PasFiPro ‘25

12-13 FEBRUARY 2025

LeMERIDIEN DUBAI AIRPORT

DUBAI, UAE

FCIA · NFCA®

FCIA 2025 MEMBER MEETING & SYMPOSIUM

PASSIVE FIRE PROTECTION

CODES & FIRE TEST STANDARDS

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FCIA/NFCA

Specs, Code,
Designs, Listings

FCIA's DIIM ™

FM 4991/UL QFCP
Programs AND
Mfr. Education

PFP/BARRIER
MANAGEMENT
Fire Codes

IBC Ch. 17 - NFPA 80 - NFPA 1

Building & Fire Code Requirements

- Qatar MNFPA 101, NFPA 5000 – Chapter 8
- NFPA 1, Chapter 12
- International Codes –
  - New and Existing Buildings International Building Code – Chapter 7
  - International Fire Code – Chapter 7

- ***Minimum requirements*** - ***Construction*** & ***Maintaining Protection***

Code – NFPA 101, NFPA 1

- 8.2.3.1 The fire resistance of structural elements and building assemblies shall be determined in accordance with test procedures set forth in ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, or ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*; other approved test methods; or analytical methods approved by the authority having jurisdiction.

Standard Tests Establish Fire-Resistance

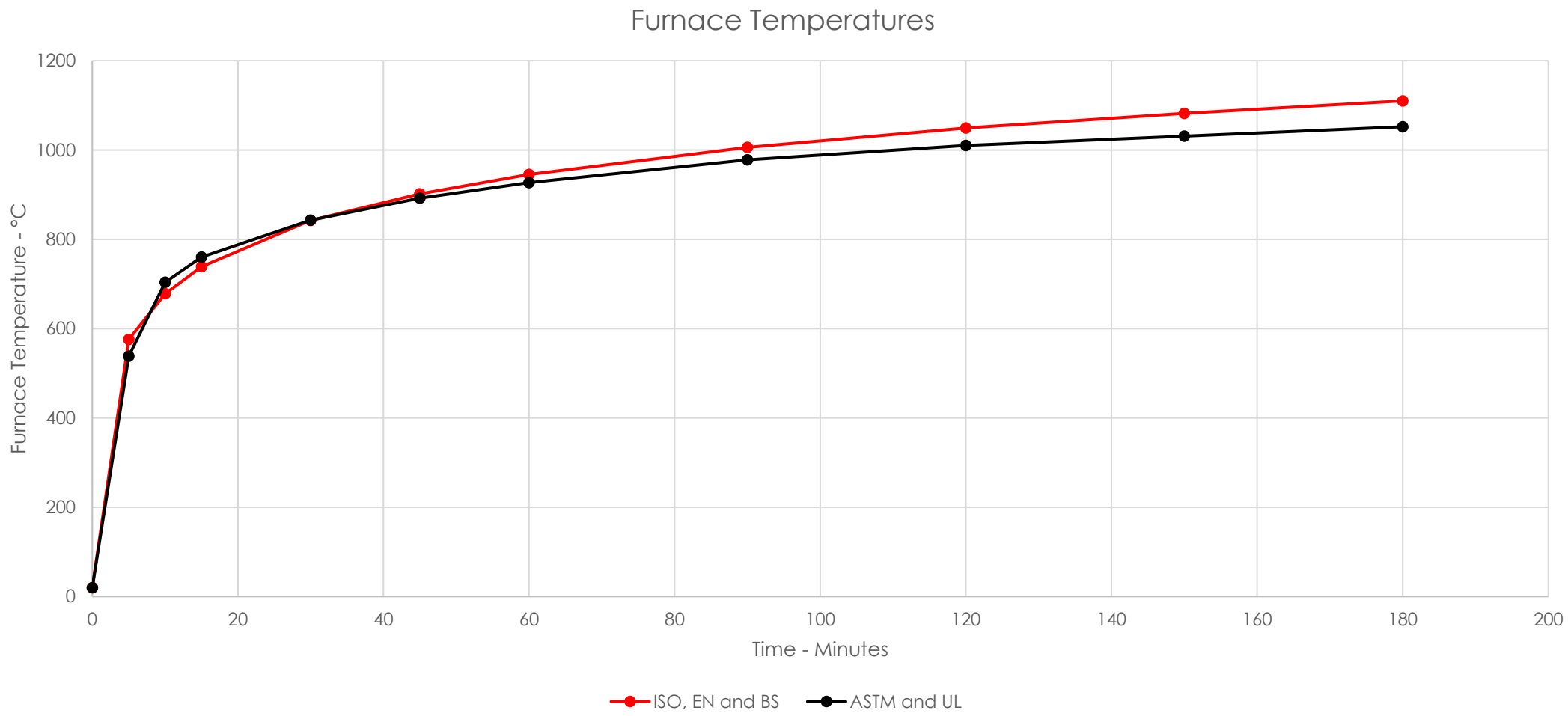
- US/Qatar/UAE, Other areas
  - ASTM E119
  - NFPA 251 (Withdrawn)
  - UL 263
- Canada
  - ULC-S101
- Euro/India/UK
  - ISO 834
  - BS476/EN1363

UL Image

Building Components

- Columns
- Beams
- Floor/Ceilings or Roof/Ceilings
- Walls

Furnace Temperatures Same for ALL



FCIA Image

Columns

- Sample size – Minimum 9 ft
- Most often tested unloaded

UL Image

UL Image

Conditions of Acceptance – Columns

- **1000ºF / 1200ºF**

OR

Support load if tested load bearing

UL Image

UL Image

Beams

- Sample size – Minimum 12 ft
- Load applied – Per design

UL Image

UL Image

UL Image

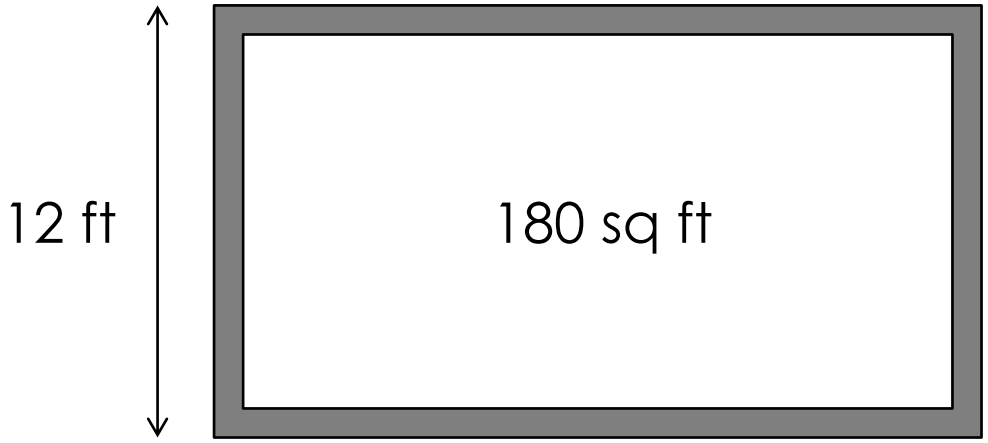
UL Image

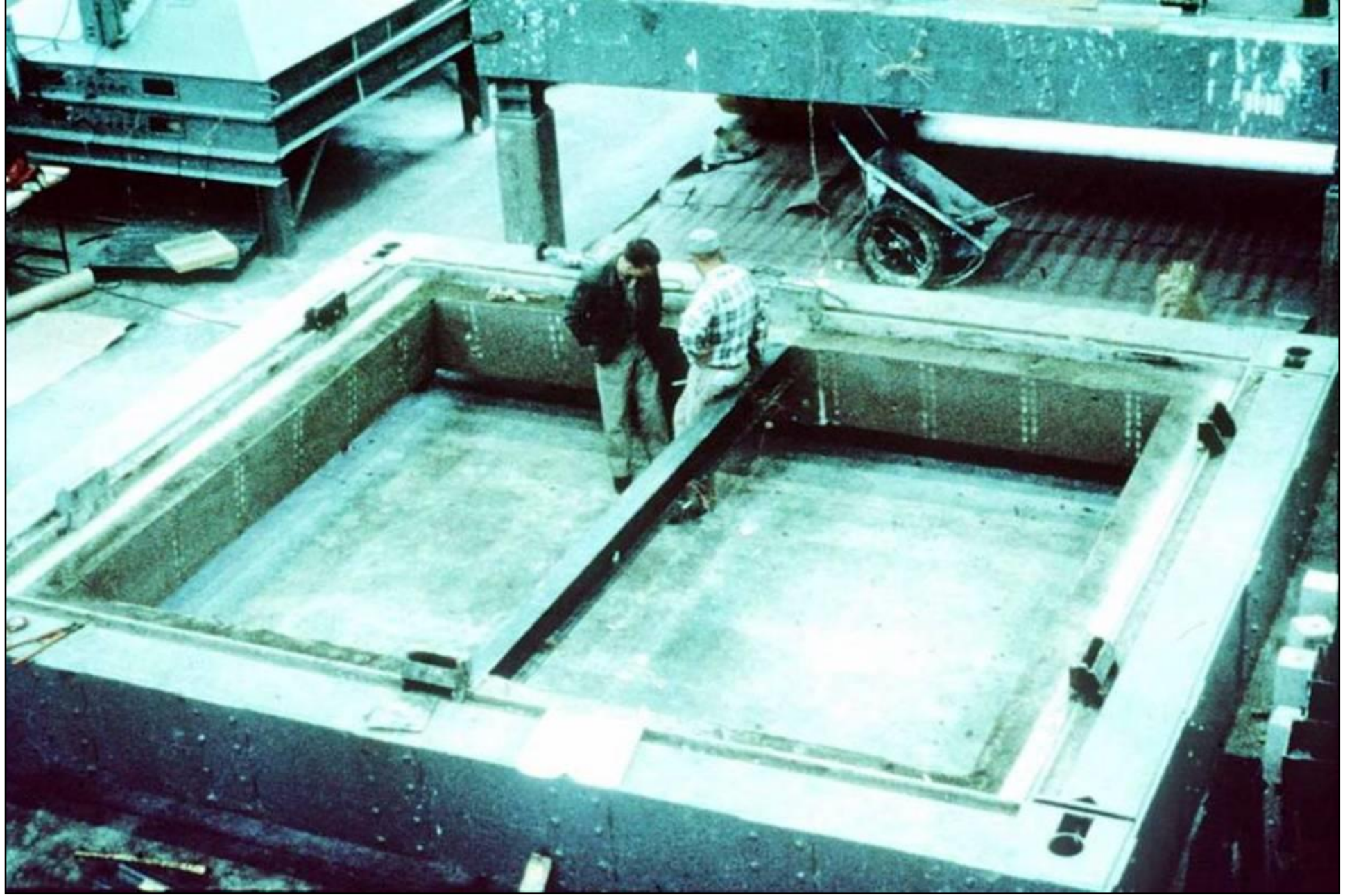
Conditions of Acceptance – Beams

- Support load
- 1100ºF / 1300ºF

Floor/Ceiling or Roof/Ceilings

- Sample size – 180 sq ft / 12 ft
- Load applied – Per design





UL Image

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Conditions of Acceptance
Floor/Ceilings or Roof/Ceilings

- Support load
- Flame passage
- 250ºF / 325ºF
- Support temperatures

Code – NFPA 101/5000, NFPA 1

- Firestopping in Each …NFPA 101
  - 8.2 – Construction & Compartmentation
  - 8.3 – Fire Barriers
  - 8.4 – Smoke Partitions
  - 8.5 – Smoke Barriers
- Firestopping in NFPA 5000 =
  - Section 8.2, Fire-Resistance-Rated Construction
  - Section 8.4, Fire Barrier Walls
  - Section 8.8, Penetrations
  - Section 8.9, Joints & Perimeter Fire Containment
  - Section 8.10, Smoke Partitions
  - Section 8.11, Smoke Barriers
  - Section 8.12, Vertical Openings
- Firestopping in NFPA 1…Chapter 12

Code - NFPA 101

- **8.3.4.2* Firestop Systems and Devices Required.**
  - ***N* 8.3.4.2.1** Penetrations for cables, cable trays, conduits, pipes, tubes, combustion vents and exhaust vents, wires, and similar items to accommodate electrical, mechanical, plumbing, and communications systems that pass through a wall, floor, or floor/ceiling assembly constructed as a fire barrier shall be protected by a firestop system or device.
  - ***N* 8.3.4.2.2 Testing.** The firestop system or device shall be tested in accordance with ASTM E814, *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, or ANSI/UL 1479, *Standard for Fire Tests of Through-Penetration Firestops*, at a minimum posi- tive pressure differential of 0.01 in. water column (2.5 Pa) between the exposed and the unexposed surface of the test assembly.
  - F & T – Not less than 1 hour, not less than fire-resistance rating of barrier penetrated.

NFPA 101, 2018

Code - NFPA 101

- 8.3.4.2.5 - .1 (1, 2, 3, 4) Alternative Firestop Requirements
  - 1 - Where tested with the ASTM E119 or UL 263 Assembly
  - 2 – Enclosed in a shaft
  - 3 – Where Concrete Grout or Mortar FILLS annular space
    - Cast Iron, Copper, Steel Piping, Conduit or tubing, concrete/masonry,
    - AND where penetrating items <6” (150mm)
    - AND opening size < 1SF (.09sm)
    - AND grout is FULL Thickness
  - 4 – where penetration is limited to 1 floor, tested in accordance with E119,

NFPA 101, 2018

Code - NFPA 101

(1) Where penetrations are tested and installed as part of an assembly tested and rated in accordance with ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, or ANSI/UL 263, Standard for Fire Tests of Building Construction and Materials

(2) Where penetrations through floors are enclosed in a shaft enclosure designed as a fire barrier

(3) Where concrete, grout, or mortar has been used to fill the annular spaces around cast-iron, copper, or steel piping, conduit, or tubing that penetrates one or more concrete or masonry fire resistance–rated assemblies, and all of the following applies:

(a) The nominal diameter of each penetrating item does not exceed 6 in. (150 mm).

(b) The opening size does not exceed 1 ft2 (0.09 m2).

(c) The thickness of the concrete, grout, or mortar is the full thickness of the assembly.

NFPA 101, 2018

Code - NFPA 101

(4) Where penetration is limited to one floor, the firestop- ping material is capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to the time–temperature fire conditions of ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, or ANSI/UL 263, Standard for Fire Tests of Building Materials, under a minimum positive pressure differential of 0.01 in. water column (2.5 Pa) at the location of the penetration for the time period equivalent to the required fire resistance rating of the assembly penetrated, and the firestopping materials are used with the following penetrating items:

(a) Steel, ferrous, or copper cables
(b) Cable or wire with steel jackets
(c) Cast-iron, steel, or copper pipes
(d) Steel conduit or tubing

NFPA 101, 2018

Code - NFPA 101

- **8.3.5.2 Joint System Requirements.**

- ***N* 8.3.5.2.1*** Joints made within or at the perimeter of fire barriers, between fire resistance–rated assemblies, or where fire barriers meet other fire barriers, the floor or roof deck above, or the outside walls shall be protected with a joint system that is designed and tested to prevent the spread of fire for a time period equal to that of the assembly in which the joint is located

- **8.3.5.2.2** Joints made within or at the perimeter of fire barriers used as smoke barriers shall be capable of restricting the transfer of smoke in accordance with 8.5.7.4.
- ***N* 8.3.5.2.3** Joints shall be installed in accordance with a tested system, and installed and maintained in accordance with the manufacturer's instructions.
- **8.3.5.2.4** Testing of the joint system in a fire barrier shall be representative of the actual installation suitable for the required engineering demand without compromising the fire resistance rating of the assembly or the structural integrity of the assembly.
- ***N* 8.3.5.2.5** Such materials, systems, or devices shall be tested as
- part of the assembly in accordance with the requirements of ASTM E1966, *Standard Test Method for Fire-Resistive Joint Systems*, or ANSI/UL 2079, *Standard for Tests for Fire Resistance of Building Joint Systems*.

NFPA 101, 2018

Code - NFPA 101

- **8.3.5.2 Joint System Requirements.**
- **8.3.5.3** Joints made between a fire barrier and a non-fire- resistance-rated floor or roof sheathing, slab, or deck above shall be protected by an approved continuity head of wall joint system installed as tested in accordance with ASTM E2837, *Standard Test Method for Determining the Fire Resistance of Continu- ity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies*, and the system shall have an F rating and T rating of not less than the required fire resistance rating of the fire barrier.
- **8.3.5.4* Exterior Curtain Walls and Perimeter Joints.**
- **8.3.5.4.1** Voids created between the fire resistance–rated floor assembly and the exterior curtain wall shall be protected with a perimeter joint system that is designed and tested in accordance with ASTM E2307, *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multistory Apparatus*.
- **8.3.5.4.2** The perimeter joint system shall have an F rating equal to the fire resistance rating of the floor assembly.

NFPA 101, 2018

Code - NFPA 101

- **Smoke Partitions – No Fire-Resistance-Rating, only Smoke Resistive**
  - **L Rated Assemblies**
  - **OR**
  - **Smoke & Sound Sealants**

NFPA 101, 2018

Code –NFPA 1

- **12.3 Fire-Resistive Materials and Construction.**
- **12.3.1** The design and construction of fire walls and fire barrier walls that are required to separate buildings or subdivide a building to prevent the spread of fire shall comply with Section 12.3 and NFPA 221.
- **12.3.2 Quality Assurance for Penetrations and Joints.** In new buildings three stories or greater in height, a quality assurance program for the installation of devices and systems installed to protect penetration and joints shall be prepared and monitored by the RDP responsible for design. Inspections of firestop systems and fire-resistive joint systems shall be in accordance with 12.3.2.1 and 12.3.2.2.

NFPA 101, 2018

Code –NFPA 1

- **12.3.2.1** Inspection of firestop systems of the types tested in accordance with ASTM E814, *Standard Test Method for Fire Tests of Through-Penetration Fire Stops*, or /UL 1479, *Standard for Fire Tests of Through-Penetration Firestops*, shall be conducted in accordance with ASTM E2174, *Standard Practice for On-Site Inspection of Installed Fire Stops*. [***5000***:40.9.1]

- **12.3.2.2** Inspection of fire-resistive joint systems of the types tested in accordance with ASTM E1966, *Standard Test Method for Fire-Resistive Joint Systems*, or UL 2079, *Standard for Tests for Fire Resistance of Buildings Joint Systems*, shall be conducted in accordance with ASTM E2393, *Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers*.
- [***5000***:40.9.2]

Code – International Building Code

SECTION 714—PENETRATIONS

714.2 Installation. A *listed penetration firestop* shall be installed in accordance with the manufacturer's installation instructions and the listing criteria.

714.4 – Fire-Resistance-Rated Walls – Fire Barriers, Smoke Barrier walls, Fire Partitions…

714.4.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved penetration firestop* system installed as tested in accordance with ASTM E814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) and shall have an *F rating* of not less than the required *fire-resistance rating* of the wall penetrated.

- **714.4.3 Dissimilar materials.** Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the *fire-resistance* integrity of the wall is maintained.
- 714.5 – Horizontal Assemblies – Same
- 714.5.4 – Penetrations in Smoke Barriers – "L" Rating…. 5.0

IBC 2024

Code – International Building Code

SECTION 714—PENETRATIONS

- **714.5.4 Penetrations in smoke barriers.** Penetrations in *smoke barriers* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch of water (74.7 Pa) in both the ambient temperature and elevated temperature tests shall not exceed either of the following:

  1. 5.0 cfm per square foot (0.025 m3/ s × m 2) of penetration opening for each *through-penetration firestop system*.

  2. A total cumulative leakage of 50 cfm (0.024 m 3/s) for any 100 square feet (9.3 m2) of wall area, or floor area.

- **Smoke Barriers** – Hospitals, Healthcare, Underground Buildings, wherever smoke resistive properties are needed.

IBC 2024

Code – International Building Code

SECTION 715—JOINTS AND VOIDS

- **715.2.1 Listed system installation.** *Listed fire-resistant joint systems*, perimeter fire containment systems and *continuity head-of-wall systems* shall be securely installed in accordance with the manufacturer's installation instructions and the listing criteria in or on the joint or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected *building* movements and to resist the passage of fire and hot gases.
- **715.3 Fire-resistance-rated assembly intersections.** *Joints* installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an *approved fire-resistant joint* system designed to resist the passage of fire for a time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which the time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which the system is installed.

IBC 2024

Code – International Building Code

SECTION 715—JOINTS AND VOIDS

- **715.3.1 Fire test criteria.** *Fire-resistant joint systems* shall be tested in accordance with the requirements of either ASTM E1966 or UL 2079. Nonsymmetrical wall *joint* systems shall be tested with both faces exposed to the furnace, and the assigned *fire-resistance rating* shall be the shortest duration obtained from the two tests. Where evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the *building official*, the wall need not be subjected to tests from the opposite side.
- **715.4 Exterior curtain wall/fire-resistance-rated floor intersections.** Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* to prevent the interior spread of fire. Such systems shall provide an *F rating* for a t me period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly.
- **Exceptions:** An approved perimeter fire containment system shall not be required for voids in the following locations:
- 1. Floors within a single dwelling unit.
- 2. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
- 3. Mezzanine floors.
- **715.4.1 Fire test criteria.** *Perimeter fire containment systems* shall be tested in accordance with the requirements of ASTM E2307.

IBC 2024

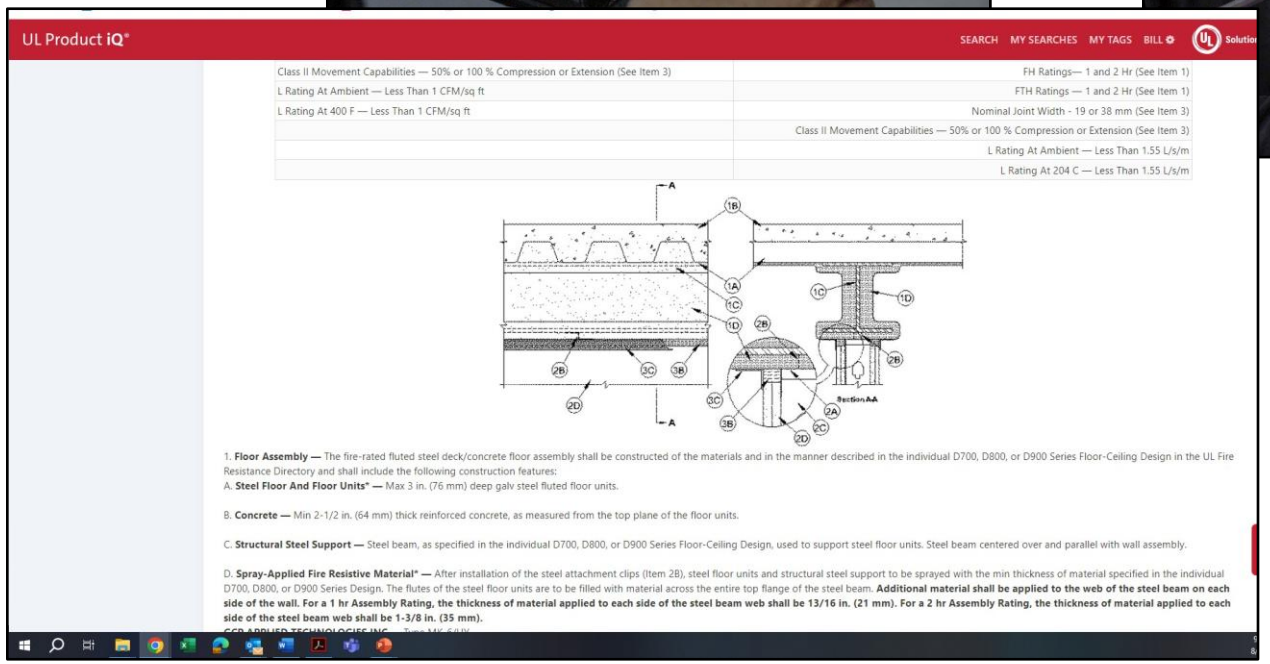
Fire-Resistance Testing – ASTM E119/UL263

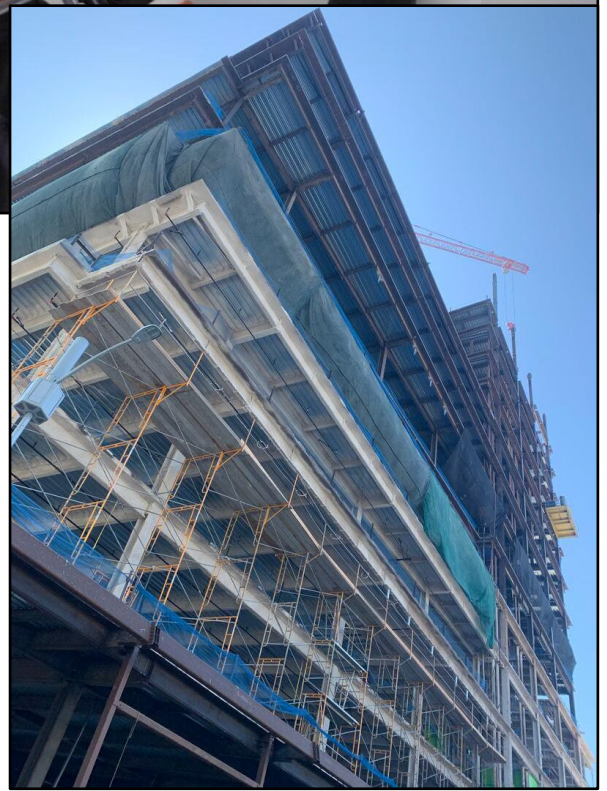
- Columns
- Beams
- Floor/Ceilings or Roof/Ceilings
- **Walls**

Building & Fire Code Requirements

- Compartment & Structural Fire Protection Terms - **US**
  - ***Exterior Walls & Horizontal Assemblies***
  - ***Fire Walls (IN-Fire Wall or Fire Separating Wall)***
  - ***Fire Compartment (UK/IN)***
  - ***Fire Barrier (IN-Fire Resisting Barrier)***
  - ***Fire Partitions (Not in NFPA)***
  - ***Fire Separations (CAN)***
  - ***Smoke Barriers***
  - ***Smoke Partitions***
  - ***Archaic Assemblies***

Systems & Materials …
Structural & Effective Compartmentation





Building & Fire Codes – Assemblies/Breaches
Similar Fire Test Time-Temperature Curves

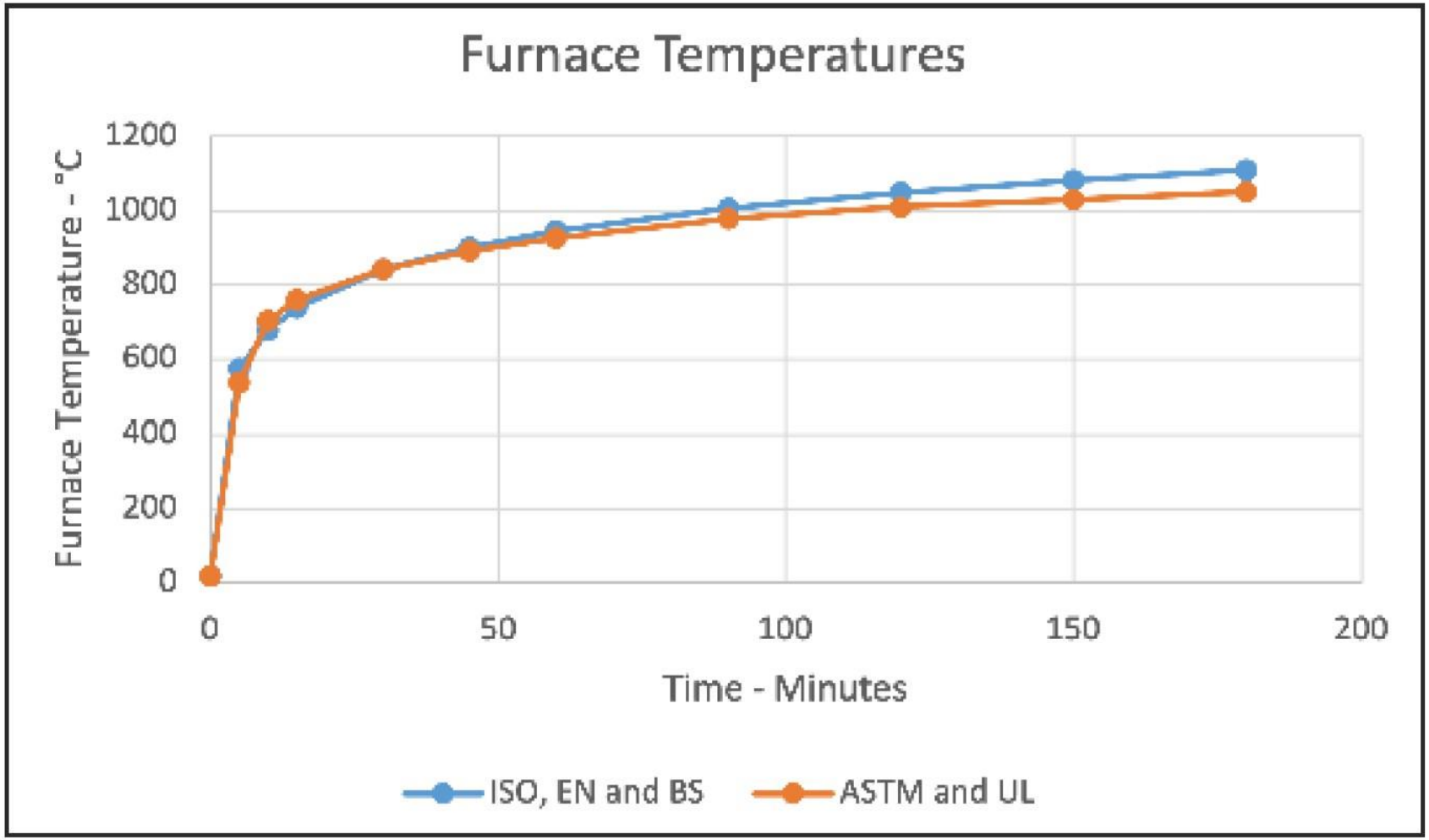


Figure 1 - Comparison of furnace temperatures, the time/temperature curve
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Wall Testing Furnace

USG Photo

Walls – U, V, W

- **Tested in accordance with …’**
  - Standards – ASTM E119, UL 263, CAN/ULC-S101
    - Flame Passage
    - Heat Transmission
    - **Hose Stream Test**
  - BS476, EN 1363, IS 3809
    - Insulation
    - Integrity
- No Contractor Qualifications
- Special Inspection??

Gypsum Panel Walls

- Gypsum Panel Core Types – Regular, X, C
- Test Standard & Acceptance Criteria-*ASTM E119 & UL 263*
- Gypsum Panel Repairs

Gypsum Panel Repairs

- NFPA 1: 12.3.3.2 Where required, **fire-rated gypsum wallboard** walls or ceilings that are damaged to the extent that through openings exist, the damaged gypsum wallboard shall be **replaced or returned to the required level of fire resistance using a listed repair system or using materials and methods equivalent to the original construction.**
- Simply covering a hole or damaged area **is not a repair**
- ***GA 225 – Repair of Fire-Rated Gypsum Panel Product Systems***
- ***Must contact manufacturer to verify listed repair method***

Gypsum Panel Repairs

- GA-225 – Repair of Fire-Rated Gypsum Panel Product Systems

Figure 1: Damaged Gypsum Panel

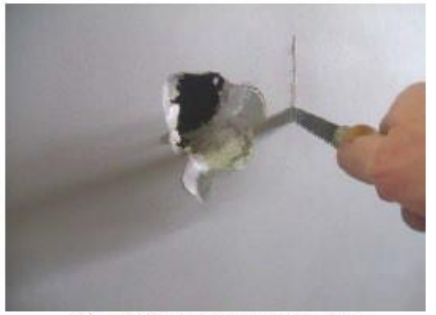


Figure 2: Square Off Damaged Area

Figure 3: Frame Opening

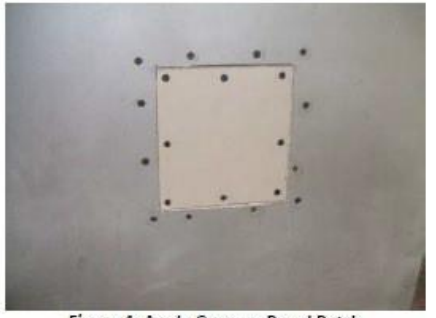


Figure 4: Apply Gypsum Panel Patch

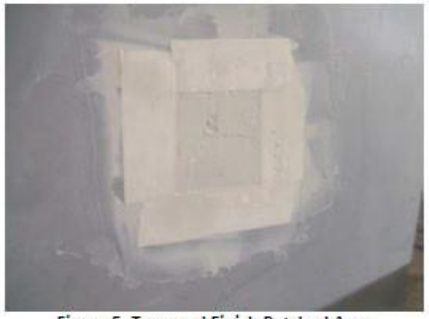
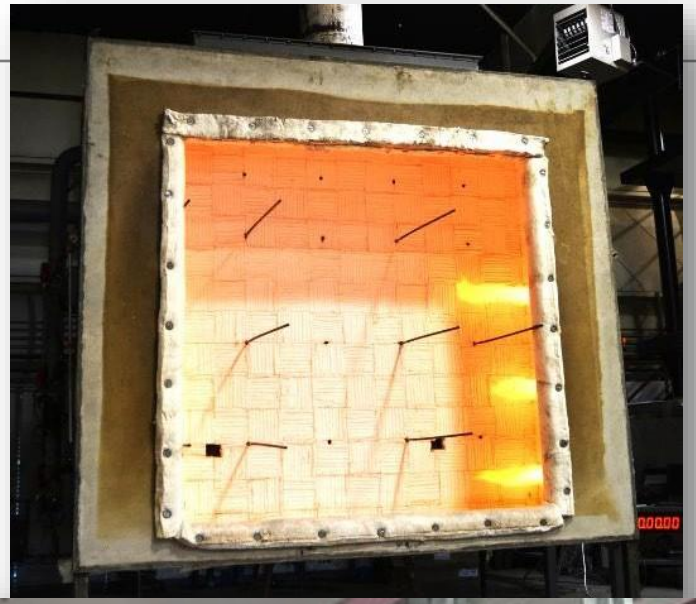


Figure 5: Tape and Finish Patched Area

Figure 6: Redecorate Repaired Area

Fire, Smoke, Combo, Radiation Damper Standards

- **UL 555** - standard for Fire dampers
- **UL 555S** - standard for Smoke dampers
- **UL 555C** - standard for Ceiling Radiation dampers
- CAN/ULC-S112 (Fire), 112.1 (Smoke Control)
- ISO 21925-1:2018 – Fire Dampers
- EN 1366-2 Fire Resistance (Integrity E), Smoke Leakage, (S)
- Contractor Qualifications? Inspection, NFPA 80



Greenheck Image

Fire Dampers & Compartmentation

Fire Damper Annular Space?

FCIA Images

Fire Rated Glazing & Compartmentation

TGP Image

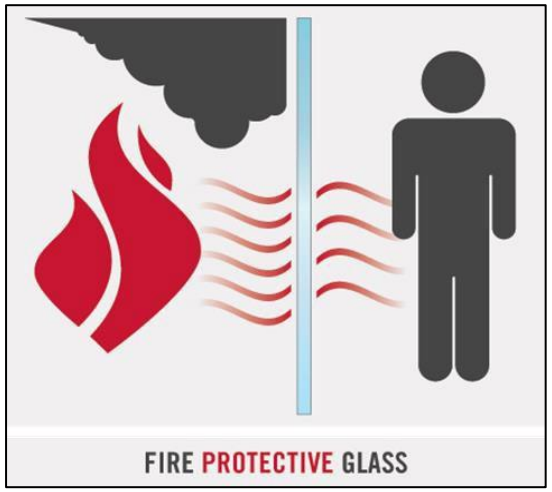
Standards
Fire-Protection-Rated Glazing

- When Used in Fire Door Assemblies
  - UL 10B
  - UL 10C
  - NFPA 252
- Fire Window Assemblies
  - UL 9
  - NFPA 257
- ***NBC references NFPA 80, CAN/ULC-S106***
- ***ISO – 12543 – Heat, Flame***
- ***EN 1363, 1364, 1365, Heat, Flame in minutes…***

Fire Door / Window Assembly Under Test

Conditions of Acceptance
Fire-Protection-Rated Glazing

- Flame Passage
- Hose Stream after Full Duration Fire Exposure
  - Limited Openings (Max 5% Fall-Out) Permitted
- Fire-Protective = Does not limit Radiant Heat; not a wall!
- Contractor Qualifications? Inspection?
- NFPA 80, Inspection, Maintain Protection



Fire Door Assemblies Under Test

Hose Stream Test

Fire Door and Shutter Assemblies – IBC Section 716

- IBC Referenced Standards
  - Side-hinged or pivoted swinging doors - UL 10C or NFPA252 (positive pressure)
  - Tin-clad fire door assemblies - UL 10A, UL 14B, and UL 14C
  - Other types of doors - UL 10B or NFPA 252 (neutral pressure)
- NOT REFERENCED

  ISO 3008-1:2019 & ISO 834-1

  BS EN 1634 & BS 476

Firestopping for Continuity
Products become SYSTEMS Based on Testing

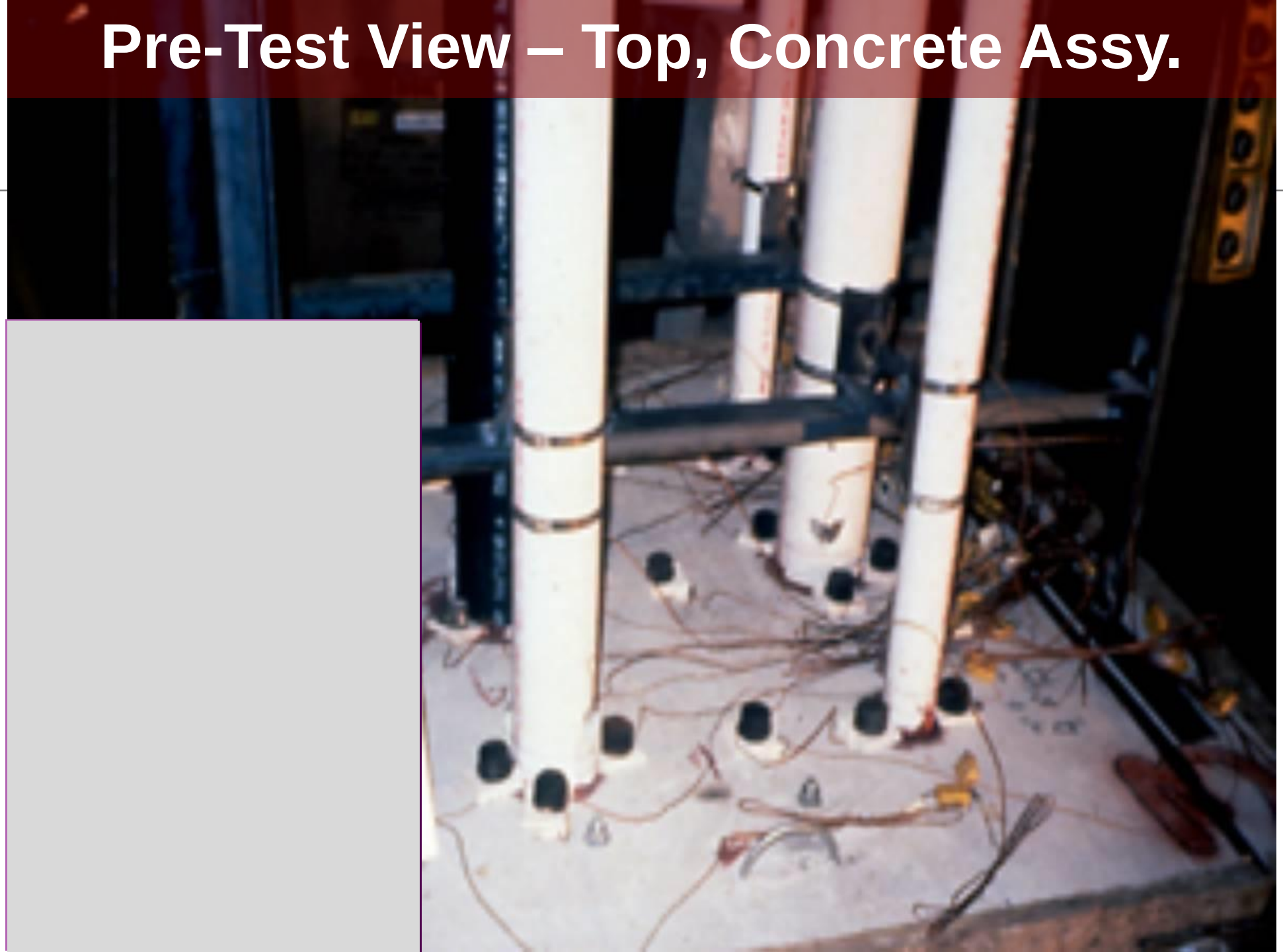
- **'Field Erected Construction…Tested to…'**
  - Standards – UL 1479, ASTM E814, FM 4990, UL 2079, ASTM E1966, ASTM E2307, ASTM E2837
    - F Rating – Flame/Hose in US
    - T Rating – Temperature/Hose in US
    - L Rating – Smoke
    - W Rating – Water
    - M Rating – Movement
    - H – Hose Stream Test in Canada
  - ISO 10295-1 – F & T…NO H
  - EN 1366-3 – F & T … NO H

3M Image

Conditions of Acceptance
FT Rating

Passage of Flame
180ºC (325ºF) Temperature Rise
Hose Stream

Pre-Test View – Top, Concrete Assy.



Affinity Firestop Photo

Hose Stream Test – Not in EN/ISO-UK Standards

UL Photo

L Rating (Optional) UL1479/2079 (SMOKE)

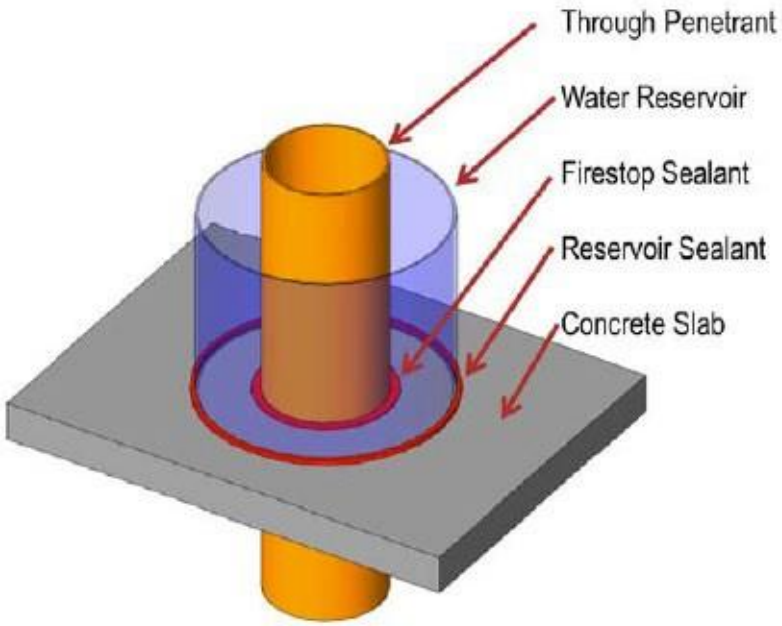
Air Leakage Rate at Ambient Temperature
Air Leakage Rate at 400ºF (204ºC)

“L” Ratings - Smoke Barriers & Firestopping

- Smoke Barriers differ from Smoke Partitions?
  - **Smoke Barrier** –
    - **IBC** – Hourly Rated, “restricting the passage of smoke”
      - Quantified Firestop “L” Rating
        - < 5 cfm/sf (IBC 2006)
        - < 50 cfm per 100 sf of Wall Area (IBC 2009)
    - **NFPA** – … ‘restricting the passage of smoke’…
      - Hourly Rated, Quantified Firestop L Rating Chapter 8
      - NO quantified “L” Rating … Healthcare Chapter
      - Continuous, Barrier to Barrier, … through concealed spaces
      - Not always fire-resistance-rated
  - **Smoke Partition** –
    - **IBC** – Continuous barrier, not fire rated…’retard’
    - **NFPA** – Continuous membrane that is designed to form a barrier to ***limit the transfer of smoke***….

W Rating (Optional)

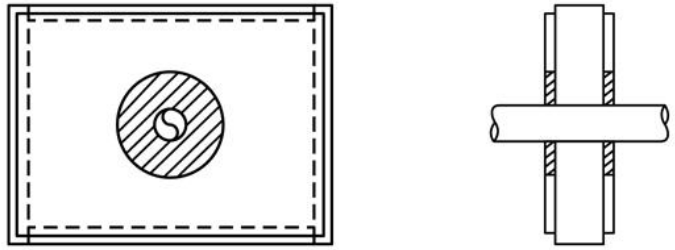
- W Rating – UL 1479
  - 0.91 m (36”) Water, Water Column 72 hrs
  - Class 1 = No Leakage
  - Must Pass Fire & Hose Stream Test After Water Exposure

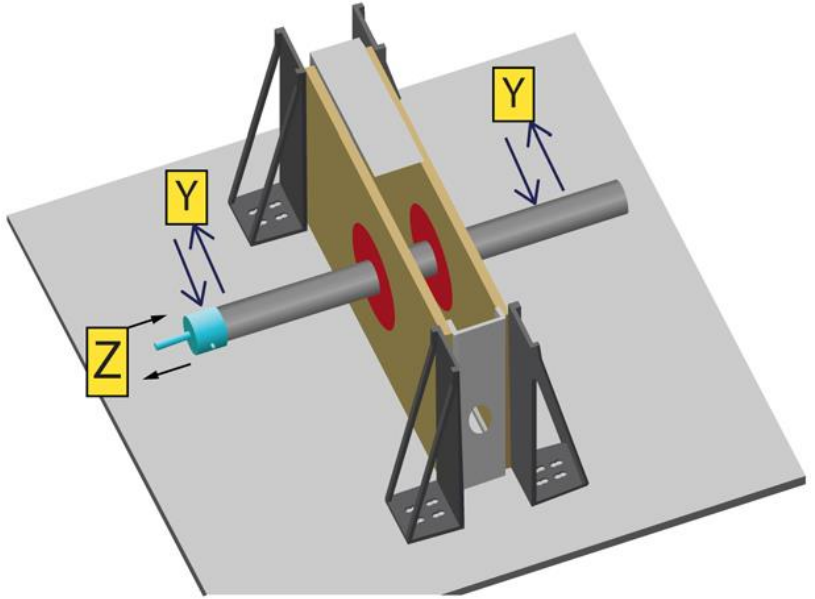


W Rating (Optional) ULC-S115

Optional program, applicable to incidental water
3 Ft. WC (0.91 M WC) Pressure Head / 72 Hr Exposure
Firestop subjected to water exposure, followed by standard fire and hose stream tests
Firestop systems assigned a W Rating

M Rating (Optional – ASTM E3037 Image)





M Rating (Optional) ASTM E3037

Applicable to movement of penetrating item/Assembly

Penetrating item move perpendicular and/or in plane of barrier - ASTM E3037

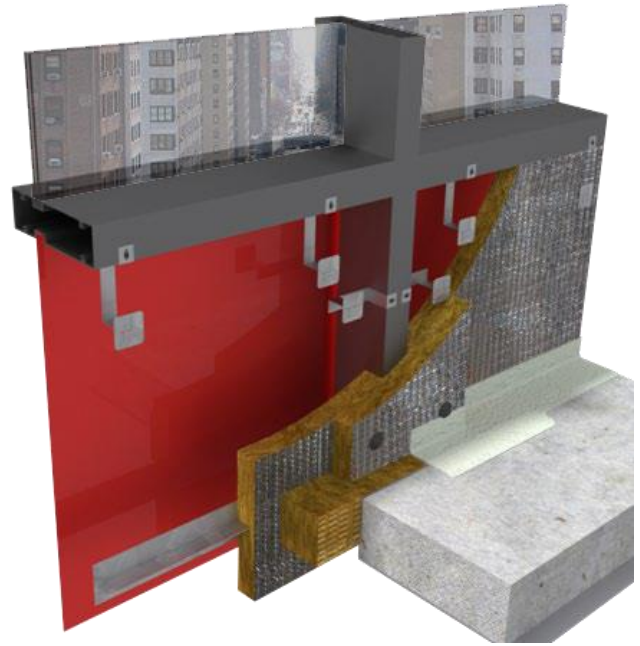
After movement, fire and hose stream test

Firestop systems - M Rating

- Rating within plane based on percentage of annular space
- Rating perpendicular to barrier based on dimension

IBC & Curtain Walls – ASTM E2307

- Prevent Fire Spread – @ Interior Safing Slot
  - Interior Flame
  - Exterior Flame Plume from Window
  - Time & Temperature
  - Tested Systems….
- EN 13501-2



OCF/Thermafiber Graphics

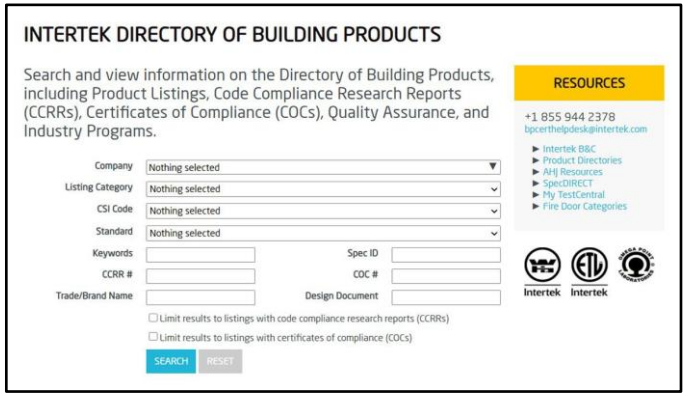
Building & Fire
Worldwide Code Requirements

- *Chemical, Biological, Radiation, Explosion, Germ, etc.*
  - Standards?
    - C – Which Chemicals? Check with manufacturer
    - B – Which Agents? Check with manufacturer
    - R – Nuclear Power Plant Standards? Check with manufacturer
    - E – Blast Strength? Check with manufacturer
    - G – Germ – Check with manufacturer & industrial hygienist
  - How to Regulate for Unexpected Events?
  - Due Diligence – Review Required by code?
  - ***SPECIFIED …***

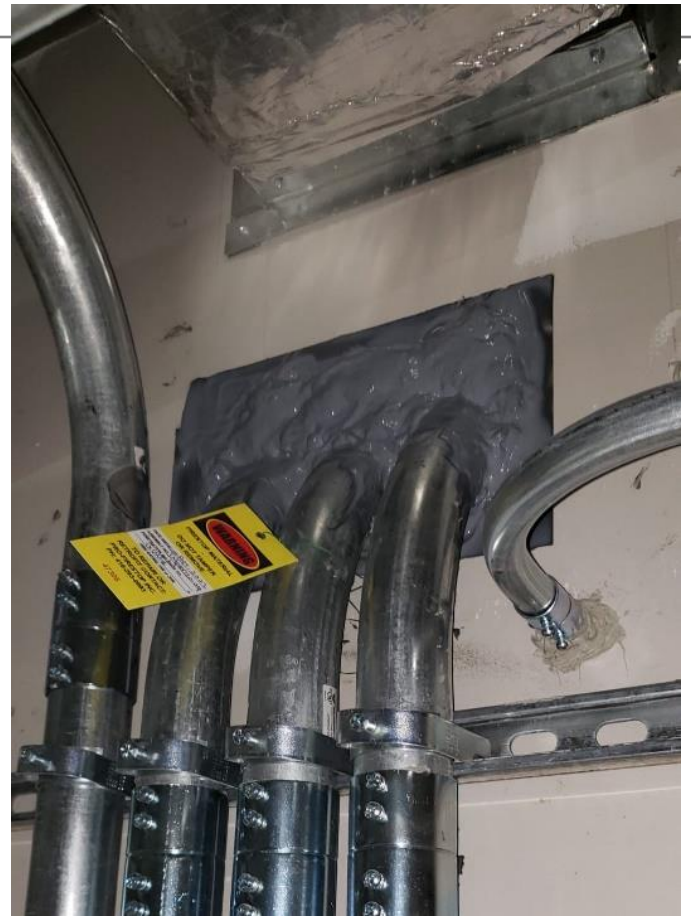
Barrier Continuity
Products become SYSTEMS

- **Fire Rated Systems Directories –**
  - **FM Approvals**
  - **Intertek**
  - **UL/ULC Product iQ Online Directory**

Systems Selection & Analysis…Not as easy as it looks…



Labels – Identification Systems



Engineering Judgments/EFRRA

Variances to Systems at Site?

First Action in Process

Find another system – Same Manufacturer

Find another system – Different Manufacturer

If no system exists in either case….

Second Action – EJ

Engineering Judgment –

"EJ"

Equivalent Fire Resistance Rated Assembly

"EFRRA"

J. Sharp – ProFirestop Photo

C. Zussman – Pepper Photo

Engineering Judgments/EFRRA

EJ Process….

Reviewed by Designer,
Possibly Fire Consultant
P.Eng. Stamp?
AHJ after Architect Approval
Signoff by EOR, FS Manufacturer

IFC Protocol….

J. Sharp – ProFirestop Photo

C. Zussman – Pepper Photo

Engineering Judgments/EFRRA

IFC EJ Guidelines for the Evaluation …
Engineering Judgments for firestop systems should:
Not a substitute for existing designs – all manufacturers
Emphasizes importance of tested designs
Should be issued only by those who know the components
Based on sound engineering practices and knowledge of performance of the designs
Based on interpolation of previous testing
Issued only for a specific jobsite
Presented in clear detail
https://firestop.org/resources/engineering-judgm

Engineering Judgments/EFRRA

International Firestop Council – Manufacturers Protocol
www.firestop.org

IFC Recommended Guidelines for Evaluating Firestop Systems in Engineering Judgments.

‘Construction industry professionals, building officials, fire officials, firestop contractors and other stakeholders need appropriate guidelines for evaluating and using such judgments….’

Engineering Judgments/EFRRA

FCIA RECOMMENDS MANUFACTURER STATEMENT FOR ALL EJ's….

"Manufacturer attests this EJ will pass applicable firestop fire test with hose stream if subjected…"


FCIA


FCIA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FCIA
Firestop Contractors International Association

16. Comparison of European and American Test Standards For Firestopping

Description	EN 1366-3	ASTM E814	UL 1479
Time-Temperature heating curve	ISO 834-1 curve	ASTM E119 curve	UL Curve (same as ASTM)
Type of furnace TC	Plate type TC wth mineral insulated sheathed thermocuple	Inconel tube type chromel alumel soldered Thermocuple with electrically insulated type	
Pressure conditions	Min. +10 Pa pressure at the bottom of each penetration	Min. +2.5 Pa pressure at the bottom of each penetration (min. 2 pressure probes)	
Minimum number of furnace TCs	8 TCs (varies with furnace size-symmetrically dispersed)	Min 5 TCs (symmetrically dispersed)	Min 9 TCs (symmetrically dispersed)
Performance rating	Integrity (E), Insulation (I)criteria only	F rating, T rating (181°C) & Hose stream test	F rating, T rating (180°C)L rating, W rating & Hose stream test
Min length of Specimen	500mm	305mm	279 to 914mm
Min. distance from boundary/ furnace edge	200mm		305mm

17. Comparison of European and American Test Standards For Joint system

Description	EN 1366-4	UL 2079
Time-Temperature heating curve	ISO 834-1 curve	UL Curve (same as ASTM E119)
Type of furnace TC	Plate type TC wth mineral insulated sheathed thermocuple	Inconel tube type chromel alumel soldered Thermocuple with electrically insulated type
Pressure conditions	Min. +15 Pa pressure at the mid height of each seal	Min. +2.5 Pa pressure at the bottom of each penetration (min. 2 pressure probes)
Minimum number of furnace TCs	Min. 4 TCs (symmetrically dispersed)	Min 9 TCs (symmetrically dispersed)
Performance rating	Integrity (E), Insulation (I)criteria only	F rating, T rating (180°C)L rating, W rating & Hose stream test
Min. length of Specimen	Min. 900mm to 2.6mm or 10:1 ratio	Min. 914mm to 3700mm or 10:1 ratio
Min. distance from boundary/ furnace edge	200mm & 200mm along the longer edge	305mm from edge of furnace wall

Firestop System Directories

- **UL Directory/Product iQ Tour**
  - Numbering
  - Listings
- **Other listing directories**
  - **Intertek**
  - **FM Approvals**
  - More.
- EJ/EFRRA’s

Review of UL Firestop and Joint Systems on UL Product iQ

NUMBERING SYSTEM

The firestop systems are identified in this category by an alpha-alphanumeric identification system. The alpha components identify the type of assembly being penetrated and the numeric component identifies the type of penetrating item.

The first alpha component is an F, W or C. The significance of the letter used is:

Letter	Description
F	A floor is being penetrated
W	A wall is being penetrated
C	Either a floor or wall is being penetrated

The second alpha component may be any letter. The significance of the letter used is:

Review of UL Firestop and Joint Systems on UL Product iQ

The second alpha component may be any letter. The significance of the letter used is:

Letter	Description
A	Concrete floors with a minimum thickness less than or equal to 5 in.
B	Concrete floors with a minimum thickness greater than 5 in.
C	Framed floors
D	Steel decks in marine vessels
E	Floor-ceiling assemblies consisting of concrete with membrane protection
G	Cross laminated timber (CLT) floor assembly
F, H through I	Not used at present time
J	Concrete or masonry walls with a minimum thickness less than or equal to 8 in.
K	Concrete or masonry walls with a minimum thickness greater than 8 in.
L	Framed walls
M	Bulkheads in marine vessels
N	Composite panel walls
O	Cross laminated timber (CLT) wall assembly
P through Z	Not used at present time

The numeric component uses sequential numbers to identify the penetrating item. The significance of the number used is:

Review of UL Firestop and Joint Systems on UL Product iQ

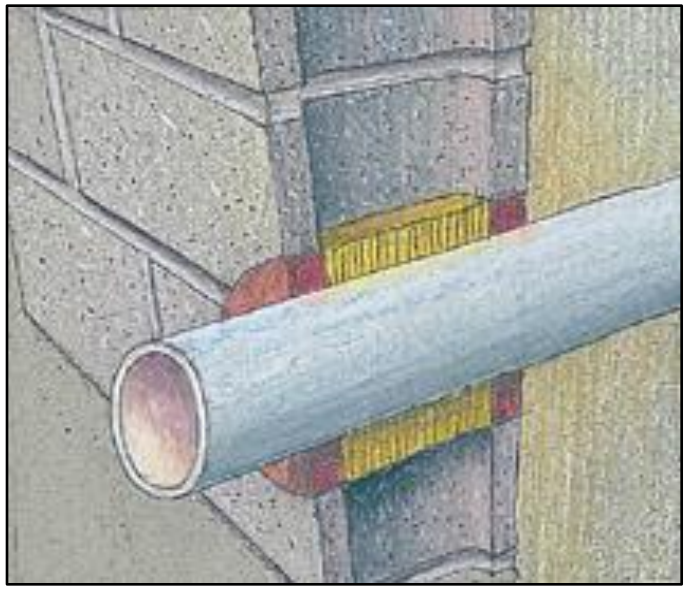
No. Range	Description
0000-0999	No penetrating items
1000-1999	Metallic pipe, conduit or tubing
2000-2999, 21000-29999	Nonmetallic pipe, conduit or tubing
3000-3999	Electrical cable
4000-4999	Cable trays with electrical cable
5000-5999	Insulated pipe
6000-6999	Miscellaneous electrical penetrants, such as busducts
7000-7999	Miscellaneous mechanical penetrants, such as air ducts
8000-8999	Groupings of penetrations, including any combination of items listed above
9000-9999	Not used at present time

ADDITIONAL INFORMATION

ditional information, see Fire-resistance Ratings (BXRH).

How do Contractors Select/Analyze Systems & Inspection Agencies Analyze?

- Wall or Floor Compartment Construction Type, Rating
- Wall or Floor Thickness
- Penetrating Item, Coverings
- Size, Type, Thickness
- Annular Space, Joint, Breach Sizes
- Packing/Damming/Backing/Forming
- Fill Material(s), Seal Materials



STI Graphic

= Fire Stop, Fire Stopping, Firestop System Manufacturers Instructions, Tested and Listed Designs

Firestop Education

Codes, Testing

Design
Installation
Inspection
Maintain Protection & Management

www.FCIA.org
Info@FCIA.org

FCIA
Firestop Contractors International Association

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