resistance-rating for a given steel section W/D ratio.

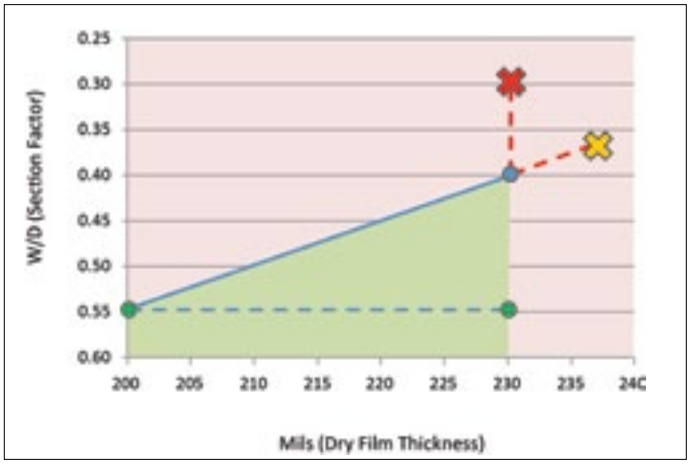


Figure 3

DFT Required for a Two-Hour Fire-Rating for the Lightest Steel Section Listed in UL 263 (0.40 W/D). To remain compliant with UL 263 guidelines, Specifiers may use any point on the blue line or within the green areas below to determine the appropriate IFRM DFT. They are not permitted to extrapolate data in the direction of the red or orange Xs. Sherwin Williams Image

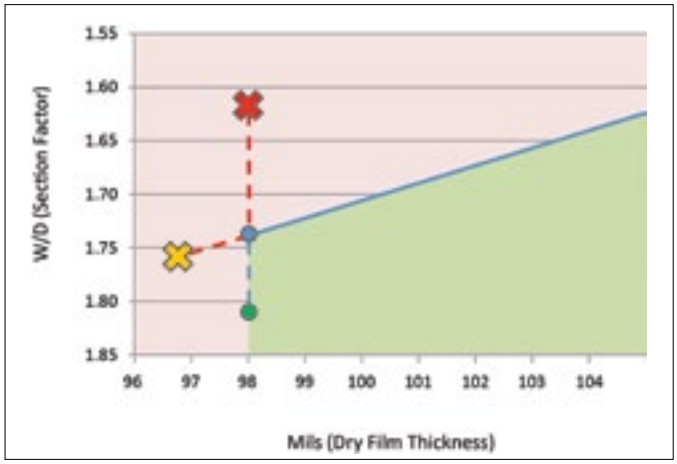


Figure 4

DFT Required for a Two-Hour Fire-Rating for the Heaviest Steel Section Listed in UL 263 (1.74 W/D). Specifiers are able to use any IFRM DFT on the blue line or within the green areas below, but they are not permitted to extrapolate in the direction of the red or orange Xs. Sherwin Williams Image

The blue lines represent UL's maximum published data points, with the lightest steel listed having a W/D ratio of 0.40 (where the blue line in **Figure 3** ends). The X-axis shows the required coating DFT in relation to the steel section's W/D ratio (Y-axis). For instance, a steel section with a W/D ratio of 0.40 will require a 230-mil DFT for a two-hour fire-resistance-rating (blue dot). A steel section with a 0.55 W/D ratio will require a minimum DFT of 200 mils (left-hand green dot) and could have an IFRM coating applied up to a 230-mil DFT without worry (right-hand green dot). However, the DFT cannot exceed 230 mils for either steel section because UL's listing does not include that data. That means Specifiers cannot extrapolate the data to a lower W/D ratio (red X) or to a higher DFT (orange X).

Looking at stronger/heavier steel sections, the same principle is true. **Figure 4** shows the lowest W/D listed in the UL 263 (ASTM E119) Specification (blue dot). At this W/D ratio of 1.74, the two-hour DFT requirement is 98 mils. UL's guidelines permit IFRM coating sections with a greater W/D ratio – for example, 1.8 (green dot) – with the same minimum 98-mil DFT. Because a Manufacturer has not requested that UL test sections beyond the 1.74 W/D ratio, its guidelines do not allow Specifiers to extrapolate a reduced DFT for stronger steel sections (orange X). The same is true for not extrapolating data for lighter steel sections (red X). Rather, Specifiers should follow the blue line up to match a lower W/D ratio with the correct minimum DFT.

EXTRAPOLATION DANGERS AVOIDED

To ensure a building has the appropriate fire-resistance-rating throughout, Engineers and Architects must properly specify the IFRM DFT for each steel section. To avoid the risk of applying too little or too much IFRM coating material, their specifications must not rely on extrapolated data beyond published limits. When UL data is not available for a particular steel section, find an IFRM coatings Supplier that follows UL's guidelines to help identify a safe, workable alternative. And, use an IFRM Fireproofing Applicator that has the quality control and company culture to get the thicknesses applied within the tolerances allowed by the listing and Manufacturers' instructions.

Bob Glendenning is a Structural Engineer and is the Global Fire Engineering Manager for the Fire Engineering and Estimation Team at Sherwin-Williams Protective & Marine Coatings, which supports the specification of engineered fire-protection solutions based on simple and complex calculations, as well as inputs from Building Information Modeling (BIM) software. Bob spent more than 20 years in the steelwork industry before joining Sherwin-Williams to lead its Fire Protection team 17 years ago. He can be reached at bob.glendenning@sherwin.com or +44 (0) 1204 556423

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WRITTEN BY **FCIA STAFF**

OPERATIONS MANUALS FOR FIRE-RESISTANCE-RATED ASSEMBLIES – WHY NOT?

At the FCIA Office, we have had several questions about 'Operation and Maintenance Manuals' for Firestop Products and Systems from multiple building occupancy Facility Directors, including education occupancies.

We at FCIA are unaware of 'Operation and Maintenance Manuals' for firestop systems. We are aware of many documents that may assist Building Owners and Managers about how to maintain Firestop Systems once the firestop products are installed to the tested and listed system.

Hiring a Firestop Contractor that has a company Quality Management System that gets firestop products installed to the tested and listed systems is the key to getting what was specified – Firestop SYSTEMS. Documentation is integral to knowing whether or not Firestop Systems are installed. The documentation, requested in Division 1 of specifications in section 01-78-39, Project Record Documents, is the 'Inventory' of Fire-Resistance package that the General Contractor is to provide to the Building Owner and Manager, from which Operations Manuals are started.

Some Manufacturers put maintenance and repair instructions for the products used in Firestop Systems in product data sheets. As such, the Firestop Manufacturer(s) used for the systems on any project should provide operation and maintenance – and repair – requirements. These requirements are possibly on their product data sheets or other documents. Either way, they need to be part of the Fire-Resistance Inventory sent to the Building Owner from the General Contractor.

WHAT SHOULD FIRESTOP O&M MANUALS INCLUDE?

Several key items should be on the documents for Manufacturers' repair instructions when it comes to Firestop Systems, especially the firestop sealants.

- How is the product to be repaired? Sealants? Wrap Strips? Composite Sheets? Pillows and Bricks? Mortars?
- Does the firestop product need to be removed completely and new product installed?
- Can a patch of the same material used in the system design be installed in the removed or damaged area?
- What is required to make a patch? Is it allowed?
- How will a patch affect the leakage, or "L-Rating"?
- How will a patch affect the ability to handle penetrating item and or wall, floor assembly movement?
- Will the patch be as resistant to chemicals as the original product?

Firestop products need Operations, Maintenance and Repair Instructions. Superl Photo

And, it's not just about patches. Any Firestop Manufacturer's open path device looks like it needs no maintenance. The same can be said for an opening in a fire-resistance-rated assembly with multiple penetrations and other products used for firestopping, such as composite sheets, foam bricks, pillows, mortar or sealants.

However, if a worker installs a penetrating item that is not included in the tested and listed system – regardless of firestop product used - then the fire-resistance-rating has been violated. The assembly might not perform as intended in a fire. There's more to Firestop Maintenance than meets the eye!

If the firestop product data sheets do not give specific guidance or are vague, contact the Manufacturer in writing for specific instructions on whatever firestop product(s) were used on the project. And, don't forget to look at the listing to see if the annular spaces, penetrating items, sleeves and joint gap sizes match the listing. Can't figure out who's product is installed? Contact a Firestop Contractor. They can do research on all Manufacturer's products.

FCIA recommends that the Firestop Contractor ask the Manufacturer of the Firestop Systems products to provide an 'Operation and Maintenance – and Repair - Manual' for their specific, regularly used products so the Firestop Contractor can provide this to their clients.

The only way to know what's required for the products for the life of the building is for the Manufacturer of the products to provide maintenance and repair methods that relate to their products. We have the utmost respect for the investment each Manufacturer has made in chemistry, and we know that it is a unique part of their competitive advantage and not some general guideline. A general guideline has no idea what chemists have invented to make their products unique.

OTHER FIRE-RESISTANCE FEATURES

This same discussion about 'Operations and Maintenance Manuals' applies for all the fire-resistance-rated and smoke-resistant assemblies and their features, fire and smoke dampers, fire-rated swinging doors, fire-rated rolling doors and fire-resistance-rated glazing.

Interestingly, the International Fire Code and NFPA 1, *The Fire Code*, NFPA 101, *The Life Safety Code*, have requirements that state that the fire-resistance of the walls and floors needs to be maintained continuously and *repaired* when damaged, breached or penetrated. None of the codes seem to have a requirement for an 'Operation and Maintenance Manual' for firestopping nor the other features of fire-resistance. However, the statement "repaired when damaged, breached or penetrated" means there should be repair methods published by all fire-resistance industries for their products to keep fire-resistance working all day, every day.

FIRE DAMPERS, FIRE DOORS, GYPSUM WALLBOARD I,O & M

In other industries, there are 'Installation, Operations and Maintenance Manuals'. For instance, the automatic fire damper Manufacturers do provide an 'Installation, Operation and Maintenance Manual' with their fire dampers that might even have a maintenance log included. Ruskin's heading is below. The document includes how to test smoke and fire dampers, code requirements for when the testing is required as a minimum, and much more.

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OPERATION & MAINTENANCE INSTRUCTIONS

While required frequency of periodic operation and testing varies by local jurisdiction, most local municipalities' reference one of two national standards. NFPA 80 covers the requirements for fire dampers and NFPA 105 covers the requirements for smoke dampers. Both documents contain the frequency requirements for periodic operational testing:

In addition, NFPA 72 and NFPA 92 describe the periodic testing requirements for smoke control systems. Dampers that are part of a smoke control system shall be cycled as part of this testing. When possible, the dampers should be operated under normal air flow conditions.

NFPA 105

a. After damper installation is completed, an operational test shall be conducted.
b. Each damper shall be tested and inspected 1 year after installation.
c. In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
d. In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
e. The test shall be conducted with normal HVAC airflow.
f. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
g. All documentation shall be maintained by the property owner and available for review by the AHJ

OPERATIONAL TESTING SMOKE AND FIRE/SMOKE DAMPERS

Dampers with Position Indication

1. Use the signal from the damper's position indication device as an inspection to ensure the damper is in the fully open position.
2. Remove electrical power (or air pressure) from the actuator allowing the actuator to spring to the fail position.
3. Use the signal from the damper's position indication device as an inspection to ensure the damper reaches the fully closed position.
4. Reapply electrical power (or air pressure) to open the damper.
5. Use the signal from the damper's position indication device as an inspection to ensure the damper reaches the fully opened position.

Dampers without Position Indication

1. Visually confirm that the damper is in the fully opened position.
2. Ensure that all obstructions are out of the path of the damper blades and then remove electrical power (or air pressure) from the actuator allowing the actuator to spring to the fully closed position.
3. Visually confirm that the damper has fully closed.
4. Reapply electrical power (or air pressure) to open the damper.
5. Visually confirm that the damper returns to the open position.

MAINTENANCE

Although regular physical inspections are not required by ICC or NFPA, the local authority having jurisdictions may require periodic maintenance. When maintenance is preformed the following check list should be followed.

- Check actuator and tighten the linkage or coupling as necessary.
- Clean the damper blades and other working parts as necessary.
- Lubricate linkage, bearings, and other moveable parts with a silicone or graphite lubricant. **Do not use petroleum-based products as they could cause excessive dust buildup.**
- Cycle the damper/actuator following the instructions above.
- Consult Ruskin if problems are encountered.

FSDOM-514/Replaces FSDOM-413 ©Ruskin 2014

Ruskin Image

Greenheck even provides a maintenance log as part of their O&M manual.

Maintenance Log

Date _____ Time _____ AM/PM Date _____ Time _____ AM/PM
Notes: Notes:

Date _____ Time _____ AM/PM Date _____ Time _____ AM/PM
Notes: Notes:

Date _____ Time _____ AM/PM Date _____ Time _____ AM/PM
Notes: Notes:

Date _____ Time _____ AM/PM Date _____ Time _____ AM/PM
Notes: Notes:

Warranty

GREENHECK
Building Value in Air.

Greenheck Image

Fire Doors can come with operation and Maintenance Instructions. ChemPruf Doors Image.

Rolling fire door. Cookson Image

In a search for maintenance and operation instructions, Manufacturers provide this information for rolling fire doors. In the swinging fire door industry, maintenance and repair is in the guides written by each individual Manufacturer of the door and builder's hardware products. This is due to the unique capabilities of each Manufacturer's products.

Rolling fire door manufacturers have very specific installation, maintenance and repair instructions, some with maintenance schedules described in the document.

Installation and Maintenance Instructions. Cookson Image

USG Image

In gypsum wallboard assemblies, USG has a complete guide specific to USG products that describes possible problems and repair solutions. Similarly, National Gypsum publishes in their "Purple Book" a description of how to repair fire-resistance-rated gypsum partitions. Why? Fire-resistance-rated assemblies are subject to the fire and hose stream test. A simple patch will not pass the fire-tests.

The key point is that fire-resistance is no different than another part of the building. It needs to be maintained, and products need to be repaired and/or replaced. Firestop and Barrier Management Services Contractors need to be sure that their clients have the operations, maintenance and repair methods recommended for each specific Manufacturer's products. It's critical to fire- and life-safety.

Image: Sam Morris/Las Vegas News Bureau

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CODES AND STANDARDS NEWS

ICC RECEIVES NIBS AWARD

Every year, the National Institute of Building Sciences (NIBS) recognizes individuals and organizations that have provided outstanding service to the Institute, the building community and the nation. This year, the Institute honored the International Code Council with its Institute Honor Award at the annual awards reception and dinner on Jan. 9, 2019, during its Building Innovation 2019 conference in Washington, D.C. The award recognizes the exceptional contribution the ICC has made to the nation and the building community.

The Code Council received the award along with other sponsors of the updated and expanded Natural Hazard Mitigation Saves Study – the Federal Emergency Management Agency, the Economic Development Administration, the United States Department of Housing and Urban Development, the Insurance Institute for Business & Home Safety, the National Fire Protection Association, and the American Institute of Architects.

NIBS Image

CHICAGO LOOKING AT IBC

The City of Chicago was a leader in Code Development with its first codes adopted originally in 1875, just after the Great Chicago Fire of 1871. The Chicago Building Code and Municipal Fire Code have served the City well for 125+ years.

Mayor Rahm Emmanuel decided not to run for a 3rd term this year. He has committed to submitting to the City Council an Ordinance to adopt a 'Chicagoized' International Building Code (IBC). Chicago Building Commissioner Judy Frydland said it's important that Chicago be speaking the same 'building language', terminology, as other surrounding suburbs. To modify the IBC, the City of Chicago has formed working groups who are reviewing sections of both the Chicago Building Code and the 2018 IBC to mesh the two into a workable Chicago Code. Watch for more on this in March as final drafts are presented.

UL FIRE COUNCIL & ICC

UL's Fire Council meets each year at the UL Annual Meeting. Beth Tubbs, P.E., FSFPE, Senior Staff Engineer at the International Code Council, was recently invited to join the Fire Council Membership Committee of Underwriters Laboratories Inc. The Fire Council is one of nine councils whose members provide support to UL by bringing practical experience to bear on a broad range of engineering and safety matters. Beth works with the Fire Code Action Committee where FCIA participates as an interested organization. Congrats from FCIA & *Life Safety Digest.*

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INDUSTRY NEWS

FCIA'S BARRIER MANAGEMENT SERVICES SECTION

While travelling North America presenting at APPA, ASHE and CHES Conferences, Facility Directors have asked, "Where do we find companies that provide a single source for barrier surveys, repairs and maintenance?" To answer this call, the FCIA's Barrier Management Services Section of FCIA.org was launched. All FCIA Firestop Contractor Members are listed FREE in the Firestopping section.

To date, over 20 FCIA Members have joined the group with varying services including fire door inspections, fire damper inspections, barrier wall or floor repairs, and fire-rated glazing inspections as part of their offerings to customers. Check out this new place to find the best Contractors, Manufacturers, Consultants and others who provide Barrier Management Services. www.fcia.org/barriermanagementservices.php?select=alpha

ASHE Image

ASHE & FIRE SWINGING DOOR INSPECTION RESOURCES

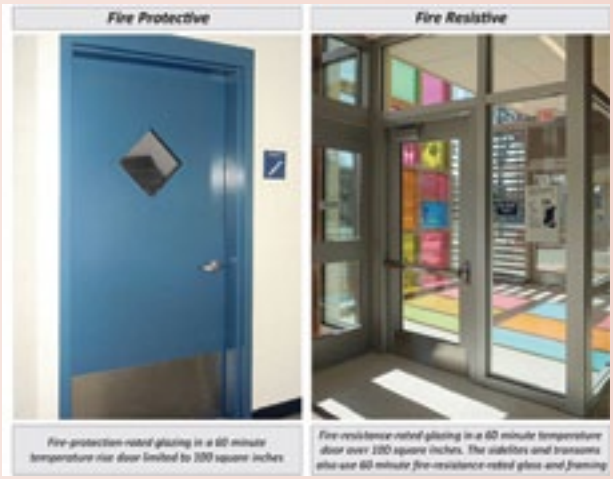
The American Society for Healthcare Engineering (ASHE) has provided new resources to healthcare and other building occupancy facility personnel. The resources include a book, a Door Inspection and Maintenance workshop, and free articles at a special link. www.ashe.org/resources/fire-door-inspection-resources.shtml

The Fire Door inspection book, "Inspecting and Maintaining Swinging Doors: A How-To-Guide to Egress and Fire Door Safety", is written by Keith Pardoe. Keith has been a friend to FCIA, speaking most recently at the FCIA Education and Committee Action Conference in 2018. He is Chair of NFPA 80, Standard for Fire Doors and Other Opening Protectives.

NFPA & FIRE DOORS

NFPA's Fire Protection Research Foundation has begun work on full-scale fire-testing of fire doors to bring more clarity on the varying gaps between the door and frame. The tests will try and verify that the minimum gap sizes prescribed in NFPA 80 are sufficient to prevent door failure during fire. After the current requirements are verified, the Foundation will change the sizes of the gaps to see what affects the assembly's ability to pass a fire-test. Findings could become part of the 2022 edition of NFPA 80. NFPA has a webinar available where Keith Pardoe presented and a 1-hour online training module available.

Check out www.NFPA.org for info.



SAFTIFirst Image

FCIA/ASHE/TJC/UL BARRIER MANAGEMENT SYMPOSIUM ON VIDEO

Fire-Resistance-Rated and Smoke-Resistant Assemblies are critical components of the building's safety plan, a plan that also includes detection and alarms, sprinklers, an emergency defend in place, and an egress plan.

FCIA worked with ASHE, the Joint Commission and UL to develop and present a custom program geared at educating Healthcare Facility Personnel, the FCIA Barrier Management Symposium. So far, the full-day program has been presented to thousands of individuals around North America, and the FREE Access Video Series promises to expand the reach of the education. FCIA's Bill McHugh is the moderator for the Barrier Management Symposium Video Series. Firestopping is included prominently in this series. http://www.ashe.org/education/barriermanagement.shtml

DHI FIRE + EGRESS DOOR ASSEMBLY INSPECTION CLASSES

DHI is offering its education classes with greater frequency in 2019 for Fire + Egress Door Assembly Inspectors. Fire-Rated Doors are a big part of the Barrier Management Services provided by FCIA Members and others. Check out DHI's programs at www.DHI.org.

FIRE-RATED GLAZING ASSEMBLIES

Fire-Rated Glazing is used in doors, sidelights, and even full walls. Test standards exist for each application – doors, walls, etc. FCIA has worked with the Fire-Rated Glazing Industry consultants at the ICC Code Hearings for several years. We testified on code proposals to reinsert fire-resistance-rated corridors in sprinklered buildings.

Lots of changes have taken place in the fire-rated glazing industry's code sections in the last 10 years. Fire-Rated Glazing, like firestopping, must be installed to the tested and listed system. The SYSTEM includes frames, attachment, and even firestop products that might be in the listing. Check out the article in this issue of *Life Safety Digest* on Fire-Rated Glazing.

NEW GYPSUM ASSOCIATION DESIGN MANUAL

The GA-600 Gypsum *Fire Resistance and Sound Control Design Manual* has been revised. The document has fire-resistance-rated gypsum assembly designs and a new focus on acoustics. Check it out at the www.Gypsum.org.

FCIA PROPOSING NEW LABELING STANDARD

At ASTM's E06 Committee, FCIA's Standards Committee has proposed to use the FCIA's Recommended Practice, Identifications Systems (labeling) as a basis for a new ASTM Standard. Identifying installed firestop systems helps Special Inspection Agencies and Building Owners understand what was installed to speed their processes up during construction and maintenance.

ASTM Standards have a good chance of being adopted by the various code organizations, such as the International Building Code or NFPA 5000, the Building Construction and Safety Code. The FCIA's Standards Committee looks forward to working through the ASTM Standards Development Process for this important Standard. FCIA Members can access the Recommended Practice for Identification Systems document at www.FCIA.org in the Members Only Section.

Dalton Protection Image

Pro-Firestop Image

NFCA ANNUAL CONFERENCE

The National Fireproofing Contractors Association holds its Fireproofing Educational Conference and Education for Contractor Accreditation Program for Contractors and education for Special Inspectors in Orlando this March. A great lineup of speakers is lined up. Learn more at www.nfca-online.org/events/index.asp.

NEW UL GUIDE INFORMATION ON FIREPROOFING FOR STRUCTURAL STEEL

Over the past few years, UL has worked with the Fireproofing Manufacturers to produce a new Guide on SFRM and IFRM Fireproofing.

The document has just been released and is posted at NFCA's website, www.NFCA-online.org.

NASFM & PROJECT FAIL-SAFE

The National Association of State Fire Marshals (NASFM) successfully wrapped up the research on the quantification of fire protection features undertaken in Project FAIL-SAFE. The research reports yielded many important findings, providing valid, scientific data into areas with potential for enhanced fire-safety. The research reports and important information about the project can be found at NASFM's website.

One important outcome developed from the research is the MATRIXTM Fire Risk Evaluation tool. The MATRIX is a web-based application that is used for quantifying risk in existing buildings. The MATRIXTM is available for use, free of charge, at www.safety-layering.com/.

FCIA INDUSTRY CALENDAR

MARCH

March 17-20
ASHE Planning Design & Construction Summit and Exhibition
Phoenix, AZ
www.ASHE.org

March 18-22
NFCA Annual Conference & CAP Training
Orlando, FL
www.nfca-online.org/events/index.asp

APRIL

April 1-4
Association of General Contractors
Denver, CO
www.AGC.org

April 8-10
International Facility Managers Association (IFMA) Facility Fusion US
Atlanta, GA
www.facilityfusion.ifma.org

April 22-26
AWCI Annual Convention & INTEX Expo
National Harbor, MD
www.AWCI.org

April 23-26
FCIA Education and Committee Action Conference
Chicago, IL
www.fcia.org/articles/events.htm

April 29-May 8
ICC Committee Action Hearings
Albuquerque, NM
www.iccsafe.org

MAY

May 22-26
Construction Specifications Canada Conference
Regina, SK
www.CSC-DCC.ca

JUNE

June 6-8
AIA Conference on Architecture
Las Vegas, NV
www.conferenceonarchitecture.com

June 17-20
NFPA Conference & Expo
San Antonio, TX
www.NFPA.org

June 22-25
BOMA International Conference & Expo
Salt Lake City, UT
www.BOMA.org

JULY

July 14-17
ASHE Annual Conference and Technical Exhibition
Baltimore, MD
www.ASHE.org

July 15-17
APPA Conference and Exhibition
Denver, CO
www.appa.org

SEPTEMBER

September 18-20 (tentative)
FCIA Canadian Symposium
Montreal, Canada
www.fcia.org

September 22-24
Canadian Healthcare Engineering Society (CHES) Annual Conference
Saskatoon, SK
www.ches.org

OCTOBER

October 9-11
CSI CONSTRUCT
National Harbor, MD
www.constructshow.com

October 16-18
International Facility Managers Association (IFMA) World Workplace
Phoenix, AZ
www.worldworkplace.ifma.org

October 20-30
ICC Annual Conference and Public Comment Hearings
Clark County, NV
www.ICCSAFE.org

October 26-30
RAIC 2018 Festival of Architecture
Toronto, ON
www.raic.org

NOVEMBER

November 5-8
FCIA Firestop Industry Conference & Trade Show
Miami, FL
www.fcia.org/articles/events.htm

November 6-8
DHI's conNextions
Cleveland, OH
www.DHI.org

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