Firestopping

- The History of Firestopping – Codes, Standards and More.

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FCIA
Firestop Contractors International Association

Topics

Firestopping:

- Past
- Present
- Future

Past

Past – The Early Years

- The first firestopping was done for marine applications in the 60's. These were both very crude and robust by today's standards. Typically steel sleeves were welded to bulkhead, pipes or cables passed through the sleeve, and ends of sleeves plugged.
- For commercial construction, the 1973 Standard Building Code required: "All openings around exposed pipes or power shafting shall be filled with approved non-combustible material, or shall be closed off by close-fitting metal caps at the ceiling and floor line, and on each side of a wall or partition."
  - Relied on the code official determining what was an "approved" material.

Past – The Early Years

- Brown's Ferry Nuclear Plant Fire – March 22, 1975 – Firestopping, consisting of a foamed plastic covered with FR coating, was a contributing factor to a near nuclear disaster. This fire was pivotable in the development of firestopping as it know it today.
- Shortly after the Brown's Ferry fire, UL and the codes writers recognized the need for more robust firestopping. The first step in that process was to develop a test method for evaluating the systems.
- UL's Leon Przybyla and Abdur Abassi began work on developing a test method for firestopping in 1975.

Past – The Early Years

- UL published the first Firestop listing for Nelson Electric in 1976. Listing published under the product category “Wall Opening Protective, Multiple-Cable Devices” (ZCMU) as a product listing. This listing was published as a product listing due to it simplistic nature. This product category was later renamed “Wall and Floor Opening Protective, Multiple-Cable Devices” (ZCMU), “Through-Penetration Firestop Devices” (XHCR) and finally “Firestop Devices (XHJI). Listing based on fire tests conducted using an UL 263 / ASTM E119 time-temperature curve.

Past – The Early Years

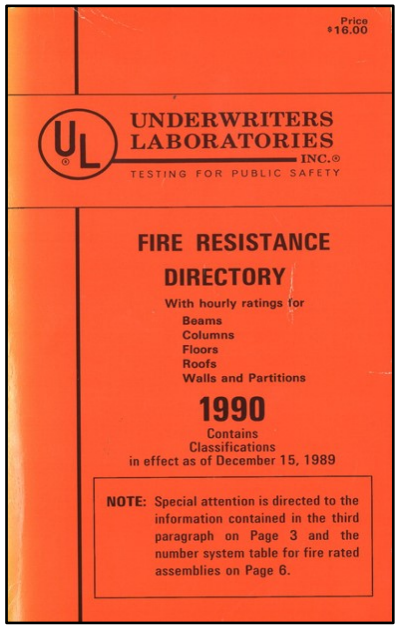
- UL published the first Firestop System listing for Semco covering a silicone foam in 1977. Listing published under the product category "Wall and Floor Opening Protective, Multiple-Cable Systems" (ZCOR). This product category was later renamed "Through-Penetration Firestop Systems" (XHEZ). Listing likewise was based on fire tests conducted using an UL 263 / ASTM E119 time-temperature curve.
- By December, 1980, UL had 23 published firestop systems and four firestop device product listings.

Past – The Early Years

- The product category “Wall and Floor Opening Protective, Multiple-Cable Devices” (ZCMU) was renamed “Through-Penetration Firestop Devices” (XHCR) in 1982.
- The product category “Wall and Floor Opening Protective, Multiple-Cable Systems” (ZCOR) was renamed “Through-Penetration Firestop Systems” (XHEZ) in 1982.
- UL began testing firestop devices and system to UL 1479 in 1982.

Past – The Early Years

- These early listings were published in the UL Building Materials Directory.
- Listings transferred over to the Fire Resistance Directory in 1989.



Past – Development of UL 1479 – Firestop Systems – XHEZ

- UL and the industry began developing a test method to address protection of penetrations in 1975. UL and the codes recognized the need for more robust firestopping.
- Intent was to develop a unique fire test standard which complimented UL 263 and ASTM E119, but addressed the unique nature of firestop systems:
  - Sample size
  - Differential pressure
  - Length of penetrating item
  - Temperature measurement / thermocouple pad size
  - F and T Ratings

Past – Development of UL 1479 – Firestop Systems – XHEZ

- First edition of ASTM E814 published in 1982.
- First edition of UL 1479 published in Jan, 1983.
- UL began using the published UL 1479 standard to test firestop systems in late 1982.
- UBC Standard 43-6 published in 1991.

Past – Early Codes – 1979-1988 UBC

- Simultaneously, the codes began to require tested firestop systems. 1979 UBC required the following:
  - Penetrations. Penetration through walls, floors and ceilings which require protected openings shall be protected:
    - Walls or partitions, and floors or ceilings, may be penetrated provided penetrations are firestopped using an approved material securely installed and capable of maintaining its integrity when subjected to time-temperatures curve prescribed in UBC Standard No. 43-1 (UL 263 / ASTM E119) for the specific assembly.

Past – Early Codes – 1979-1988 UBC

- Openings for steel electrical outlet boxes not exceeding 16 square inches in area, provided the area of such openings does not aggregate more than 100 square inches for any 100 square feet of wall or partition area. Outlet boxes on opposite sides of walls or partitions shall be separated by a horizontal distance of 24 inches.
- Where walls and partitions are penetrated by outlet boxes of other materials or where larger openings are required, they shall be qualified by tests conducted in accordance with the provisions of Section 4302 (UBC Standard No. 43-1 / UL 263 / ASTM E119).
- Occasional noncombustible pipes may be installed within or through floors, provided they are protected so as to prevent the movement of hot flames or gases.

Past – Modern Code Requirements - 1991 UBC

- 4304. (e) Penetrations.
  - Penetration through walls which require protected openings (doors) and floors shall be protected by a through-penetration firestop system tested to UBC Standard 43-6 (UL 1479 / ASTM E814) having an F and T rating. T Rating waived under certain circumstances.
    - Exception: Noncombustible penetrating items not larger than 4 in. diameter or 16 sq in. may penetrate the walls and floor, providing the annular space is filled with a material which will prevent passage of flames and hot gasses sufficient to ignite cotton waste when subjected to a UBC Standard No. 43-1 (UL 263 / ASTM E119) time-temperature curve under a min 0.01 in. water column.

Past – Modern Code Requirements - 1991 UBC

- Openings in walls for steel electrical outlet boxes not exceeding 16 square inches in area, provided the area of such openings does not aggregate more than 100 square inches for any 100 square feet of wall or partition area. Outlet boxes on opposite sides of walls or partitions shall be separated by a horizontal distance of 24 inches.

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

The mid to late 80s and early 90s brought about a rapid advancement of the firestop industry.

- Reduced required positive furnace pressure from 0.03 in. water column to 0.01 in. water column in 1985.
- Through-Penetration Firestop Devices (XHCR) product listings were converted into firestop systems in 1991.
- Industry requests UL to consider inclusion of accelerated aging requirements for all firestop materials in UL 1479 in 1992.
  - This request leads to multi-year research on how best to evaluate effects of age on firestopping materials.

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- After much research and discussion, UL 1479 was revised to include requirements for accelerated aging for intumescent firestopping materials in August, 2000.
  - Materials exposed to elevated temperature of 158°F for 270 days and high humidity of 97 to 100% and 95°F or 180 days
  - After exposure materials subjected to expansion pressure and expansion factor testing
- These requirements remain in place today.

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- Renumbered all firestop systems from numeric sequence to current numbering system in 1992.
  - Used the opportunity to rewrite systems in a standardized format. This was done in part to facilitate electronic searches.

C-AJ-1079

What does this mean?

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- L Rating added to UL 1479 in 1993.
  - Developed in response to provisions in the NFPA 101 Life Safety Code requiring penetration in smoke barriers to resist the free passage of smoke and hot gases.
  - Test methodology originated in Germany.
  - Based on what was simultaneously being done for the door industry.
  - L Rating methodology was published in the May 13, 1993 edition of UL 1479.
    - Rating is optional
    - 0.30 in. water column differential pressure

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- Test conducted at ambient and 400°F
- No acceptance criteria developed – Listings reflected the leakage determine by tests
- First listing published in 1994 Fire Resistance Directory

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- Revised furnace pressure requirements during testing to require 0.01 in. water column of pressure, 12 in. below floor-ceiling assemblies in 1994.
- W Rating added to UL 1479 in 2004.
  - Original intent was to determine ability of system to prevent floor to floor migration of water.
  - Intent later expanded to also address the ability of firestopping materials to continue to perform after exposure to water.

Past – Evolutionary Changes to UL 1479 and UL 1479 Listings

- Three Classes of Exposure:
  - Class 1 – 3 ft water column for 72 hrs
  - Class 2 – 20 ft water column for 10 min
  - Class 3 – 58 ft water column for 10 min
- F and T Ratings determined after water exposure.
- First listings published in 2005 Fire Resistance Directory. All current listings focus on Class 1 Exposure.
- Added requirements for the testing of membrane-penetrations through wall assemblies in June, 2015.
  - Covers both outlet box penetrations and other membrane-penetrations.

Past – Approved / Qualified Contractor Programs

- Programs that certify a company has the knowledge and quality control procedures to properly install firestopping
  - Min. 2 years in firestop installation business
  - Designated Responsible Individual (DRI) is formally tested by FM or UL at regular intervals
  - Documented and archived record keeping system for all installations
  - Must have an approved Quality Control Manual

FM APPROVED 4991

UL Underwriters Laboratories Qualified Firestop Contractor Program

ULC Underwriters' Laboratories of Canada Laboratoires des Assureurs du Canada Qualified Firestop Contractor Program

Past – Development of UL 2079 – Joint Systems – XHBN

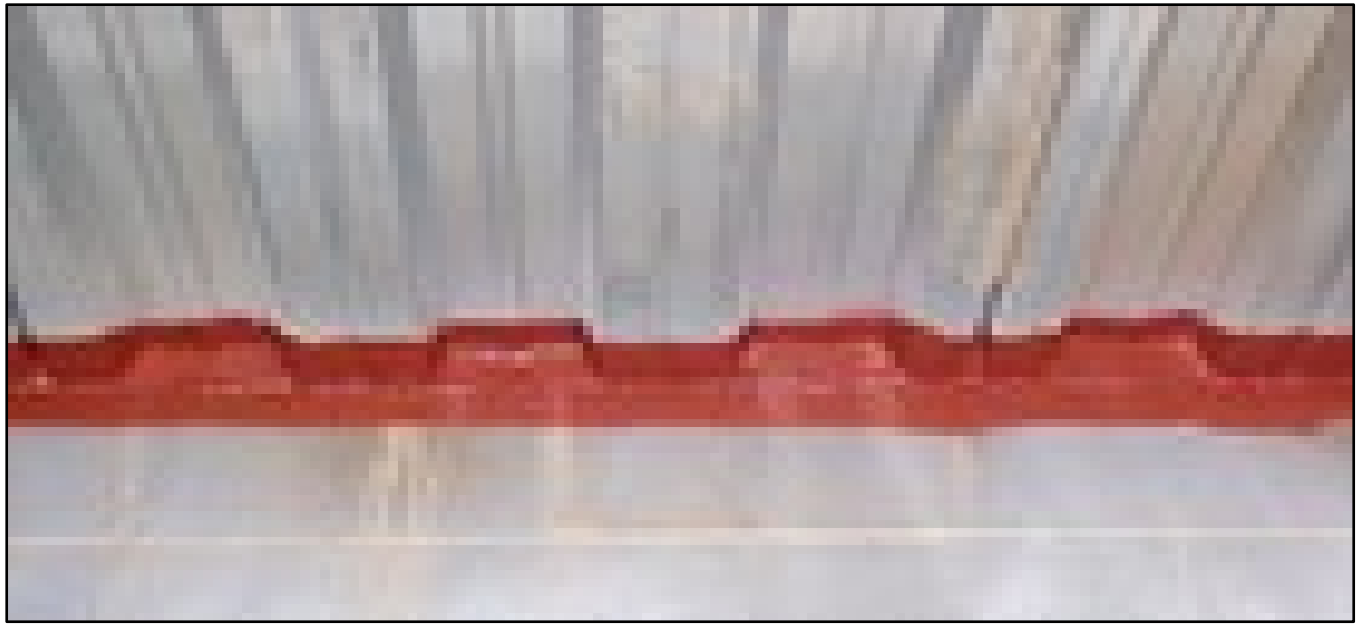
- UL began development of UL 2079, covering **Fire-Resistive Joint Systems**, in 1992.
- New standard supported testing on joint systems which was first conducted in 1960 and first published in approximately 1984.
- Intent was to develop a unique fire test standard which complimented ANSI/UL 263 and ASTM E119, but addressed the unique nature of joint systems:
  - Sample size - Permits small-scale testing based on length of sample to maximum width of joint system ratio

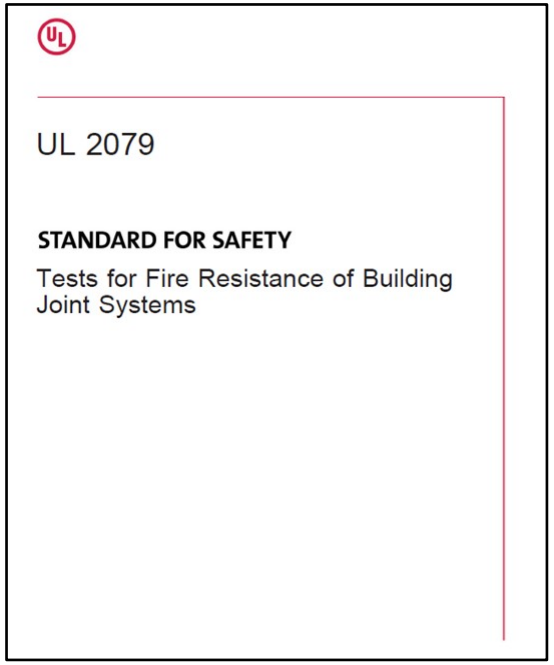
Past – Development of UL 2079 – Joint Systems – XHBN

- Differential pressure
- Temperature measurement / thermocouple pad size
- Assembly and L Ratings - Unlike firestop system, new standard mandated unexposed surface temperature limitations
- Cyclical movement on joint systems intended for accommodate movement:
  - Class 1 – Thermal
  - Class II – Wind Sway
  - Class III – Seismic

Past – Development of UL 2079 – Joint Systems – XHBN

- New Standard published November 29, 1994.
- Counterpart standard, ASTM E1966, published in 1998.





Past – Evolutionary Changes to UL 2079 and UL 2079 Listings

The mid 90s brought about a rapid acceptance of joint systems, along with modifications of listing requirements.

- Renumbered prior joint systems from fire-resistance based numbering system to current system in 1995.
- W Rating added to UL 2079 in 2006.
  - Original intent was to determine ability of system to prevent floor to floor migration of water
  - Intent later expanded to also address the ability of joint materials to continue to perform after exposure to water

Past – Evolutionary Changes to UL 2079 and UL 2079 Listings

- Three Classes of Exposure:
  - Class 1 – 3 ft water column for 72 hrs
  - Class 2 – 20 ft water column for 10 min
  - Class 3 – 58 ft water column for 10 min
- Assembly Rating determined after water exposure.
- Currently there are no listings relating to a W Rating.

Past – Evolutionary Changes to UL 2079 and UL 2079 Listings

- Methodology for evaluating accelerated aging for intumescent materials added to UL 2079 in December, 2014.
  - Methodology mirrors that in UL 1479.
    - Materials exposed to elevated temperature of 158°F for 270 days and high humidity of 97 to 100% and 95°F or 180 days
    - After exposure materials subjected to expansion pressure and expansion factor testing
  - This testing is optional for materials used in joint systems.

Past – Development of ASTM E2307 – Perimeter Fire Containment Systems – XHDG

- UL began discussing the development of a test method for **Perimeter Fire Containment Systems** (i.e. perimeter fire barriers, perimeter firestops) in 1991.
- UL struggled with the concept of how to configure the test sample to expose the underside of the perimeter joint to fire.
- Break through came when ICBO-ES published AC108 covering an intermediate-scale test for flammability of combustible components on the exterior of exterior walls in January, 1996. This method was later published as ICBO Standard 26-9, and later yet as NFPA 285.

Past – Development of ASTM E2307 – Perimeter Fire Containment Systems – XHDG

- UL and Omega Point simultaneously began development of test method and test equipment for perimeter fire containment systems (i.e. perimeter fire barriers, perimeter firestops) in 1996.
  - Method used the AC108 intermediate-scale furnace, adapted to account for the nuances of perimeter fire containment systems. Methods from the two labs differed in details but were conceptually identical.

Past – Development of ASTM E2307 – Perimeter Fire Containment Systems – XHDG

- Included cyclical movement on perimeter fire containment systems intended to accommodate movement.
  - Class I – Thermal
  - Class II – Wind Sway
  - Class III – Seismic
- UL developed Integrity and Insulation Ratings, Omega Point developed F and T Ratings.

Past – Development of ASTM E2307 – Perimeter Fire Containment Systems – XHDG

- First UL Perimeter Fire Containment System published in 1997.
- Formal standard, ASTM E2307, published in 2004.

Past – Development of ASTM E2837 – Continuity Head-of-Wall Joint Systems – XHBO

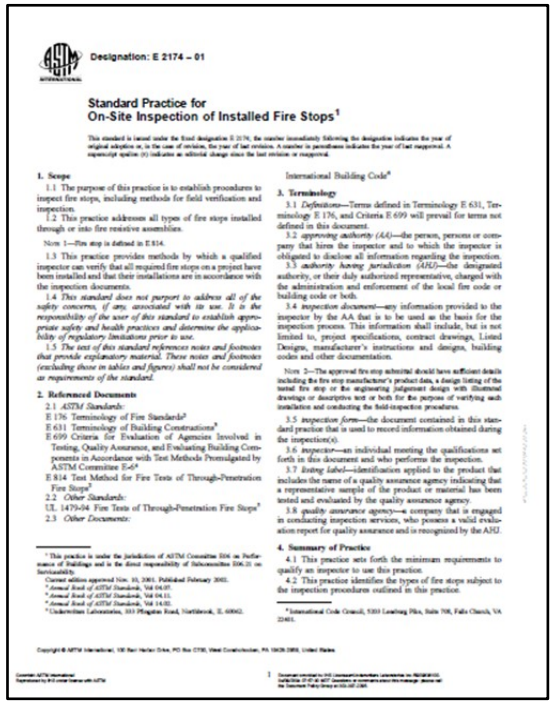
- ASTM began discussing the development of a test method for **Continuity Head-of-Wall Joint Systems** which intersect the bottom of a non-rated floor or roof system in 2006.
- UL conducted research work for the Metal Building Manufacturer's Association to develop test method.
- Method developed is conceptually similar to that used for UL 2079 Head-of-Wall Joint Systems.

Past – Development of ASTM E2837 – Continuity Head-of-Wall Joint Systems – XHBO

- Included cyclical movement on joint systems intended to accommodate movement.
  - Class I – Thermal
  - Class II – Wind Sway
  - Class III – Seismic
- Test method develops F and T Ratings.
- Formal standard, ASTM E2837, published in 2011.
- First UL Continuity Head-of-Wall Joint System published in 2013.

Past – Development of ASTM E2174 / E2393 – Inspection Standards for Firestop Systems and Joint Systems

- At the request of FCIA, ASTM began discussing the development of inspection standards for the on-site inspection of firestop systems and joint systems in 2000.
- Standards allowed two parallel paths for inspections:
  - Visual inspections
  - Destructive inspections



Designation: E 2174 – 01

Standard Practice for
On-Site Inspection of Installed Fire Stops[1]

This standard is issued under the fixed designation E 2174; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The purpose of this practice is to establish procedures to inspect fire stops, including methods for field verification and inspection.

1.2 This practice addresses all types of fire stops installed through or into fire resistive assemblies.

Note 1—Fire stop is defined in E 814.

1.3 This practice provides methods by which a qualified inspector can verify that all required fire stops on a project have been installed and that their installations are in accordance with the inspection documents.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.5 *The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.*

2. Referenced Documents

2.1 *ASTM Standards:*
E 176 Terminology of Fire Standards[2]
E 631 Terminology of Building Constructions[2]
E 699 Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E-6[2]
E 814 Test Method for Fire Tests of Through-Penetration Fire Stops[2]

2.2 *Other Standards:*
UL 1479-94 Fire Tests of Through-Penetration Fire Stops[3]

2.3 *Other Documents:*
International Building Code[4]

3. Terminology

3.1 *Definitions*—Terms defined in Terminology E 631, Terminology E 176, and Criteria E 699 will prevail for terms not defined in this document.

3.2 *approving authority (AA)*—the person, persons or company that hires the inspector and to which the inspector is obligated to disclose all information regarding the inspection.

3.3 *authority having jurisdiction (AHJ)*—the designated authority, or their duly authorized representative, charged with the administration and enforcement of the local fire code or building code or both.

3.4 *inspection documents*—any information provided to the inspector by the AA that is to be used as the basis for the inspection process. This information shall include, but is not limited to, project specifications, contract drawings, Listed Designs, manufacturer's instructions and designs, building codes and other documentation.

Note 2—The approved fire stop submittal should have sufficient details including the fire stop manufacturer's product data, a design listing of the tested fire stop or fire engineering judgment design with illustrated drawings or descriptive text or both for the purpose of verifying such installation and conducting the field-inspection procedures.

3.5 *inspection form*—the document contained in this standard practice that is used to record information obtained during the inspection(s).

3.6 *inspector*—an individual meeting the qualifications set forth in this document and who performs the inspection.

3.7 *listing label*—identification applied to the product that includes the name of a quality assurance agency indicating that a representative sample of the product or material has been tested and evaluated by the quality assurance agency.

3.8 *quality assurance agency*—a company that is engaged in conducting inspection services, who possess a valid evaluation report for quality assurance and is recognized by the AHJ.

4. Summary of Practice

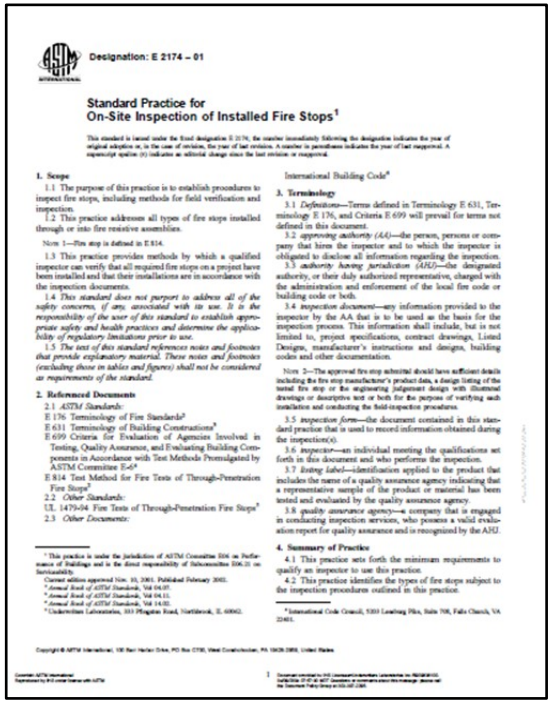
4.1 This practice sets forth the minimum requirements to qualify an inspector to use this practice.

4.2 This practice identifies the types of fire stops subject to the inspection procedures outlined in this practice.

[1] This practice is under the jurisdiction of ASTM Committee E04 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.
Current edition approved Nov. 10, 2001. Published February 2002.
[2] *Annual Book of ASTM Standards*, Vol 04.07.
[3] *Annual Book of ASTM Standards*, Vol 04.11.
[4] *Annual Book of ASTM Standards*, Vol 14.02.
[5] Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062.
[6] International Code Council, 5203 Leesburg Pike, Suite 708, Falls Church, VA 22041.

Past – Development of ASTM E2174 / E2393 – Inspection Standards for Firestop Systems and Joint Systems

- ASTM E2174 published in 2001; ASTM E2393 in 2004.
  - ASTM E2174 – Installed Firestop Systems
  - ASTM E2393 – Installed Joint Systems and Perimeter Fire Barriers
- Serves as basis for on-site inspections of firestop systems and joint systems.



Designation: E 2174 – 01

Standard Practice for
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1. Scope

2. Referenced Documents

3. Terminology

4. Summary of Practice

Past – Evolutionary Changes to Code Requirements – 1996 to 1999 Legacy Codes

- Three Legacy Codes:
  - Southern Building Code Congress International – Standard Building Code
  - Building Officials & Code Administrators – National Building Code
  - International Conference of Building Officials – Uniform Building Code
- Vickie Lovell, Code Consultant to the International Firestop Council, did an outstanding job modernizing and harmonizing the requirements of the three legacy codes in the mid 90s.
- Three codes included the following provisions relating to the protection of penetrations:

Past – Evolutionary Changes to Code Requirements – 1996 to 1999 Legacy Codes

- Tested as part of a wall or floor-ceiling assembly.
- Tested to UL 1479 / ASTM E814.
- Exception for noncombustible penetrants of limited size through walls and floor-ceiling assemblies, protected with concrete, grout or mortar installed to full thickness of wall or floor-ceiling assembly.
- Exception for noncombustible penetrating items protected with materials which prevent ignition of cotton waste when subjected to UL 263 / ASTM E119 time-temperature fire conditions under a min 0.01 in. water column positive pressure.
- Electrical box exceptions.

Past – Evolutionary Changes to Code Requirements – 1996 to 1999 Legacy Codes

- Firestop Systems tested to UL 1479 / ASTM E814 required F Rating on wall penetrations and F and T Ratings on floor penetrations, with exceptions.
- Three codes contained provisions relating to the protection of joints:
  - Full-scale testing to UL 263 / ASTM E119
  - Cyclical movement on joint systems intended for accommodate movement
  - Joint system tested at maximum joint width
  - Positive furnace pressure
  - Mandatory unexposed surface temperature (i.e. T Rating)

Past – Evolutionary Changes to Code Requirements – 1996 to 1999 Legacy Codes

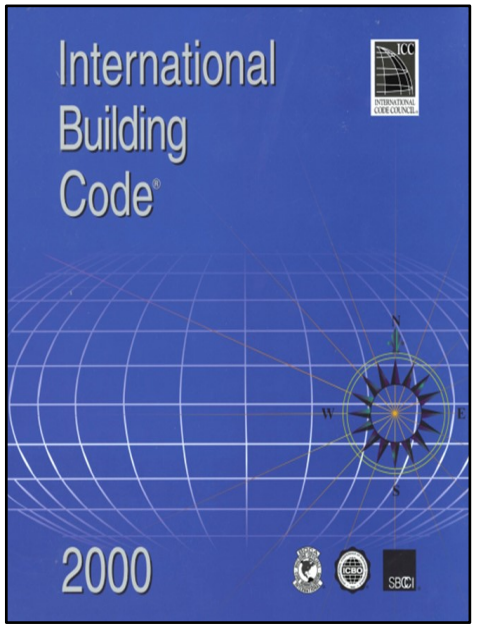
- Three codes contained provisions relating to the protection of perimeter voids:
  - UBC required voids created at intersection of exterior wall and floor slab to be sealed with approved material, securely installed and capable of preventing passage of flames and hot gases sufficient to ignite cotton waste when subjected to UL 263 / ASTM E119 time-temperature fire conditions under a min 0.01 in. water column positive pressure.

Past – Evolutionary Changes to Code Requirements – 1996 to 1999 Legacy Codes

- The SBC required voids created at intersection of exterior wall and floor slab to be sealed with approved material designed and tested for this purpose.
- The NBC was silent on this protection.
- All three code lacked details on how that material would be tested.

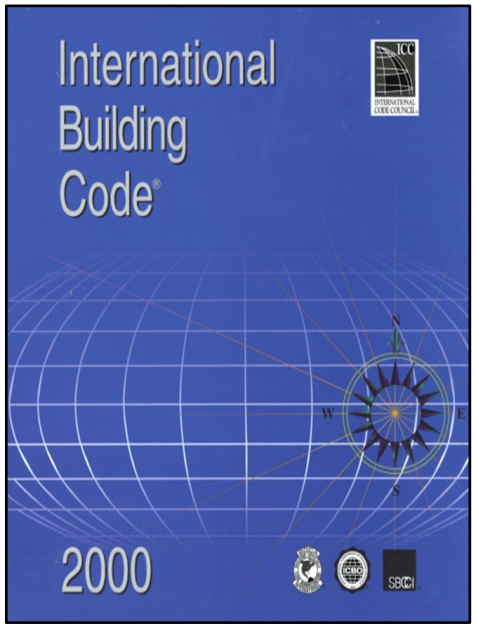
Past – International Building Code

- The three legacy code writers merged in the late 90s into one organization, the International Code Council (ICC). Original intent was NFPA was to be part of ICC. NFPA ultimately decided to maintain their independence.
- The legacy building codes were merged into one model building code, the International Building Code (IBC).
- First edition of the IBC was published in 2000.
- Requirements for the protection of penetrants mirrored the last editions of the three legacy codes.



Past – International Building Code

- Requirements for the protection of joints changed significantly:
  - UL 263 / ASTM E119 was replaced with UL 2079, thereby allowing small-scale testing on the narrower width joints.
- Requirements for the protection of perimeter voids mirrored the 1997 edition of the UBC.



Past – Evolutionary Changes to IBC

- A number of evolutionary changes to the IBC occurred from the 2000 edition to the 2018 edition thanks to the efforts of IFC and FCIA.
- Significant changes were as follows:
  - 2003 IBC – Methods of protecting membrane penetrations by outlet boxes continued to expand.
  - 2006 IBC – Methods of protecting membrane penetrations by outlet boxes continued to expand.
  - 2006 IBC – Requirements were added that penetrations and joints in or through smoke barriers are required to have an L Rating when tested in accordance with UL 1479 and UL 2079, respectively.

Past – Evolutionary Changes to IBC

- 2006 IBC – ASTM E2307 was referenced as an optional test method for evaluating the perimeter void.
- 2009 IBC – Provisions relating to the protection of duct penetrations using firestop systems was clarified.
- 2009 IBC – Methods of protecting membrane penetrations by outlet boxes continued to expand.
- 2012 IBC – Requirement added that interior fire-resistance-rated wall assemblies shall be identified as being fire rated through specific marking at specific locations.
- 2012 IBC – Methods of protecting membrane penetrations by outlet boxes continued to expand.

Past – Evolutionary Changes to IBC

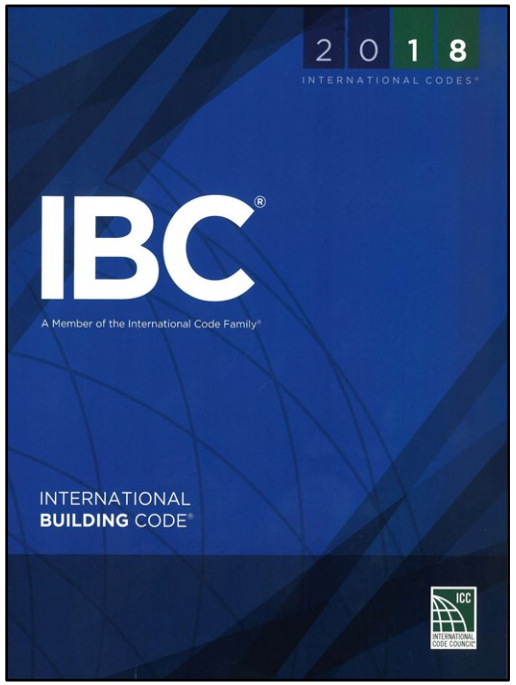
- 2012 IBC – ASTM E2307 became the base requirement for testing perimeter voids. An additional provision was added that stated floor to ceiling glass systems need only meet the traditional UL 263 / ASTM E119 time-temperature fire conditions, essentially as required by the 2000 IBC.
- 2012 IBC – Requirements added for special inspections for firestop systems and fire-resistant joint systems in high-rise buildings (occupied floor > 75 ft above FPD access) and Category III and IV buildings, based on the inspections standards ASTM E2174 and E2393, respectively.

Past – Evolutionary Changes to IBC

- 2015 IBC – Requirement added that void between fire barrier and nonrated roof be filled with an approved material.
- 2015 IBC – Requirement added that void between curtain wall and vertical fire barrier be filled with an approved material.
- 2015 IBC – Methods of protecting membrane penetrations by outlet boxes continued to expand.
- 2018 IBC – Provision added that firestop systems and fire-resistant joint systems shall be installed in accordance with the manufacturer's instructions and the listing criteria.

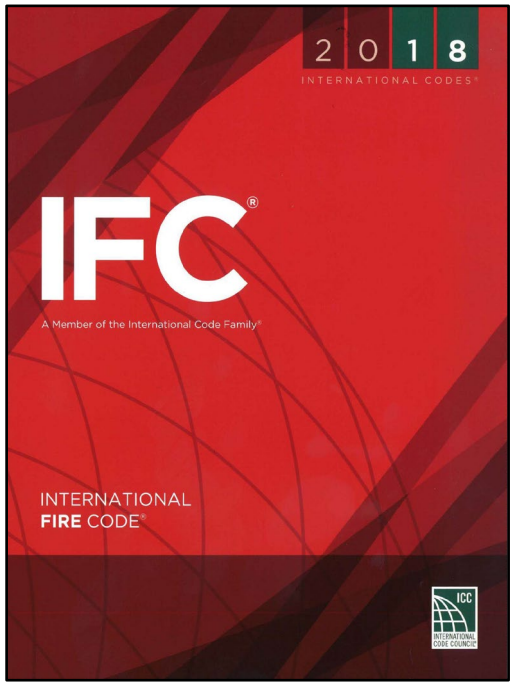
Past – Evolutionary Changes to IBC

- 2021 IBC – Rewrote Section 715 covering Fire-Resistant Joint Systems to clarify existing requirements. Changes were primarily editorial.
- 2021 IBC – Requirements for special inspections of firestop systems and joint systems expanded to include R occupancies (Residential) with occupant load greater than 250.

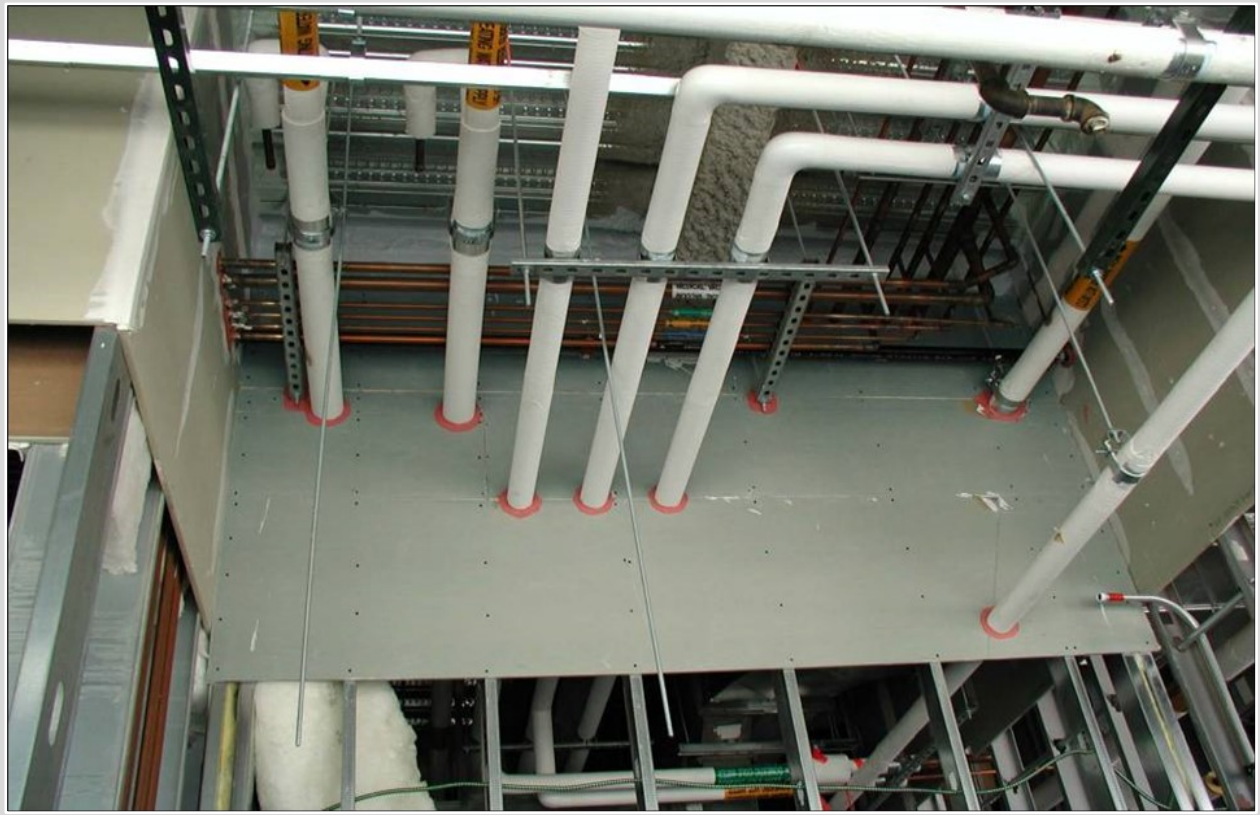


Past – Evolutionary Changes to the IFC

- 2019 International Fire Code (IFC) – Rewrote Chapter 7 covering inspection and maintenance of Fire and Smoke Protection Features, including fire-resistance-rated construction and the methods of protecting breaches through that construction.



Present



Present Requirements

- Your Industry has been an active participant is developing a well defined set of requirement relating to the fire safety of commercial buildings.
- Programs now in place include:
  - A well defined set of code requirements
  - A well defined set of test standards which compliment the code requirements
  - Three qualified/approved contractor programs
  - Inspection standards for firestop systems and fire-resistant joint systems

Present Requirements

- Special inspection requirements for key types of buildings
- Criteria for evaluating competency of special inspectors
- Establishment of Master Audit Certificate of Compliance (MACC) Program

You should be very proud of the accomplishments of your Industry!!!

Future

Future

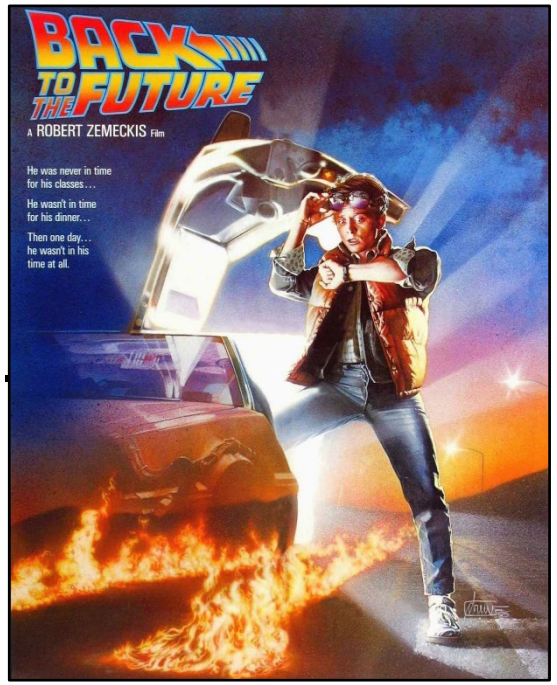
- How do we get beyond improperly protected penetrations?
- What standards can we created?
  - Membrane penetrations of horizontal assemblies
  - Interior Rated Wall to Non-rated Exterior Wall Joint System
- What certifications can the labs publish?
  - Systems covering mass timber and CLT construction
- What education can we provide?

Future

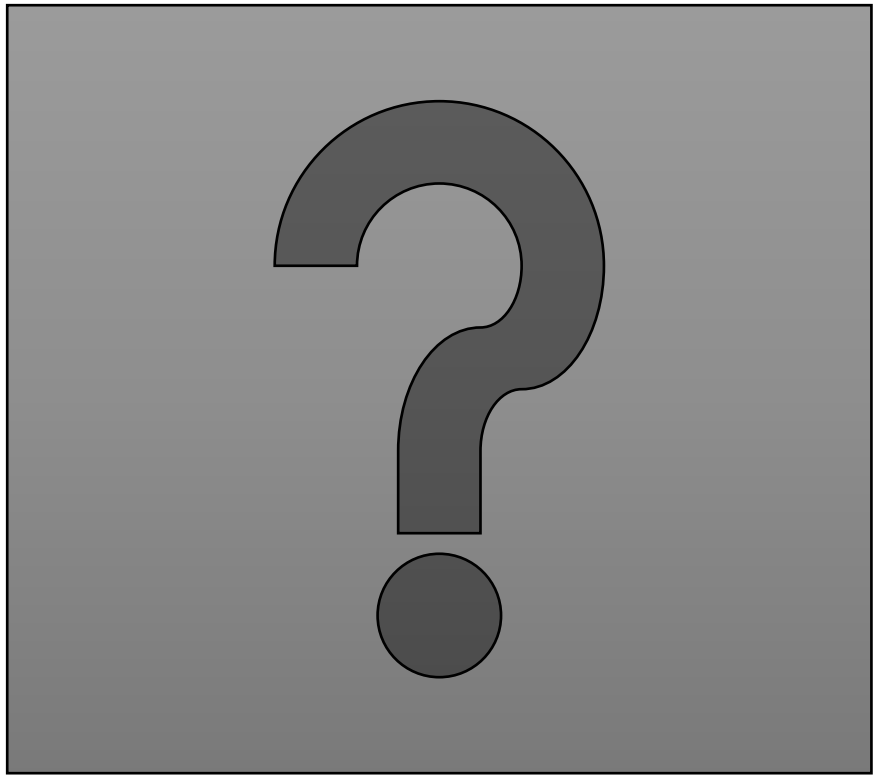
- What changes are needed in the Codes?
  - Continuity Head-of-Wall Joint Systems
  - Identification of field installed systems
  - Requirements for “Approved” or “Qualified” Contractors.
  - Expansion of Special Inspections
  - Engineering Judgments
- What should the laboratories Directories look like?

Future – What do we want it to be?

- The future looks promising.
- It is up to all of us to keep it that way.
- Plenty of work to do.
- The FCIA contribution will continue to breed change.
- Keep bringing your expertise to the standards and certification industry.
- 20 years of great history and track record. Many more years to come.
- The future depends on our investments now.



Questions??



Thanks for Attending!!!

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