FIRESTOP 101:
A LIFE SAFETY ISSUE

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Senior Fire Protection Specialist

LEARNING OBJECTIVES

Upon completing this program, the participant should be able to:

1. Understand the key test standards related to firestopping in applicable codes
2. Understand the many variables that affect firestop performance
3. Understand the secondary attributes of firestop products
4. Improve specifications, drawings and details to promote proper selection and quality installation of firestop systems

AGENDA

- **Consequences of Building Fires**
- Fire Safe Building Construction & Code Requirements
- Firestop System Testing & Listings
- Beyond Fire Resistance – Secondary Attributes of Firestop
- Specifying Firestop Systems
- Hilti Firestop

HOW OFTEN DOES A FIRE DEPARTMENT RESPOND TO A FIRE IN THE US?

CONSEQUENCES OF FIRES

Fire Departments respond to a fire every 24 seconds

Annual Direct Property Loss $25+ Billion

Annual Civilian Deaths
3655+ Lives Lost or ~10 lives every day

Source: NFPA Fire Loss Statistics 2018

WHAT IS THE LEADING CAUSE OF DEATH IN STRUCTURE FIRES?

SMOKE AND TOXIC GASES ARE THE LEADING CAUSE OF DEATH IN A FIRE

- Approximately **75%** of all fire deaths are caused by smoke inhalation
  - Hall, Jr. John R. NFPA Fire Analysis & Research, Quincy, MA. “Burns, Toxic Gases, and other Hazards”
- Visibility: **47%** of survivors caught in a fire could not see more than 12 feet
  - NFPA Fire Protection Handbook, 18th Ed. Table 1-1P. Pg.1-15
- Approximately **57%** of people killed in fires are not in the room of the fire’s origin
  - NFPA Fire Protection Handbook, 18th Ed. Table 8-1P. Pg. 8-17
- Smoke travels **120-420** feet per minute under fire conditions
  - Estimate based upon ceiling jet velocity calculations for typical ceiling heights and heat release rates

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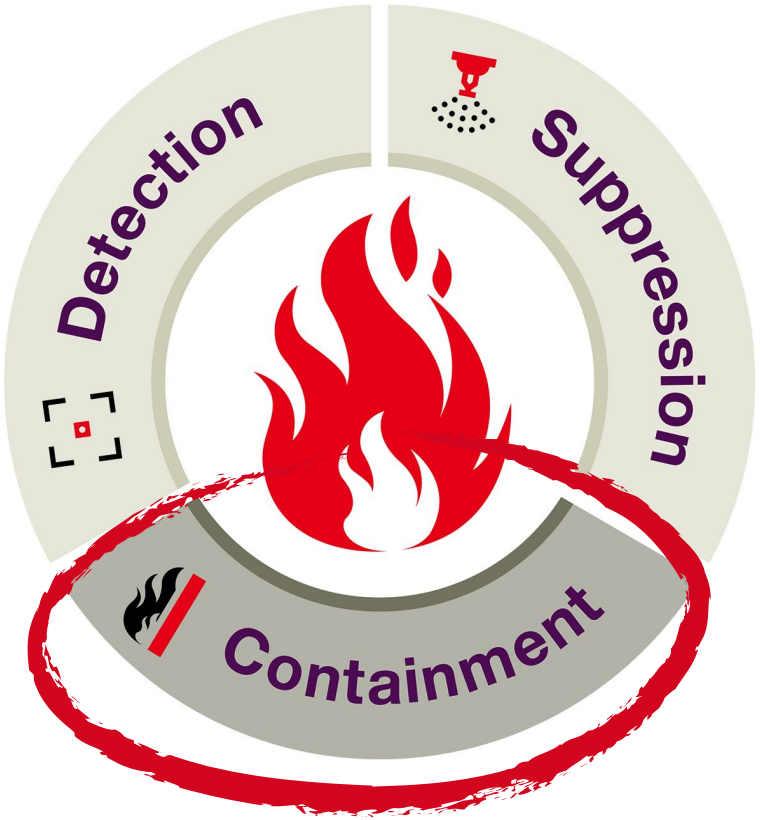
PROTECTING A BUILDING TAKES A BALANCED APPROACH, DETECTION AND SUPPRESSION ALONE ARE NOT ENOUGH



We cannot rely on any single action or safeguard to keep people safe

1ST INTERSTATE BANK – LOS ANGELES - 1988

- “The automatic sprinkler system was drained and building fire pumps shut off at time of fire.”
- “The vertical spread was also through poke-through, pipe recesses, and utility shafts.”
- “The lack of firestopping between the floor slabs and the skin permitted the fire to spread from floor to floor through this space. Fire was observed spreading through this area even before the glass and mullions failed.”

GRENFELL TOWER – 2017

- 80 dead
- 4th floor freezer electrical short caused the fire
- Building Façade helped the blaze to spread quickly
- Fire-stopping material between Apartments and communal corridors had been removed during a renovation several years ago, allowing the blaze to spread

JOHN HANCOCK BUILDING FIRE – CHICAGO – 2015

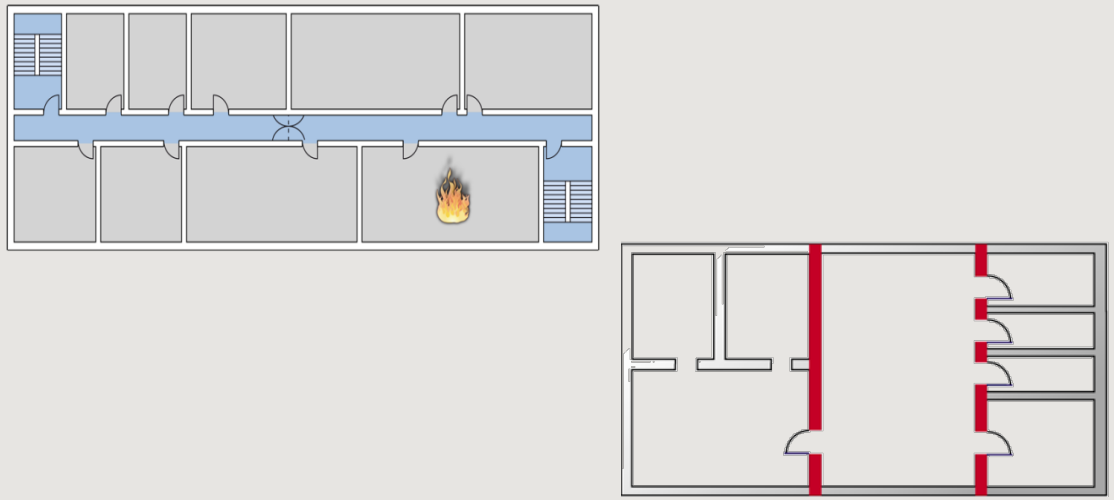
- Caused by a candle left on in an apartment on the 50th floor
- What happened here was that the alarm system failed during fire
- Visitors in the observatory at the 99th floor were asked to evacuate, but they could only manage to get down to the 70th floor due to the smoke rising through the stairwell
- Fire protection systems in place and the fire fighters where able to extinguish the fire, the consequences were not as bad as they could have been.
- Cannot rely on one single action to keep people safe during a fire

11/21/2015

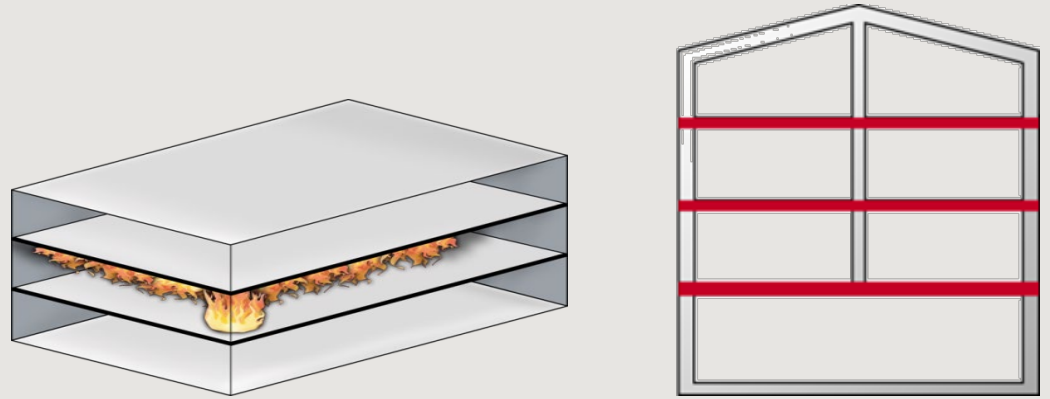
ONE GLOBALLY APPLIED PRINCIPLE FOR FIRE SAFETY: COMPARTMENTATION (FIRE COMPARTMENTS)

The spread of fire can be restricted by dividing a building into separate compartments with fire-resistive walls and floors—increasing the availability of escape routes for occupants.

Fire rated walls



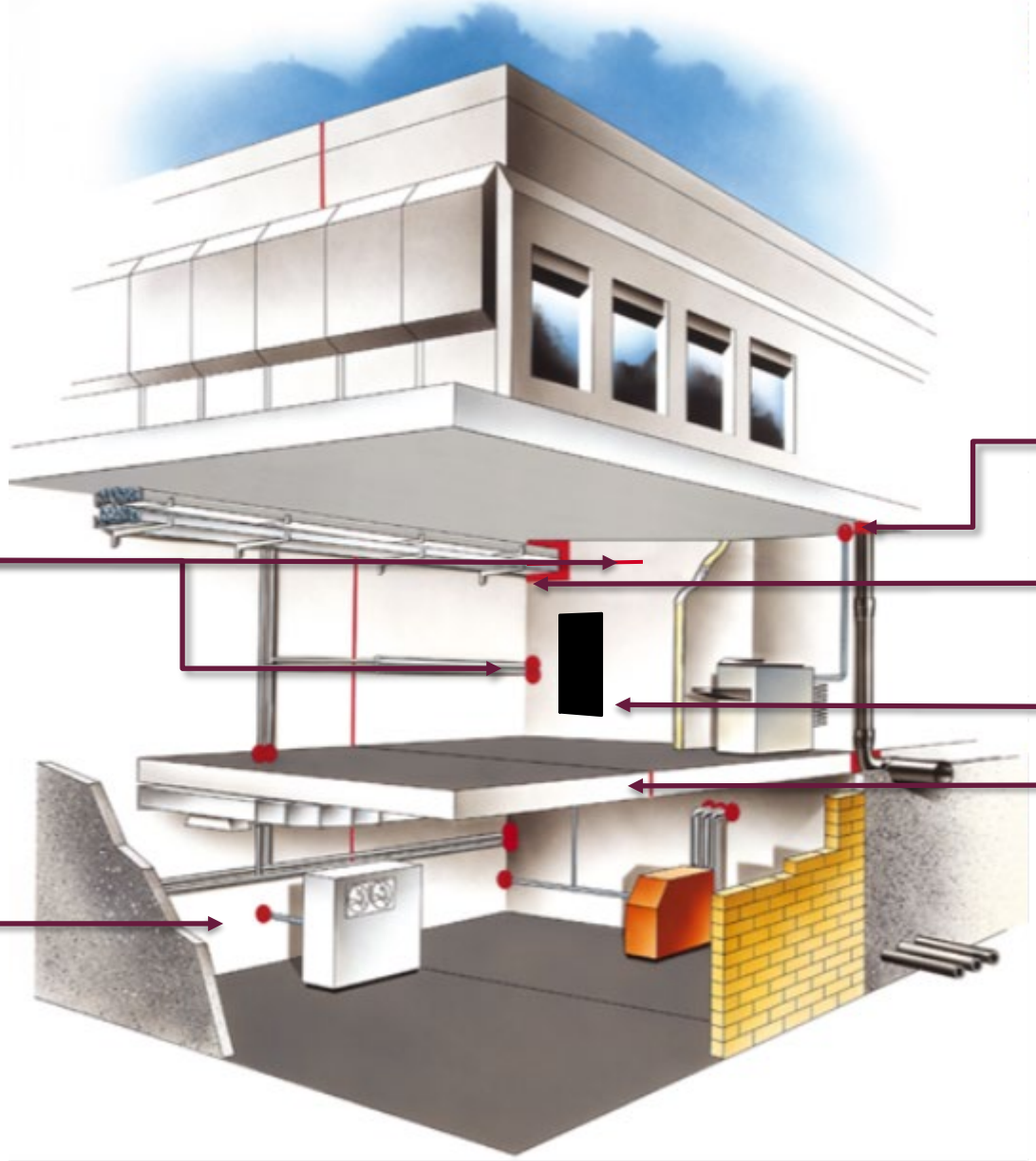
Fire rated floors



WHEN COMPARTMENTATION WORKS

- Hell's Kitchen New York 2014
- Compartmentation worked to keep the blaze contained to its origin
- Started due to an overloaded power strip in an apartment on the 20th floor.
- Only one casualty due to smoke inhalation

AREAS THAT CAN ALLOW FOR FIRE/SMOKE SPREAD:



Unsealed/Open Joints

Membrane (one-sided) penetrations

Unsealed Pipe Penetrations/Ducts

Unsealed Cable Penetrations

Doors

Gaps at edge of slab

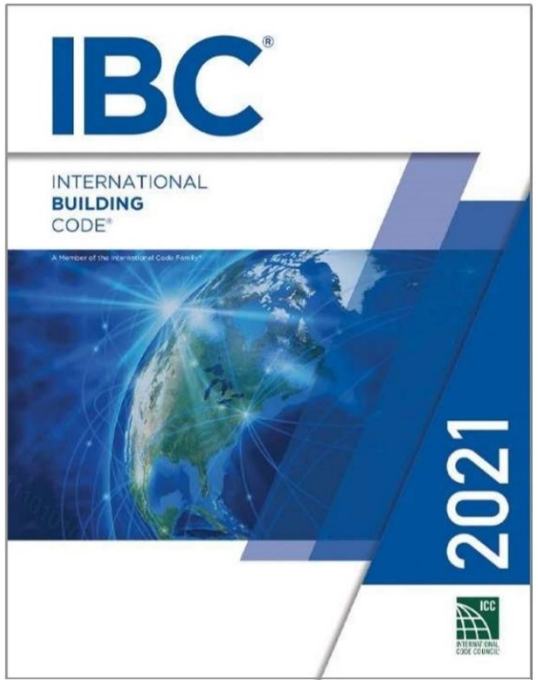
FIRESTOP HELPS RESTORE THE INTEGRITY OF FIRE RATED ASSEMBLIES

Through penetrations	Joints	Membrane penetrations
		

Firestop is used to seal openings and joints in fire-resistance rated wall and/or floor assemblies

FIRESTOPPING IS NOT NEW:
REQUIRED BY ALL CURRENT AND LEGACY CODES

ICC
INTERNATIONAL CODE COUNCIL®



NFPA®

nec®

INTERNATIONAL BUILDING CODE (2021) RELEVANT CODE SECTIONS AND FIRE TESTS

Code Section	Category	Referenced Test Standard
714.4.1.2	Through Penetrations (Walls)	ASTM E814 or UL 1479
714.5.1.2	Through Penetrations (Floors)	ASTM E814 or UL 1479
714.4.2	Membrane Penetrations	ASTM E814 or UL 1479
715.3.1	Fire Resistant Joints Systems	ASTM E1966 or UL 2079
715.4.1	Exterior Curtain Wall/Floor Intersection (Perimeter Joint)	ASTM E2307
1705.18	Special Inspections of Fire Resistant Penetration & Joints	Penetrations: ASTM E2174 Joints: ASTM E2393

Understanding the testing process is key to designing fire resistant systems

INTERNATIONAL BUILDING CODE (2021) FIRESTOP REQUIREMENTS

Section 714.4.1.2 – Through-penetration firestop systems

- *"Through penetrations* shall be protected by an *approved penetration firestop **system*** installed as tested in accordance with ASTM E 814 or UL 1479…"

Section 715.3.1 – Fire resistant joint systems

- "*Fire-resistant joint **systems*** shall be tested in accordance with the requirements of either ASTM E1966 or UL 2079…"

What is the key term in the code language above?

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Section 715.3.1 – Fire resistant joint systems

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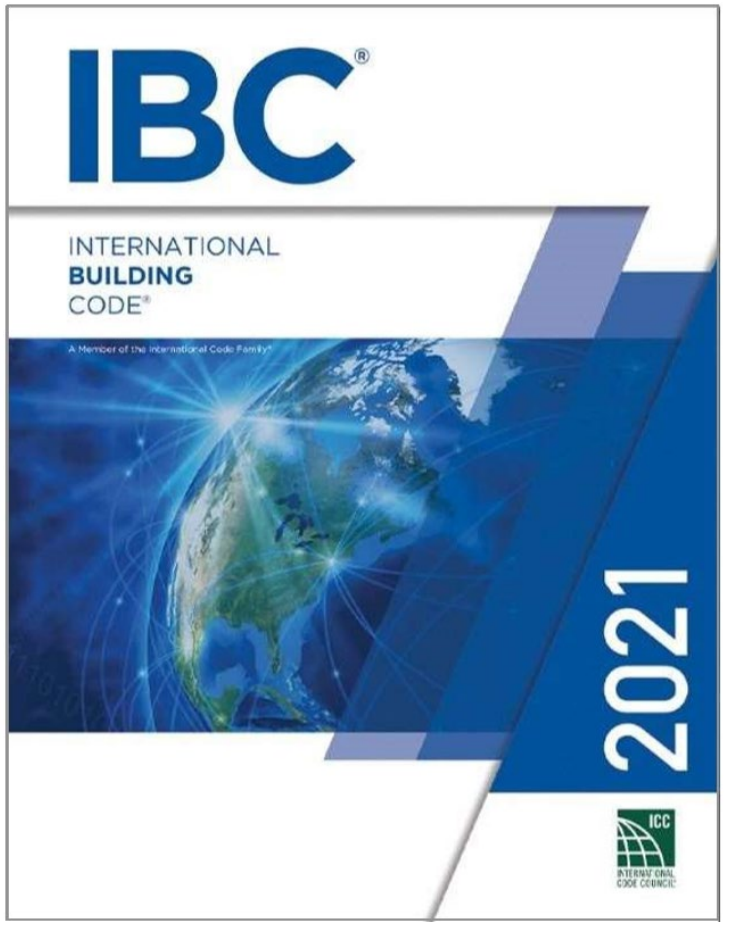
Firestopping is a system approach. The product and installation instructions specific to that product make the system



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MANY FACTORS AFFECT FIRE PERFORMANCE, AND EACH ARE PARAMETERS IN THE TESTING OF A SYSTEM

Through Penetrations	Joints
• Size and type of penetrating item(s) • Size and shape of opening • Desired fire rating (hrs.) • Floor or wall construction type and thickness • Annular space • Firestop products used	• Joint width • Desired assembly rating (hrs.) • Floor or wall construction type and thickness • Movement requirements (%) • Stud width for gypsum walls • Firestop products used

Once a tested firestop system has achieved the desired fire ratings, then a “Firestop System” is issued (published) by the testing agency

SYSTEMS FOR JOINTS & PENETRATIONS ARE TESTED TO ASTM E814/UL 1479, ASTM E1966/UL 2079

F-Rating

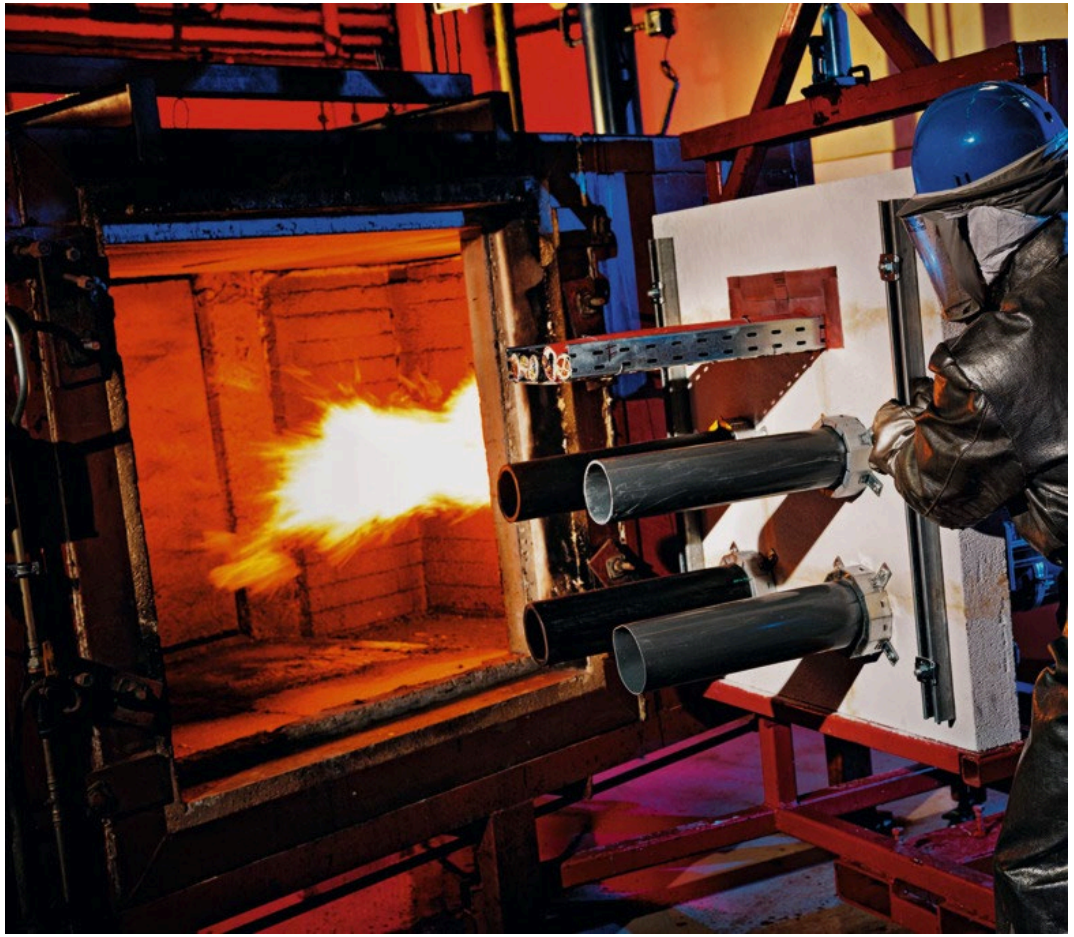
- The duration of time in which flames do not pass through the system

T-Rating / FT-Rating (Canada)

- The time period it takes for the non-fire side of the assembly rise by 325°F (181°C) above its initial ambient temperature

To receive either rating the firestop system must pass the hose stream test*

*Hose stream test not required in Canada



HOSE STREAM TEST VERIFIES MECHANICAL INTEGRITY OF SYSTEM AFTER FIRE EXPOSURE

Stream delivered through 2½ inch hose with a straight-bore nozzle at:

- 30 psi - 1, 2 & 3-hour tests
- 45 psi - 4-hour test

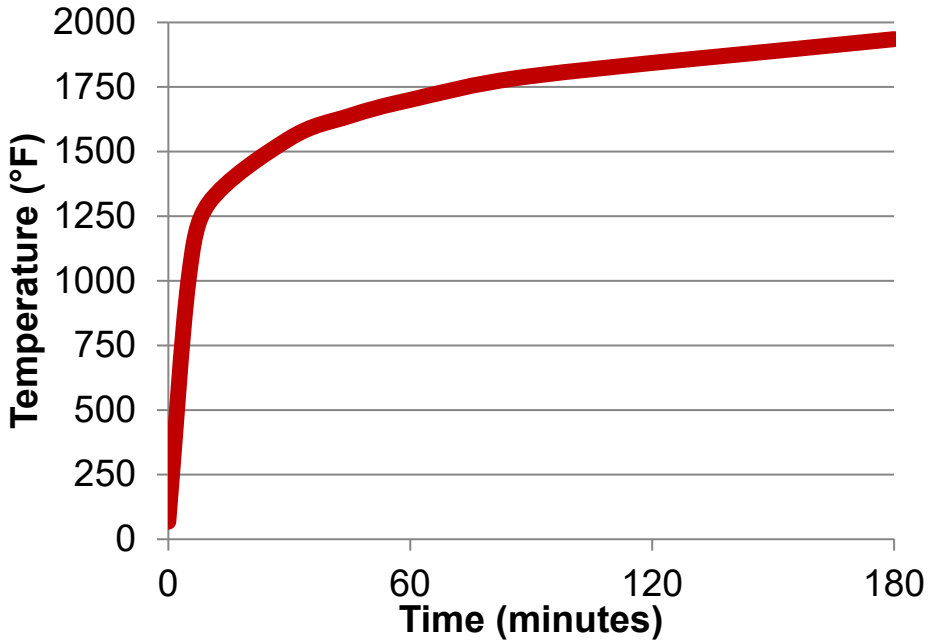
Time duration calculated based upon the area of the test assembly and the fire resistance period.

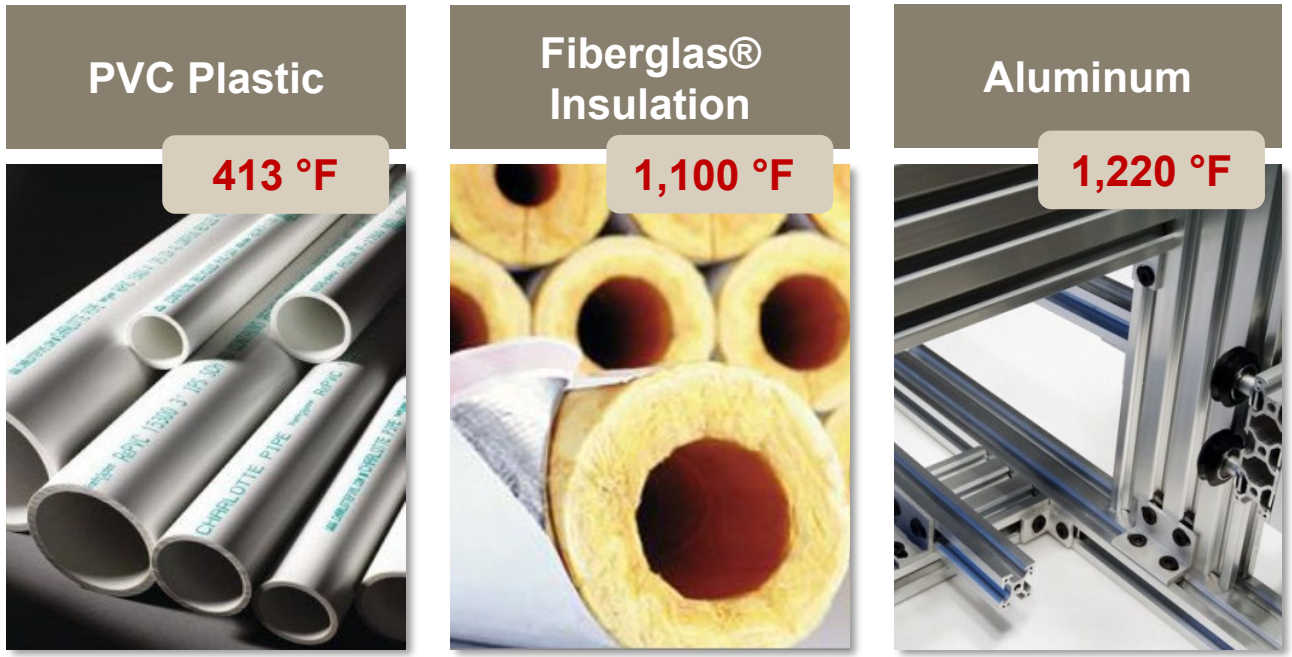
*Hose stream test not required in Canada.

To pass test, must not produce any though-gaps in firestop system

BUILDINGS ON FIRE CAN REACH TEMPERATURES WELL IN EXCESS OF THEIR MELTING POINTS VERY QUICKLY

This temperature-time curve (from ASTM E119 Standard) is considered to represent a severe fire exposure. Compared to the melting temperatures of the products on the right, it's clear why firestop products and systems are so important, most of these materials will fail in the first hour, leaving the penetrations exposed.

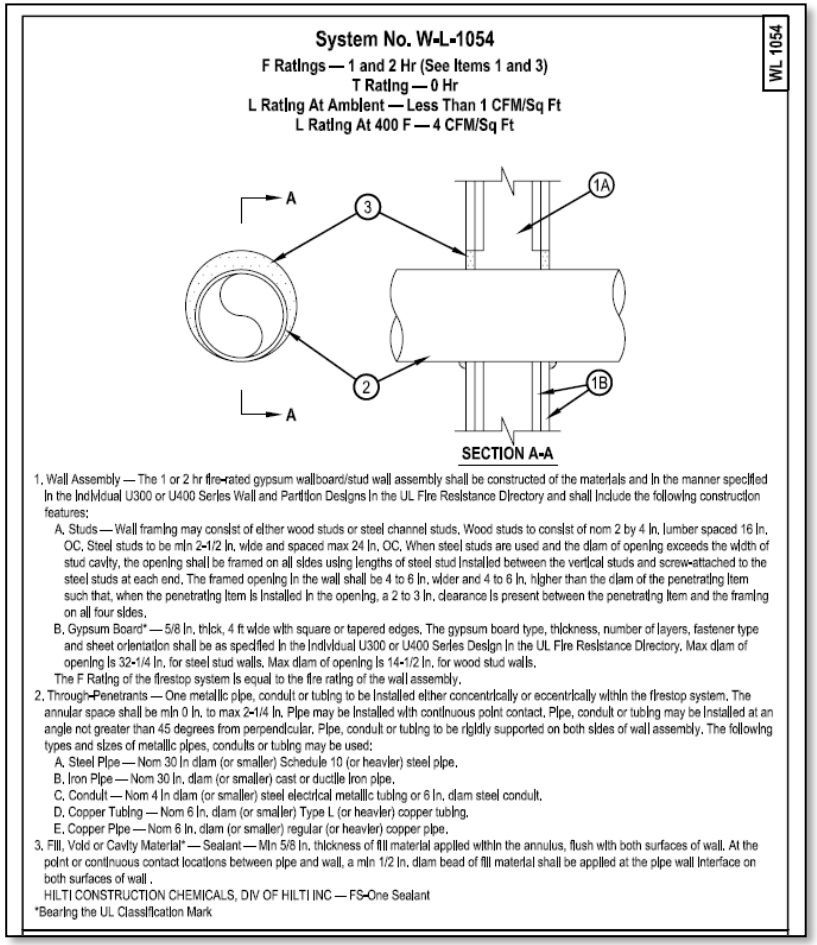




Combustible penetrating items typically require specialized firestop products

FIRESTOP SYSTEMS IDENTIFY EACH COMPONENT REQUIRED TO ACHIEVE THE DESIRED FIRE RATING

- Fire rated assembly construction components
- Acceptable size and type of penetrating items
- Firestop materials needed to fill voids
- Specified limits for size of opening, annular space, etc.
- Each tested system is given their own Firestop System Number



System No. W-L-1054

F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/Sq Ft
L Rating At 400 F — 4 CFM/Sq Ft

WL 1054

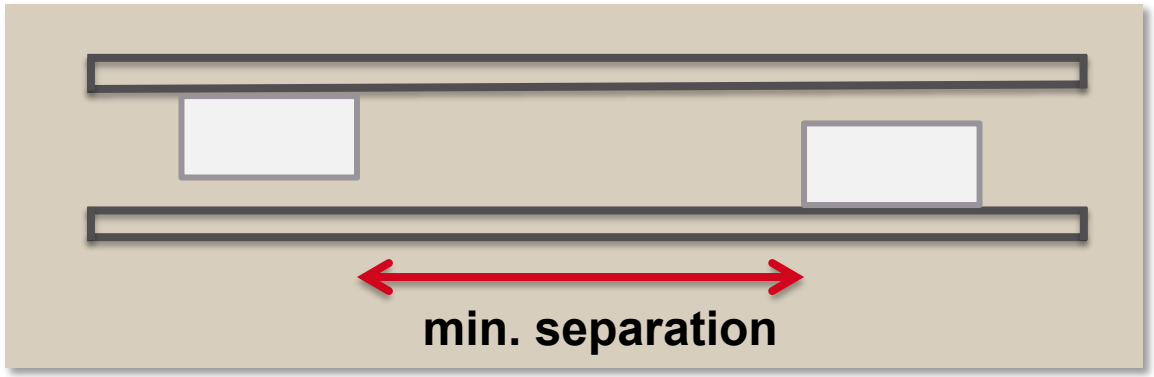
SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the Individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* — 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the Individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. for steel stud walls. Max diam of opening is 14-1/2 in. for wood stud walls.
   The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. Pipe may be installed with continuous point contact. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe — Nom 30 in diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. diam (or smaller) cast or ductile iron pipe.
   C. Conduit — Nom 4 in diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
   D. Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe — Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall .
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant
*Bearing the UL Classification Mark

IBC 714.4.2: MEMBRANE PENETRATIONS FIRESTOP SYSTEMS TESTED TO ASTM E814 / UL 1479

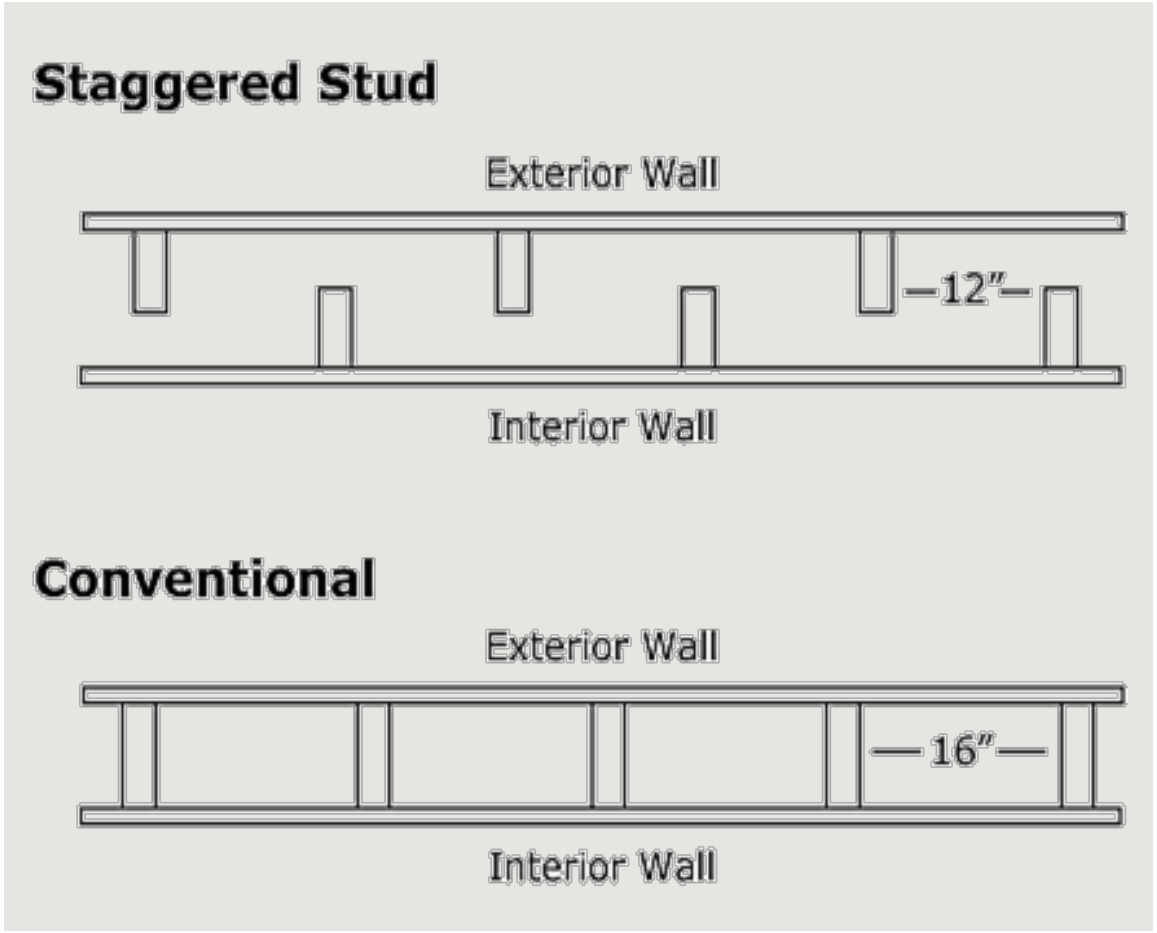
Recessed fixtures shall be installed such that the required fire resistance will not be reduced.

- Total area of openings does not exceed 100 square inches for any 100 sq. ft. of wall
- Steel electrical boxes on opposite sides of wall must be separated by a horizontal distance > 24 inches

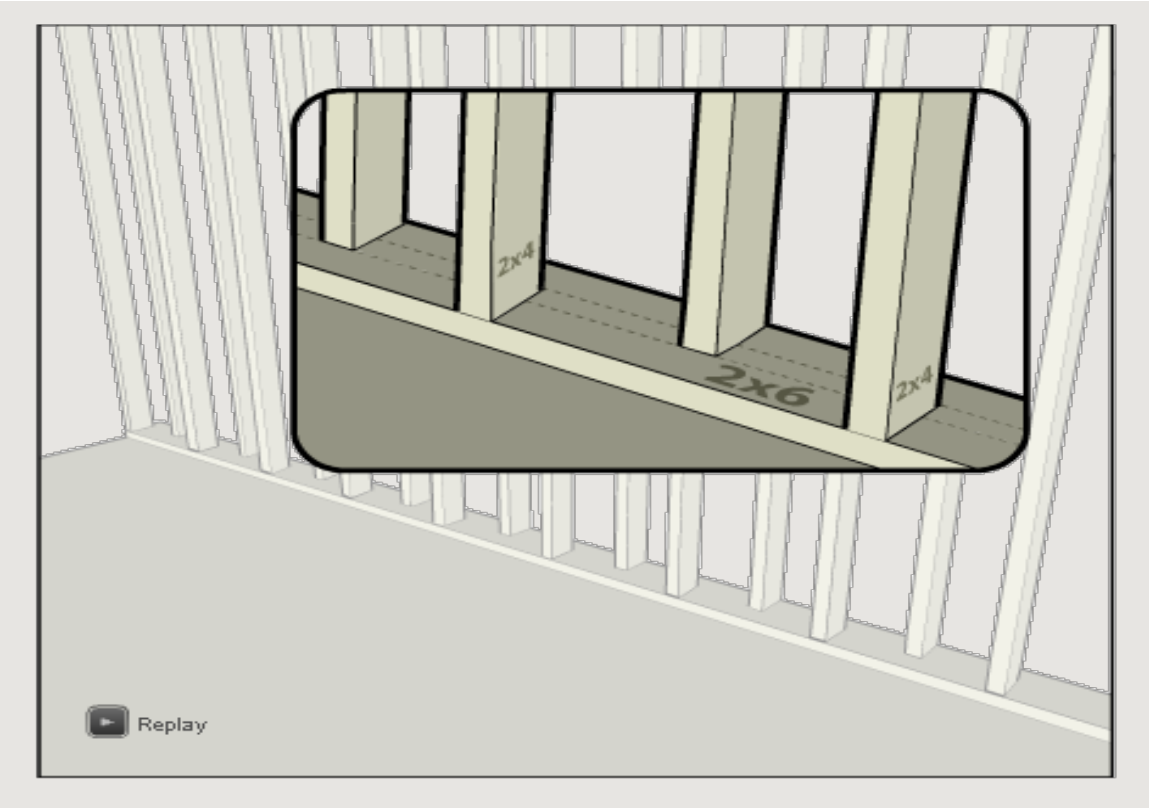


Steel boxes outside these parameters must be protected

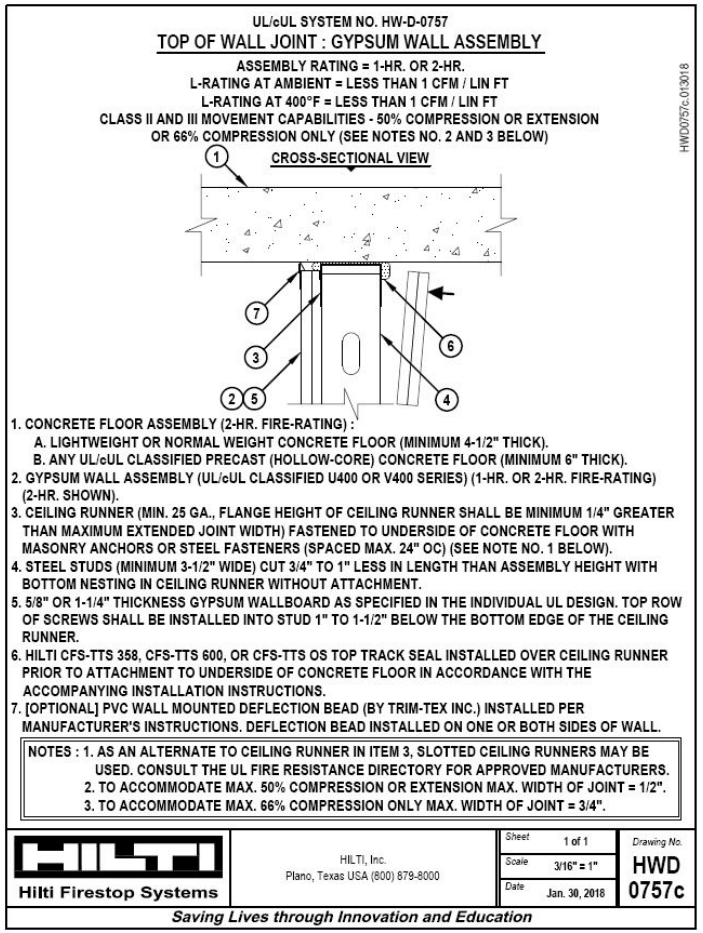
24” SEPARATION FOR BOXES ON OPPOSITE SIDES OF THE WALL ONLY ACCEPTABLE FOR CONVENTIONAL STUD WALLS



Staggered Stud wall



FIRE RESISTANT JOINT – APPLICATIONS



UL/cUL SYSTEM NO. HW-D-0757

TOP OF WALL JOINT : GYPSUM WALL ASSEMBLY

ASSEMBLY RATING = 1-HR. OR 2-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / LIN FT
L-RATING AT 400°F = LESS THAN 1 CFM / LIN FT
CLASS II AND III MOVEMENT CAPABILITIES - 50% COMPRESSION OR EXTENSION OR 66% COMPRESSION ONLY (SEE NOTES NO. 2 AND 3 BELOW)

CROSS-SECTIONAL VIEW

HWD0757c-013018

1. CONCRETE FLOOR ASSEMBLY (2-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR (MINIMUM 4-1/2" THICK).
   B. ANY UL/cUL CLASSIFIED PRECAST (HOLLOW-CORE) CONCRETE FLOOR (MINIMUM 6" THICK).
2. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
3. CEILING RUNNER (MIN. 25 GA., FLANGE HEIGHT OF CEILING RUNNER SHALL BE MINIMUM 1/4" GREATER THAN MAXIMUM EXTENDED JOINT WIDTH) FASTENED TO UNDERSIDE OF CONCRETE FLOOR WITH MASONRY ANCHORS OR STEEL FASTENERS (SPACED MAX. 24" OC) (SEE NOTE NO. 1 BELOW).
4. STEEL STUDS (MINIMUM 3-1/2" WIDE) CUT 3/4" TO 1" LESS IN LENGTH THAN ASSEMBLY HEIGHT WITH BOTTOM NESTING IN CEILING RUNNER WITHOUT ATTACHMENT.
5. 5/8" OR 1-1/4" THICKNESS GYPSUM WALLBOARD AS SPECIFIED IN THE INDIVIDUAL UL DESIGN. TOP ROW OF SCREWS SHALL BE INSTALLED INTO STUD 1" TO 1-1/2" BELOW THE BOTTOM EDGE OF THE CEILING RUNNER.
6. HILTI CFS-TTS 358, CFS-TTS 600, OR CFS-TTS OS TOP TRACK SEAL INSTALLED OVER CEILING RUNNER PRIOR TO ATTACHMENT TO UNDERSIDE OF CONCRETE FLOOR IN ACCORDANCE WITH THE ACCOMPANYING INSTALLATION INSTRUCTIONS.
7. [OPTIONAL] PVC WALL MOUNTED DEFLECTION BEAD (BY TRIM-TEX INC.) INSTALLED PER MANUFACTURER'S INSTRUCTIONS. DEFLECTION BEAD INSTALLED ON ONE OR BOTH SIDES OF WALL.

NOTES : 1. AS AN ALTERNATE TO CEILING RUNNER IN ITEM 3, SLOTTED CEILING RUNNERS MAY BE USED. CONSULT THE UL FIRE RESISTANCE DIRECTORY FOR APPROVED MANUFACTURERS.
2. TO ACCOMMODATE MAX. 50% COMPRESSION OR EXTENSION MAX. WIDTH OF JOINT = 1/2".
3. TO ACCOMMODATE MAX. 66% COMPRESSION ONLY MAX. WIDTH OF JOINT = 3/4".

Hilti Firestop Systems
HILTI, Inc.
Plano, Texas USA (800) 879-8000
Sheet 1 of 1
Scale 3/16" = 1"
Date Jan. 30, 2018
Drawing No. HWD 0757c
Saving Lives through Innovation and Education

Metal Deck Joints

Top & Bottom of Wall

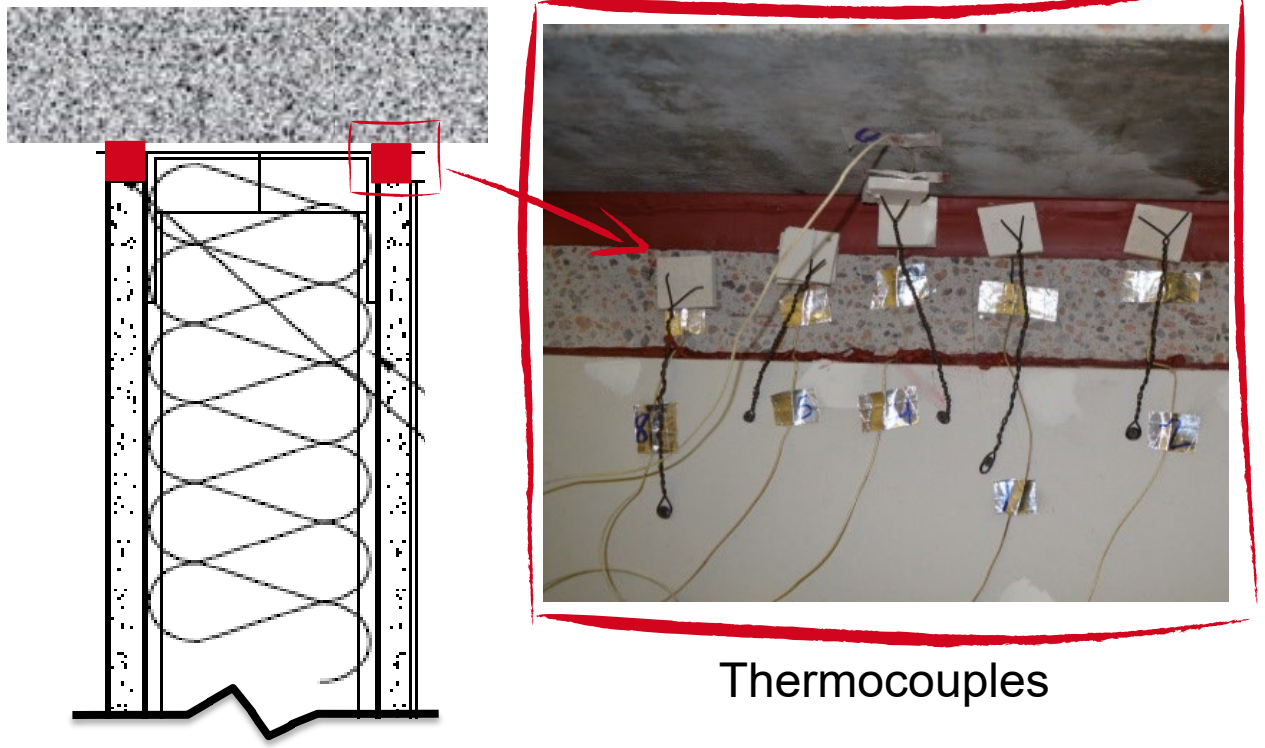
Wall to Wall

Edge of Slab

IBC SECTION 715.3.1: JOINT FIRESTOP SYSTEMS TESTED TO ASTM E 1966 / UL 2079

Assembly Rating

- Fire and **temperature** on the non-fire side of the joint are measured using thermocouples
- Hose stream required for top-of-wall and wall-to-wall joints
- Joint undergoes cyclic testing prior to fire testing



Thermocouples

A revised UL 2079 5th test edition came into effect on August 26, 2017 affects pre-formed firestop devices

ASTM E 1966 JOINT CYCLING TEST IS USED TO EVALUATE DYNAMIC JOINTS UNDER THE SPECIFIED TEST CONDITIONS

- Ability of a fire resistive joint system to undergo movement without reducing the fire rating of the adjacent fire separating elements
- Duration for which test specimens will contain a fire and retain their integrity during a predetermined test exposure.
- Each project type is going to require different movement capabilities
- Movement types and classes are defined in Table 1 (Cycling Requirements) of ASTM E1399
- Tested dynamic joint systems indicate the % of compression and extension permitted for maximum joint width

Almost all construction joints are dynamic

Class	Movement	Minimum Number of Cycles	Cycle Rates (cpm)
I	Thermal	500	Less than or equal to 1
II	Wind Sway	500	Greater than or equal to 10
III	Seismic	100	Greater than or equal to 30
IV	Combined	100	Greater than or equal to 30
		400	Greater than or equal to 10

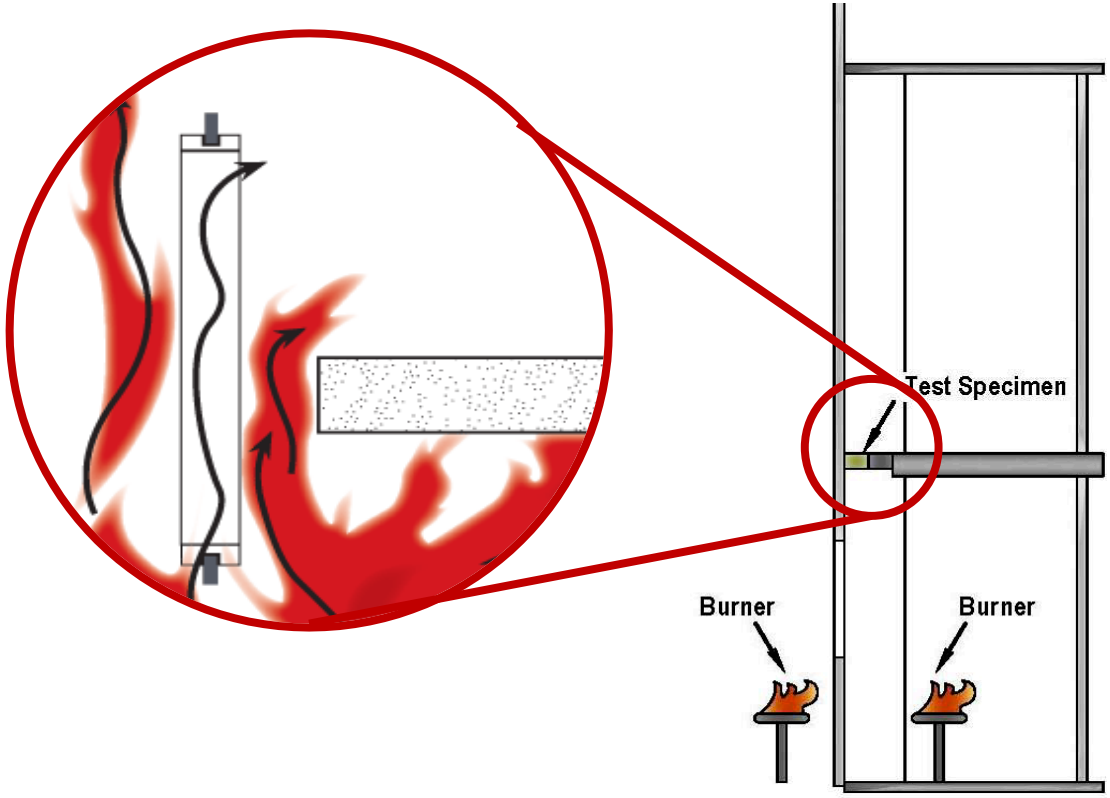
TABLE 1 Cycling Requirements (Source: ASTM E1399 Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems)

Compression

Extension

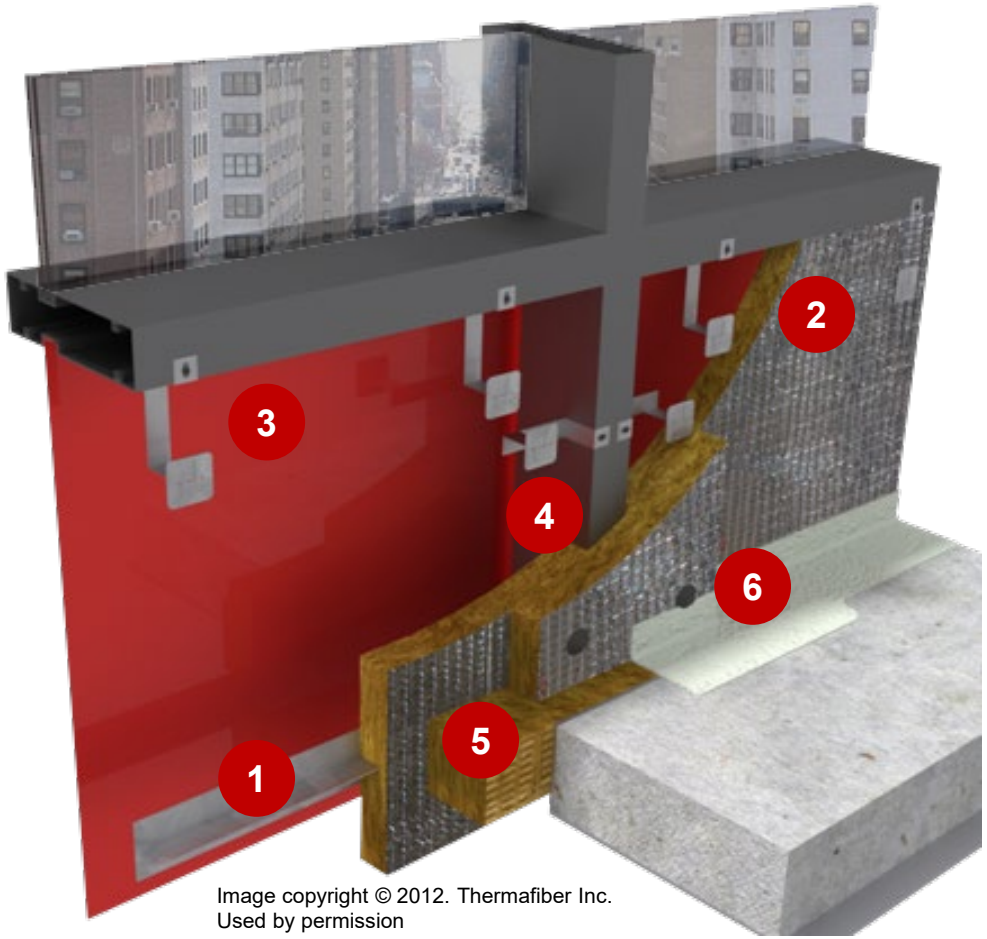
Compression

IBC 715.4.1: PERIMETER FIRE BARRIER (JOINT) EXTENDS THE FIRE RATING OF THE FLOOR TO THE EXTERIOR WALL



Perimeter fire barrier testing to E2307 – fire exposure from both below and from outside

KEY ELEMENTS TO PERIMETER FIRE BARRIER SYSTEM

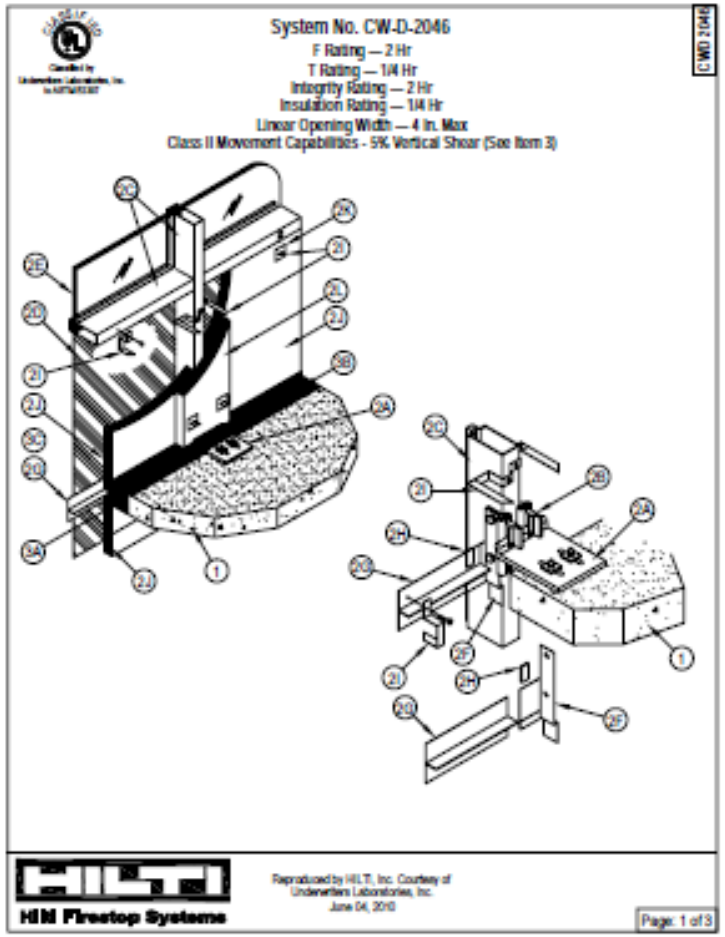


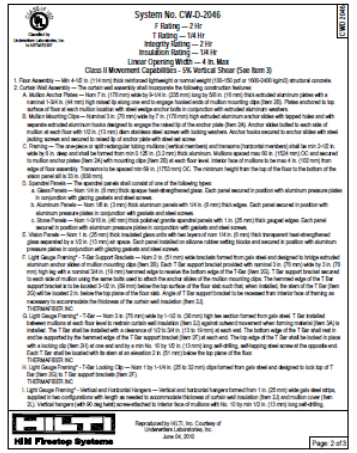
1. Stiffener angle at floor line
2. Insulation board
3. Mechanical attachment of insulation board
4. Protection of mullions
5. Mineral wool safing (compression fit)
6. Firestop sealant

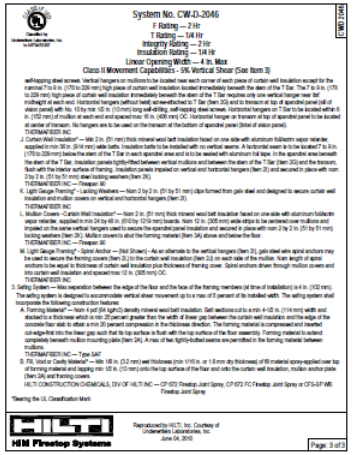
EDGE OF SLAB FIRESTOP SYSTEMS IDENTIFY EACH COMPONENT REQUIRED TO ACHIEVE THE DESIRED RATING

Curtain wall tested system can have numerous components, such as:

- Floor
- Curtain wall
  - Mullion cover (depends on system)
  - Framing (aluminum or steel)
  - Spandrel
  - Vision panels
  - Insulation
- Safing system
  - Forming material / Cavity material







Due to unique design of many curtain wall systems, EJs are typically issued

WHEN A TESTED FIRESTOP SYSTEM DOES NOT MATCH A FIELD CONDITION, ENGINEERING JUDGMENTS NEEDED

Engineering Judgments (EJ) are issued in accordance with the guidelines established by the International Firestop Council.

- Not to be used in lieu of available tested systems
- Must be issued by qualified technical personnel
- Based upon previously tested system(s)
- Based upon assumption that the recommended system (EJ) would pass if tested for the required rated period of time
- Issued only for a single job, location and application

IFC

INTERNATIONAL FIRESTOP COUNCIL

THE Source of Firestop Expertise®

INTERNATIONAL BUILDING CODE (2021)

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1705.18	Special Inspections of Fire Resistant Penetration & Joints	Penetrations: ASTM E 2174 Joints: ASTM 2393

Understanding the testing process is key to designing fire resistant systems

FIRESTOP SPECIAL INSPECTION MANDATED FOR HIGH-RISES AND RISK CATEGORY III & IV BUILDING

Buildings that require a Special Inspection of the installed firestopping have been defined in the IBC to be high-rise buildings, as well as Risk Category III, Substantial hazard to human life in event of failure and Risk Category IV buildings considered Essential facilities (IBC 2021 - 1705.18)

- High-rise: Occupied floor > 75 ft. above lowest level of FD access

- Risk category III building:
  Substantial hazard to human life in event of failure (IBC 1604.5)
  Examples:
  - Elementary school > 250 occupants
  - Public assembly > 300 occupants
- Risk Category IV building:
  Essential facilities (IBC 1604.5)
  Examples:
  - Medical facilities (I-2) having surgery or emergency treatment
  - Buildings containing highly toxic materials that may endanger public

AGENDA

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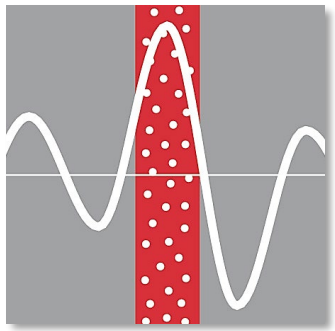
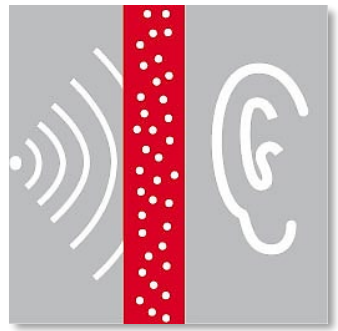
- **Beyond Fire Resistance – Secondary Attributes of Firestop**
- Specifying Firestop Systems
- Hilti Firestop

FIRESTOP PRODUCTS CAN PROVIDE ADDITIONAL BENEFITS TO MEET YOUR PROJECT NEEDS

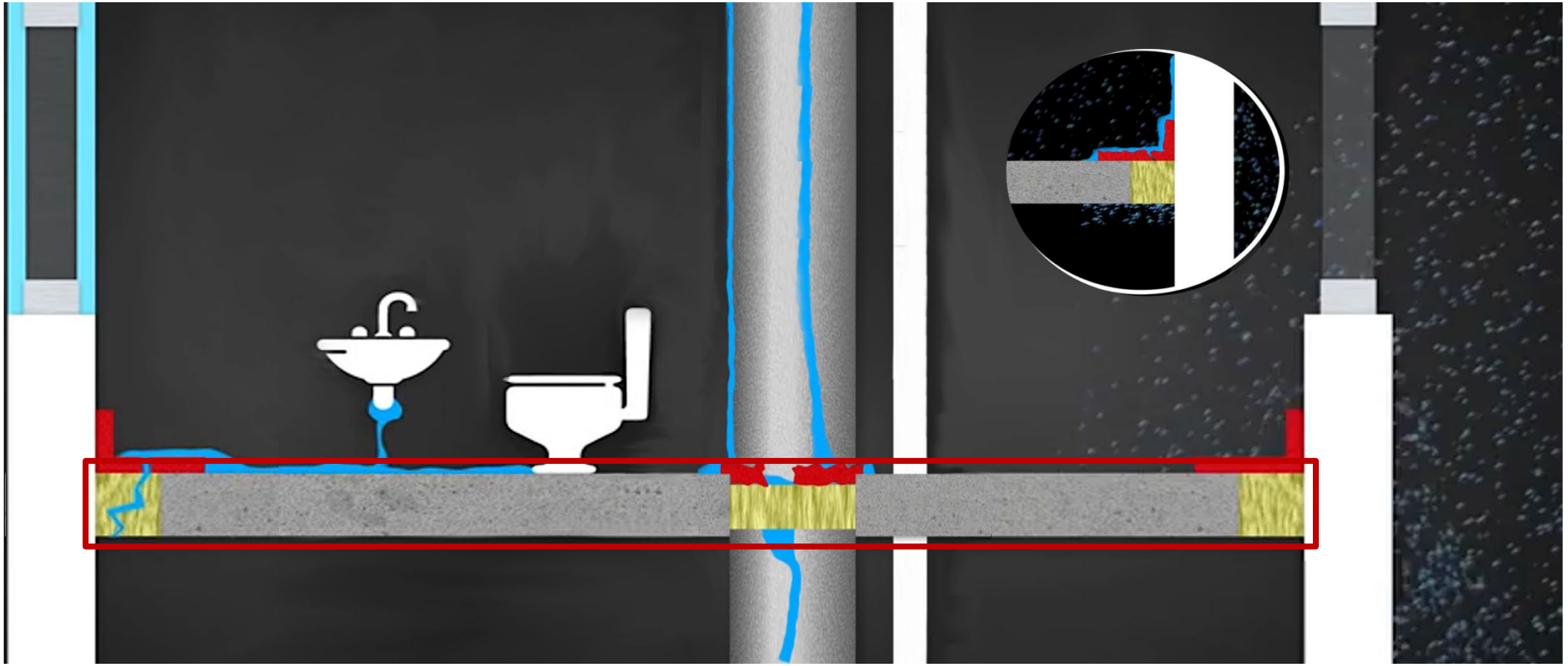






Proper Installation	Air Tightness	Movement	Water Resistance	Sound Attenuation
System Selection	Smoke & Toxic Gas	TOW (Vertical Loads)	Constructability	Privacy
Product Selection	Infection Control	EOS (Horizontal & Vertical Loads)	Containment	Health and Safety
Training/ Certification	Energy Savings	Penetrations (Expansion/ Contraction)	Contamination (mold)	
Inspection	Pressure (+/-) Control	Seismic		

WATER RESISTANCE HELPS COMBAT DAMAGE DUE TO RAIN OR PLUMBING DISASTERS



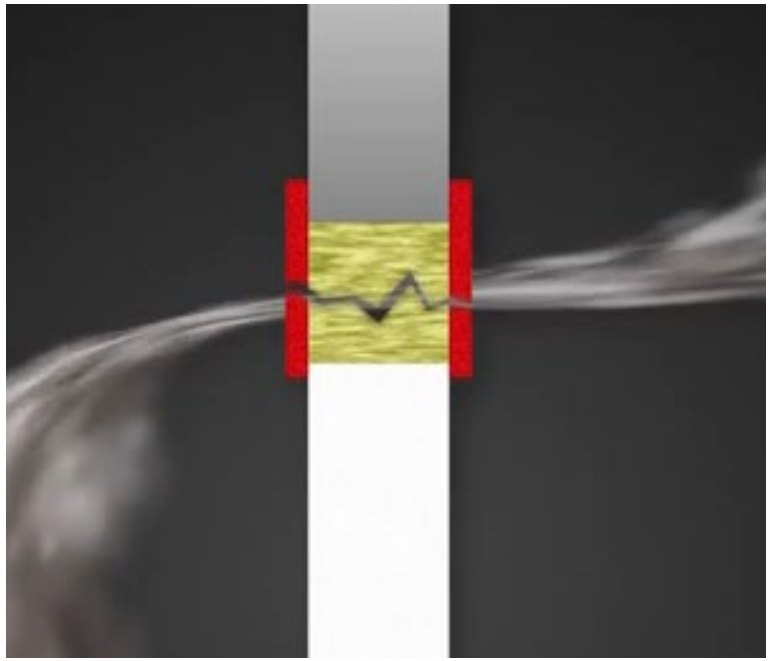
The impact of water damage can have a significant effect on the building, during or after construction

FIRESTOP SYSTEM ARE SPECIFICALLY DESIGNED AND TESTED FOR WATER RESISTANCE

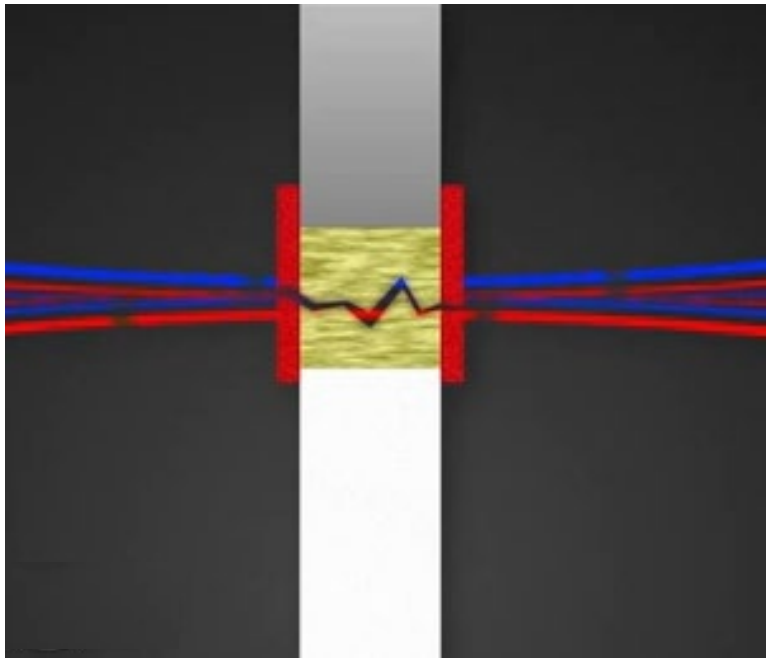
- **W-Rating** (optional test) – determines effectiveness of a firestop system to restrict flow of water.
- Tested to resist up to 3 feet of water column for 72 hours
- Specify for floor penetration
- **ASTM D6904** “Standard Practice for Resistance to Wind Driven Rain…”
- Specify for perimeter fire barrier system

W rated
SYSTEMS AVAILABLE

AIR RESISTANT SEALANTS CAN RESTRICT THE MOVEMENT OF SMOKE, AIRBORNE PATHOGENS, AND SOUND



Smoke penetration

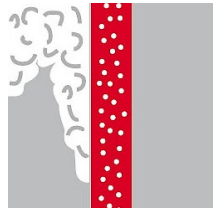


Air Leakage results in:

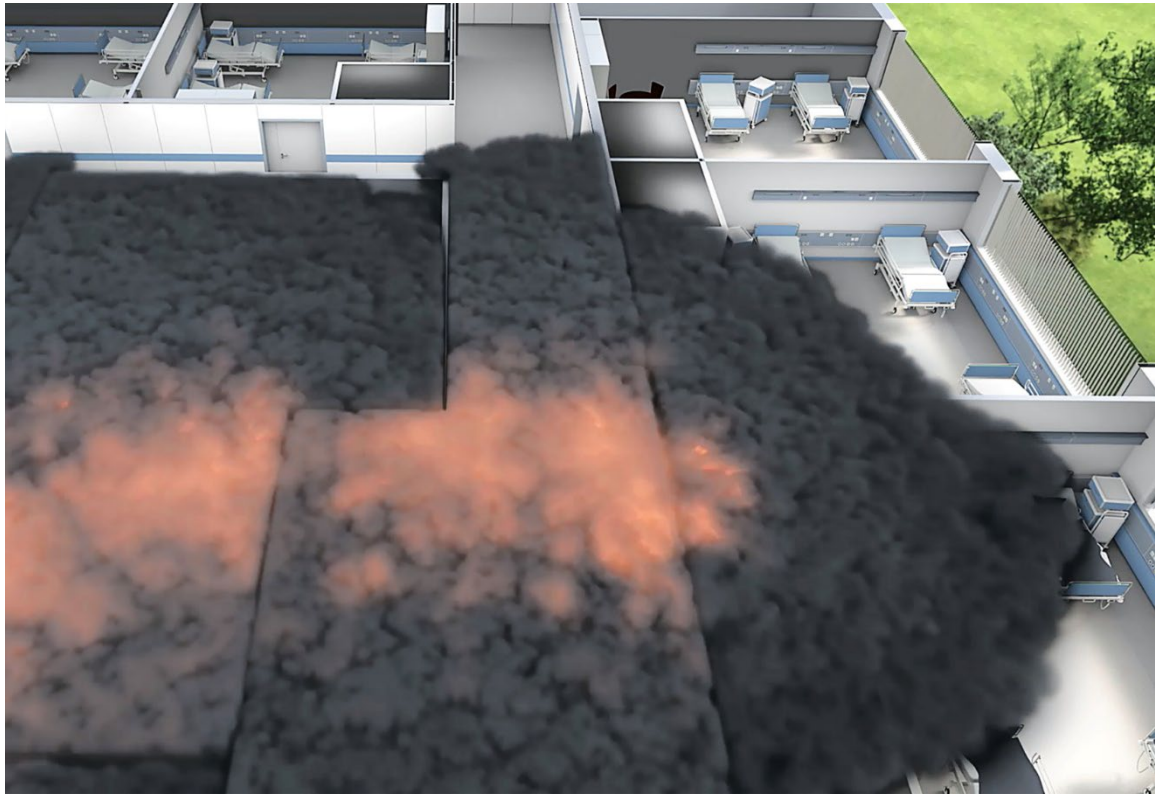
- Moisture damage
- Hot/Cold spots
- Disease transmission

Sound transmission

LEAKAGE RATING (L-RATING) DETERMINES SUITABILITY TO RESTRICT PASSAGE OF SMOKE

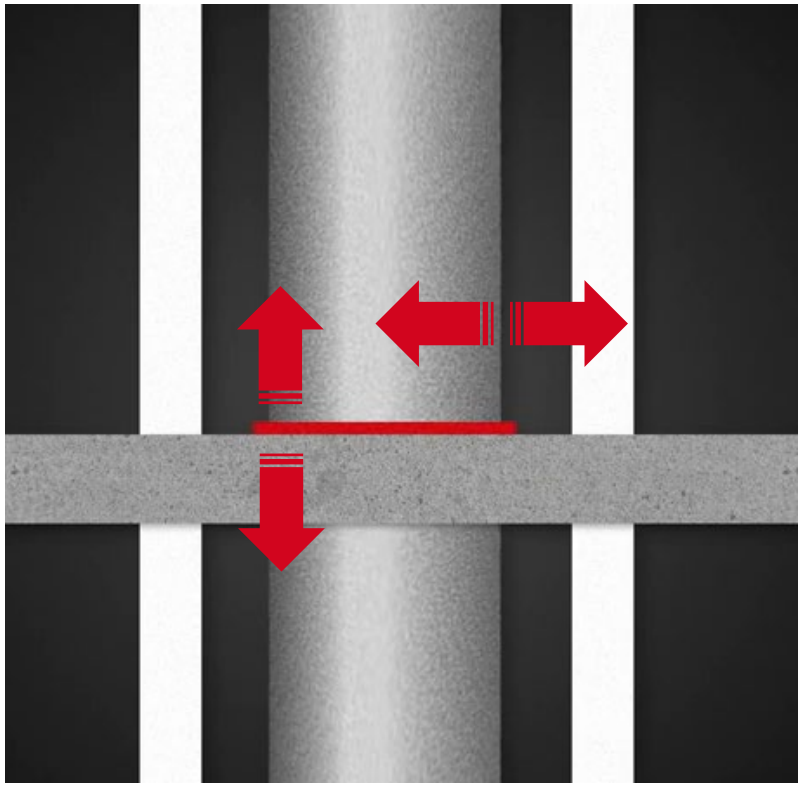


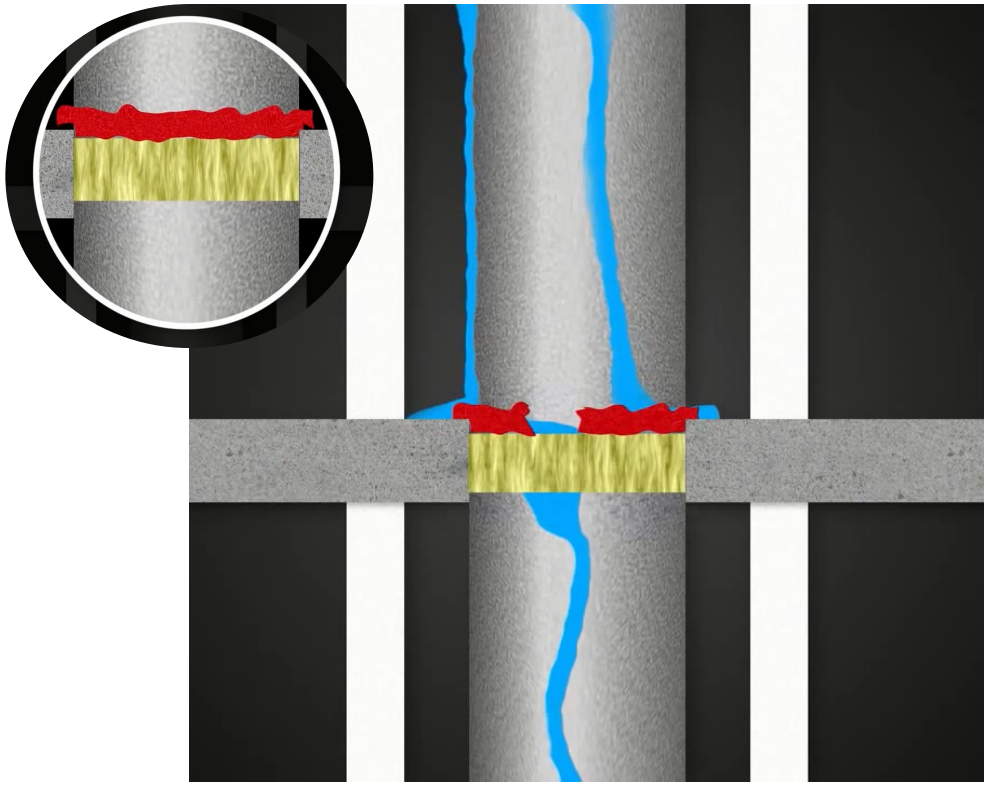
- Optional test per UL 1479. Required on smoke barriers (healthcare, prisons, etc.)
- Smoke Barrier is a continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly that is designed & constructed to restrict the movement of smoke
- Measures amount of air leakage through the firestop system
- Test conducted at two temperature ranges:
  - Ambient temperature (simulates cold smoke away from fire origin)
  - 400°F (simulates warm smoke near fire origin)
- Measured in CFM: the lower the number, the better the L-Rating



Even with smoke as the leading killer in fires, this rating varies greatly from one system to another

DYNAMIC MOVEMENT OCCURS WITH JOINTS AND PIPE PENETRATIONS





A new test method for measuring movement capabilities of through-penetration firestop systems is available with ASTM E3037 (published November 2016)

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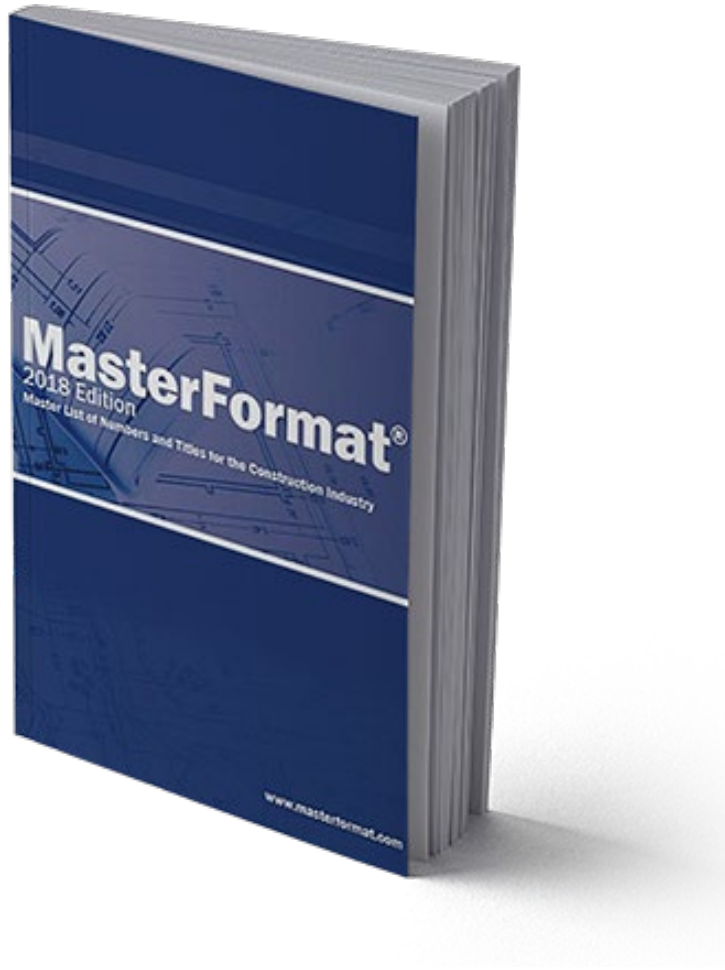
CSI MASTERFORMAT™ SPECIFICATION DIVISIONS

Specification Divisions

- Division 7 - Thermal & Moisture Protection
- Division 21 - Fire Suppression
- Division 22 - Plumbing
- Division 23 - HVAC
- Division 26 - Electrical
- Division 27 - Communications
- Division 28 - Electronic Safety & Security



ENGAGE AN EXPERIENCED INSTALLER WHO IS QUALIFIED TO PERFORM THE FIRESTOP WORK

Part 1 General > Installer Qualifications

- Firestop Manufacturer Training
- FM 4991 Approved Firestop Contractor
- UL Qualified Firestop Contractor Program
- Manufacturer Accredited Firestop Specialty Contractor

FM APPROVED 4991

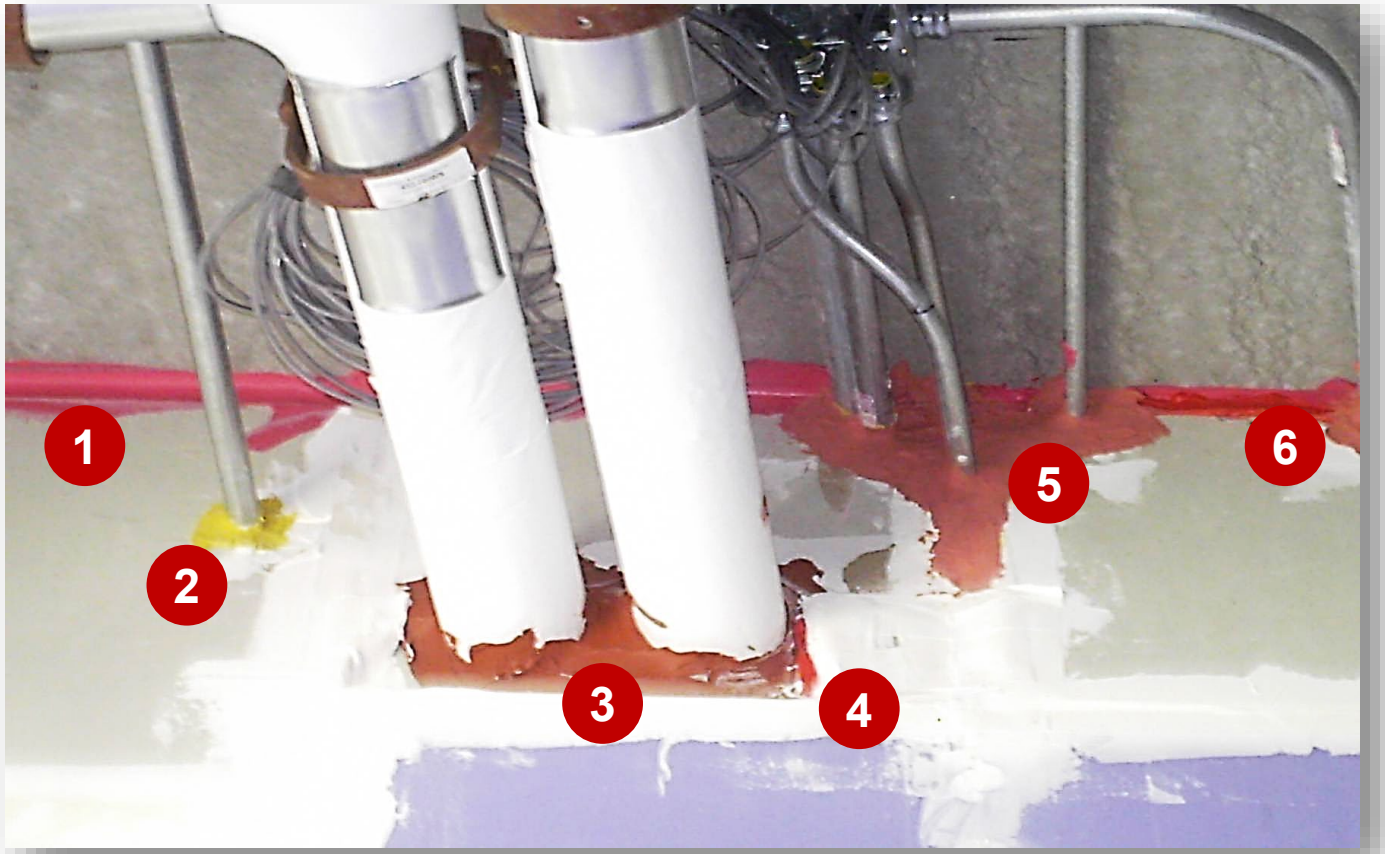
Underwriters Laboratories Qualified Firestop Contractor Program

Hilti Accredited Firestop Specialty Contractor

SINGLE SOURCE MANUFACTURER OF FIRESTOP PRODUCTS HELPS ENSURE CONSISTENCY AND COMPATIBILITY

Part 2 Products > Firestopping

Common error:
Six (6) different firestop products by three (3) different manufacturers



FIRESTOP PRODUCTS TYPES FOR PENETRATIONS/JOINTS

Part 2 Products > Materials

Traditional Sealants and Sprays

Pre-formed firestop

TRADITIONAL VS. PRE-FORMED FIRESTOP SOLUTIONS

Part 2 Products > Materials

Traditional Sealants and Sprays	Pre-formed firestop
• Correct installation highly dependent on installer • Surface cleaning/ tooling is required (and often neglected) • Depth of fill material varies per installation/installer • Shelf life and storage issues • Prone to waste	• Easy fast installation • Surface cleaning not required • Depth of fill material always correct • Pre-cured. No shelf life. • Some devices can be re-penetrable • Easy to inspect

FIRESTOP SYSTEMS SCHEDULE IDENTIFIES MOST COMMON SYSTEMS

Part 3 Execution > Schedules

Firestop schedules should include:

- Application
  - Type of penetrant
  - Joint type
- F-rating
- Basis of design UL Systems

Firestop schedules can be included:

- Within firestop specifications
- On construction drawings

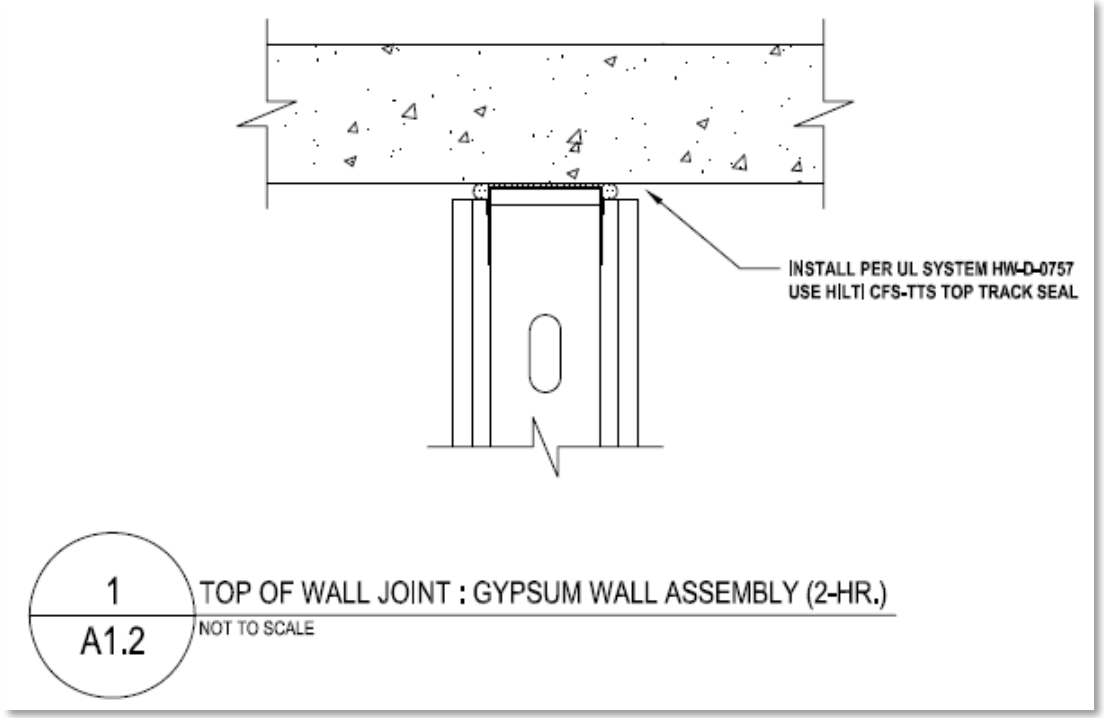
Schedule of firestop systems (example)

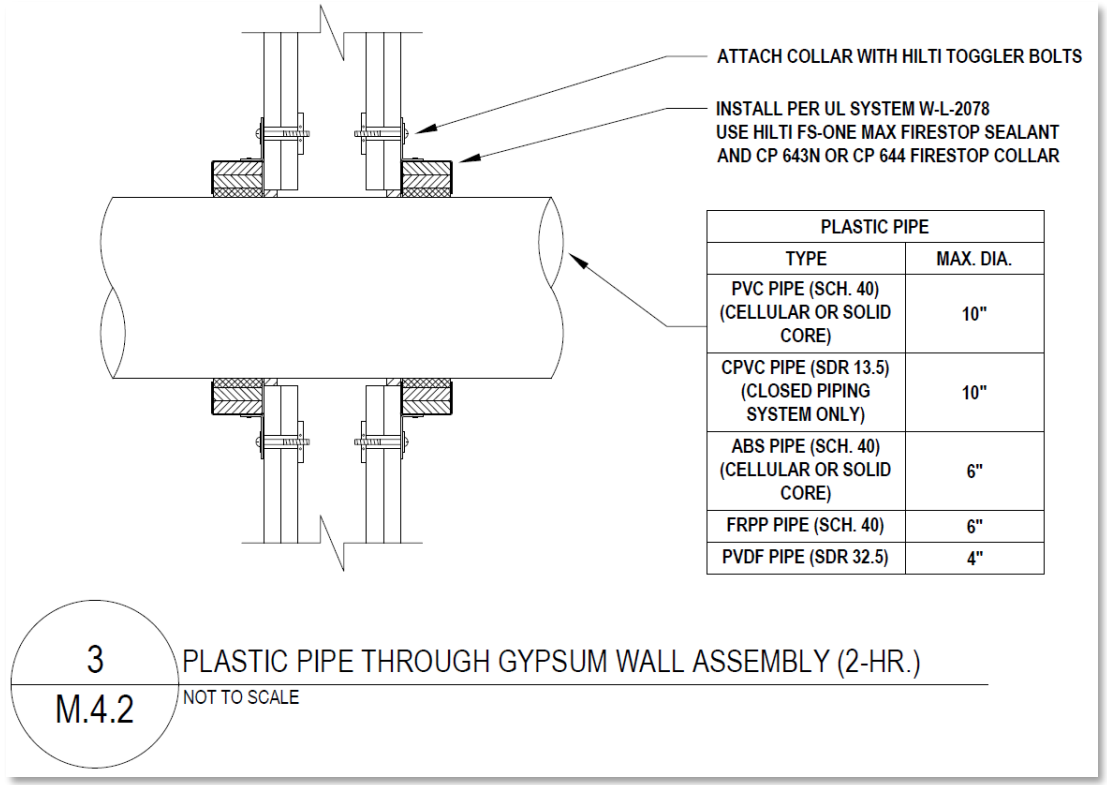
CONCRETE FLOORS		
TYPE OF PENETRANT	F-RATING (HR)	BASIS OF DESIGN UL SYSTEM
CIRCULAR BLANK OPENINGS	1	F-A-0006, C-AJ-0055, C-AJ-0090
	2	F-A-0006, C-AJ-0055, C-AJ-0090
	3	F-A-0006, C-AJ-0055, C-AJ-0086,
SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, F-A-1028, F-A-1017
	2	C-AJ-1226, F-A-1028, F-A-1017
	3	C-AJ-1226, F-A-1017
	4	C-BJ -1037, C-BJ-1034
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	F-A-2053, F-A-2025, C-AJ-2109, C-AJ-2098, C-AJ-2271, C-AJ-2167,
	2	C-AJ-2098, C-AJ-2271, C-AJ-2167, C-BJ-2021, C-AJ-2371, C-AJ-2342
	3	F-A-2054, C-AJ-2109, C-AJ-2098, C-AJ-2371, C-AJ-2342
	4	C-BJ 2016, C-AJ-2017
SINGLE/CABLE BUNDLES	1	F-A-3007,C-AJ-3095,C-AJ-3180, C-AJ-3283
	2	F-A-3007,C-AJ-3095,C-AJ-3334, F-A-3060
	3	F-A-3007, C-AJ 3095, C-AJ-3285

Specifying UL Firestop Systems is key to proper firestopping on projects

STANDARD FIRESTOP DETAILS

Construction Drawings > Typical Details Sheet



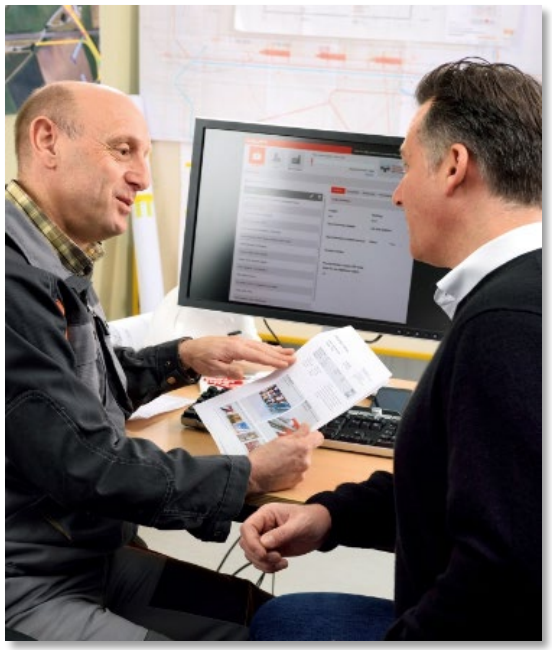


Include typical firestop details for most common applications

LABELING AND DOCUMENTATION OF EACH FIRESTOP APPLICATION IMPROVES QUALITY ASSURANCE

Part 3 Execution > Identification and Documentation

Label and record



Create report

Cloud storage

Inspections

Software programs available to make tracking and documentation easier

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HILTI HAS A RANGE OF INNOVATIVE SOLUTIONS TO ADDRESS KEY FIRESTOP APPLICATIONS

Standard

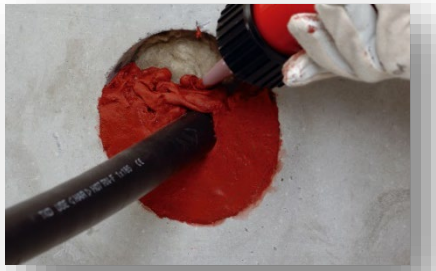
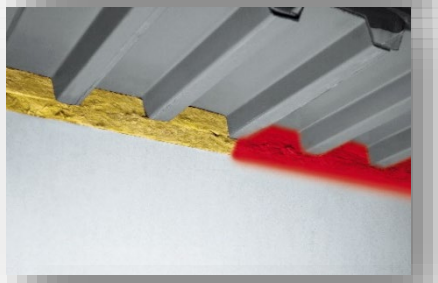
Hilti quality at economical price

Premium

Premium performance for a wide range of applications

Ultimate

Ultimate performance for demanding applications

Through-Penetrations	Cable Management	Joints	Edge of Slab
			
			
			

HILTI'S BEST IN CLASS FIRESTOP SOLUTIONS

CP 653 Speed Sleeve

CFS-TTS Top Track Seal

CP 680 Cast-In Device

CFS-EOS QS Edge of Slab Quickseal

HILTI FIELD ENGINEERING SUPPORT SERVICES

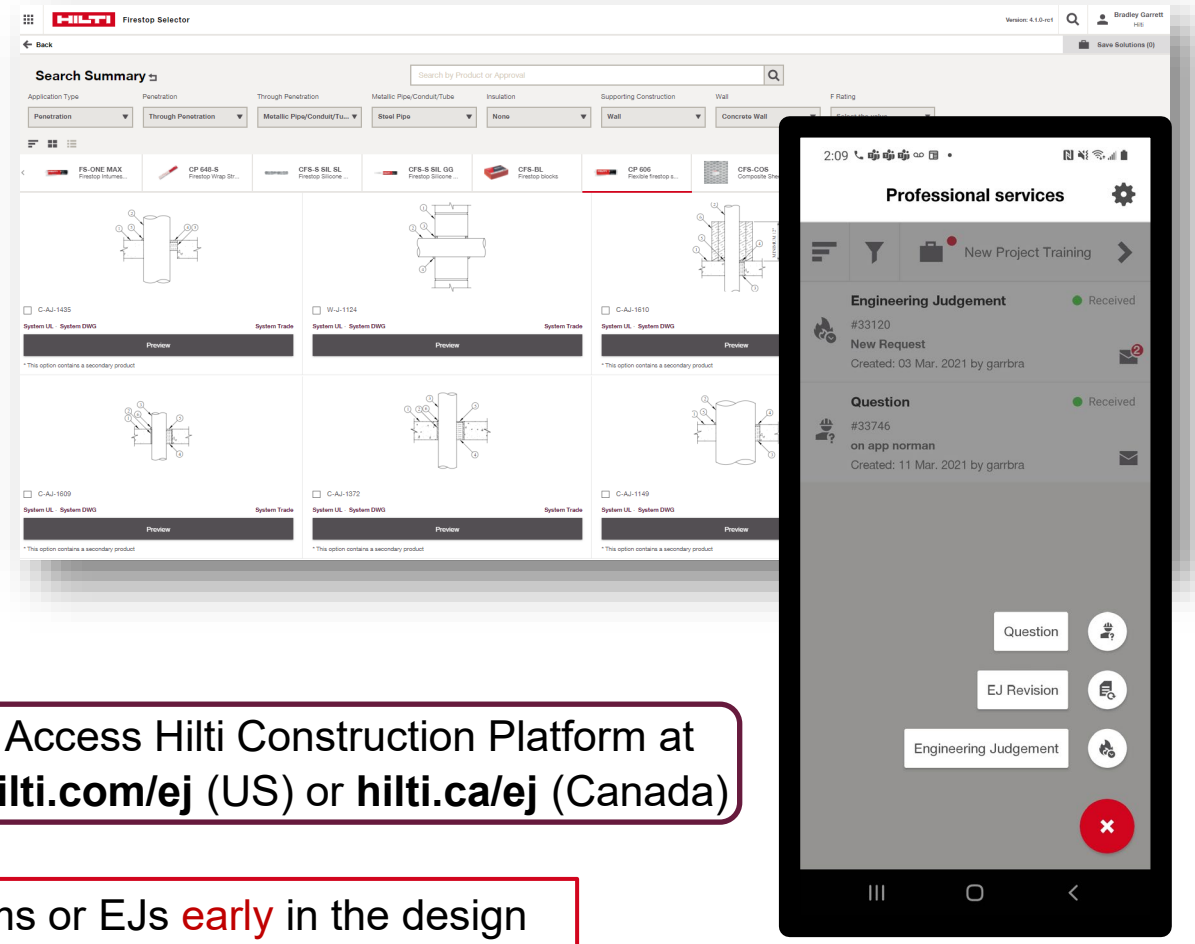
Technical Support Services

- Specifications updates
- Façade reviews during design (Firestopping + CW attachment options)
- Firestop system selection
- Continuing education courses and seminars
- Installer training
- Software training
- Engineering Judgment support
- Onsite testing and job consultation

FIND FIRESTOP LISTINGS AND REQUEST ENGINEERING JUDGMENTS ON THE HILTI CONSTRUCTION PLATFORM

The Hilti Construction Platform and Firestop Selector Mobile App enable users to efficiently:

- Create and submit Engineering Judgment requests
- Receive email notifications
- Check status of requests on the app
- Communicate with the Fire Protection Design Team
- Find firestop systems through direct, guided, and advanced search options
- Filter firestop systems by product



Access Hilti Construction Platform at **hilti.com/ej** (US) or **hilti.ca/ej** (Canada)

Secure tested firestop systems or EJs early in the design phase to ensure constructability and help prevent problems.

THANK YOU

Hilti can help you find technical solutions for your projects

US:
1-800-879-8000 – Customer Service
usfirestopeng@hilti.com
www.hilti.com/firestop

Canada:
1-800-363-4458 – Customer Service
CAFireStop@hilti.com
www.hilti.ca/firestop

Ask Hilti:
https://ask.hilti.com