FCIA Webinar Series

Firestopping, Fireblocking, and Draftstopping – What's the Difference?

Bill McHugh, Technical Director of FCIA
Rich Walke, CTI, Consultant to FCIA

FCIA
Firestop Contractors International Association

September 17, 2024

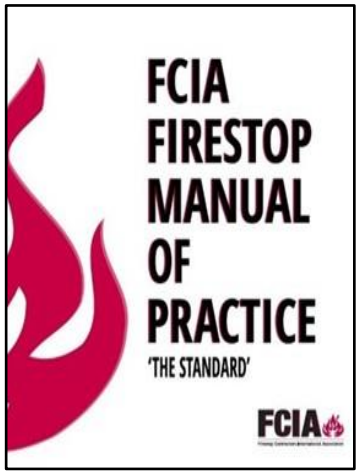
FCIA – Firestop Contractors International Association

- **Fire Exits??**

- **Thanks to FCIA Members**
  - Firestop Contractors
  - Manufacturers, Consultants
  - Firestop Distributors, Reps, Friends

FREE RESOURCES

- ***Info@FCIA.org - REQUEST*** **FREE STUFF**
  - **FREE Life Safety Digest**
  - **FREE MOP, if you Qualify….**
  - **FCIA Passive Fire Protection Barrier Management Symposium https://www.fcia.org/Events/Barrier - Management-Symposium**
- **Firestopping DIIM - FCIA.org/About**



FCIA – Firestop Contractors International Association

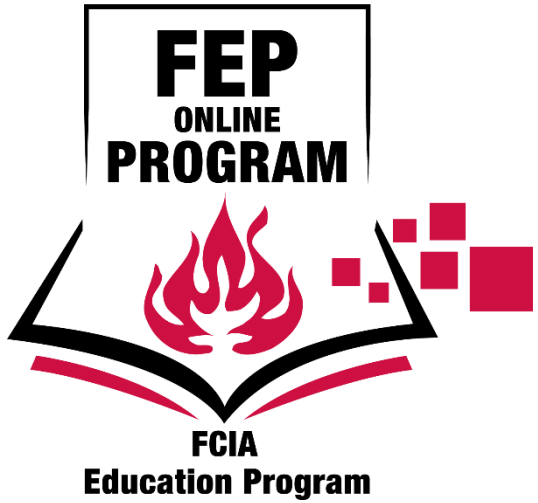
- UL QFCP, FM 4991 Contractor Programs
- ASTM Firestop Inspection Standards
- IAS AC 291 Inspection Agency Accreditation Program
- Firestop Education Program
  - Contractor, Inspection Agency, AHJ, Others

FCIA Actions –

- ***NEW Education for Careers in Firestopping!!***

- ***FCIA's Firestop Education Program (FEP)***
  - ***3.5 Hours Level 1 – LAUNCHED***
  - ***16.5 Hours Level 2 - LAUNCHED***
  - ***4.0 Hours Level 3 – LAUNCHED***

- ***24 Hours Education…***
- ***30++ Hours = Education & Exams –***
  - ***Members – Unlimited Subscription***
  - ***Non-Members – Visit FCIA.org***
  - ***SPECIFIERS, Code Officials, Fire Marshals – FREE Level 1***



FCIA – Firestop Contractors International Association

- **FCIA @ ASTM, ICC, NFPA, UL, ULC STP's, more…**
- **Tools @ FCIA.org …**
  - Specifiers, Facility Directors
  - AHJ's, Building Owners
  - Firestop Contractors & Inspection Agencies
- **Advocacy….**

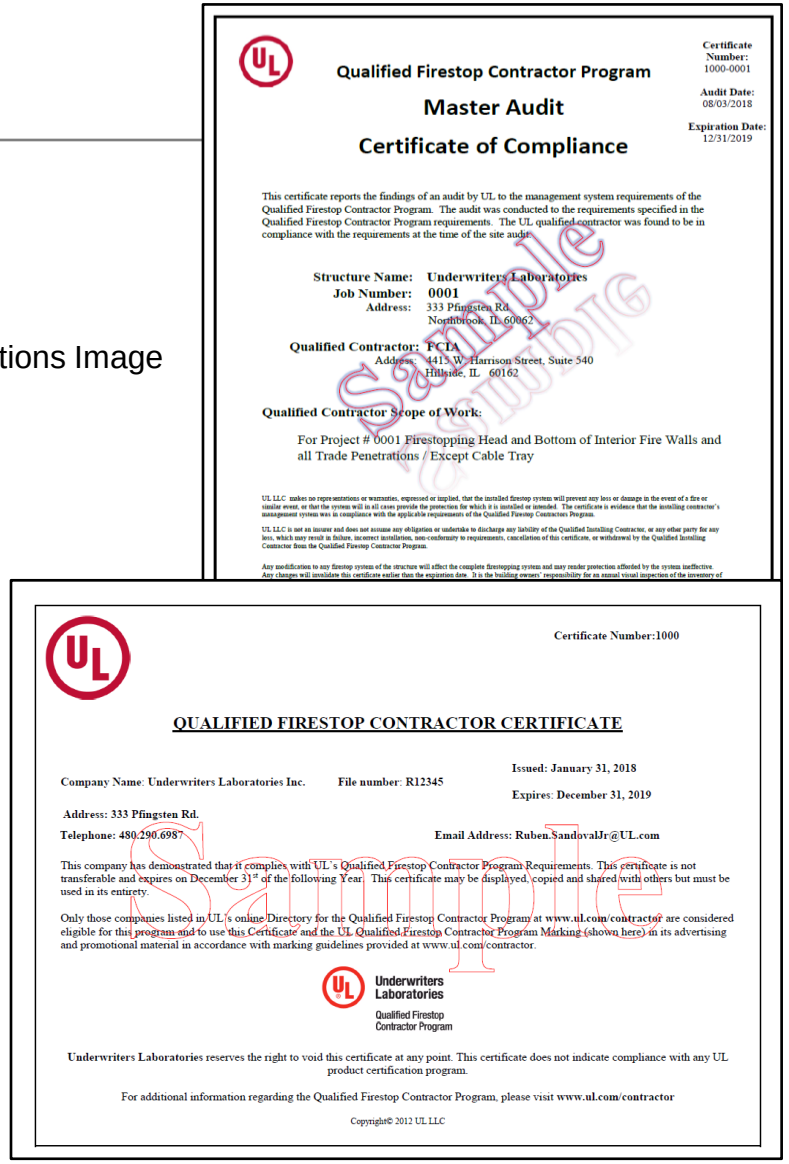
Master Audit Certificate of Compliance Program

A **Jobsite Specific Management System Audit** – Our audit provides verified processes were followed to properly installed firestop systems.

A **Renewable Jobsite Specific Certificate** – After completion of a successful audit, we issue a jobsite specific certificate that is renewable for the building owner.

Improved Firestop Systems Documentation – The MACC certificate in conjunction with the firestop systems documentation, **builds the fire-resistance inventory required by the 2018 International Fire Code** for fire and smoke protection features.

UL Solutions Image



Qualified Firestop Contractor Program

Master Audit

Certificate of Compliance

Certificate Number: 1000-0001

Audit Date: 08/03/2018

Expiration Date: 12/31/2019

This certificate reports the findings of an audit by UL to the management system requirements of the Qualified Firestop Contractor Program. The audit was conducted to the requirements specified in the Qualified Firestop Contractor Program requirements. The UL qualified contractor was found to be in compliance with the requirements at the time of the site audit.

Structure Name: Underwriters Laboratories
Job Number: 0001
Address: 333 Pfingsten Rd
Northbrook, IL 60062

Qualified Contractor: FCIA
Address: 4415 W. Harrison Street, Suite 540
Hillside, IL 60162

Qualified Contractor Scope of Work:

For Project # 0001 Firestopping Head and Bottom of Interior Fire Walls and all Trade Penetrations / Except Cable Tray

Sample

Certificate Number:1000

QUALIFIED FIRESTOP CONTRACTOR CERTIFICATE

Company Name: Underwriters Laboratories Inc. File number: R12345

Issued: January 31, 2018

Expires: December 31, 2019

Address: 333 Pfingsten Rd.

Telephone: 480.290.6987 Email Address: Ruben.SandovalJr@UL.com

This company has demonstrated that it complies with UL's Qualified Firestop Contractor Program Requirements. This certificate is not transferable and expires on December 31st of the following Year. This certificate may be displayed, copied and shared with others but must be used in its entirety.

Only those companies listed in UL's online Directory for the Qualified Firestop Contractor Program at www.ul.com/contractor are considered eligible for this program and to use this Certificate and the UL Qualified Firestop Contractor Program Marking (shown here) in its advertising and promotional material in accordance with marking guidelines provided at www.ul.com/contractor.

Underwriters Laboratories
Qualified Firestop Contractor Program

Underwriters Laboratories reserves the right to void this certificate at any point. This certificate does not indicate compliance with any UL product certification program.

For additional information regarding the Qualified Firestop Contractor Program, please visit www.ul.com/contractor

Copyright© 2012 UL LLC

Sample

FCIA – Firestop Contractors International Association

- India - Mumbai/Ahmadabad – Fire Safe Build India – IIT-G
- UAE - Dubai
- Qatar - Doha
- Canada
- Mexico/LATAM - CONAPCI/AMRACI
- Saudi Arabia
- Australia/New Zealand – FPA, Etc.

FCIA – Firestop Contractors International Association

- FCIA Education & Committee Action Conference
  - 30 April – 3 May 2024
- FCIA Dubai (4-6 June 2024)
- FCIA Doha (9/10 June 2024) Symposium
- FCIA Canada Symposium – 11-13 Sept.
- **FCIA Firestop Industry Conference & Trade Show –**
  - **5-8 Nov.**

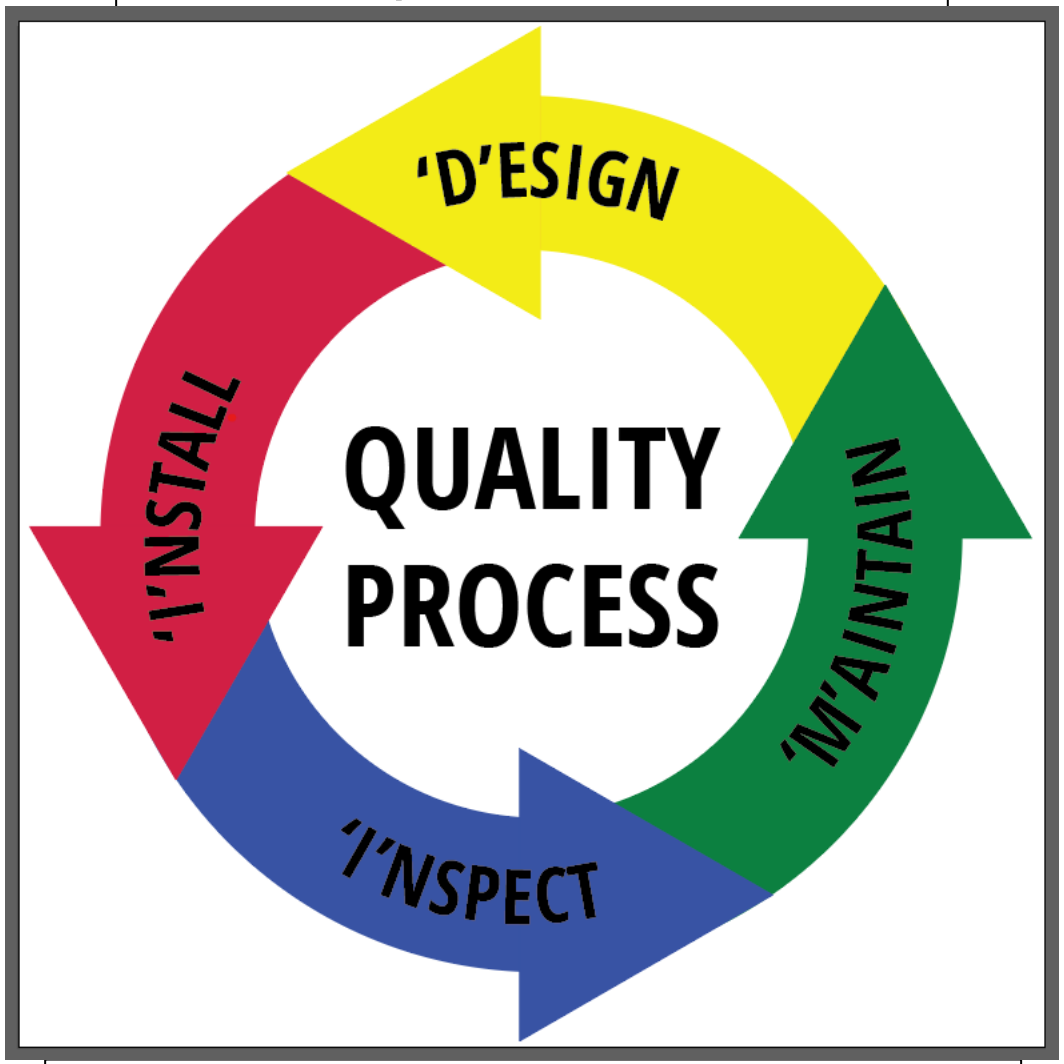
Systems & Materials….

“TOTAL FIRE PROTECTION”

- Effective Compartmentation
  - Fire Barriers, Fire Walls, Floors, Smoke Barriers
  - Firestopping, Fire Dampers, Swinging and Rolling Fire Doors, Fire-Rated Glazing
  - Fire-Resistive Protection for Ductwork
- Detection & Alarm Systems
- Sprinkler Suppression Systems
- Education & Egress –
  - Building Owners & Managers, Building Occupants and Firefighters

FCIA's DIIM™

DESIGN
Specs, Code



INSTALLATION
FM 4991/UL QFCP
Programs AND
Mfr. Education

PFP/BARRIERS
MAINTAIN
PROTECTION
Fire Codes

INSPECTION
IBC Ch. 17 -NFPA 80 - NFPA 1

FCIA

FCIA Webinar Series

Firestopping, Fireblocking, and Draftstopping - What's the Difference?

Bill McHugh, Technical Director of FCIA
Rich Walke, CTI, Consultant to FCIA

FCIA
Firestop Contractors International Association

September 17, 2024

Objective

- At the end of this lesson, you will be able to:
  - ***Understand*** the differences between firestopping, fireblocking and draftstopping
  - ***Differentiate*** between the applications which require firestopping, fireblocking and draftstopping
  - ***Understand*** the materials used for fireblocking and draftstopping

Definitions Cont.

- **THROUGH-PENETRATION FIRESTOP SYSTEM.** An assemblage consisting of a fire-resistance-rated floor, floor-ceiling, or wall assembly, one or more penetrating items passing through the breaches on both sides of the assembly and the materials or devices, or both, installed to resist the spread of fire through the assembly for a prescribed period of time. (2024 IBC)
  - Relates to the protection of penetrations through fire-resistance-rated construction
  - Applicable to both the IBC and the IRC

Definitions Cont.

- **MEMBRANE-PENETRATION FIRESTOP SYSTEM.** An assemblage consisting of a fire-resistance-rated floor-ceiling, roof-ceiling or wall assembly, one or more penetrating items installed into or passing through the breach in one side of the assembly and the materials or devices, or both, installed to resist the spread of fire into the assembly for a prescribed period of time. (2024 IBC)
  - Relates to the protection of penetrations into or out of fire-resistance-rated construction
  - Applicable to both the IBC and the IRC

Definitions Cont.

- **FIRESTOP SYSTEM.** Membrane- or through-penetration firestop system. (RW)

Definitions Cont.

- **FIREBLOCKING.** Building materials or materials *approved* for use as *fireblocking*, installed to resist the free passage of flame to other areas of the *building* through concealed spaces. (2024 IBC and IRC)
  - Only applicable to combustible construction
  - Used in both fire-resistance-rated and non-rated construction
  - With one exception, not related to protection of penetrations
  - Applicable to both the IBC and the IRC

Definitions Cont.

- **DRAFTSTOP.** A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor-ceiling assemblies, roof-ceiling assemblies and *attics*. (2024 IBC and IRC)
  - Only applicable to combustible construction
  - Used in both fire-resistance-rated and non-rated construction
  - Not related to the protection of penetrations
  - Applicable to both the IBC and the IRC

What’s the difference?

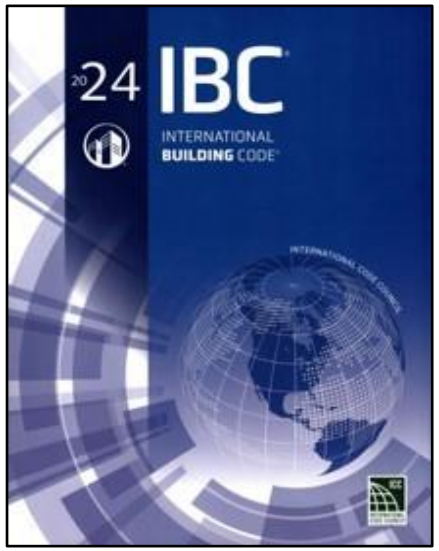
Firestopping?

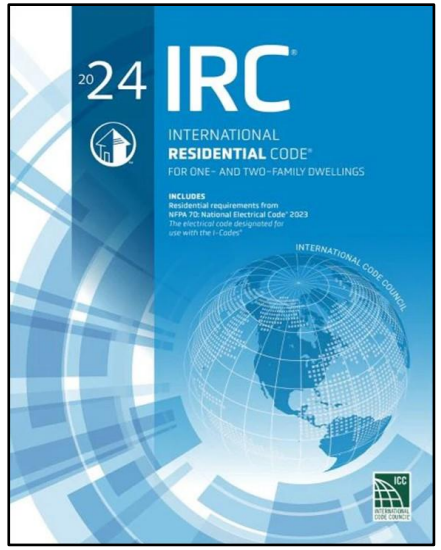
Fireblocking?

Draftstopping?

Firestopping

International Building Code and International Residential Code Requirements





IBC Chapter 7
Fire-Resistance-Rated Construction

- The IBC contains multiple wall and horizontal assemblies which required a fire-resistance rating and smoke-resistance
  - *Exterior Walls*
  - *Fire Walls*
  - *Fire Barriers*
  - *Fire Partitions*
  - *Shaft Enclosures*
  - *Smoke Barriers*
  - *Smoke Partitions*
  - Horizontal Assemblies
- Penetrations through these fire-resistance-rated assemblies are generally required to be protected with a firestop system

IRC Section R302
Fire-Resistant Construction

- The IRC likewise contains multiple wall and horizontal assemblies which required a fire-resistance rating
  - *Townhouses*
    - *Exterior Walls*
    - Walls separating *townhouse units*
      - Double walls – Each *townhouse unit* shall be separated from other *townhouse units* by two 1 hr fire-resistance-rated wall assemblies
      - Common walls – 2 hr fire-resistance-rated common walls separating *townhouse units*

IRC Section R302
Fire-Resistant Construction Cont.

- *Two-Family Dwellings*
  - Dwelling Unit Separations
    - Vertical or Horizontal Separations – Dwelling unit separations shall have a fire-resistance rating of 1 hr or 1/2 hr for non-sprinklered and sprinkled buildings, respectively
- Penetrations of wall or floor-ceiling assemblies in townhouses and two-family dwellings required to be fire-resistance-rated shall be protected in accordance with Section R302.4
  - The methods of protecting these penetrations are very similar to those required by the IBC

IRC Section R302
Fire-Resistant Construction Cont.

- **R302.4.1 Through penetrations.** Through penetrations of fire-resistance-rated wall and floor assemblies shall be protected by one of the following:
  - As tested as part of the entire wall or floor assembly
  - As tested to UL 1479 / ASTM E814
    - **Exceptions:**
      - Metallic penetrants of limited sizes protected with concrete, grout or mortar
      - Metallic penetrants protected with annular space protection material
      - Water-filled fire sprinkler piping protected with annular space protection materials

IRC Section R302
Fire-Resistant Construction Cont.

- When tested to UL 1479 / ASTM E814, through penetrations shall have an F Rating of not less than the required rating of wall or floor-ceiling assembly penetrated

IRC Section R302
Fire-Resistant Construction Cont.

- **R302.4.2 Membrane Penetrations.** Membrane penetration of fire-resistance-rated wall and floor assemblies shall be protected as follows:
  - As specified in R302.4.1 (i.e. through penetrations)
  - Recessed fixtures shall be installed so as not to reduce the required fire resistance

IRC Section R302
Fire-Resistant Construction Cont.

- **Exceptions:**
  - Steel electrical boxes installed per prescriptive requirements or protected with *listed* materials and methods
  - *Listed* electrical boxes of any material installed per prescriptive requirements or protected with *listed* materials and methods
  - Annular space created by fire sprinklers or water filled sprinkler piping covered by escutcheon plates
  - Ceiling membranes penetrations by *listed* luminaires or by luminaires protected by *listed* materials

IRC Section R302
Fire-Resistant Construction Cont.

- **R302.5 Dwelling-garage opening and penetration protection.** Openings and penetrations through the walls or ceilings separating the *dwelling* from the garage shall be in protected
  - **R302.5.3 Other penetrations.** Penetrations through the *dwelling* / garage separation requiring protection shall be protected as required by Section R302.11, Item 4. (i.e. *approved fireblocking*)

IBC Section 718
Fireblocking

- The fireblocking requirements are very similar between the IBC and the IRC

- **718.2 Fireblocking.** In combustible construction, fireblocking shall be installed to cut off concealed draft openings (both vertical and horizontal) and shall form an effective fire barrier between stories, between a top story and the roof or attic space. Fireblocking shall be provided in wood-framed construction in the following locations:

IBC Section 718
Fireblocking Cont.

- **718.2.2 Concealed Wall Spaces.** In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
    1. Vertically at the ceiling and floor levels.
    2. Horizontally at intervals not exceeding 10 feet.
- **718.2.3 Connections between horizontal and vertical spaces.** At interconnections between concealed vertical stud wall or partition spaces and concealed horizontal spaces such as occur at soffits, drop ceilings, cove ceilings and similar locations.
- **718.4 Stairways.** In concealed spaces between stair stringers at the top and bottom of the run.

IBC Section 718
Fireblocking Cont.

- **718.2.5 Ceiling and floor openings.** In specific openings, *fireblocking* of the *annular space* around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor levels shall be installed with a material specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and resist the free passage of flame and products of combustion.
- **718.2.6 Exterior wall coverings.** *Fireblocking* shall be installed within concealed spaces of *exterior walls* where permitted to be of combustible construction. *Fireblocking* installed at max intervals of 20 ft so that there will be no concealed space exceeding 100 sq ft between *fireblocking*.

IBC Section 718
Fireblocking Cont.

- **718.2.5 Concealed sleeper spaces.** Where wood sleepers are used for laying wood flooring on *masonry* or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an *approved* material to resist the free passage of flames and products of combustion or *fireblocked* so that there will be no concealed space exceeding 100 sq ft.

IBC Section 718
Fireblocking Cont.

- **718.2.1 Fireblocking materials.** *Fireblocking* shall consist of the following materials.
  1. Two-inch nominal lumber.
  2. Two thicknesses of 1-inch nominal lumber with broken lap joints.
  3. One thickness of 23/32-inch *wood structural panels* with joints backed by 23/32-inch (18.3 mm) *wood structural panels*.
  4. One thickness of 3/4-inch particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
  5. One-half-inch gypsum board.
  6. One-quarter-inch cement-based millboard.

IBC Section 718
Fireblocking Cont.

7. Batts or blankets of *mineral wool, mineral fiber* or other *approved* materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation tested in the form and manner intended for use to demonstrate its ability to remain in place and retard the spread of flames.
9. Mass Timber.
10. One thickness of 19/32 in. *fire-retardant-treated wood* structural panels.

- **718.2.1.1 Batts or blankets of mineral or glass fiber.** Batts or blankets of *mineral wool* or *mineral fiber* or other *approved* nonrigid materials shall be permitted for compliance with the 10-foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

IBC Section 718
Fireblocking Cont.

- **718.2.1.2 Unfaced fiberglass.** Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a height of not less than 16 inches measured vertically. Where piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.
- **718.2.1.3 Loose-fill insulation material.** Loose-fill insulation material, insulating foam sealants and caulk materials shall not be used as a *fireblock* unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.
- **718.2.1.4 Fireblocking integrity.** The integrity of *fireblocks* shall be maintained.

IBC Section 718
Draftstopping

- The draftstopping requirements are very similar between the IBC and the IRC

- **718.3 Draftstops in floors.** *Draftstops* shall be installed to subdivide floor/ceiling assemblies where required by Section 708.4.3. In other than Group R occupancies, *draftstops* shall be installed to subdivide combustible floor/ceiling assemblies so that horizontal floor areas do not exceed 1,000 sq ft (93 m^2).
  - Exception: Buildings equipped with an *automatic sprinkler system* in accordance with NFPA 13.

IBC Section 718
Draftstopping Cont.

- **718.3.1 Draftstop Materials.** Draftstopping materials shall be not less than 1/2-inch gypsum board, 3/8-inch *wood structural panels*, 3/8-inch *particleboard*, 1 in. nominal lumber, cement *fiberboard*, batts or blankets of *mineral wool* or glass fiber, or other *approved* materials adequately supported. The integrity of the draftstops shall be maintained.

IBC Section 718 Draftstopping Cont.

- **718.3 Draftstops in attics.** *Draftstops* shall be installed to subdivide *attic* spaces where required by Section 708.4.3. In other than Group R occupancies, *draftstops* shall be installed to subdivide combustible floor/ceiling assemblies so that horizontal floor areas do not exceed 3,000 sq ft (93 m^2).
  - Exception: Buildings equipped with an *automatic sprinkler system* in accordance with NFPA 13.
  - **718.3.1 Draftstop Materials.** Same as required for floors.

Primary Difference in *Fireblocking* Requirements Between IBC and IRC

- **R302.11 Fireblocking.** In combustible construction, *fireblocking* shall be provided to cut off both vertical and horizontal concealed draft openings and to form an effective fire barrier between *stories*, and between a top *story* and the roof space. *Fireblocking* shall be provided in wood-framed construction in the following locations:

  4. At opening around vents, pipes, ducts, cables and wires at ceiling and floor levels, with an *approved* material to resist free pass passage of flames and products of combustion. The material filling this annular space shall not be required to meet the ASTM E136 requirements.

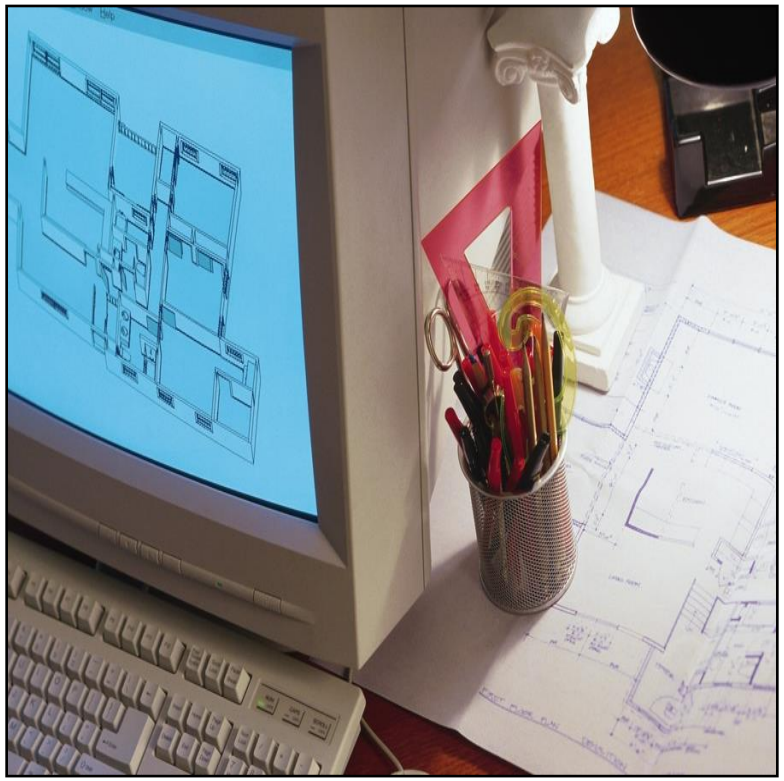
Primary Difference in *Fireblocking* Requirements Between IBC and IRC

- Prior to the publication of the IRC, the CABO One and Two-Family Dwelling Code required these material to be noncombustible based on ASTM E136. That requirement did not follow into the IRC, leaving the requirements for *approving* such materials up to the *code official*.
- The 2009 IRC was changed to clarify the materials need not be noncombustible.
- This led the foam industry to develop foam products to serve as *fireblocking* in these applications.
- ICC-ES began publishing Evaluation Reports on these foam products around 2010.

Primary Difference in *Fireblocking* Requirements Between IBC and IRC

- Early attempts by ICC-ES to publish Acceptance Criteria AC442 describing the criteria for an Evaluation Report were disapproved.
- Acceptance Criteria AC546 was published in March, 2023. This criteria now formalizes the fire testing criteria for spray-applied foam plastic used in this application.
  - Scope limits the use of criteria to sealing the annular space around penetrations of wood *fireblocking* in IRC and IBC non-rated applications. Scope specifically states the spray-applied foam plastic is not intended for use as a component of a through-penetration firestop system installed in fire-resistance-rated assemblies.

Key Points About Firestopping



Firestopping

- IBC and IRC requires firestop systems to be tested in accordance with the following standards:
  - ASTM E814 or UL 1479
- ASTM E814 and UL 1479 establishes two ratings:
  - F Rating – Passage of flames, and successful hose stream test for some hourly rating period
  - T Rating - Passage of flames, limitation on temperature rise on unexposed side, and successful hose stream test for some hourly time period
- IRC requires only an F Rating

Firestopping Cont.

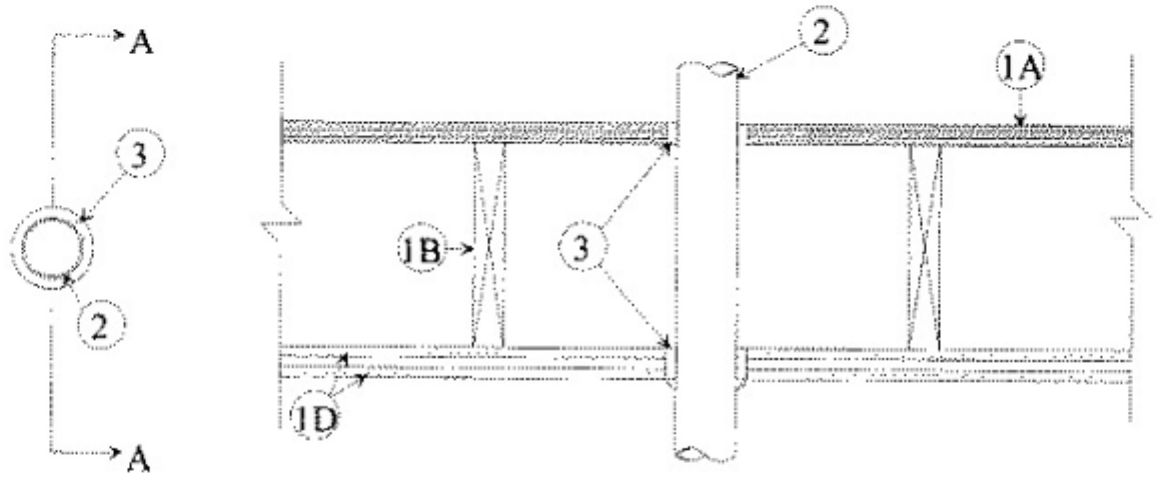
- Testing in accordance with ASTM E814 / UL 1479 establishes a firestop system which describes the overall construction of the system tested. System describes barrier penetrated, penetrating item, method of protection system and ratings achieved.
  - Construction in the field must match the system in order for the rating to apply. Any variation between published system and field construction must be evaluated through the engineering judgment process.

System No. F-C- 1XXX

May 17, 2010

F Rating — 2 Hr

T Ratings — 3/4 & 1 Hr (See Item 2)



SECTION A-A

1. **Floor-Ceiling Assembly** — The fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design No. L505, L511 or L536 in the UL Fire Resistance Directory, as summarized below:

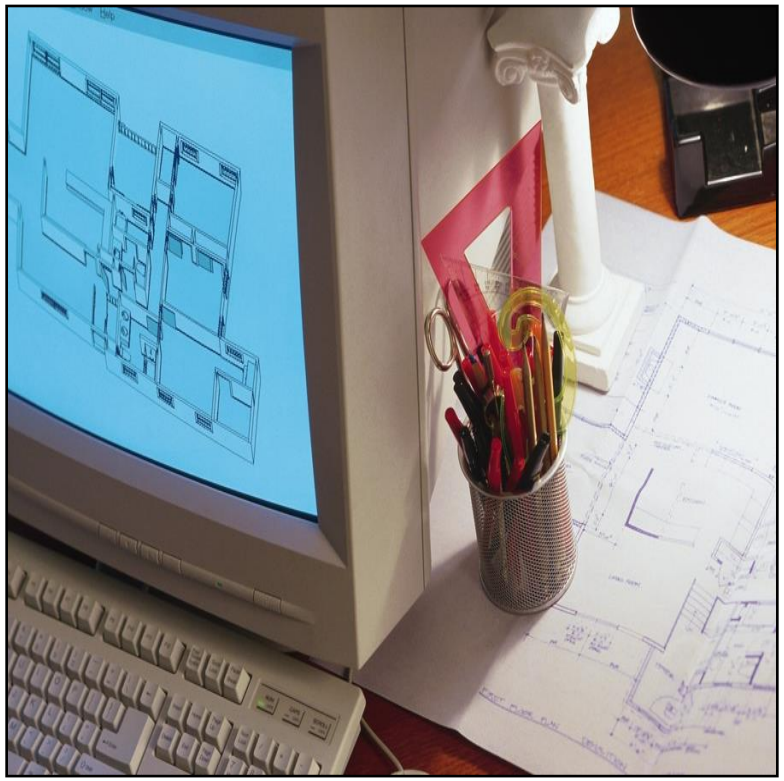
A. **Flooring System** — Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of opening is 5 in.

B. **Wood Joists** — Nom 2 by 10 in. lumber joists spaced 16 in. OC with nom 1 by 3 in. lumber bridging and with ends firestopped.

C. **Furring Channels** — (Not Shown) — Resilient galv steel furring installed perpendicular to wood joists between first and second layers of wallboard (Item 1D) and spaced max 24 in. OC.

D. **Gypsum Board*** — Nom 4 ft wide by 5/8 in. thick as specified in the individual Floor-Ceiling Design. First layer of wallboard nailed to wood joists. Second layer of wallboard screw-attached to furring channels. Max diam of opening is 5 in.

Key Points About Fireblocking



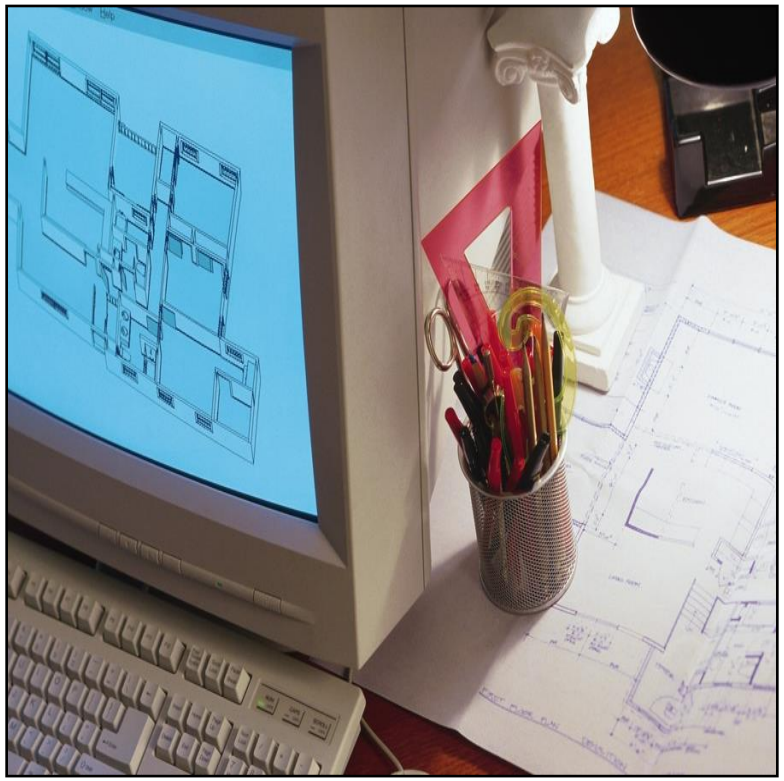
Fireblocking

- The IBC and IRC both require fireblocking within the concealed space of combustible construction to cut off both vertical and horizontal concealed draft openings and to form an effective barrier between stories and between the top story and the attic space.
- The fireblocking materials and their installation are prescriptively described in the IBC and IRC. No testing or listings are needed.

Fireblocking Cont.

- By the IRC, openings around vents, pipes, ducts, cables and wires at the top and bottom plates in non-rated combustible construction, shall be protected with an *approved* material to resist free passage of flames and products of combustion.
  - One method of approving a protection method is through the use of an Evaluation Report issued by ICC-ES, Intertek or UL based on the ICC-ES Acceptance Criteria AC546. Code officials are not obligated to accept an Evaluation Report!

Key Points About Draftstopping

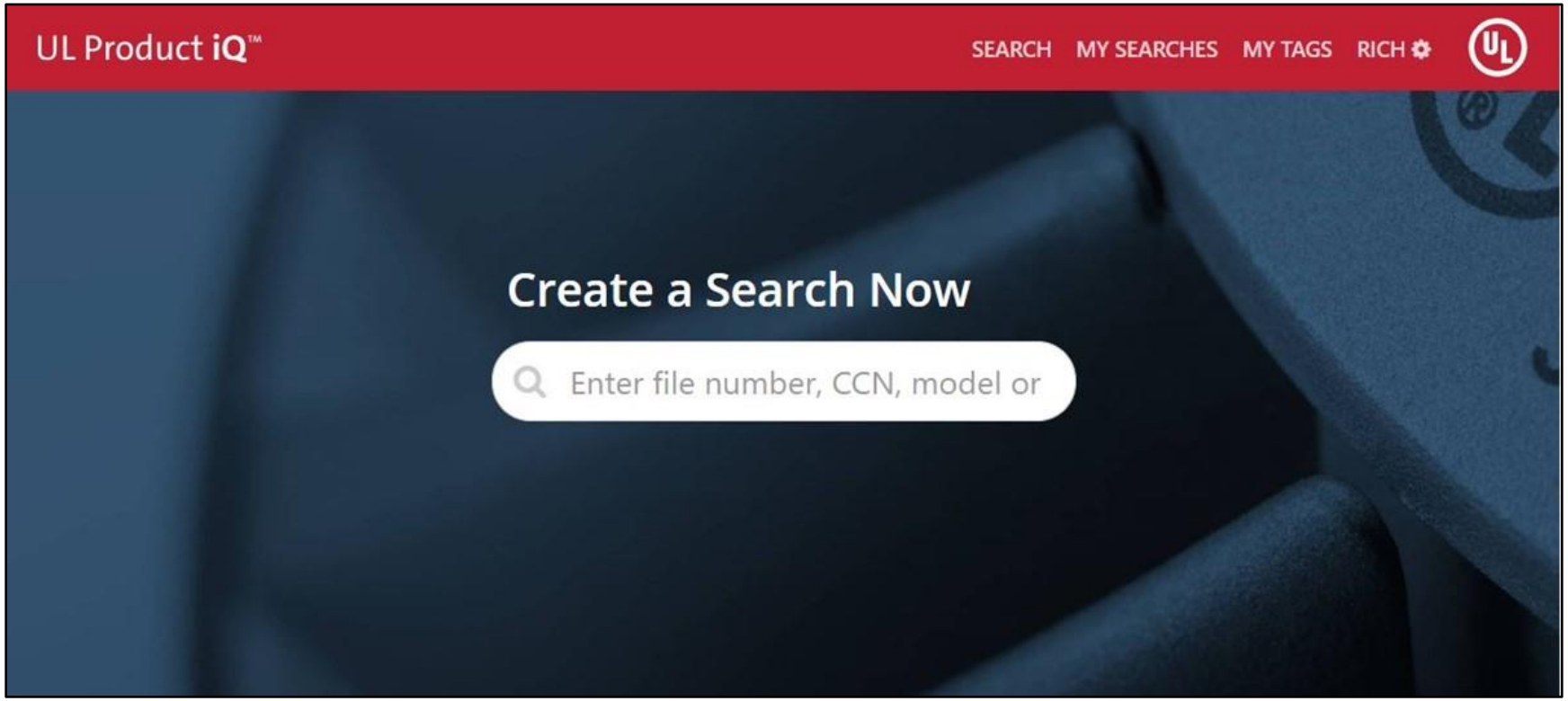


Draftstopping

- The IBC requires draftstopping within the concealed spaces of combustible floor and attic construction to subdivide the space so the floor areas do not exceed 1,000 sq ft and attic areas do not exceed 3,000 sq ft.
- The IRC requires draftstopping within the concealed spaces of combustible floor construction to subdivide the space so the floor areas do not exceed 1,000 sq ft.
- Draftstopping uses materials prescriptively described in the IRC. No testing or listings are needed.

Where Tested Fire Resistance Designs and Firestop Systems are Needed, Where Can I Find The Most Current Listings?

UL Product iQ on www.ul.com



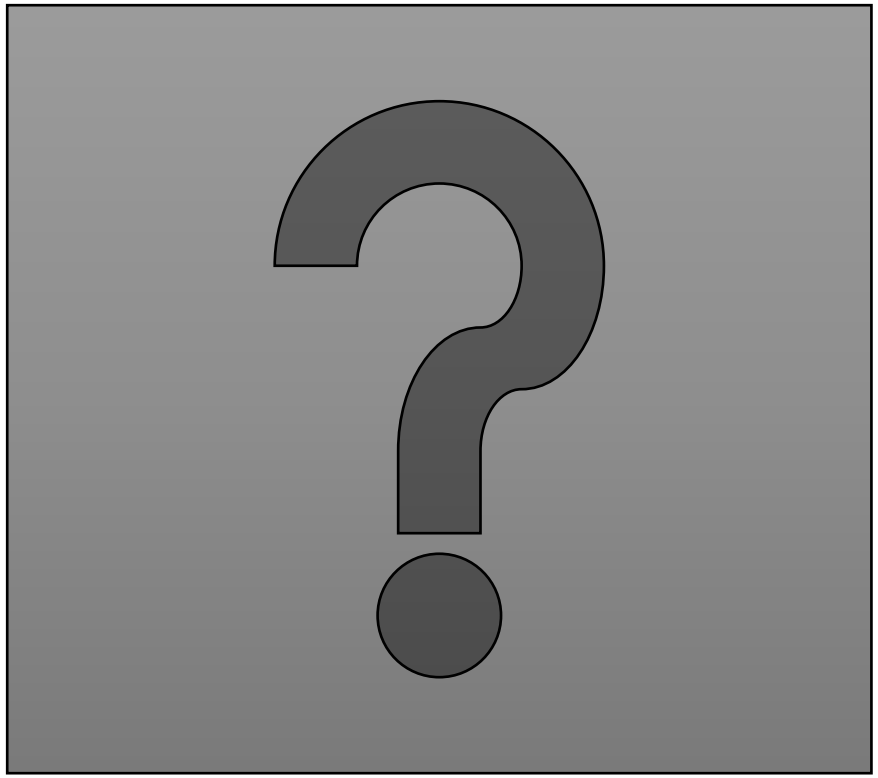
Product Categories

- BXUV – Fire Resistance Ratings – ANSI/UL 263
  - Includes approximately 2051 individual designs
  - Proprietary products specified in these designs are covered in 58 individual product categories

Product Categories

- XHEZ – Through-Penetration Firestop Systems
  - Includes approximately 7642 individual systems
  - Proprietary products specified in these designs are covered in 8 individual product categories

Questions??



Thanks for Attending!!!

Bill McHugh, Technical Director of FCIA
Rich Walke, Consultant to the FCIA
Firestop Contractors International Association
800 Roosevelt Road - Building C, Suite 312
Glen Ellyn, IL 60137
+1-708-202-1108 – info@FCIA.org