

# Specs, Fire Codes & Existing Building Requirements

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# FCIA – Firestop Contractors International Association

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- **Fire Exits??**
- **Housekeeping....**
- **Thanks to FCIA Members**
  - Firestop Contractors
  - Manufacturers, Consultants
  - Firestop Distributors, Reps, Friends
  - **FCIA Board of Directors**

# FCIA BOARD OF DIRECTORS LEADERSHIP OVER DECADES



# Welcome, Thanks, From FCIA.....

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**Firestop Contractors International Association**  
**FREE PDF MOP, SPECIFICATION & Life Safety Digest**  
**for Code Officials, Fire Marshals,**  
**& Specifiers with Design Firms**

**Info@FCIA.org**  
**www.FCIA.org**



# FCIA – Firestop Contractors International Association

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- **FREE Life Safety Digest**
- **UL/ULC, FM 4991 Contractor Programs**
- **IAS AC 291 Inspection Agency Accreditation Program**
- **Firestop Certificate & Individual Knowledge**
- **ASTM Inspection Standards**
- **Tools @ FCIA.org** for Specifiers, AHJ's, Building Owners, Firestop Contractors & Inspection Agencies
- **Watch FCIA.org for Webinar Announcements!**



# FCIA Action!

- Doha FCIA Symposium; Members
- Mumbai/Ahmadabad – Fire Safe Build India – IIT-G
- Dubai – FCIA Symposium; Civil Defence
- Riyadh – BIG5 Show; UL, ICC, TBWIC
- More...



# FCIA Actions –2023

- **Conferences**
  - **FCIA MENA - India**
    - Doha – Feb. 5
    - FSBI – Feb. 9, 10
    - Dubai – Feb. 15
    - Riyadh – Feb. 18
  - **FCIA ECA @ New Orleans, USA – May 10-13**
  - **FCIA CAN @ Ottawa, Ontario – Sept. 24-26**
  - **FCIA FIC @ ABQ, NM USA – Oct. 23-27**
- **Webinars & Symposiums**
- **Code Development & Standards Discussions**
- **Committee Action**
- **International Discussions**

# FCIA Actions – 2021 & 2022

- ***NEW Education for Careers in Firestopping!!***
- ***FCIA's Firestop Education Program***
  - ***3.5 Hours Level 1 - Firestopping***
  - ***16.5 Hours Level 2 – Firestopping Deep Dive***
  - ***3.5 Hours Level 3 – COMING SOON***
- ***30 Hours Education & Exams –***
  - ***Members – Unlimited Subscription***

# Systems & Materials....

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# Outline

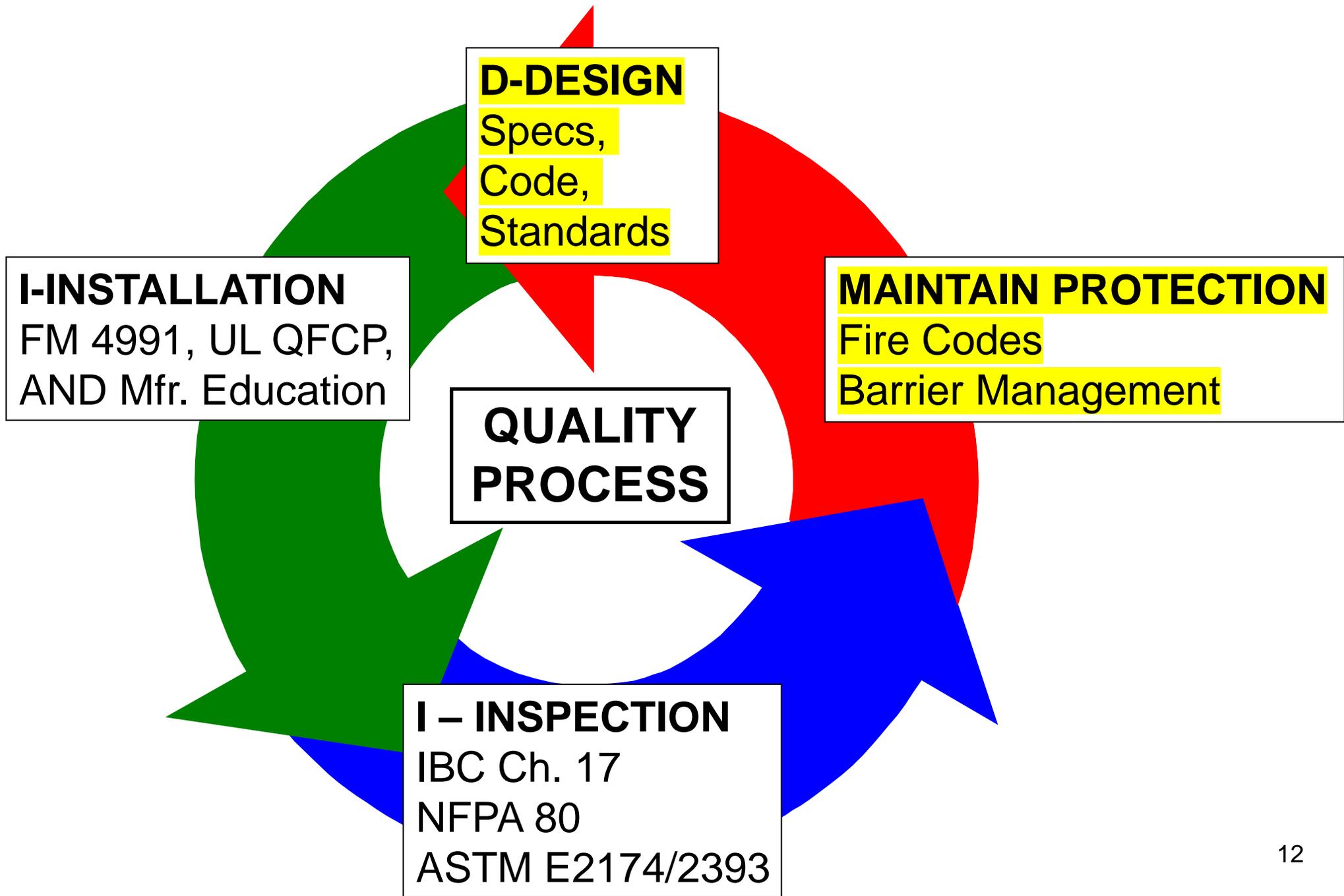
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- FCIA – DIIM – Firestopping
  - Design – Specs, Codes, Testing, Products
  - Installation –
    - FM 4991, UL/ULC Qualified Firestop Contractor Programs
  - Inspection –
    - ASTM E2174 / E2393 Inspection Standards
    - IAS AC 291, Inspector Qualifications
  - Maintenance – Fire Codes; Barrier Management
  - Firestopping for Safety –
    - Repairs??

# “TOTAL FIRE PROTECTION”

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



# Firestopping / Barrier Management for Safety “DIIM”

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- Properly **Designed** and Specified Firestopping
  - FCIA – 07 84 00 - Firestopping
- **Tested and Listed Systems** – ASTM E814 / UL 1479, ASTM E1966 / UL 2079, FM 4990, ULC-S115, ASTM E2837, E2307, E3037, more
- Professional **Installation** – FCIA Member, FM 4991 Approved, UL/ULC Qualified Contractors
- Properly **Inspected** – ASTM E2174 / 2393 Processed by IAS AC 291 Accredited Inspection Agencies, Inspectors w/FM, UL, ULC,IFC Exam Success
- **Maintained & Managed** – Annually – FCIA Members – NFPA 1, 101, International Fire Code

# Firestopping Specifications

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- Construction Specifications Institute
- Construction Specifications Canada
- *MasterFormat*
  - *Master List – Titles & Numbers*
  - *Focus on Work Results*



# Firestopping Specifications

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- **Scope Summary – Firestopping Specifications**  
Provide firestop systems consisting of a material, or combination of materials installed to retain the integrity of fire-resistance-rated assemblies by maintaining an effective **barrier against the spread of flame, smoke, water, movement**, at through penetrations, blank openings, construction joints, or at the gap that is created at the building perimeter of the horizontal fire resistance rated assembly and exterior wall and in or adjacent to either fire-resistance or non-fire-resistance-rated barriers in accordance with the requirements of the Building Code in force at the location of this project.

# SCOPE Summary

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“Retain Integrity of Fire-Resistance-Rated Assemblies”

- Non-Rated Assemblies?
- Smoke?
- Water?
- Hot Gases?
- Movement?
- Chemical, Biological, Radiation Resistance?
- To what standards?
- F, T, L, W, M

Clarify in your Proposal - Resistances

# SCOPE Summary

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- Scope covers what you do...some PDS
  - “Seal” - “Sealing” – Against What?
  - F & T = ONLY **Protecting against fire spread**, Temperature
  - F & T & L – Fire, Temperature, Air Leakage (SMOKE)
  - F & T & L & M – Adds Movement for Pen’s
  - F & T & L & W – Adds Water Resistance (3’)
  - F & T & L & M & E - Adds Exposure Resistance, E2750 ONLY.
  - F & T & L & M & E & ALL C, B, R, G, S Impact???
  - Manufacturer Testing Available -- Request

# Scope Summary

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- **Scope Summary – 07 84 00 = ONE DISCIPLINE**
  - *Penetrations*
  - *Joints*
  - *Perimeter Fire Containment –*
    - *Horizontal ONLY*
    - *Horizontal and Vertical*
    - *Vertical ONLY*

# Sections

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- 07 84 13 – Penetration Firestopping
  - 07 84 13.13 – Penetration Firestopping Mortars
  - 07 84 13.16 – Penetration Firestopping Devices
- 07 84 43 – Joint Firestopping
- 07 84 53 – Building Perimeter Firestopping (Alternate Terms/Abbreviations: fire safing.)
- 07 86 00 – Smoke Seals (Includes: material installed at the perimeter of openings to prevent the spread of smoke.)
  - NOTE: Smoke Seals are in another location –
  - Perimeter of ‘openings’. Annular Spaces?
  - Openings not defined.

# Sections where Firestopping might be Found!

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- Rated expansion control assemblies.
- 03 15 00 for concrete expansion and contraction joints.
- 07 71 29 for roof expansion joints. (Not often rated, but....)
- 07 84 43 for fire-resistant joint sealants.
- 07 91 00 for preformed joint seals.
- 07 92 00 for joint sealants.

# Firestopping Specifications

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- **07 84 00 – REFERENCES FROM....Section 01 78 39 CLOSEOUT / Project Record Documents = INVENTORY Requirements (SYSTEMS)**
  - Penetrations – Joints - Perimeter Fire Containment
- **Firestopping Inventory**
  - Life Safety Drawings
  - Manufacturers Installation Instructions
  - Product Data Sheets
  - Safety Data Sheets
  - Tested and Listed Systems

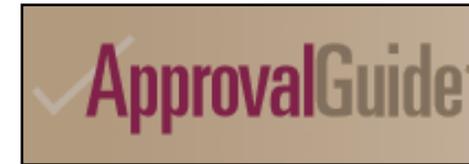
# References

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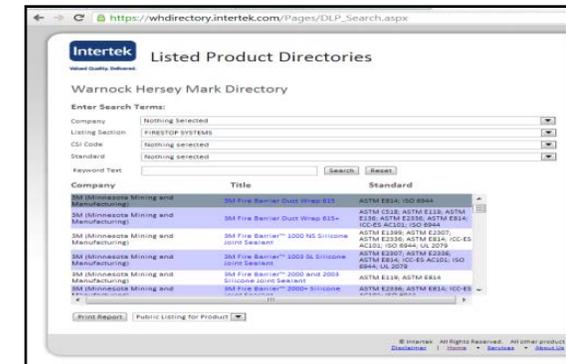
- FCIA – MOP, RPP-Labels, Survey
- FM 4991, Standard for the Approval of Firestop Contractors, FM 4990, Penetration Firestop Standard, FM Firestop Exam
- IAS – IAS AC291
- IFC – Guidelines for Using EJ's
- NFPA – 1, 101, 5000
- UL – 1479, 2079, UL QFCP, UL Firestop Exam
- IFC Guidelines for Engineering Judgments

# Firestopping for Continuity Products Become Systems

- Firestop Systems Directories –
  - UL
  - Intertek
  - FM Approvals
  - Others



***Systems Selection & Analysis...Not as easy as it looks...***



# Engineering Judgments/EFRRRA

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- Field or other Variances to Tested and Listed Systems?
  - No System Exists, period....
- Why???
  - Lack of Planning
  - Unique Conditions



J. Sharp – ProFirestop Photo



C. Zussman – Pepper Photo

# Engineering Judgments/EFRRA

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- **First Action in Process**
  - Find another system – Same Manufacturer
  - Find another system – Different Manufacturer
  - If no system exists in either case....
- **Second Action –**
  - *Engineering Judgment* – “EJ”
  - *Equivalent Fire Resistance Rated Assembly* – “EFRRA”
- *Based on engineering, IFC Protocol*
- *Inspection Agency?*

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

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- Wall or Floor Construction Type, Rating
- Wall or Floor Thickness
- Penetrating Item, Coverings
- Size, Type, Thickness
- Annular Space Sizes
- Joint / Gap Sizes
- Backing Materials
- Fill Material(s)

**= *Rated Firestop System***



STI Graphic

# ASTM References

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- E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- E814 – Standard Test Method for Fire Tests of Penetration Firestop Systems
- E119 – Standard Test Method for Fire Tests of Building Construction
- E2174 – Standard Practice for On-Site Inspection of Installed Firestop Systems
- E2750 – Standard Guide for Extension of Data from Penetration Firestop System Tests Conducted in Accordance with ASTM E814
- E1966 – Standard Test Method for Fire-Resistive Joint Systems
- E2307 – Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus
- E2393 – Standard Practice for On-Site Inspection of Installed Fire-Resistive Joint Systems and Perimeter Fire Barriers
- E2785 – Standard Test Method for Exposure of Firestop Materials to Severe Environmental Conditions
- E2837 – Standard Test Method for Determining the Fire Resistance of Continuity Head of Wall Assemblies and Nonrated Horizontal Assemblies
- E2874 – Standard Test Method for Determining the Fire-Test Response Characteristics of a Building Spandrel-Panel Assembly Due to External Spread of Fire
- E3037 – Standard Test Method for Measuring Relative Movement Capabilities of Through-Penetration Firestop Systems
- E3038 – Standard Practice for Assessing and Qualifying Candidates as Inspectors of Firestop Systems and Fire-Resistive Joint Systems
- ~~E3157 – Standard Guide for Understanding and Using Information Related to Installation of Firestop Systems~~

# UL References

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- UL 263 – Fire Tests of Building Construction Materials
- UL 723 Surface Burning Characteristics of Building Materials
- UL 1479 - Fire-Tests of Through-Penetration Firestops
- UL 2079 - Tests for Fire Resistance of Building Joint Systems
- UL Qualified Firestop Contractor Program
- UL Firestop Exam

# Specs....

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- System Performance
  - F – Fire,
  - T – Temperature (Exceptions?)
  - L – Air Leakage
  - W – Water Ratings
  - M – Movement Ratings
  - I & I – Insulation (F, T) & Integrity (F) Ratings
  - Firestop Products Physical Properties
  - FIRESTOP SYSTEMS *Listings*
  - *Manufacturers Instructions*
  - *Engineering Judgements, Equivalent Fire-Resistance-Rated Assemblies*
  - Documentation

# Delivery Storage and Handling

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- Original, unopened containers
  - NO Repackaging
  - LABELS on PRODUCTS
- Store and handle - manufacturer's instructions.
  - PDS (Product Data Sheet)
  - MII (Manufacturer's Installation Instructions)
  - SDS (Safety Data Sheet)

# Quality Assurance

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- Contractor Qualifications
  - FM 4991, Standard for the Approval of Firestop Contractors
  - UL/ULC Qualified Firestop Contractor Program
  - FCIA Member in Good Standing
  - Licensed by the State, Local Authority, where applicable
  - Successfully Completed 5 projects, similar comparable Scale.
- Inspection Agency – Affects Contractor Productivity
  - Special Inspection Agency – IAS AC291
  - Special Inspector – FM, UL Firestop Exams, IFC Exam

# Firestop Contractor Qualifications

## FM & UL/ULC – 4 Components

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1. Office Facility Quality Management System Audit
2. Field – Jobsite Audit
3. Employ a person
  - UL/FM Firestop Exam @ 80% or better
  - DRI if employed by Approved/Qualified Firm
    - ***Designated Responsible Individual (DRI)***
4. Annual Audit



# Quality Assurance

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- Quality Assurance - Project Conditions –
  - ***Systems, Listings, Manufacturers Installation Instructions, Product Data Sheets, Safety Data Sheets***
  - **Sequencing – Pre-Construction Meeting**
    - Use Systems Listings, Manufacturers Instructions, to prepare all breaches to receive firestopping.
  - **Environmental Regulations –**
    - Volatile Organic Compounds
    - DISPOSAL IS IN THE SPEC TOO...in accordance with local regulations

# Execution

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- Examine, Preparation – Substrates
  - Manufacturers Installation Instructions by Product
  - Clean, Dry, Dimensions on Listings to Field

# Execution

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- Installation - *SYSTEMS*
  - **Manufacturer's Installation Instructions (MII)**
    - Product Data Sheets. Safety Data Sheets
    - MII & Other info from Manufacturer ONLY
  - **Listings (Tested and Listed Systems)**
  - Schedule Work – Access
  - Install Packing, Damming, Forming
  - Install fill material(s)
  - Finish as recommended by manufacturer
  - Finish smooth (No spaghetti)
  - Finish in accordance with Listing

# Execution – Special Inspections

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- **Independent inspection Agency** employed and paid by owner, examines firestopping in accordance with
  - ASTM E 2174, Standard Practice for On-Site Inspection of Installed Firestops
  - ASTM E 2393, Standard Practice for On-Site Inspection of Installed Firestop Joint Systems.
- **Type of Firestop** - *By system by firestop contractor*
- **Type of Building Inspected** – *High Rise Buildings, Category III and IV, IBC 1604.5*
- **Special Inspection - Drawings**
- **Special Inspections Schedule – 01 45 33**

# Field Quality Control

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- Certificate of Conformance issued by Firestop Contractor that the *'work has been carried out in accordance with the specification.'*
- *UL Master Certificate of Compliance?*

# 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 Slide



# Documentation

## FIRE-RESISTANCE INVENTORY

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- **Provide details of installations, with Tested and Listed Systems and/or EJ/EFRRA's and locations on Life Safety Drawings ...**
  - Binder, electronic or software application/program
  - Shall be part of the closeout documents.
  - Documentation shall be composed in a concise and comprehensible manner so that the Authority Having Jurisdiction (AHJ) can understand and verify installations.
  - ***In Accordance with 01 78 39 - Project Record Documents***

# Firestop Identification System - Labeling

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- “Firestop System – Do Not Remove or Tamper”
- UL or other laboratory tested and listed system number.
- Date of Installation.
- Installing Contractor Company name, contact information.
- Installing Individual Identifier  
OR
- Bar Code
- Location Identifier in the Cloud

# Firestopping Specifications Summary

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- NEW Buildings – Section 07 84 00 Specification
  - [www.FCIA.org](http://www.FCIA.org)
- Part 1 – Focus on
  - Systems
  - Not Products
  - Manufacturers
- “Single Manufacturer to the greatest extent possible” – EJ’s

# Firestopping Specifications Summary

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- 07 84 00 or Individual Sections
  - [www.FCIA.org](http://www.FCIA.org)
- Part 1 – Qualifications
  - FCIA Member in Good Standing, AND
  - FM 4991, Standard for the Approval of Firestop Contractors,

OR

  - UL Qualified Firestop Contractor Program

AND

  - Manufacturer Accredited, Approved, Trained

# Firestopping Specifications Summary

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- Part 1 – Qualifications – Special Inspection
  - Special Inspection Agency –
    - IAS AC 291 Accredited Special Inspection Agencies
  - Special Inspector Qualifications
    - FM Firestop Exam
    - UL Firestop Exam
    - AND
    - IFC Exam – ASTM E 3038

# Firestopping Specifications Summary

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- Part 1 – Qualifications – Special Inspection
  - Special Inspection Agency –
    - IAS AC 291 Accredited Special Inspection Agencies
  - Special Inspector Qualifications
    - FM Firestop Exam
    - UL Firestop Exam
    - AND
    - IFC Exam – ASTM E 3038

# Firestopping Specifications Summary

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- Part 2 – Products
  - Manufacturers
  - Specific Products Difficult...could be MANY!
  - “Products used in Systems to maintain integrity of fire-resistance-rated assembly”
  - More....

# Firestopping Specifications Summary

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- **Part 3 – Execution, Quality Control**
  - **Installer Qualifications**
    - **FM 4991, UL QFCP, AND Manufacturer Education**
  - **Special Inspection**
    - **ASTM E 2174 - Penetrations**
    - **ASTM E 2393 - Joints**

# Built Right = Maintain Right

## 01 78 00 – Closeout Submittals

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- 01 78 29 – Final Site Survey
- 01 78 33 – Bonds
- 01 78 36 – Warranties
- **01 78 39 – Project Record Documents**
- 01 78 43 – Spare Parts
- **01 78 46 – Extra Stock Materials**
- 01 78 53 – Sustainable Design Closeout Documentation

# Firestop Repairs

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- Repairs
  - Instruction requirements by manufacturer
  - Listed systems
  - Patching
    - Systems.....
    - Adhesion
    - Movement
    - T, L, W Ratings
    - ***As recommended by MFR***



Affinity Firestop Photo

# Built Right = Maintain Right

## 01 78 00 – Closeout Submittals

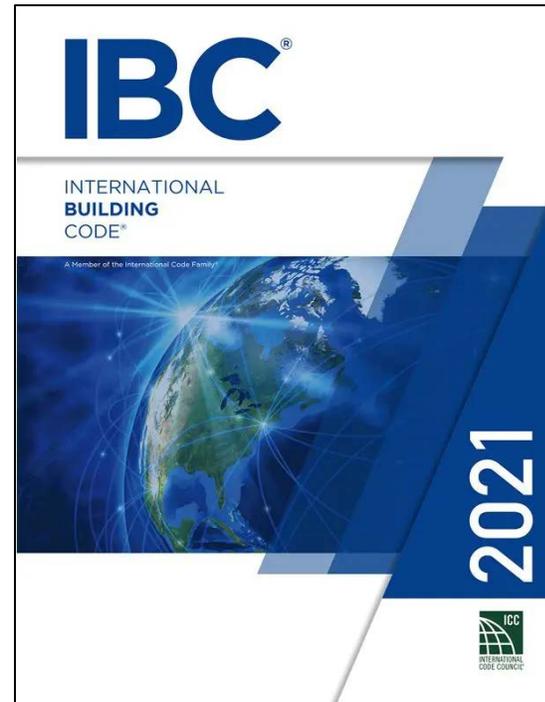
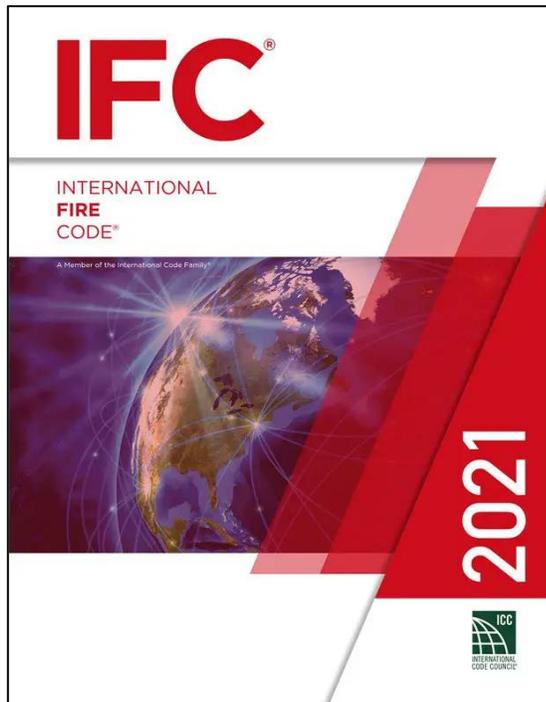
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# Existing Buildings? Did you know...

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- **Fire, existing building codes have existed for decades**
- Fire Codes dictate maintaining protection of structural fire-protection and fire-resistance-rated compartmentation



# Questions??



# Fire Codes, Specs, & Existing Building Requirements

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