EDUCATIONAL SESSION

EDUCATIONAL SESSION

Firestop System Movement Certification Program
Membrane Penetration Standardization Developments
UL Master Audit Certificate of Compliance Program
New UL Online Certification Directory
Q&A
FIRESTOP SYSTEM MOVEMENT CERTIFICATION PROGRAM
Movement happens.
- Seismic activity
- Building settlement
- Building deflection
- Mechanical vibration
- Thermal expansion
- Water hammer
- Wind forces
**FIRESTOP SYSTEM MOVEMENT CERTIFICATION PROGRAM**

**PAST**
- Firestop community requested a standardized test method for firestop movement.
- Examine the ability of firestop systems to remain in place during cure and after installation.
- Petitioned ASTM to begin a working group for the standard development.

**PRESENT / FUTURE**
- UL is establishing certification program.
- Task group established to develop testing and certification guidelines.
- Survey stakeholders within the firestop community about how this program should take form.
- Bring program outline to the broader firestop community.
FULL SCALE BUILDING EARTHQUAKE SIMULATION
FULL SCALE BUILDING EARTHQUAKE SIMULATION
FULL SCALE BUILDING EARTHQUAKE SIMULATION
FULL SCALE BUILDING EARTHQUAKE SIMULATION
• Declaration of movement capability.
• Standardized test method.
• Not a fire test.
• Generic construction and test specimen.
• May be representative of field construction.
• No pass fail criteria, rather a quantification of performance.
• Fire testing is left to the request of the authority having jurisdiction.
• UL certification will require compliance with a fire test in accordance with UL 1479.
ASTM E3037 SCOPE

• To determine relative movement capability…
• To standardize a comparison of movement…
• …amplitudes of relative movement between the penetrating items and the substrate…
• …limited movements tested, and limited number of variables examined.
• …not be representative of all possible through-penetration firestop systems.
• … not intended to predict the absolute movement capabilities of all likely permutations of through penetration firestop systems…
FIRESTOP SYSTEM MOVEMENT – TEST APPARATUS
FIRESSTOP SYSTEM MOVEMENT

1. SELECT MATERIAL
2. SELECT CONSTRUCTION
3. INSTALL CONDITION
4. CYCLE – Z DIRECTION
5. CYCLE – Y DIRECTION
6. MEASURE AND RECORD
7. UL 1479 FIRE TEST*
8. REPORT RESULTS

*UL 1479 standard is used for fire testing.

SELECT MATERIAL → SELECT CONSTRUCTION → INSTALL CONDITION

CYCLE – Z DIRECTION → MEASURE AND RECORD → CYCLE – Y DIRECTION

MEASURE AND RECORD → UL 1479 FIRE TEST* → REPORT RESULTS

UL 1479 standard is used for fire testing.

SELECT MATERIAL → SELECT CONSTRUCTION → INSTALL CONDITION

CYCLE – Z DIRECTION → MEASURE AND RECORD → CYCLE – Y DIRECTION

MEASURE AND RECORD → UL 1479 FIRE TEST* → REPORT RESULTS

UL 1479 standard is used for fire testing.
FIRESTOP SYSTEM MOVEMENT – 1 CYCLE

1 → 0 → 2 → 3

Max + → Start → Max -
### FIRESTOP SYSTEM MOVEMENT – DISPLACEMENT FOR Y DIRECTION

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<th>Y Direction</th>
<th>Cycles</th>
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### FIRESTOP SYSTEM MOVEMENT – DISPLACEMENT Z DIRECTION

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FIRESTOP MOVEMENT – DESIGN FORMAT T.B.D.

<table>
<thead>
<tr>
<th>ANSI/UL1479 (ASTM E814)</th>
<th>CAN/ULC S115</th>
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<tr>
<td>F Rating — 1 and 2 Hr</td>
<td>FH Rating — 1 and 2 Hr</td>
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<td>T Rating — 0 Hr</td>
<td>FTH Rating — 0 Hr</td>
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<tr>
<td>L Rating At Ambient — &lt; 1 CFM/sq ft</td>
<td>L Rating At Ambient — &lt; 1 CFM/sq ft</td>
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**ASTM E3037 – Movement**

<table>
<thead>
<tr>
<th>Y Direction</th>
<th>50 % of Annular Space</th>
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<tbody>
<tr>
<td>Z Direction</td>
<td>1 in.</td>
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</table>

SECTION A-A
• Movement is dependent upon annular space.
• Easier to calculate percentage of annular space for the Y direction.
• Z direction is best quantified in overall magnitude.
• MUST KEEP THIS SIMPLE!

### FIRESTOP MOVEMENT – POSSIBLE FORMAT

<table>
<thead>
<tr>
<th>Annular Space (in.)</th>
<th>Y Dir. (% Annular Space)</th>
<th>Z Dir. (in.)</th>
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<tbody>
<tr>
<td>0.125 – &lt; 1</td>
<td>5</td>
<td>0.125</td>
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<tr>
<td>1 - &lt; 2</td>
<td>25</td>
<td>0.5</td>
</tr>
<tr>
<td>≥ 2</td>
<td>100</td>
<td>3.21</td>
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3. **Through Penetrants** — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. See Table in Item 4 for sizes of penetrants A, B, D and E that may be used. See Item 3C below for size of conduit that may be used. The annular space shall be as specified in Table in Item 4 below. The following types of metallic pipes, conduits or tubing may be used:

   A. Steel Pipe — Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Cast or ductile iron pipe.
   C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) steel conduit.
   D. Copper Tubing — Type L (or heavier) copper tubing.
   E. Copper Pipe — Regular (or heavier) copper pipe.

4. **Firestop System** — The F Rating of the system is dependent upon the type of concrete, thickness of concrete, annular space, fill and packing material thickness, packing material density and penetrant size as shown in the Table below. W Rating applies to annular spaces of min 0 in. (point contact) to max 1-7/8 in. and to Configuration A detail only.
FIRESTOP SYSTEM MOVEMENT – GOALS

• Make applicable and usable for the industry.
• Gain industry support.
• Limit complexity and potential for error.
• Mesh with existing designs.
• Complete plan by end of 2018.
• Initiate testing and publications in Q1 2019.
Finished Product

• What will the deliverable be?
• If the information is in the design what format will it take?

Testing

• What penetrant sizes and type to test when design has a range of diameters and annular spaces?

Extension of Data

• Can coverage be extended from limited testing?

WHAT WORKS FOR THE FIRESTOP COMMUNITY?
MEMBRANE PENETRATION FIRESTOP EFFORT
MEMBRANE PENETRATION FIRESTOP EFFORT

Create small scale test method for horizontal assemblies.
No passage of flame.

Limit 325°F temperature rise.

Withstand hose stream.
UL 263 – PARTITIONS

- Limit unexposed surface temperature.
- Prevent openings and passage of flame and hot gasses.
- Withstand hose stream.
- Maintain applied load.*
  * May be non-load bearing.

Load

Prevent openings

Withstand hose stream

UL

WALL

- < 250 °F – Avg.
- < 325 °F – Ind.
VIDEO - UL 1479 FIRESTOP SYSTEM HOSE STREAM TEST
MEMBRANE PENETRATION FIRESTOP EFFORT

- Working on 2 concepts for the STP to consider:
  - Comparative method without opening.
  - Comparative method with generic membrane penetrant.
- STP will review and consider item(s) for ballot.
MEMBRANE PENETRATION FIRESTOP EFFORT – CONCEPT 1

Full Scale - UL 263 Test - No Pen's.
- UL 263 compliant
  - supports load
  - limits unexposed surface temp's.
  - prevents openings.
  - offers benchmark for small scale no pen's testing.

Small Scale - No Pen's.
- relates small scale assembly to full scale UL 263 compliant assembly.
- sets benchmark for small scale memb. pen. testing.

Small Scale - Membrane Pen.
- measured against conditions of acceptance for UL 1479 (UL 263).
- validates small scale test will comply.
MEMBRANE PENETRATION FIRESTOP EFFORT – CONCEPT 2

Full Scale - UL 263 Test - Reference Penetration.
UL 263 compliant
- supports load
- limits unexposed surface temp's.
- prevents openings.
- offers benchmark for small scale reference pens testing.

Small Scale - Reference Penetration.
- relates small scale assembly to full scale UL 263 compliant assembly.
- sets benchmark for small scale memb. pen. testing.

Small Scale - Membrane Pen.
- measured against conditions of acceptance for UL 1479 (UL 263).
- validates small scale test will comply.
MEMBRANE PENETRATION FIRESTOP EFFORT

VS.

[Diagram showing two different firestop efforts]
MEMBRANE PENETRATION FIRESTOP EFFORT

VS.
MEMBRANE PENETRATION FIRESTOP EFFORT – NEXT STEPS

• Task group to complete concepts.
• Deliver concepts to UL STP.
• Determine of proposed concepts are worthy of submitting for adoption into UL 1479.
• Send to ballot.
• Publish next edition of UL 1479 with accepted criteria.
UL MASTER AUDIT CERTIFICATE OF COMPLIANCE (MACC) PROGRAM
Section 701.6

- Requires the building owner to maintain an inventory of all required fire-resistance-rated construction, including firestop systems.
- Requires annual inspection.

Section 703

- Penetrations
UL MASTER AUDIT CERTIFICATE OF COMPLIANCE PROGRAM (MACC)

What it is…

- Specific jobsite certificate with expiration.
- Means to satisfy 2018 I.F.C. for passive fire and smoke protection features.
- Optional additional extension of UL’s Qualified Firestop Contractor Program (Q.F.C.P.).
- Requested by architects, contractors and building owners.
- Field audit by UL of the qualified firestop contractor efforts.

What it is **NOT**…

- All inclusive inspection of contractor workmanship and installation.
- Surveillance of the firestop inspection.
- Declaration of UL firestop systems approval.
- Alternate to UL Q.F.C.P.
- Eligible to non-UL qualified firestop contractors.
- Conducted automatically. Formal request is required.
UL MACC FIELD AUDIT ITEMS FOR REVIEW

- Construction documents
- Storage conditions
- Inspection
- Testing
- Non-conforming material records
- Incoming material inspection
- Equipment records including calibration when applicable
- Management Documentation reviews*
- Corrective and Preventive Action records*
- Staff education, training, competency evaluations and training effectiveness*
- DRI Audits*
- Management review records*
UL QFCP MACC - RESOURCES

UL QUALIFIED FIRESTOP CONTRACTOR PROGRAM MASTER AUDIT CERTIFICATE OF COMPLIANCE (MACC) OPTION:

Introduction - UL Qualified Firestop Contractors have the option of participating in the Master Audit Certificate of Compliance (MACC) program. The QFCP Master Audit Certificate of Compliance (MACC) program is an extension of the Qualified Firestop Contractors Program (QFCP) in which UL will perform a job site visit to assess elements of the QFCP Program as well as the requirements described below. All requirements of the UL Qualified Firestop Contractor Program shall apply, although not all elements may be assessed during the job site visit, since they may not be applicable for the unique job site project.

forms should be submitted as early in the job as possible to ensure that audit coordination works for all involved parties.

Coordination of the Master Audit - The DRI and the assigned UL Auditor will work to establish a mutually agreeable time to conduct the site audit. The audit shall be completed prior to final completion of the project.

Project Scope - The contractor, upon request of the audit, shall define the project scope. The project scope shall clearly define the work that was completed by the contractor. The description may be a written description of all work completed by the contractor, reference specific drawings that define the specific work completed by the contractor, or a combination of both. During the on-site audit, the UL Auditor will verify that the defined scope matches the description provided. The scope will be provided for reference on the Site Audit Certificate.

https://industries.ul.com/blog/firestop-contractor-programs
XHEZ - Through-penetration Firestop Systems
System No. W-J-5145

January 23, 2015

F Rating - 2 Hr

T Ratings - 0, 1-1/2 or 2 Hr (See Item 3)
UL QUALIFIED FIRESTOP CONTRACTOR INFORMATION

[Qualified Contractor Programs] Qualified Firestop Contractors

See General Information for Qualified Contractor Programs

GENERAL

This category covers qualified firestop contractors, which are organizations that (1) install through-penetration firestop systems (see XHEZ); (2) employ at least one individual defined as a Designated Responsible Individual (DRI) who has passed a UL written exam that tests knowledge of the “Firestop Manual of Practice for Firestop Contractors,” published by the Firestop Contractors International Association (FCIA), and the product categories associated with through-penetration firestop systems; and (3) establish, implement and maintain a management system that focuses on the selection and installation of firestop systems. The DRI employee also has the responsibility to maintain the contractor’s management system and train staff with respect to the selection and installation of firestop systems.

The management system required to be established, implemented and maintained by the contractor is derived from industry standards, as identified by FCAO and ISO 9001 requirements for management systems. The management system addresses the following:

1. Review of project design and construction document requirements
2. Procurement of firestop materials
3. Storage, handling, packaging, preservation and delivery of firestop materials
4. Installation, application and field quality assurance procedures
5. Inspection, testing and calibration of installed firestops

Benefits of engaging a qualified contractor

To ensure that the products being used in firestop installations are certified and qualified by the manufacturer to the appropriate standards, the following benefits are associated with the use of UL qualified firestop contractors:

- Increased confidence in the installation process — A UL qualified contractor is aware of the latest installation practices and materials, providing a level of confidence that the installation will meet performance expectations.
- Increased productivity — UL qualified contractors are trained and experienced in the installation process, enabling them to complete installations more efficiently and effectively.
- Cost savings — By working with a UL qualified contractor, the customer can expect cost savings in the long term, as the contractor ensures that the installation is performed correctly, reducing the risk of costly rework or failures.

The UL Qualified Firestop Contractor Program allows contractors to proactively demonstrate their commitment to the proper installation of firestop systems.

To participate in the program, a contractor must:
1. Register on the UL Qualified Firestop Contractor Program website
2. Provide a list of projects they have completed
3. Agree to the terms and conditions of the program

This program is open to firestop contractors who meet the eligibility criteria and are committed to providing high-quality firestop installations.

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## UL PRODUCT SPEC

### 1. HOW DO YOU WANT TO SEARCH?

#### UL PRODUCT CATEGORY

Gypsum Board, CKNX

**Guide Information for Fire-resistance Ratings**

**GENERAL**

This category covers gypsum board investigated for use in fire-resistance designs as detailed in Fire-resistance Ratings - ANSI/UL 263 (B9UV).

› Show additional information...

#### VIEW UL CERTIFIED PRODUCTS

View list

#### UL STANDARDS

UL 263 Scope

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Print  New Search
UL RESOURCES

LOCATE SPECIFIC DESIGNS AND SYSTEMS

Walls, Floors, Beams and Columns

Firestop Systems

Joint Systems

Perimeter Fire Containment Systems

Find Designs >  Find Systems >  Find Systems >  Find Systems >

ARCHITECT SUPPORT
Click here to chat
UL ONLINE CERTIFICATIONS DIRECTORY (PRODUCT IQ)

UL ONLINE CERTIFICATIONS DIRECTORY (PRODUCT IQ)
UL ONLINE CERTIFICATIONS DIRECTORY (PRODUCT IQ)

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# Relevant Firestop Test Standards – North America

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<th>Standard Scope</th>
<th>Standard Reference</th>
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<tr>
<td>Penetration Firestop Systems</td>
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<td>Firestop Joints</td>
<td>UL 2079/ULC S115 ASTM E1966 ASTM E2837</td>
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<td>Fuel Pipe Protection</td>
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## Relevant Fire Test Standards – N.A. / U.K. / Europe / Beyond

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<td>Steel Protection</td>
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<td>ULC S101</td>
<td>EN 1364 – 1, 2</td>
<td>BS 476: Part 20, 21</td>
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<td>EN 1366–2</td>
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THANK YOU VERY MUCH.

Luke Woods
QUESTIONS?