FCIA Webinar Series

Fire-Resistance in Canada

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

FCIA
Firestop Contractors International Association

November 14, 2023

FCIA – Firestop Contractors International Association

- **Fire Exits??**

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

Welcome, Thanks, From FCIA…..

Firestop Contractors International Association

FREE PDF MOP, SPECIFICATION for Code Officials, Fire Marshals,

& Specifiers with Design Firms

Life Safety Digest FREE for ALL

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FCIA – Firestop Contractors International Association

- Info@FCIA.org for FREE Webinars
- Info@FCIA.org FREE Life Safety Digest
- INFO@FCIA.org FREE FCIA MOP PDF
- UL/ULC, FM 4991 Contractor Programs
- ASTM Inspection Standards
- IAS AC 291 Inspection Agency Accreditation
- FCIA Firestop Education
  - Firestop Certificate & Individual Knowledge
- Resources - VISIT FCIA.org

FCIA Actions –

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

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

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

FCIA – Firestop Contractors International Association

- Canada – Symposiums, National Prescence, NBCC, NFC
- Qatar - Doha FCIA Symposium; Members
- India - Mumbai/Ahmadabad – Fire Safe Build India – IIT-G
- UAE - Dubai – FCIA Symposium; Civil Defence
- Saudi Arabia - Riyadh – BIG5 Show; UL, ICC, TBWIC
- Mexico/LATAM - CONAPCI/AMRACI
- Australia/New Zealand – FPA, Etc.
- UK

FCIA – Firestop Contractors International Association

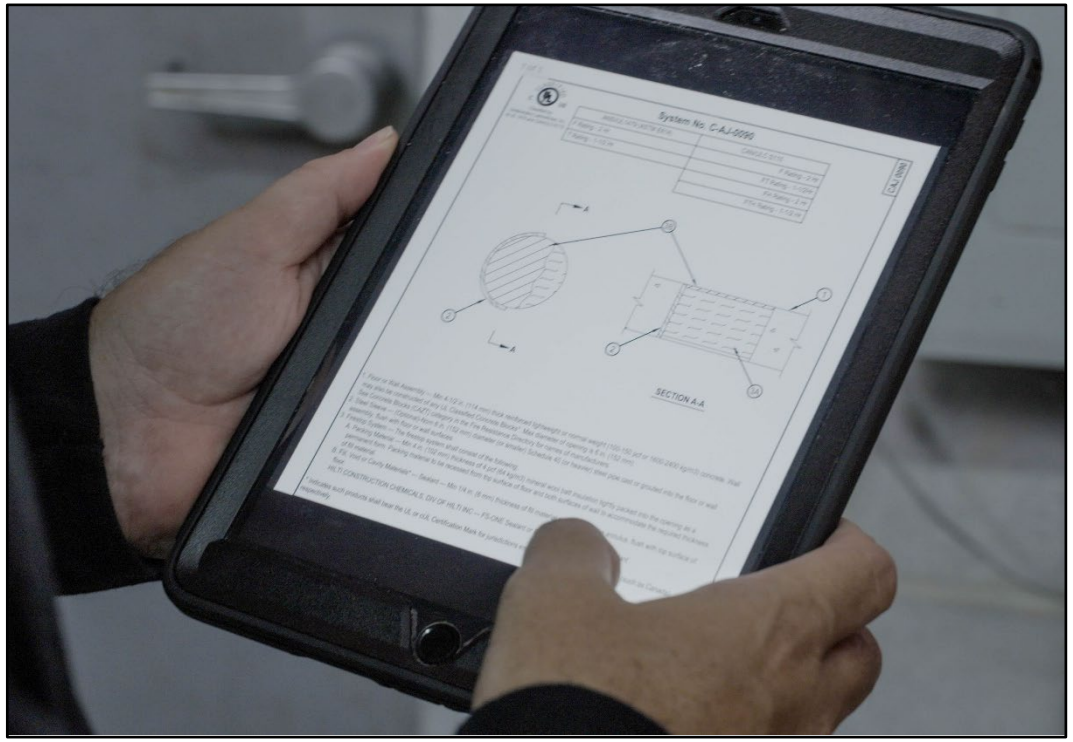
- **UL/ULC, FM 4991 Contractor Programs**
  - DRI's
  - Exams for Contractors, Inspection Agencies

  IAS AC 291 Inspection Agency Program
  - Responsible Individuals / Competence

- **ASTM Inspection Standards – ASTM E2174 & ASTM E2393**
  - ***High Rise, Category III & IV, R>250 ('21), NFPA 1, NFPA 101 Appx. & in Specifications Worldwide***

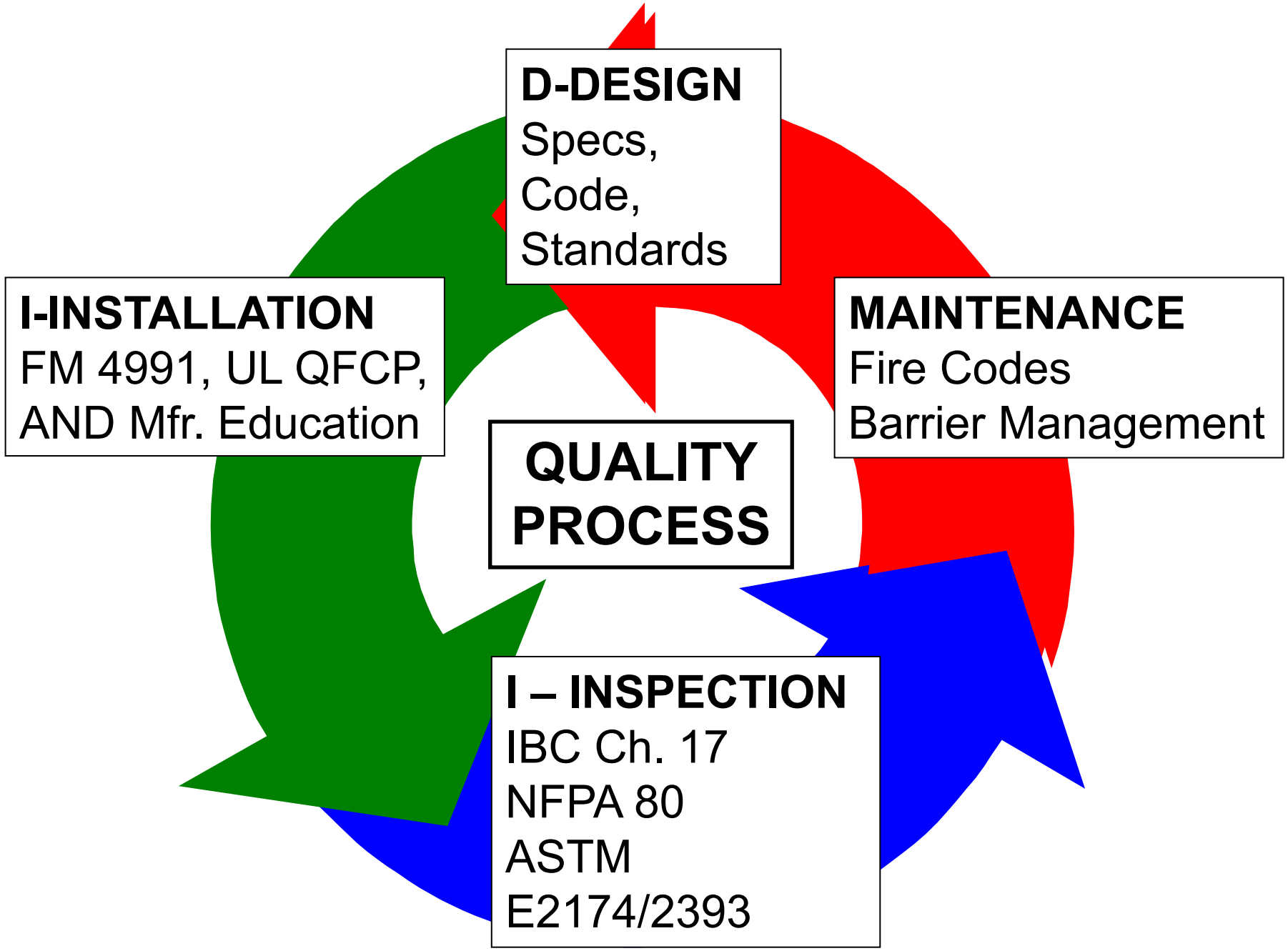
- **Watch FCIA.org for Webinar Announcements!**

Systems & Materials….



“TOTAL FIRE PROTECTION”

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


D-DESIGN
Specs,
Code,
Standards
I-INSTALLATION
FM 4991, UL QFCP,
AND Mfr. Education
MAINTENANCE
Fire Codes
Barrier Management
QUALITY
PROCESS
I – INSPECTION
IBC Ch. 17
NFPA 80
ASTM
E2174/2393

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Building & Fire Code Requirements

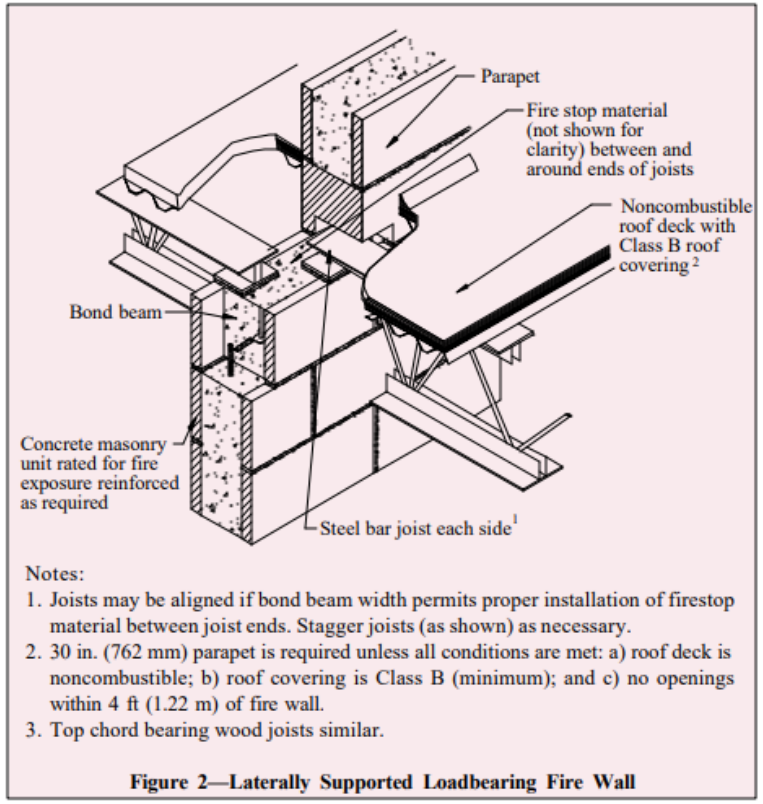
- Canadian Codes –
  - New and Existing Buildings – National Building Code of Canada
  - Maintenance – National Fire Code of Canada
- International Code Council Codes (US Based) –
  - New and Existing Buildings – International Building Code – Chapter 7
  - Maintenance – International Fire Code – Chapter 7
- NFPA Codes (US Based) –
  - New and Existing Buildings – NFPA 5000 & 101 – Chapter 8
  - Maintenance – NFPA 101 & 1
- UAE Fire and Life Safety Code – Chapter 1, Section 21
- Other Worldwide Codes
- ***Minimum requirements*** - ***Construction*** & ***Maintaining Protection***

Fire Separations, Firestopping and Code Requirements

Canadian Building and Fire Codes

National Building Code Requirements

- Fire-Resistance-Rated Assemblies – NBC Defined Terms
  - *Fire Wall*
  - *Fire Separation*



Notes:
1. Joists may be aligned if bond beam width permits proper installation of firestop material between joist ends. Stagger joists (as shown) as necessary.
2. 30 in. (762 mm) parapet is required unless all conditions are met: a) roof deck is noncombustible; b) roof covering is Class B (minimum); and c) no openings within 4 ft (1.22 m) of fire wall.
3. Top chord bearing wood joists similar.

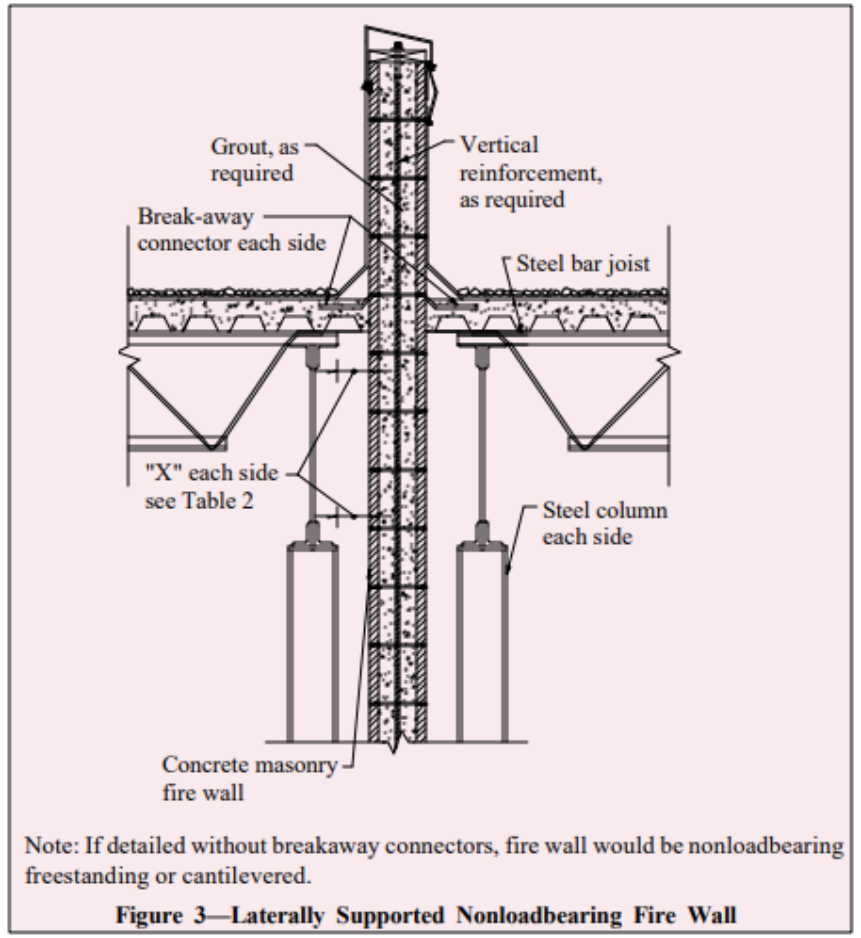
Figure 2—Laterally Supported Loadbearing Fire Wall

NCMA-TekAid Photo

Gypsum.org Photo

National Building Code Requirements Cont.

- ***Firewall*** means a type of *fire separation* of *noncombustible construction* that subdivides a *building* or **separates adjoining *buildings*** to resist the spread of fire and that has a *fire-resistance rating* as prescribed in this Code and has **structural stability** to remain intact under fire conditions for the required fire-rated time.



Note: If detailed without breakaway connectors, fire wall would be nonloadbearing freestanding or cantilevered.

Figure 3—Laterally Supported Nonloadbearing Fire Wall

NCMA-TekAid Photo

National Building Code Requirements Cont.

- *Fire Separation* - A construction assembly that acts as a barrier against the spread of fire.
  - *Fire-resistance-rated* or Non-rated
  - Combustible or Noncombustible Construction
  - Horizontal or Vertical
  - Load Bearing or Nonload Bearing
  - Continuity
    - Outside wall to outside wall
    - Floor to floor/roof above
  - Protected openings, penetrations and joints

National Building Code Requirements Cont.

Compartmentation Codes

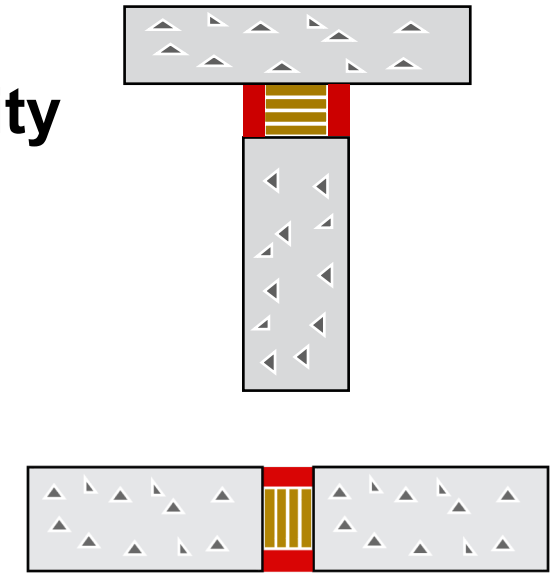
NBC - Division B, Part 3, Section 3.1.8.1 – General Requirements

1) Any wall, partition or floor assembly required to be a **fire separation shall**
   a) except as permitted by Sentence (2), be constructed as ***continuous*** element, and
   b) as required in this part, have a fire-resistance-rating as specified (see appendix A).
2) Openings in a *fire separation* shall be protected with closures, shafts or other means in conformance with Articles 3.1.8.4-19.

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section A-3.1.8.3(2) – Continuity of Fire Separations



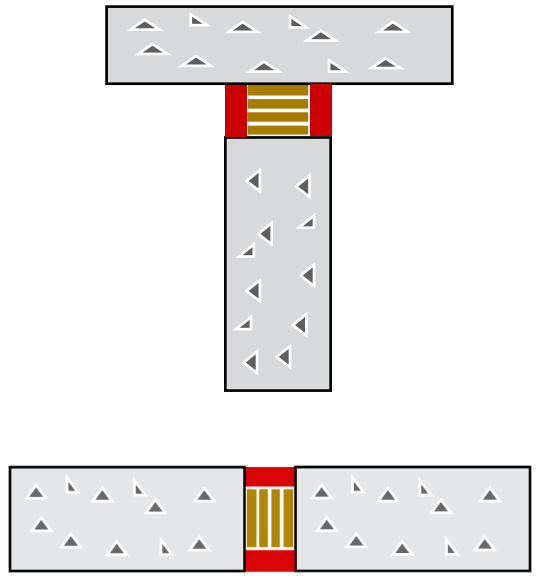
2) The **continuity of a *fire separation*** with a fire-resistance rating is maintained by **installing a firestop system** at the juncture where it abuts another fire separation, a floor, a ceiling, a roof assembly. The continuity of a fire separation without a fire-resistance rating that abuts another fire separation is maintained by filling all openings at the juncture of the assemblies with a fire-resistance-rated joint firestop system that will ensure the integrity of the fire separation at that location.

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.8.3 – Continuity of Fire Separations

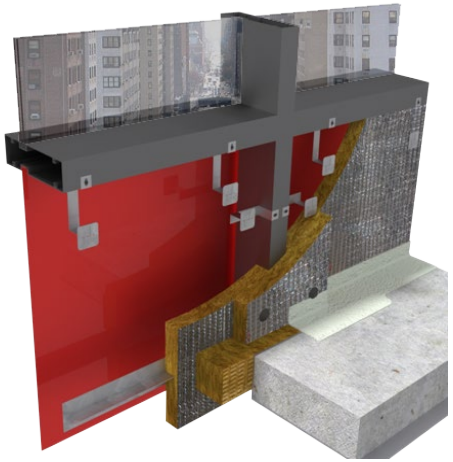
3) The *firestop* required in Sentence (2) shall have an FT rating not less than the *fire-resistance rating* of the abutting *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems.”



National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.8.3 – Continuity of Fire Separations



OCF/Thermafiber Graphics

4) Except as provided in Sentence (5), joints located in a horizontal plane between a floor and an exterior wall shall be sealed by a *firestop* that, when subjected to the fire test method in ASTM E2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-storey Test Apparatus," has an F rating not less than the *fire-resistance rating* of the horizontal *fire separation*.

- New for the 2020 NBC
- Consistent with US based requirements

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

1) Except as required by Sentences (2) to (7), and Article 3.1.9.1 penetrations of a *fire separation* or membrane forming part of an assembly required to have a *fire-resistance rating* shall be

   a) sealed by a *firestop* that, when subjected to the fire test method in **ULC-S115, "Fire Tests of Firestop Systems,"** has an F rating not less than the fire-resistance rating of the fire separation, or

   b) cast in place, where the item penetrating the *fire separation* is steel, ferrous, copper, concrete or masonry

- **Item b) revised for 2020. Item b) now limited to noncombustible penetrants.**

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

2) Except as permitted in Sentence (6), penetrations of a *fire wall* or horizontal *fire separation* that is required to have a *fire-resistance rating* in conformance with Article 3.2.1.2 shall be sealed at the penetration by a firestop that, when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, has an FT Rating not less than the *fire-resistance rating* of the *fire separation*.

Pro Firestop Photo

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

3) Except as permitted in Sentence (6) and (7), penetrations of a *fire separation* in conformance with Section 3.6.4.2.(2) (horizontal service space) shall be sealed by a firestop that, when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, has an FT Rating not less than the *fire-resistance rating* of the *fire separation*.

National Building Code Requirements Cont.

Compartmentation Codes

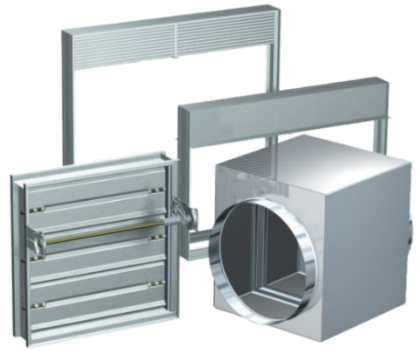
NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

4) Sprinklers are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of sentences (1) to (3), provided the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, “Installation of Sprinkler Systems”.

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations



5) **Unless specifically designed with a *firestop*, *fire dampers* are permitted to penetrate a *fire separation* or a membrane** forming part of an assembly required to have a *fire-resistance rating* without having to meet the *firestop* requirements of Sentences (1) to (3), provided the *fire dampers* is installed in conformance with NFPA 80, “Fire Doors and Other Opening Protectives”.

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

6) **Service equipment penetrations** through a horizontal *fire separation* having a *fire-resistance rating* as described in Sentences (2) and (3) that are contained within the cavity of a wall above and below the horizontal *fire separation* are permitted to be sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” has an F rating not less than the *fire-resistance rating* for the *fire separation*.

- 2010 NBC onwards…

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.1 – Penetrations

7) Service equipment penetrations through a horizontal *fire separation* having a *fire-resistance rating* as described in Sentence (3) are permitted to be sealed at the penetration by a *firestop* that, when subjected to the fire test method in CAN/ULC-S115, "Standard Method of Fire Tests of Firestop Systems," has an F rating not less than the *fire-resistance rating* for the *fire separation*, provided the penetration

a) is contained within the concealed space of a floor or ceiling assembly having a *fire-resistance rating*,

b) is located above a ceiling membrane that is a horizontal *fire separation*, or

c) is contained within a *horizontal service space* conforming to Subsection 3.6.4.2 (horizontal service space) that is directly above or below the floor.

- 2010 NBC onwards…

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.4 – Combustible Piping Penetrations

4) Combustible drain, waste and vent piping is permitted to penetrate a *fire separation* required to have a *fire-resistance rating* or membrane that forms part of an assembly required to have a *fire-resistance rating,* provided

a) except as provided in Clause (b), the piping is sealed at the penetration by a *firestop* that has an F rating not less than the *fire-resistance rating required for the fire separation* when subjected to the fire test method in CAN/ULC-S115, Fire Tests of Firestop Systems,"

ProFirestop Photo

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.4 – Combustible Piping Penetrations

b. In buildings more than 3 storeys in building height, the piping is sealed at the penetration by a *firestop* that has an F rating not less than the *fire-resistance rating* required for the fire separation when subjected to the fire test method in CAN/ULC-S115 with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, and

c. the piping is not located in a vertical service space.

- Item b) revised to reference more than 3 storeys 2020 NBC ++

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.4 – Combustible Piping Penetrations

7) Except as provided in Sentence (8), penetrations of a *fire separation* that incorporate transitions between *combustible* and *noncombustible* drain, waste and vent piping shall be sealed by a *firestop* that has an F rating not less than the *fire-resistance rating* required for the *fire separation* when subjected to the fire test method in CAN/ULC-S115, “Standard Method of Fire Tests of Firestop Systems,” with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side.

- 2020 ++

National Building Code Requirements Cont.

Compartmentation Codes

NBC - Division B, Part 3, Section 3.1.9.4 – Combustible Piping Penetrations

8) Transitions between vertical *noncombustible* drain, waste and vent piping and *combustible* branches for drain, waste and vent piping are permitted on either side of a *fire separation*, provided they are not located in a *vertical service space*.

- 2020 NBC onwards….

Summary of Requirements for Protecting Breaches

- Each type of **breach** has a unique fire test using a ULC standard and a smoke leakage test standard associated with it which compliments ULC-S101

Summary of Requirements for Protecting Breaches

- **Products Become Systems – Test Standards (Methods)**
  - **Fire & Smoke Barriers – Fire Separations**
    - ULC-S101
  - **Firestopping –** ULC-S115, E2307
  - **Swing/Rolling Fire Doors** – ULC-S104 Doors, S105 Frames, S113 for 20 minute wood doors, UL 1784 for Leakage
  - **Fire Rated Glazing –** ULC-S106, ULC-S101
  - **Fire/Smoke Dampers** –ULC-S112, ULC-S112.1, ULC-S112.2
- **SYSTEM Testing = Suitability Statement**

Firestopping Standards

ULC-S115

Summary of Requirements for Firestopping Standards

- **Penetration Firestops**
  - Fire / Hose Stream Test Standards
    - ULC-S115 (similar to but not equal to ASTM E814 / UL 1479)
      - Min 2.5 Pa positive pressure except when “unique” pressure is required
      - In buildings three storeys or more in height, the NBC requires combustible drain, waste and vent pipes to be tested at a min 50 Pa positive pressure – 50 Pa pressure makes it more difficult to pass
      - Penetrants capped on exposed side only – Net affect is a system covering a vented combustible pipe by ASTM E814 / UL 1479 is considered a closed combustible pipe system by ULC-S115

Summary of Requirements for Firestopping Standards

- **Penetration Firestops**
  - Fire / Hose Stream Test Standards
    - ULC-S115 (similar to but not equal to ASTM E814 / UL 1479)
      - Develops F, FT, FH, FTH and L Ratings – NBC dictates the required rating
        - F Rating – Flame
        - FT Rating – Flame & Temperature
        - FH Rating – Flame & Hose
        - FTH Rating – Flame, Temp & Hose
        - L Rating (Optional) – Smoke
      - L Rating is optional by the standard

Summary of Requirements for Firestopping Standards

- **Penetration Firestops**
  - Fire / Hose Stream Test Standards
    - ULC-S115 (similar to but not equal to ASTM E814 / UL 1479)
      - FCIA has submitted proposals to ULC to add optional W and M Ratings to ULC-S115 for penetration firestops
      - Certification agencies are publishing W and M Ratings already based on test requirements published in the US

Summary of Requirements for Firestopping Standards

- **Joint Firestops**
  - Fire / Hose Stream Test Standards
    - ULC-S115 (similar to but not equal to ASTM E814 / UL 1479)
      - Develops F, FT, FH, FTH and L Ratings
      - FH, FTH and L Ratings are optional by the standard – NBC dictates the required rating
      - FCIA has submitted proposals to ULC to add optional W Rating to ULC-S115 for joint firestops
      - Certification agencies are publishing W Ratings already based on test requirements published in the US

Summary of Requirements for Firestopping Standards

- **Perimeter Joint Firestops**
  - Fire / Hose Stream Test Standards
    - ULC-S115 [References ASTM E2307 (Perimeter Joint Firestops) with modifications for the conduct of the fire test]
    - ASTM E2307 says follow standard time-temperature curve, but limits max gas flow. ULC-S115 says follow standard time-temperature curve regardless of gas flow needed.
      - Tests conducted strictly in accordance with ASTM E2307 may or may not have been simultaneously tested to the requirements of ULC-S115
      - Must ask manufacturer or the test lab whether any specific system was tested strictly in accordance with ULC-S115
      - UL/ULC needs to address this issue ASAP

Summary of Requirements for Firestopping Standards

- **Continuity Head-of-Wall Joint Firestops**
  - Fire / Hose Stream Test Standards
    - ASTM E2837 – Covers protection of void above fire separation and beneath non-rated floor or roof assembly
      - Not yet required by NBC
      - Not yet included by reference in ULC-S115

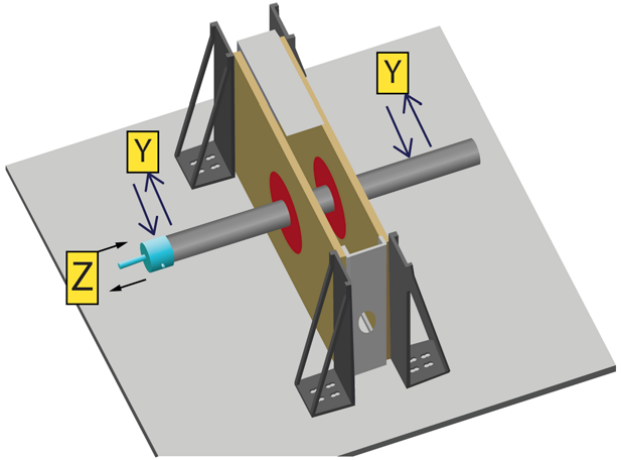
Future Changes to ULC-S115:2018 – Rev 2023

- ULC-S115:2018 open for proposed changes
- FCIA has submitted seven proposals…
  - Adjusts length of penetrating item on exposed and unexposed sides for consistency with ASTM E814 / UL 1479
  - Adjusts length of penetrating item on exposed side for partially insulated penetrating item for consistency with ASTM E814 / UL 1479
  - Addition of optional Water Leakage Test to document procedure currently being used to establish L Ratings
  - Addition of Environmental Exposure testing on intumescent firestopping materials consistent with ASTM E814 / UL 1479

Future Changes to ULC-S115:2018 – Rev 2023 Cont.

- Clarification of the method of testing membrane-penetrations in wall assemblies. Differentiates procedure for recessed boxes vs other membrane-penetrations.
- Addition of Cotton Waste test for determining flaming on unexposed side of test assembly
- Addition of optional Movement Cycling in accordance with ASTM E3037 to document procedure currently being used to establish M Ratings

- Preliminary review completed
- Next step - Resolve Negatives



ASTM Image

Where Can I Find The Most Current Listing?

- Directories of the Nationally Recognized Testing Laboratories
  - FM Global Approval Guide
  - Intertek Directory of Building Products
  - UL/ULC Product iQ Online Directory

Products become systems based on testing!!!

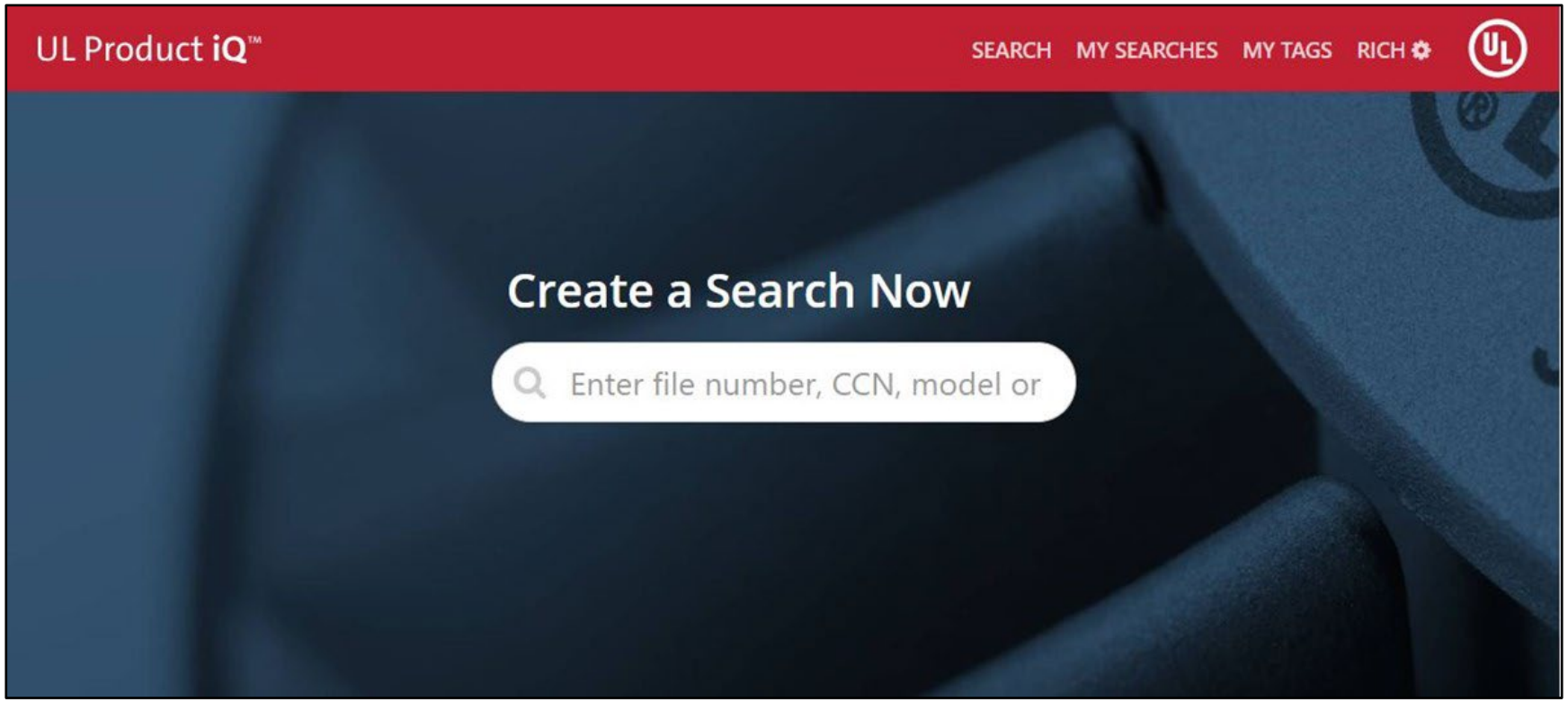
System Selection Using the UL Directories

UL Product iQ

Product iQ – UL's New Online Directory

- https://iq.ulprospector.com/en/
- Vanity addresses
  - www.ProductiQ.UL.com
  - www.UL.com/ProductiQ
  - www.UL.com/PiQ

UL Product iQ Cont.
Smart Search



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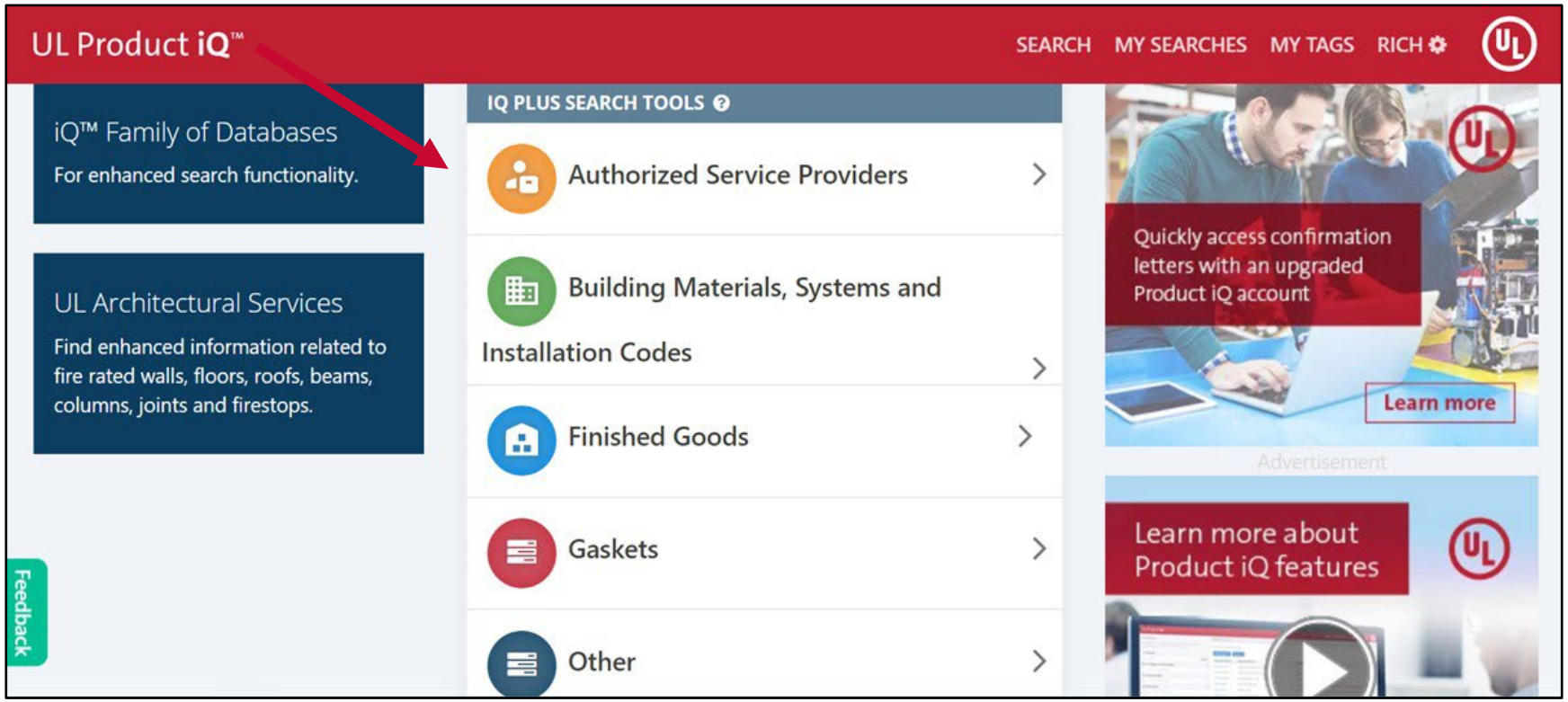
iQ Plus Search



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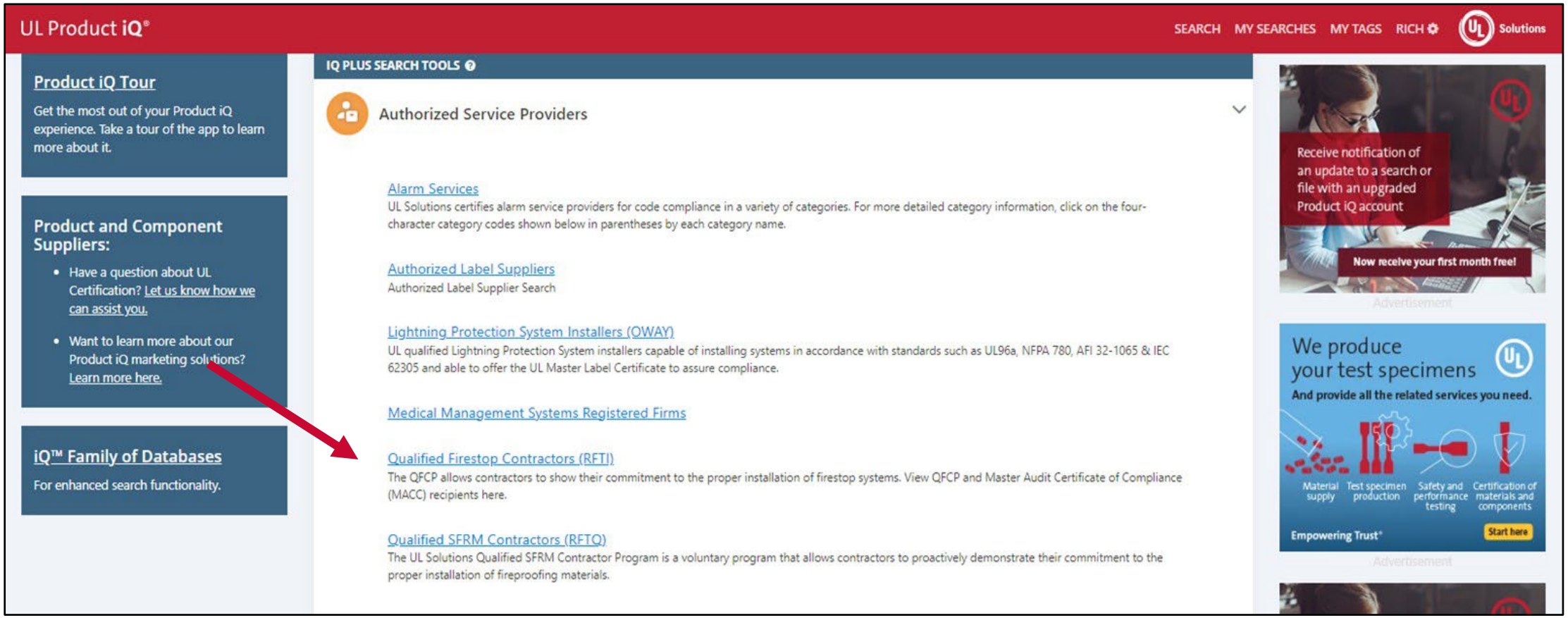
iQ Plus Search



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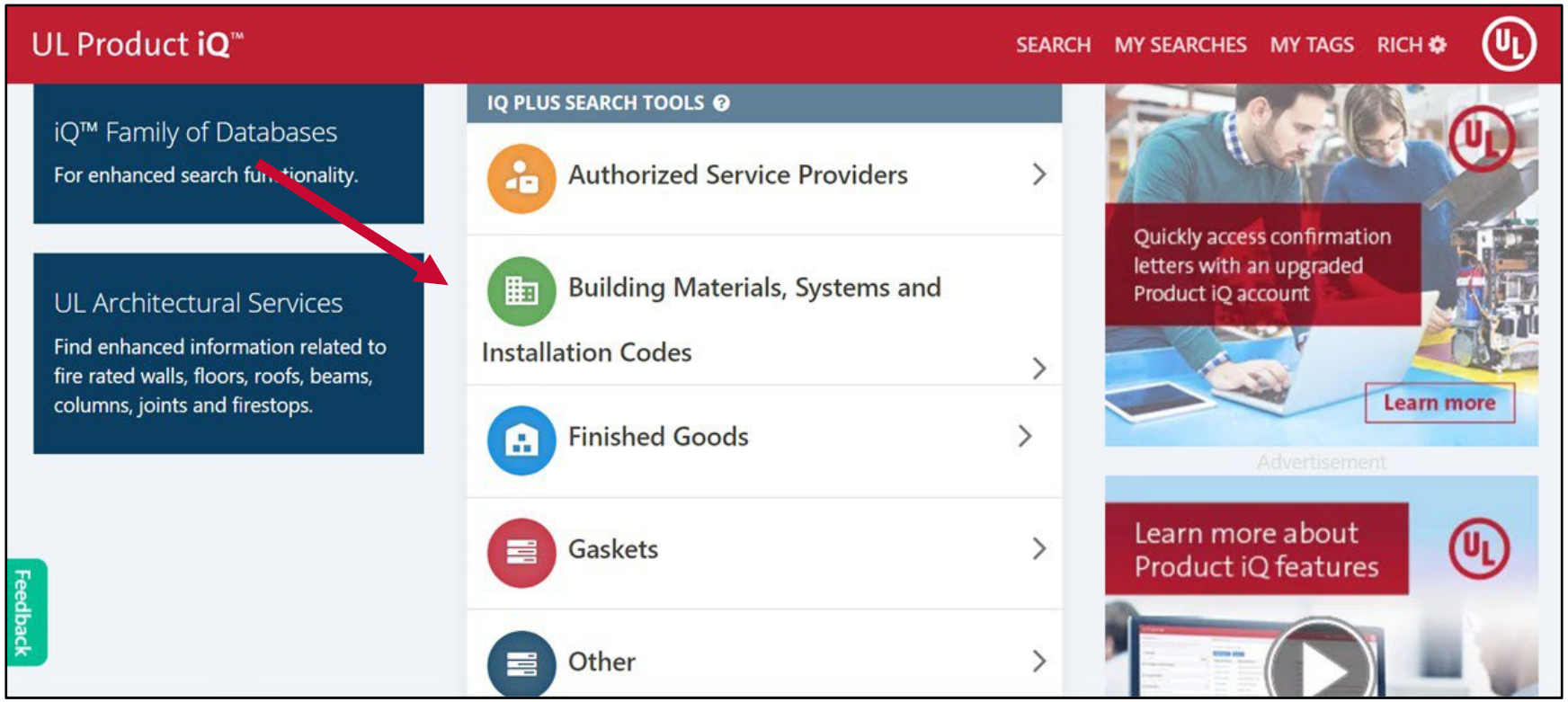
iQ Plus Search



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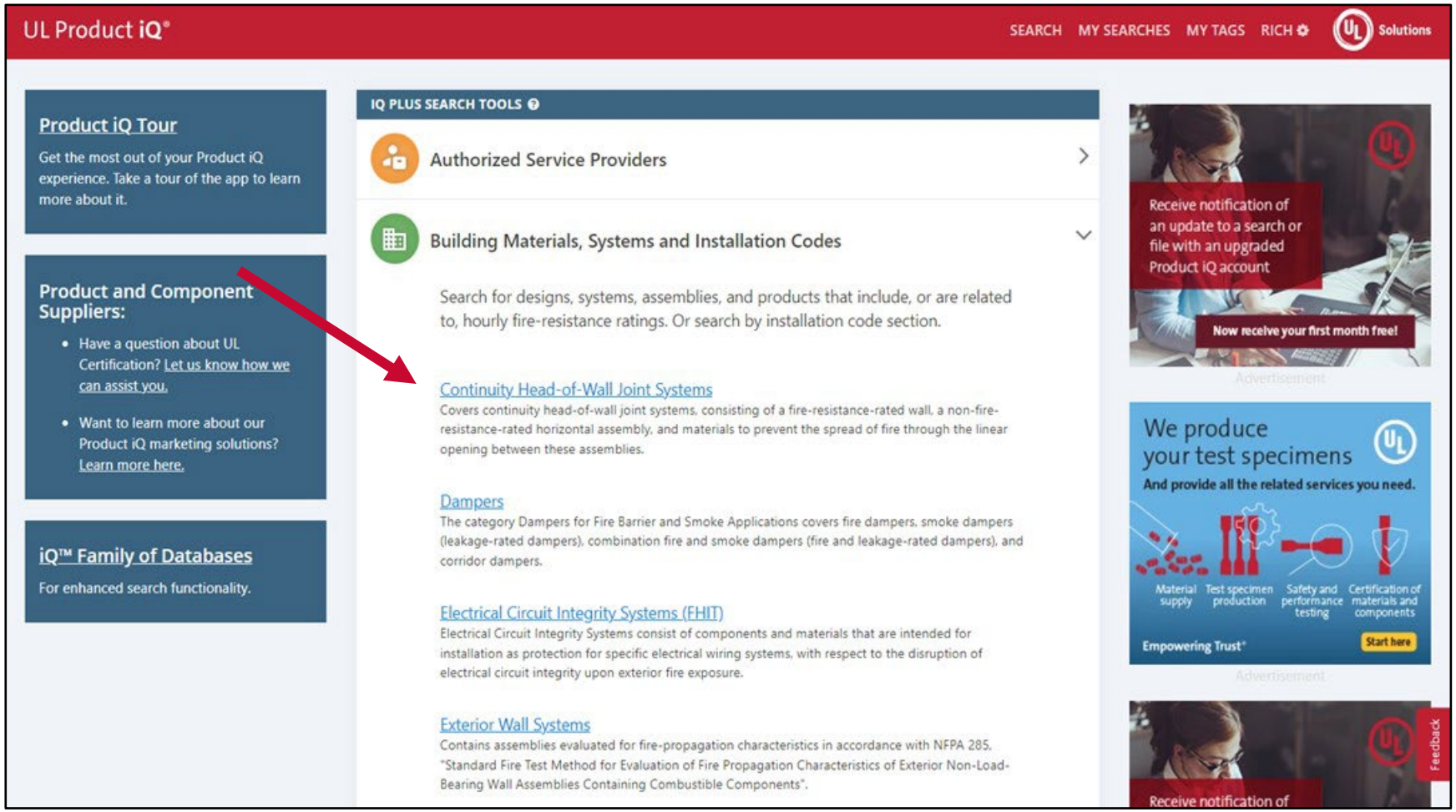

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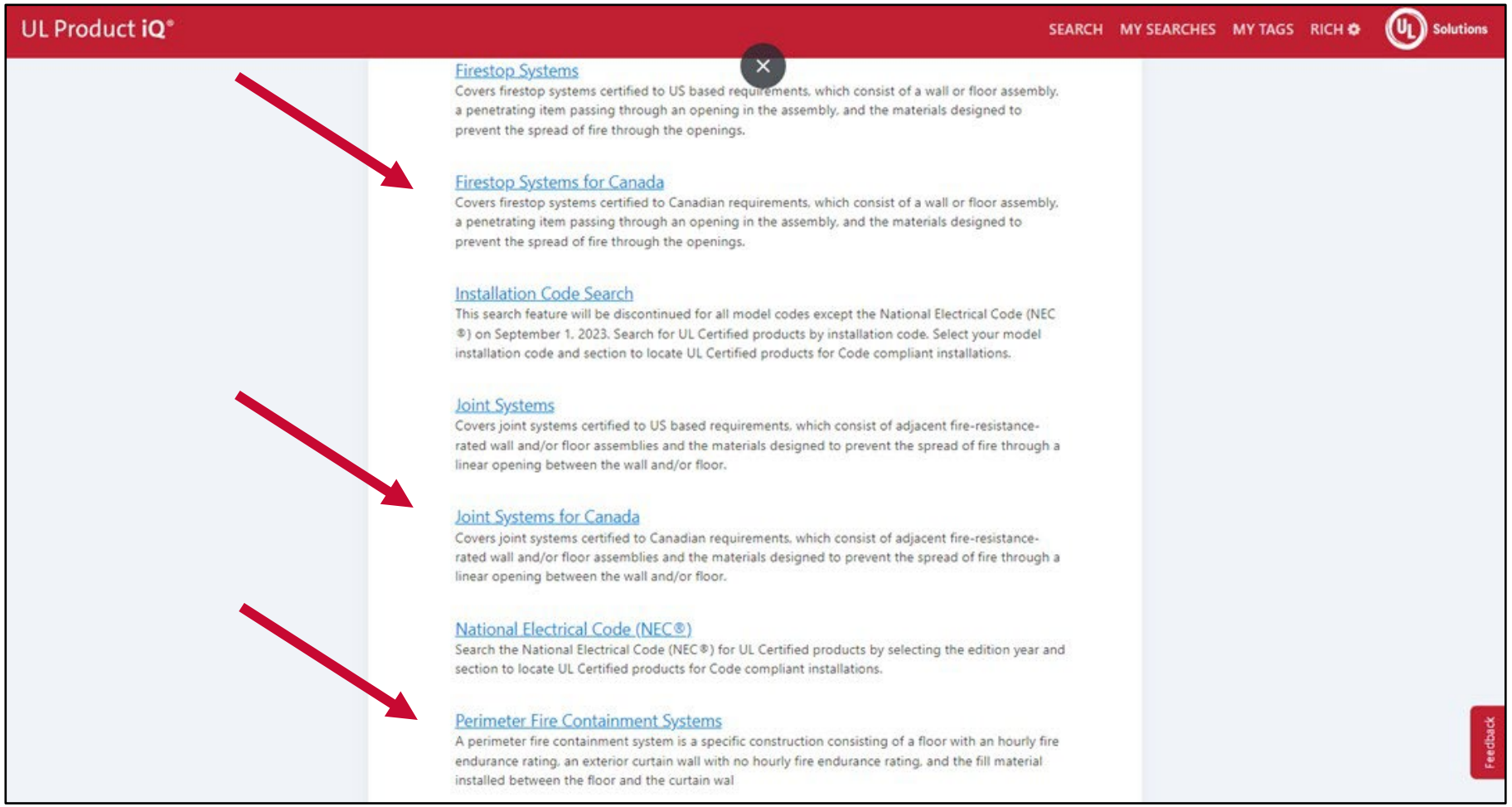


Rules for Understanding Canadian Firestop Systems

- All Firestop Systems
  - UL is in a transition period, converting the format of Canadian systems to specify pressure and Ratings based on ULC-S115. Currently format various system to system.

Rules for Understanding Canadian Firestop Systems

- Three primary differences between Canadian and US standards
  - In Canada, hose stream is optional for all firestop system resulting in different rating
  - In US, closed (process and supply) piping systems in penetration firestop systems are capped on both ends during the fire test. In Canada, capping is not permitted on unexposed side. As such, US based systems specifying closed piping systems do not meet Canadian requirements
  - In Canada, vented (drain, waste or vent) combustible piping systems in penetration firestop systems for use in buildings more than 3 storeys tall are tested at a 50 Pa differential pressure

Rules for Understanding Canadian Firestop Systems

- Penetration Firestop Systems
  - Systems bearing the reference “XHEZ7 Through-Penetration Firestop Systems Certified for Canada” or “XHEZC Firestop Systems” were tested to ULC-S115
  - US F Rating equals Canadian FH Rating
  - US T Rating equals Canadian FTH Rating

Rules for Understanding Canadian Firestop Systems

- Combustible piping systems
  - US based systems specifying closed (process and supply) piping systems do not meet Canadian requirements
  - Closed combustible piping systems are required to be tested at a 2.5 Pa pressure
  - Vented combustible piping systems intended for use in buildings 3 storeys or less in height are required to be tested at a 2.5 Pa pressure
  - Vented combustible piping systems intended for use in buildings more than 3 storeys in height are required to be tested at a 50 Pa pressure
  - Systems will typically specify the pressure assembly was tested at
  - Generally 50 Pa testing is more critical than 2.5 Pa

Rules for Understanding Canadian Firestop Systems

- Canadian penetration firestop systems tested by UL are identified by the same numbering system as US systems tested by UL (e.g. C-J-1010, F-C-2020, W-L-3030, etc.)
- Canadian penetration firestop systems tested by ULC may be identified as an SP (Service Penetration) suffix (e.g. SP234, etc.)
- Canadian penetration firestop systems containing vented combustible piping systems intended for use in buildings more than 3 storeys in height and tested by ULC may be identified as an SPC (Service Penetration for Combustible Systems) suffix (e.g. SPC55, etc.)

Rules for Understanding Canadian Firestop Systems

- Joint Firestop Systems
  - US Assembly Rating equals Canadian FTH Rating
  - Systems bearing the reference “XHBN7 Joint Systems Certified for Canada” or “XHEZC Firestop Systems” were tested to ULC-S115
  - Canadian joint firestop systems tested by UL are identified by the same numbering system as US systems tested by UL (e.g. FF-D-1010, HW-D-2020, etc.)
  - Canadian joint firestop systems tested by ULC may be identified as either a HW (Head-of-Wall) suffix (e.g. HW78) or a JF (Joint Firestop) suffix (e.g. JF99)

UL Product iQ Cont.
System No. C-AJ-1155

UL Product iQ® SEARCH MY SEARCHES MY TAGS RICH Solutions

TAGS

Add Tag

XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

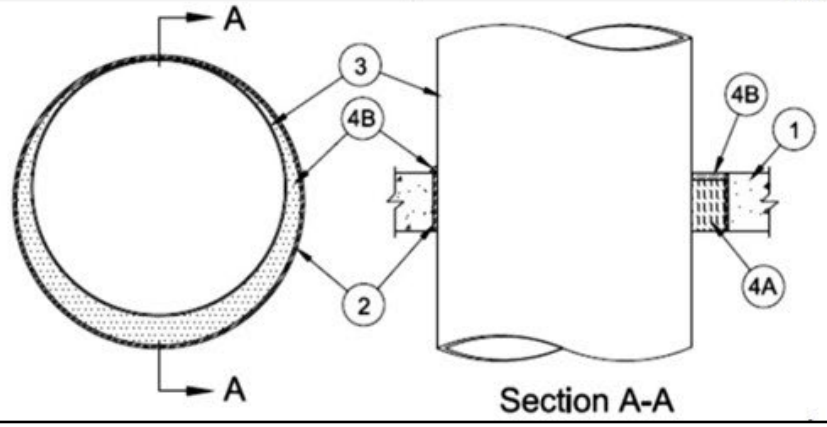
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-1155

February 20, 2015

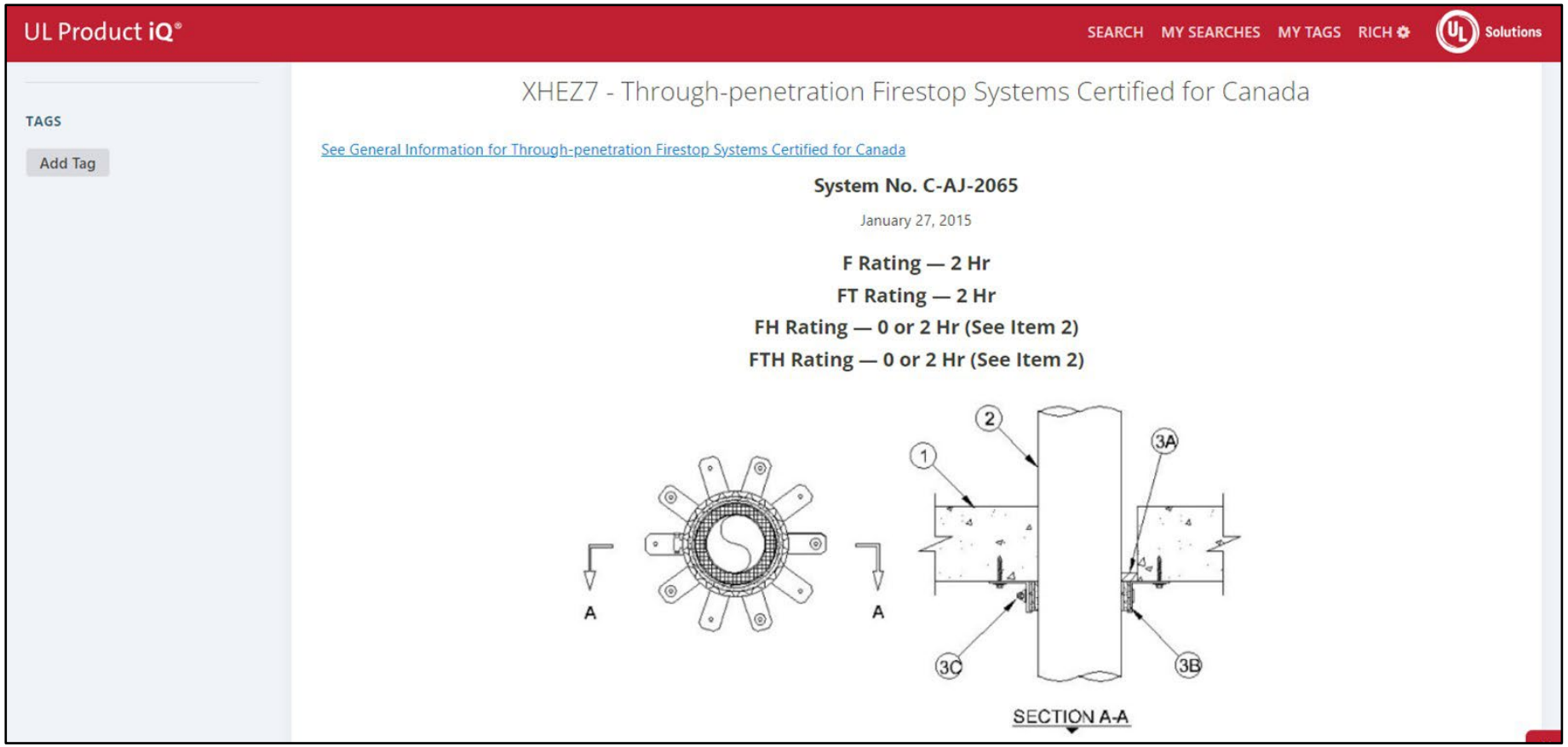
ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 and 3 Hr (See Item 3)	F Rating — 2 and 3 Hr (See Item 3)
T Rating —0 Hr	FT Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft	FH Rating — 2 and 3 Hr (See Item 3)
L Rating At 400 F — 4 CFM/sq ft	FTH Rating — 0 Hr
W Rating — Class 1 (See Item 4)	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — 4 CFM/sq ft



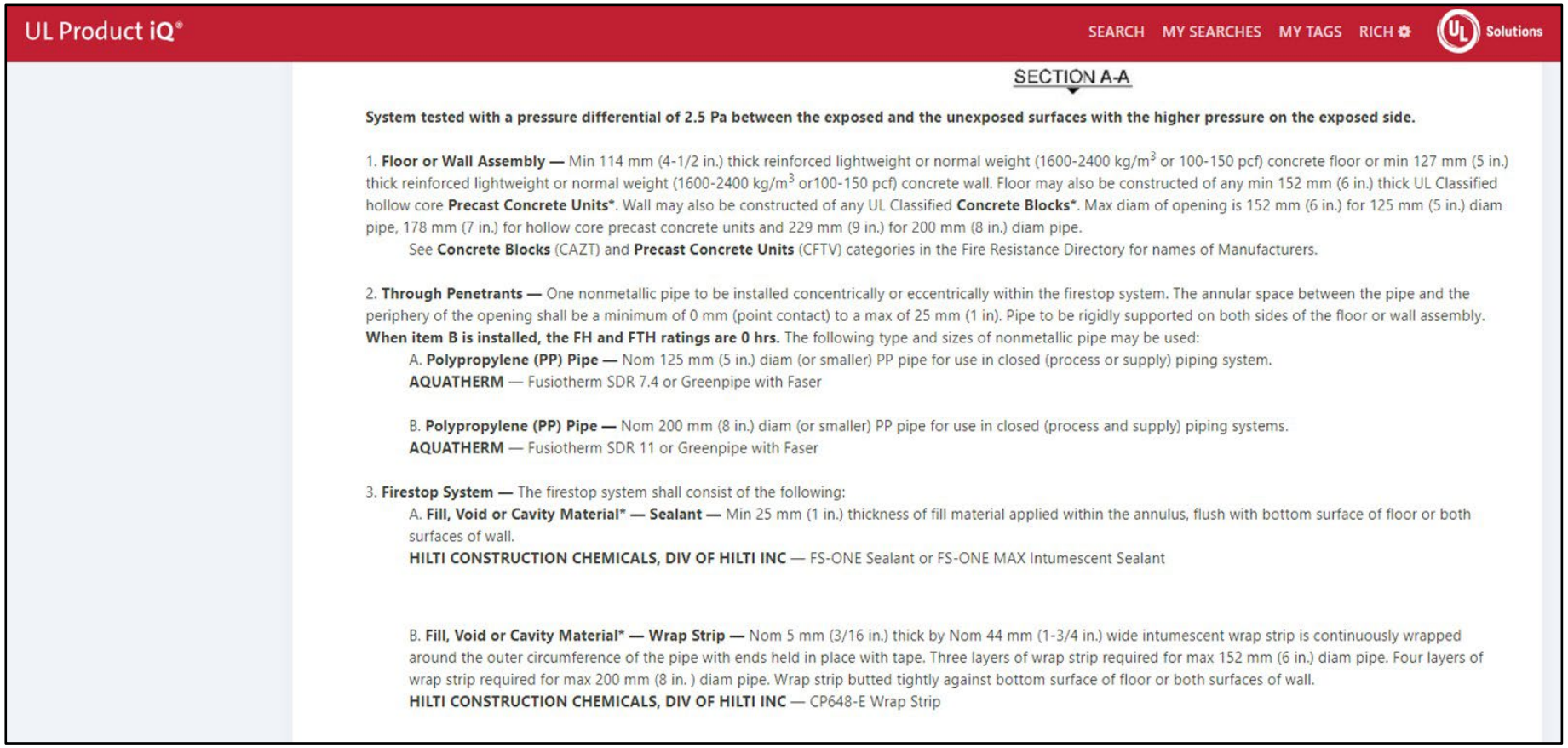
Section A-A

Feedback

UL Product iQ Cont.
System No. C-AJ-2065



UL Product iQ Cont.
System No. C-AJ-2065



SECTION A-A

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembly —** Min 114 mm (4-1/2 in.) thick reinforced lightweight or normal weight (1600-2400 kg/m^3 or 100-150 pcf) concrete floor or min 127 mm (5 in.) thick reinforced lightweight or normal weight (1600-2400 kg/m^3 or100-150 pcf) concrete wall. Floor may also be constructed of any min 152 mm (6 in.) thick UL Classified hollow core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 152 mm (6 in.) for 125 mm (5 in.) diam pipe, 178 mm (7 in.) for hollow core precast concrete units and 229 mm (9 in.) for 200 mm (8 in.) diam pipe.

See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of Manufacturers.

2. **Through Penetrants —** One nonmetallic pipe to be installed concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be a minimum of 0 mm (point contact) to a max of 25 mm (1 in). Pipe to be rigidly supported on both sides of the floor or wall assembly. **When item B is installed, the FH and FTH ratings are 0 hrs.** The following type and sizes of nonmetallic pipe may be used:

A. **Polypropylene (PP) Pipe —** Nom 125 mm (5 in.) diam (or smaller) PP pipe for use in closed (process or supply) piping system.
AQUATHERM — Fusiotherm SDR 7.4 or Greenpipe with Faser

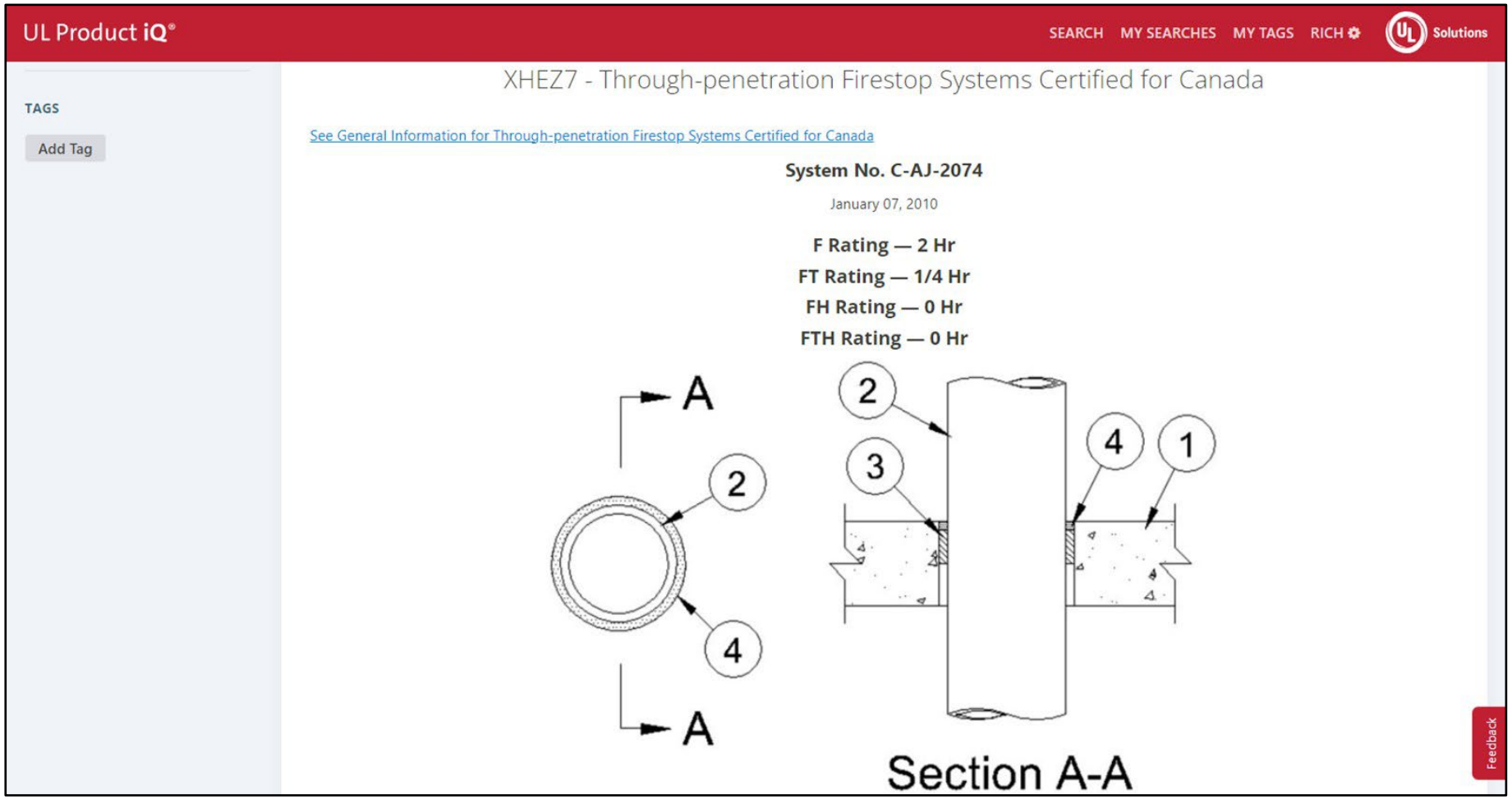
B. **Polypropylene (PP) Pipe —** Nom 200 mm (8 in.) diam (or smaller) PP pipe for use in closed (process and supply) piping systems.
AQUATHERM — Fusiotherm SDR 11 or Greenpipe with Faser

3. **Firestop System —** The firestop system shall consist of the following:

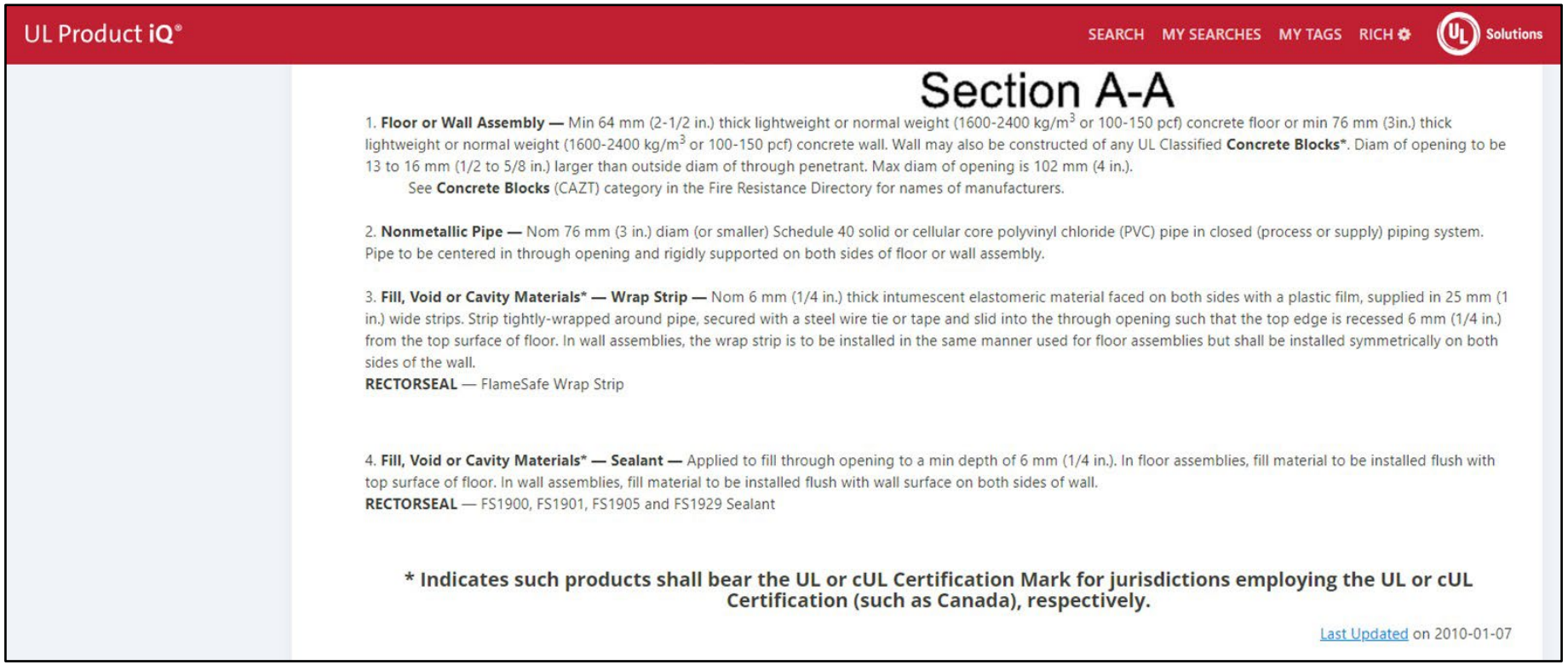
A. **Fill, Void or Cavity Material* — Sealant —** Min 25 mm (1 in.) thickness of fill material applied within the annulus, flush with bottom surface of floor or both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

B. **Fill, Void or Cavity Material* — Wrap Strip —** Nom 5 mm (3/16 in.) thick by Nom 44 mm (1-3/4 in.) wide intumescent wrap strip is continuously wrapped around the outer circumference of the pipe with ends held in place with tape. Three layers of wrap strip required for max 152 mm (6 in.) diam pipe. Four layers of wrap strip required for max 200 mm (8 in.) diam pipe. Wrap strip butted tightly against bottom surface of floor or both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E Wrap Strip

UL Product iQ Cont.
System No. C-AJ-2074



UL Product iQ Cont.
System No. C-AJ-2074



UL Product iQ Cont.
System No. C-AJ-2080

UL Product iQ®

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TAGS

Add Tag

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

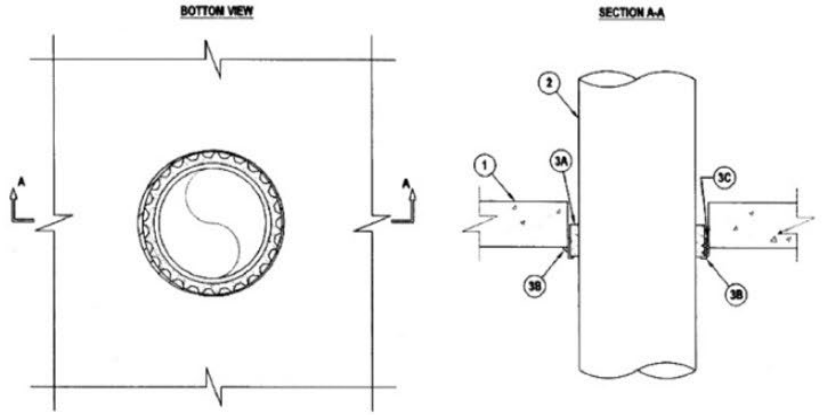
See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-2080

January 09, 2015

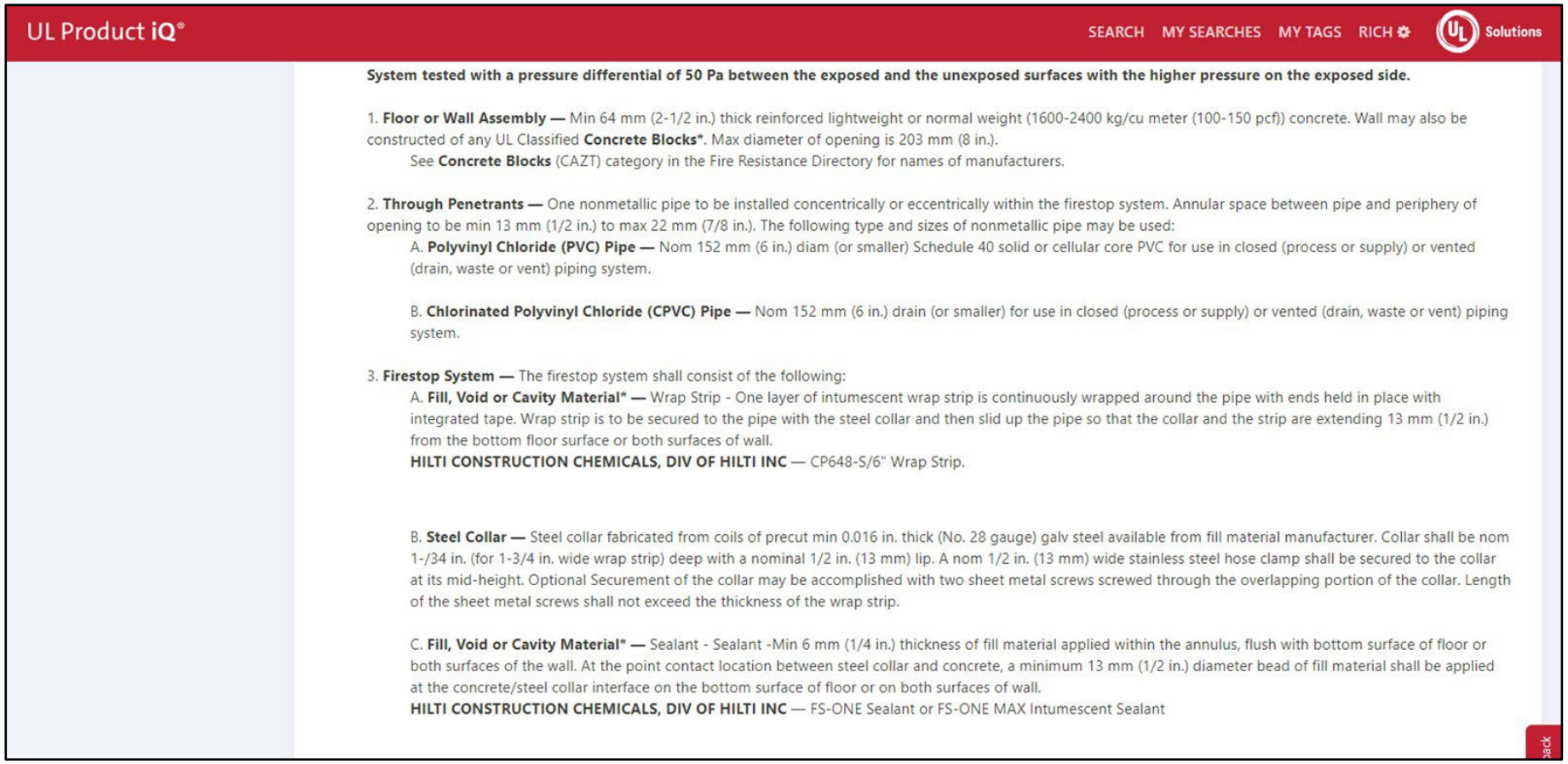
F Rating — 1 Hr

FT, FH, and FTH Ratings — 0 Hr



System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

UL Product iQ Cont.
System No. C-AJ-2080



System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembly —** Min 64 mm (2-1/2 in.) thick reinforced lightweight or normal weight (1600-2400 kg/cu meter (100-150 pcf)) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diameter of opening is 203 mm (8 in.).
   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants —** One nonmetallic pipe to be installed concentrically or eccentrically within the firestop system. Annular space between pipe and periphery of opening to be min 13 mm (1/2 in.) to max 22 mm (7/8 in.). The following type and sizes of nonmetallic pipe may be used:
   A. **Polyvinyl Chloride (PVC) Pipe —** Nom 152 mm (6 in.) diam (or smaller) Schedule 40 solid or cellular core PVC for use in closed (process or supply) or vented (drain, waste or vent) piping system.

   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe —** Nom 152 mm (6 in.) drain (or smaller) for use in closed (process or supply) or vented (drain, waste or vent) piping system.

3. **Firestop System —** The firestop system shall consist of the following:
   A. **Fill, Void or Cavity Material* —** Wrap Strip - One layer of intumescent wrap strip is continuously wrapped around the pipe with ends held in place with integrated tape. Wrap strip is to be secured to the pipe with the steel collar and then slid up the pipe so that the collar and the strip are extending 13 mm (1/2 in.) from the bottom floor surface or both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-S/6" Wrap Strip.

   B. **Steel Collar —** Steel collar fabricated from coils of precut min 0.016 in. thick (No. 28 gauge) galv steel available from fill material manufacturer. Collar shall be nom 1-/34 in. (for 1-3/4 in. wide wrap strip) deep with a nominal 1/2 in. (13 mm) lip. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Optional Securement of the collar may be accomplished with two sheet metal screws screwed through the overlapping portion of the collar. Length of the sheet metal screws shall not exceed the thickness of the wrap strip.

   C. **Fill, Void or Cavity Material* —** Sealant - Sealant -Min 6 mm (1/4 in.) thickness of fill material applied within the annulus, flush with bottom surface of floor or both surfaces of the wall. At the point contact location between steel collar and concrete, a minimum 13 mm (1/2 in.) diameter bead of fill material shall be applied at the concrete/steel collar interface on the bottom surface of floor or on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

UL Product iQ Cont.
System No. C-AJ-2697

UL Product iQ®

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TAGS

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XHEZ - Through-penetration Firestop Systems

XHEZ7 - Through-penetration Firestop Systems Certified for Canada

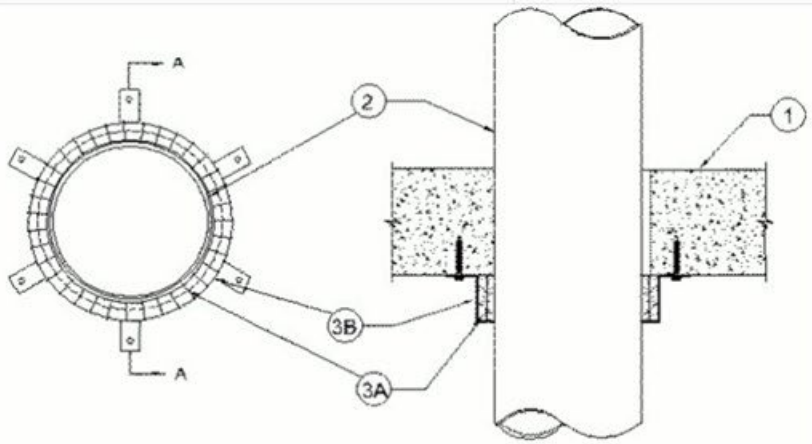
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. C-AJ-2697

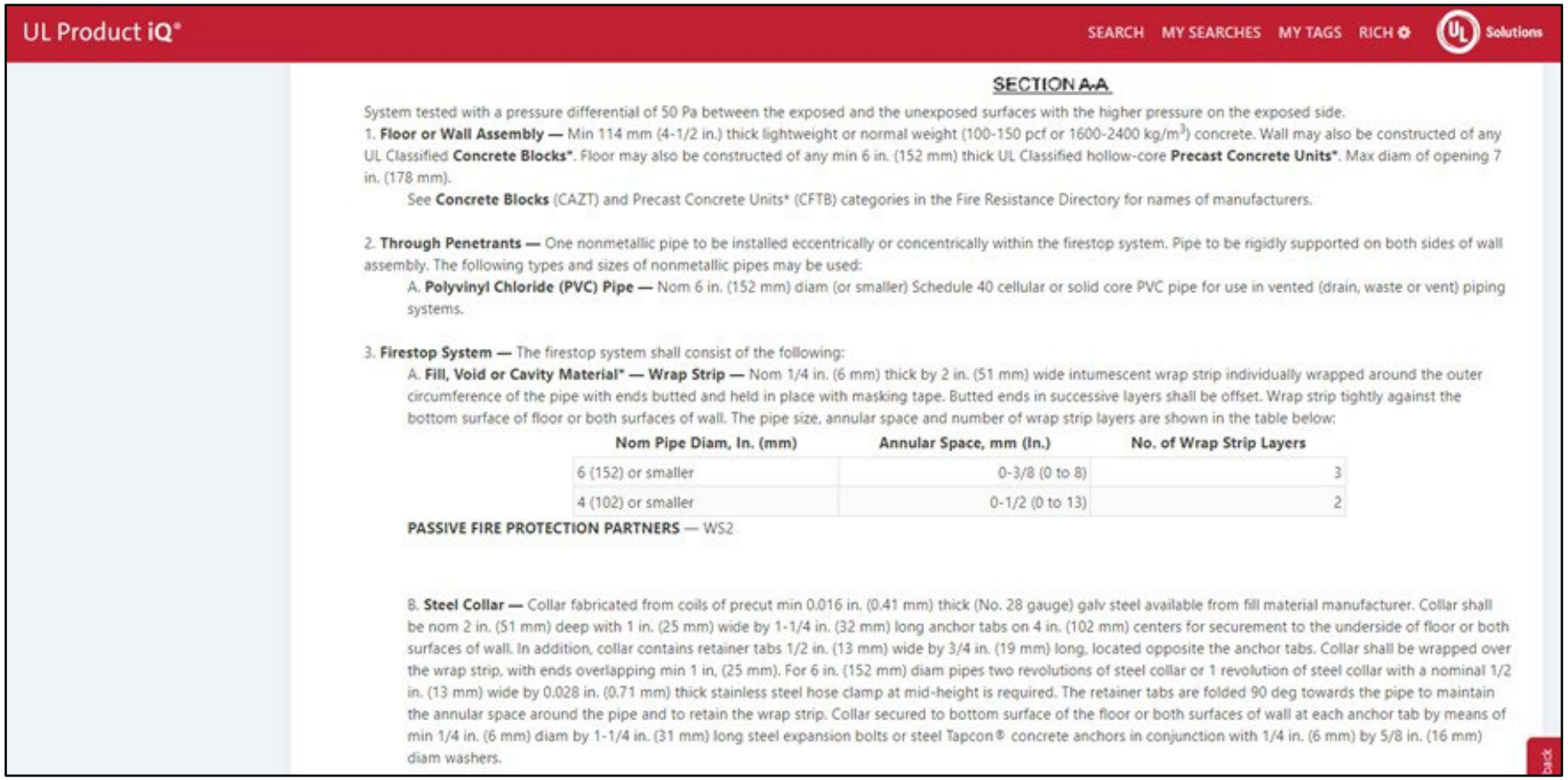
June 11, 2014

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Rating — 3 Hr	FT Rating — 3 Hr
	FH Rating — 3 Hr
	FTH Rating — 3 Hr



Feedback

UL Product iQ Cont.
System No. C-AJ-2697



UL Product iQ® SEARCH MY SEARCHES MY TAGS RICH UL Solutions

SECTION A-A

System tested with a pressure differential of 50 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembly —** Min 114 mm (4-1/2 in.) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***. Max diam of opening 7 in. (178 mm).

   See **Concrete Blocks** (CAZT) and Precast Concrete Units* (CFTB) categories in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants —** One nonmetallic pipe to be installed eccentrically or concentrically within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:

   A. **Polyvinyl Chloride (PVC) Pipe —** Nom 6 in. (152 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in vented (drain, waste or vent) piping systems.

3. **Firestop System —** The firestop system shall consist of the following:

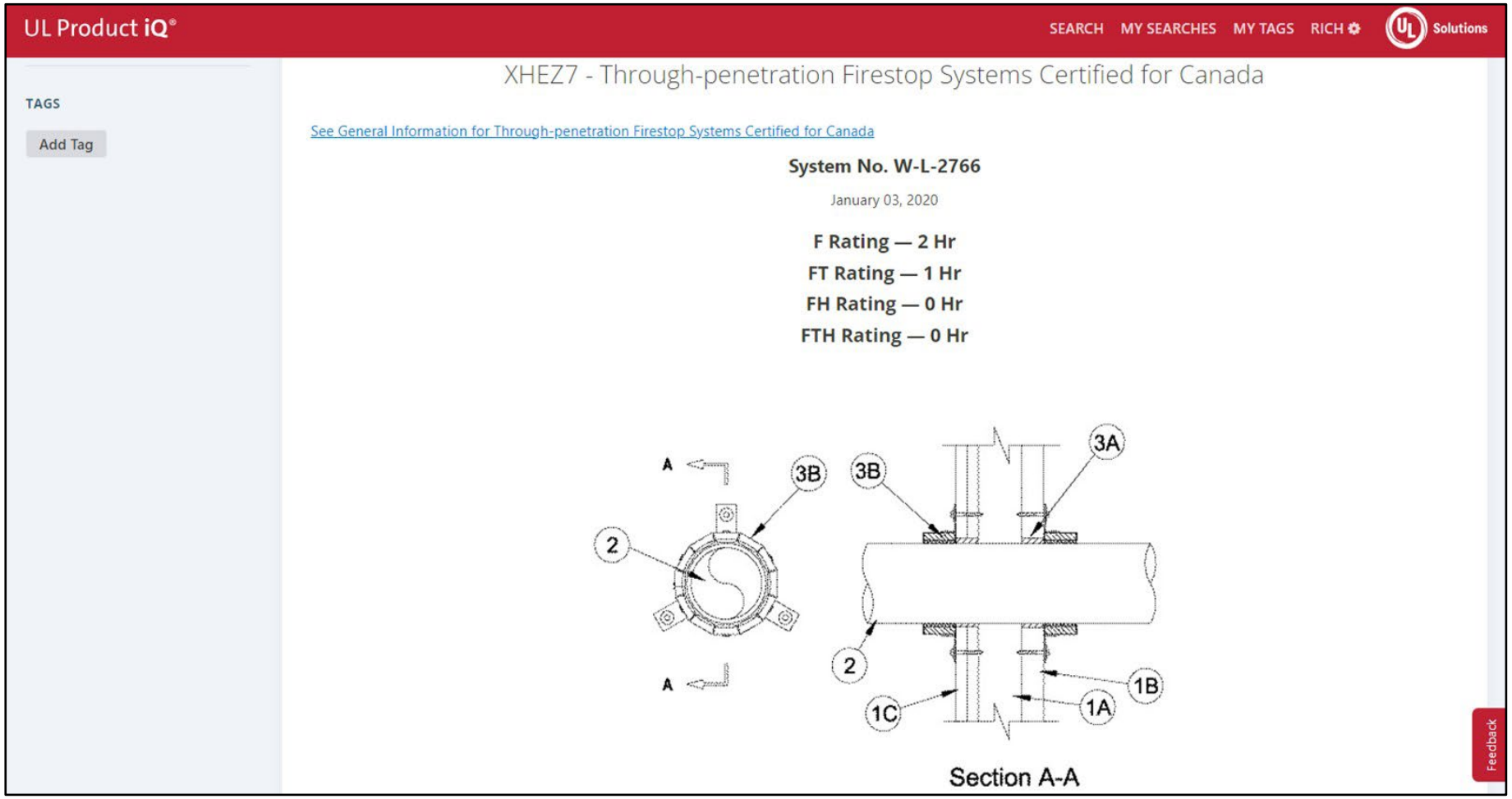
   A. **Fill, Void or Cavity Material* — Wrap Strip —** Nom 1/4 in. (6 mm) thick by 2 in. (51 mm) wide intumescent wrap strip individually wrapped around the outer circumference of the pipe with ends butted and held in place with masking tape. Butted ends in successive layers shall be offset. Wrap strip tightly against the bottom surface of floor or both surfaces of wall. The pipe size, annular space and number of wrap strip layers are shown in the table below:

Nom Pipe Diam, In. (mm)	Annular Space, mm (In.)	No. of Wrap Strip Layers
6 (152) or smaller	0-3/8 (0 to 8)	3
4 (102) or smaller	0-1/2 (0 to 13)	2

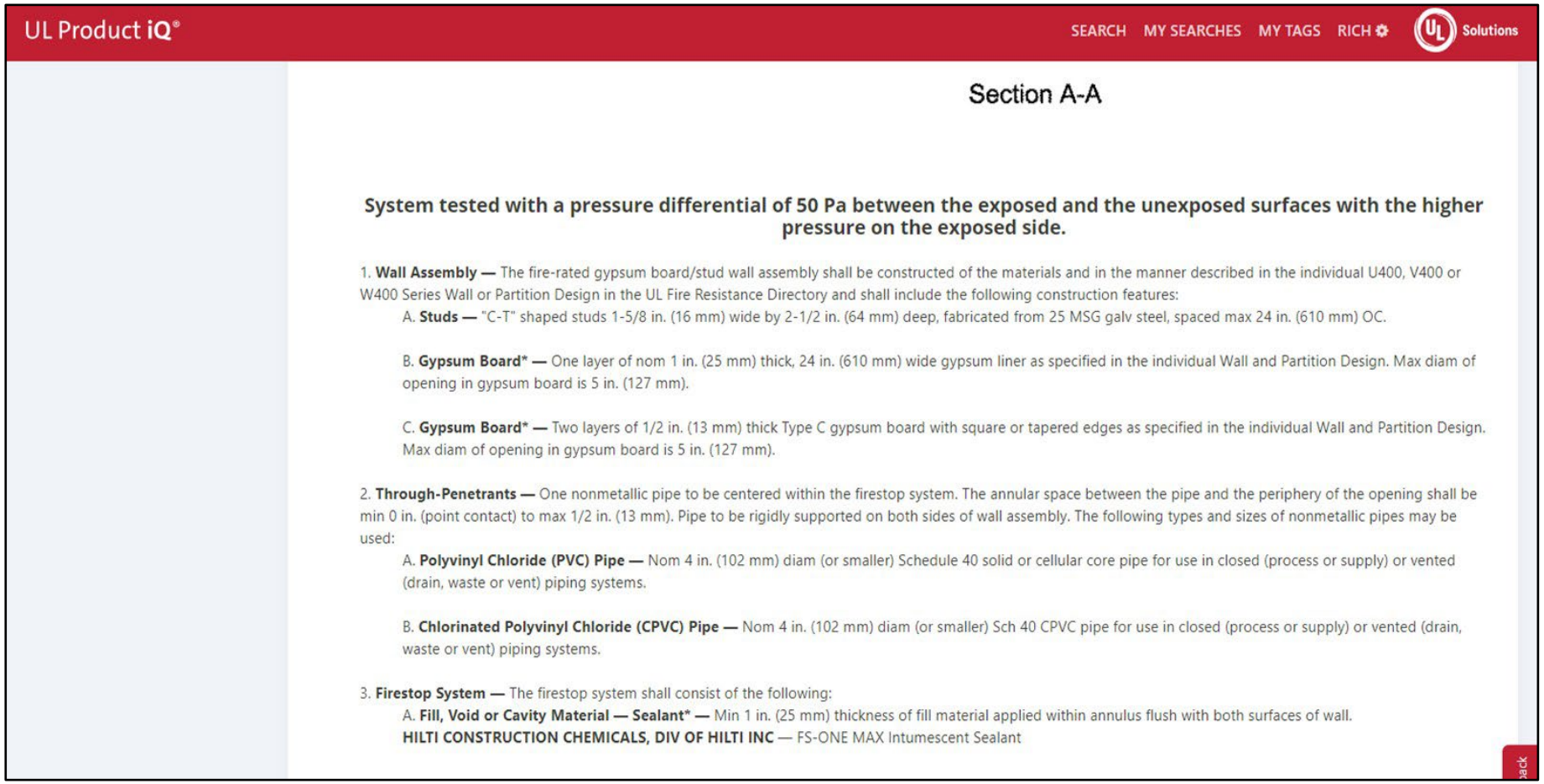
PASSIVE FIRE PROTECTION PARTNERS — WS2

B. **Steel Collar —** Collar fabricated from coils of precut min 0.016 in. (0.41 mm) thick (No. 28 gauge) galv steel available from fill material manufacturer. Collar shall be nom 2 in. (51 mm) deep with 1 in. (25 mm) wide by 1-1/4 in. (32 mm) long anchor tabs on 4 in. (102 mm) centers for securement to the underside of floor or both surfaces of wall. In addition, collar contains retainer tabs 1/2 in. (13 mm) wide by 3/4 in. (19 mm) long, located opposite the anchor tabs. Collar shall be wrapped over the wrap strip, with ends overlapping min 1 in. (25 mm). For 6 in. (152 mm) diam pipes two revolutions of steel collar or 1 revolution of steel collar with a nominal 1/2 in. (13 mm) wide by 0.028 in. (0.71 mm) thick stainless steel hose clamp at mid-height is required. The retainer tabs are folded 90 deg towards the pipe to maintain the annular space around the pipe and to retain the wrap strip. Collar secured to bottom surface of the floor or both surfaces of wall at each anchor tab by means of min 1/4 in. (6 mm) diam by 1-1/4 in. (31 mm) long steel expansion bolts or steel Tapcon® concrete anchors in conjunction with 1/4 in. (6 mm) by 5/8 in. (16 mm) diam washers.

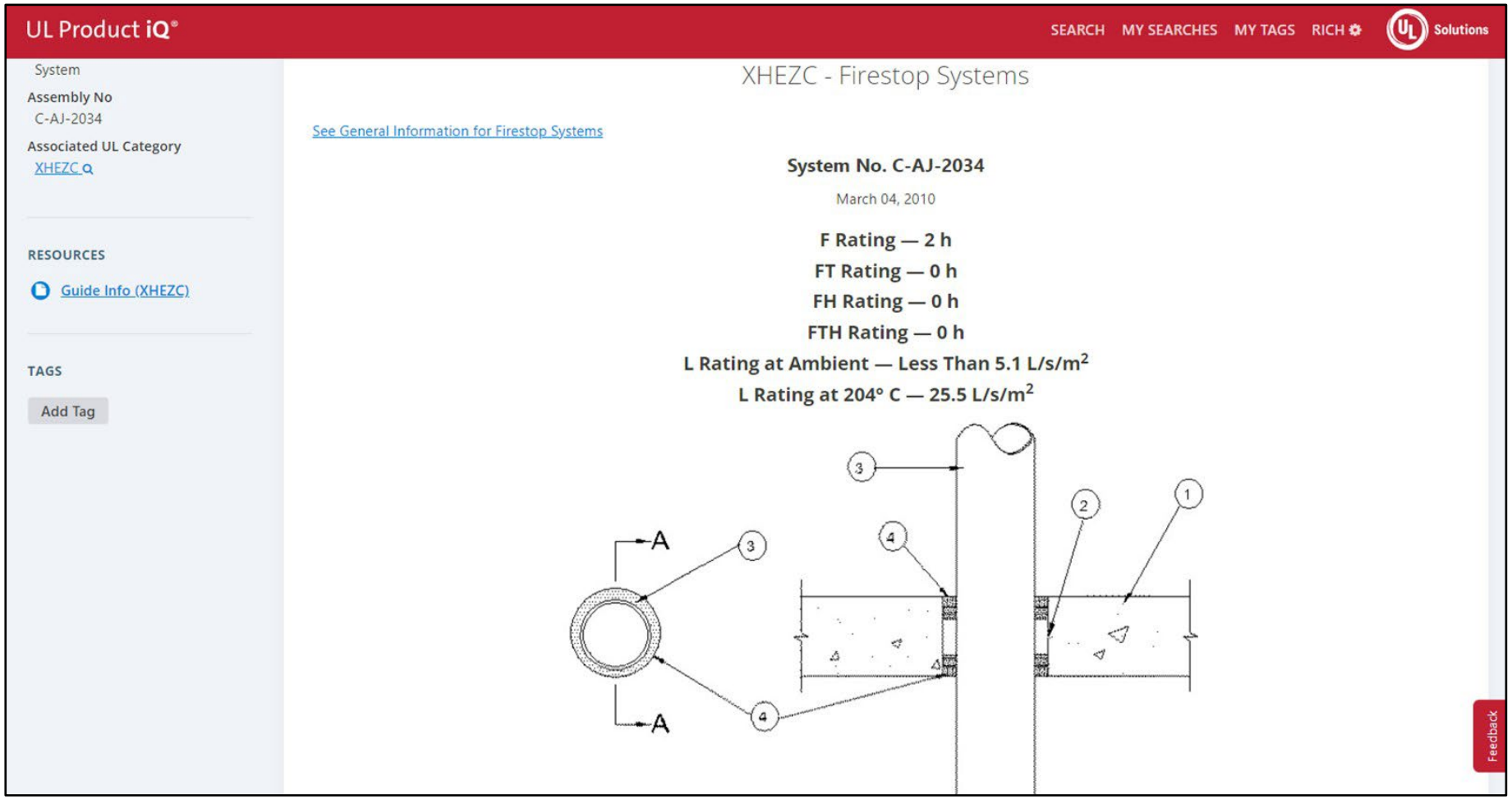
UL Product iQ Cont.
System No. W-L-2766



UL Product iQ Cont.
System No. W-L-2766



UL Product iQ Cont.
System No. C-AJ-2034



UL Product iQ Cont.
System No. C-AJ-2034

SECTION A-A

System tested with a pressure differential of 50 Pa between the exposed and unexposed surfaces with the higher pressure on the exposed side.

1. **Floor or Wall Assembly —** Min 127 mm. thick reinforced lightweight or normal weight (1600 - 2400 kg/m^3) concrete. Wall may also be constructed of any ULC Listed **Concrete Blocks**. Floor may also be constructed of any min 152 mm thick ULC Listed hollow-core **Precast Concrete Units**. Diam of opening to be 114 mm when nom 76 mm penetrant is used and 152 mm when nom 102 mm penetrant is used.
See **Concrete Blocks** (CAZTC) and **Precast Concrete Units** (CFTVC) categories in the ULC Fire Resistance Directory for names of manufacturers.

2. **Metallic Sleeve —** Cylindrical sleeve fabricated from min 0.4 mm (No. 30 gauge) galv sheet steel and having a min 25 mm lap along the longitudinal seam. Inside diam of sleeve shall be the same size as the outside diam of intumescent rings (Item 4). Length of the sleeve to be equal to the thickness of the floor or wall. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the opening and releasing the coil. The ends of the sleeve shall be flush both surfaces of the floor or wall.

3. **XFR Coated Polyvinyl Chloride(PVC) Pipe —** One nom 76 mm or 102 mm diam Schedule 40 solid core XFR coated PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system. Pipe installed concentrically within the sleeve with the annular space between pipe and sleeve sized to accommodate the thickness of the intumescent rings. Pipe to be rigidly supported on both sides of floor or wall assembly.

• 4. **Firestop Device - Intumescent Rings —** Min of two 25 mm high intumescent rings installed around pipe on both sides of the floor or wall. For nom 76 and 102 mm pipes, the rings are 13 and 19 mm thick, respectively. The two rings are to be tightly butted together and recessed into sleeve, flush with both ends of the sleeve.
NUCO INC — SelfSeal SSR

• 5. **Fill, Void or Cavity Material - Sealant —** (Not Shown) - Min 0.5 mm thickness of fill material applied over outside intumescent rings and sleeve edges on both sides of floor or wall.
NUCO INC — SelfSeal SL-100, GG-200 or GG-266

Last Updated on 2010-03-04

Feedback

UL Product iQ Cont.
System No. C-AJ-2158

UL Product iQ®

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System

Assembly No
C-AJ-2158

Associated UL Category
XHEZC

RESOURCES

Guide Info (XHEZC)

TAGS

Add Tag

XHEZC - Firestop Systems

See General Information for Firestop Systems

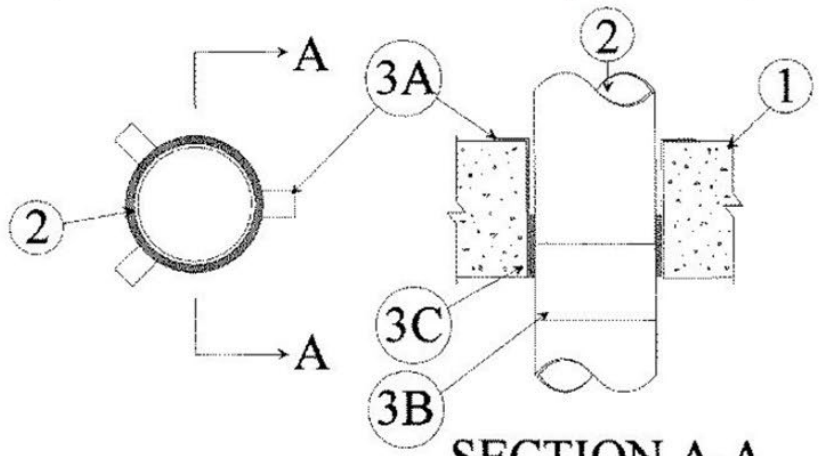
System No. C-AJ-2158

July 27, 2009

F Rating — 2 h

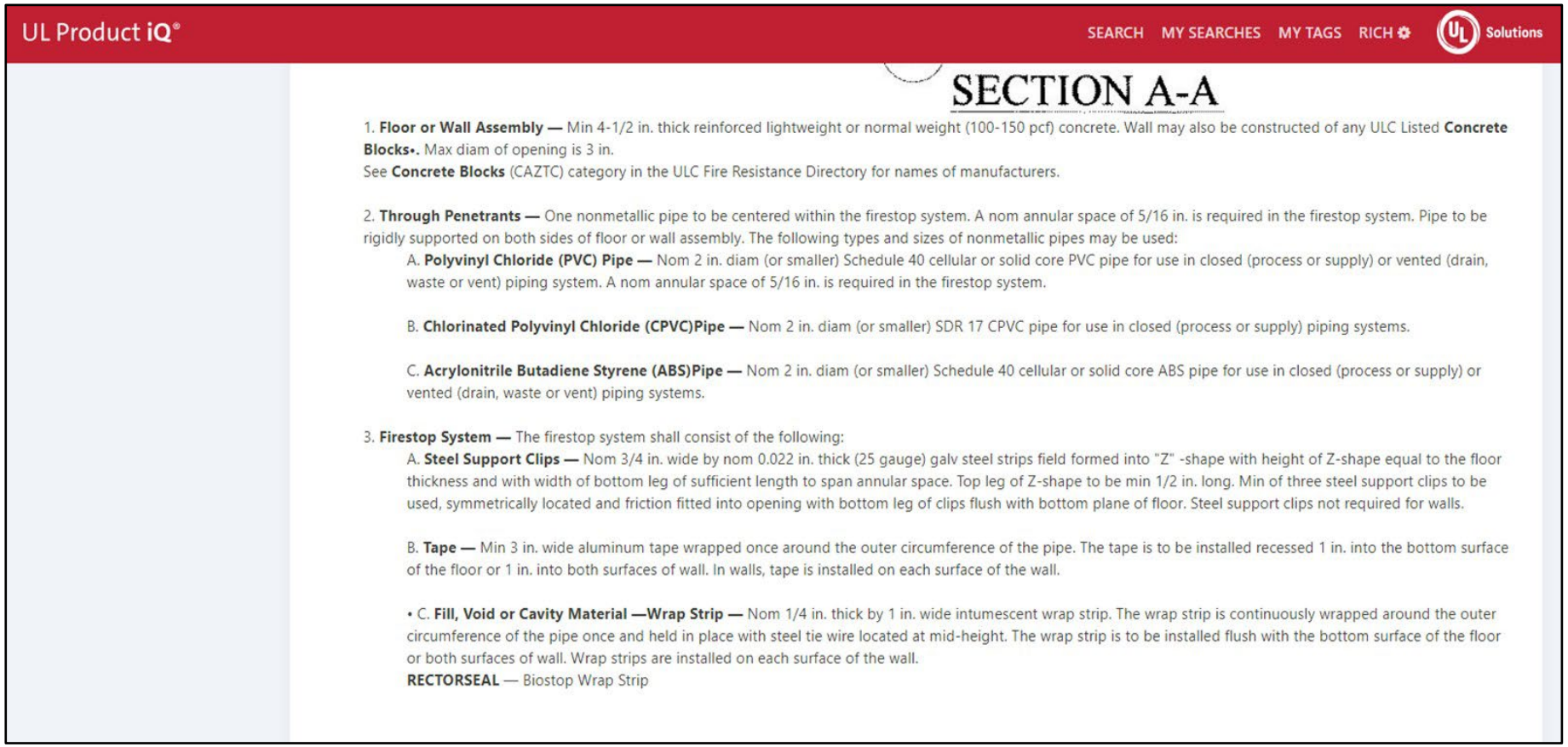
T Rating — 0 h

System not tested with a pressure differential of 50 Pa between the exposed and unexposed side of the assembly



SECTION A-A

UL Product iQ Cont.
System No. C-AJ-2158



SECTION A-A

1. **Floor or Wall Assembly —** Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any ULC Listed **Concrete Blocks•.** Max diam of opening is 3 in.
See **Concrete Blocks** (CAZTC) category in the ULC Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants —** One nonmetallic pipe to be centered within the firestop system. A nom annular space of 5/16 in. is required in the firestop system. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:

A. **Polyvinyl Chloride (PVC) Pipe —** Nom 2 in. diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system. A nom annular space of 5/16 in. is required in the firestop system.

B. **Chlorinated Polyvinyl Chloride (CPVC)Pipe —** Nom 2 in. diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems.

C. **Acrylonitrile Butadiene Styrene (ABS)Pipe —** Nom 2 in. diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

3. **Firestop System —** The firestop system shall consist of the following:

A. **Steel Support Clips —** Nom 3/4 in. wide by nom 0.022 in. thick (25 gauge) galv steel strips field formed into "Z" -shape with height of Z-shape equal to the floor thickness and with width of bottom leg of sufficient length to span annular space. Top leg of Z-shape to be min 1/2 in. long. Min of three steel support clips to be used, symmetrically located and friction fitted into opening with bottom leg of clips flush with bottom plane of floor. Steel support clips not required for walls.

B. **Tape —** Min 3 in. wide aluminum tape wrapped once around the outer circumference of the pipe. The tape is to be installed recessed 1 in. into the bottom surface of the floor or 1 in. into both surfaces of wall. In walls, tape is installed on each surface of the wall.

• C. **Fill, Void or Cavity Material —Wrap Strip —** Nom 1/4 in. thick by 1 in. wide intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe once and held in place with steel tie wire located at mid-height. The wrap strip is to be installed flush with the bottom surface of the floor or both surfaces of wall. Wrap strips are installed on each surface of the wall.
RECTORSEAL — Biostop Wrap Strip

UL Product iQ Cont.
System No. C-AJ-2307

UL Product iQ®

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System

Assembly No
C-AJ-2307

Associated UL Category
XHEZC

RESOURCES

Guide Info (XHEZC)

TAGS

Add Tag

XHEZC - Firestop Systems

See General Information for Firestop Systems

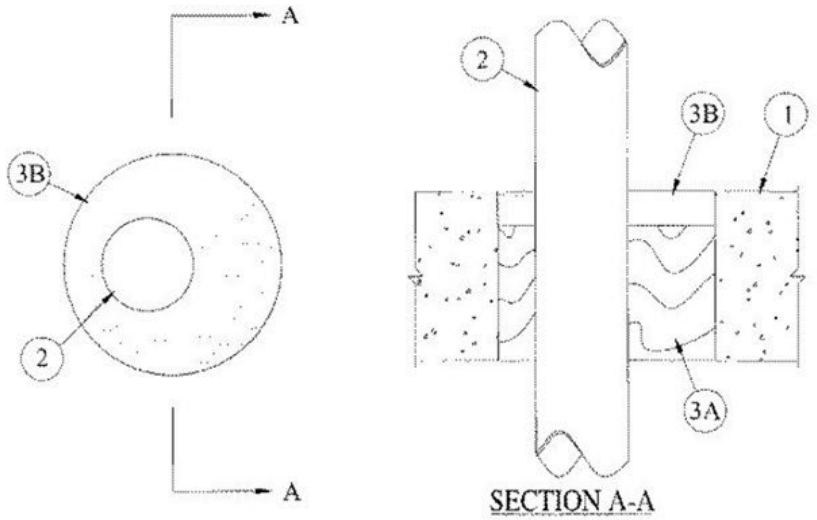
System No. C-AJ-2307

July 27, 2009

F Ratings — 1-1/2 or 2 h (See Item 2)

T Rating — 0 h

System not tested with a pressure differential of 50 Pa between the exposed and unexposed side of the assembly



UL Product iQ Cont.
System No. C-AJ-2307

1. **Floor or Wall Assembly —** Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor or min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete wall. Wall may also be constructed of any ULC Listed **Concrete Blocks•**. Max diam of opening is 4 in.

See **Concrete Blocks** (CAZTC) category in the ULC Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants —** One nonmetallic pipe to be installed concentrically or eccentrically within the firestop system. The annular space shall be min 1/2 in. to max 1-5/8 in. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:

A. **Acrylonitrile Butadiene Styrene(ABS) Pipe —** Nom 1-1/2 in. diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. When ABS pipe is used, F Rating is 2 h.

B. **Polyvinyl Chloride (PVC) Pipe —** Nom 1-1/2 in. diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. When solid core PVC pipe is used, F Rating is 2 h.

C. **Chlorinated Polyvinyl Chloride(CPVC) Pipe —** Nom 1-1/2 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems. When PVC pipe is used, F Rating is 2 h.

3. **Firestop System —** The firestop system shall consist of the following:

A. **Packing Material —** Min 4 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.

• B. **Fill, Void or Cavity Material —** Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or both surfaces of wall.
RECTORSEAL — Metacaulk 1000

Last Updated on 2009-07-27

UL Product iQ Cont.
System No. FF-D-0073

UL Product iQ®

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TAGS

Add Tag

XHBN7 - Joint Systems Certified for Canada

See General Information for Joint Systems Certified for Canada

System No. FF-D-0073

September 18, 2010

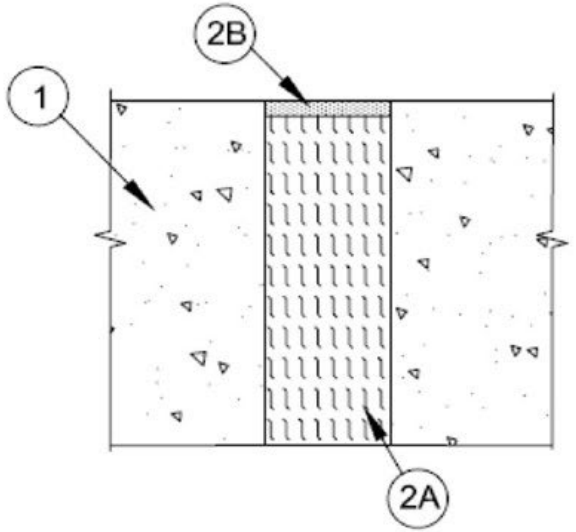
Assembly Rating — 4 Hr

Nominal Joint Width — 2 in.

L Rating at Ambient — Less than 1 CFM/Lin. Ft.

L Rating at 400 F — Less than 1 CFM/Lin Ft.

Class II Movement Capabilities — 12.5% Compression and Extension



Feedback

UL Product iQ Cont.
System No. FF-D-0074

UL Product iQ®

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TAGS

Add Tag

XHBN - Joint Systems

XHBN7 - Joint Systems Certified for Canada

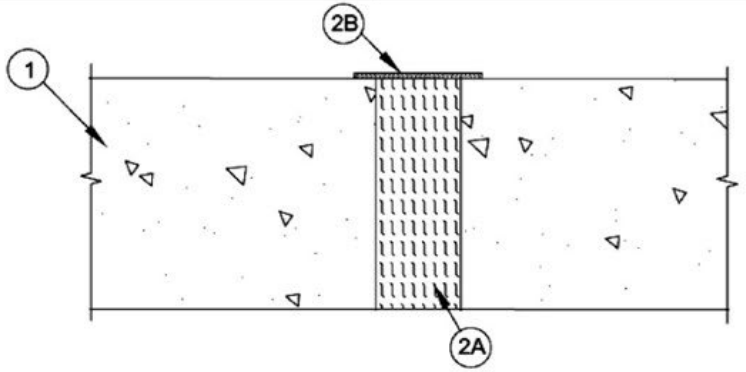
See General Information for Joint Systems

See General Information for Joint Systems Certified for Canada

System No. FF-D-0074

June 13, 2016

ANSI/UL 2079	CAN/ULC S115
Assembly Rating — 4 Hr	F Rating — 4 Hr
Nominal Joint Width — 2 in.	FT Rating — 4 Hr
Class II Movement Capabilities — 12.5% Compression and Extension	FH Rating — 4 Hr
L Rating at Ambient — Less than 1 CFM/Lin. Ft.	FTH Rating — 4 Hr
L Rating at 400 F — Less than 1 CFM/Lin Ft.	Nominal Joint Width — 2 in.
	Class II Movement Capabilities — 12.5% Compression and Extension
	L Rating at Ambient — Less than 1 CFM/Lin. Ft.
	L Rating at 400 F — Less than 1 CFM/Lin Ft.



Feedback

UL Product iQ Cont.
System No. HW73

UL Product iQ®

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System

Assembly No
HW73

Associated UL Category
XHEZC

RESOURCES

Guide Info (XHEZC)

TAGS

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XHEZC - Firestop Systems

See General Information for Firestop Systems

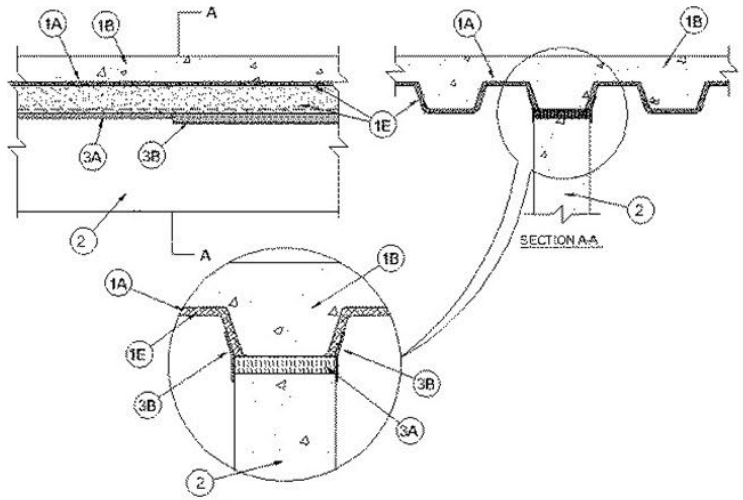
System No. HW73

October 11, 2011

F, FT, FH and FTH Ratings - 2 h

Nominal Joint Width - 25 mm

Movement Capabilities - 18.75% Compression or Extension (based on 500 cycles at a Min of 10 cycles/minute)



UL Product iQ Cont.
System No. JF129

UL Product iQ®

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Document Type
System

Assembly No
JF129

Associated UL Category
XHEZC

RESOURCES

Guide Info (XHEZC)

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XHEZC - Firestop Systems

See General Information for Firestop Systems

System No. JF129

October 11, 2011

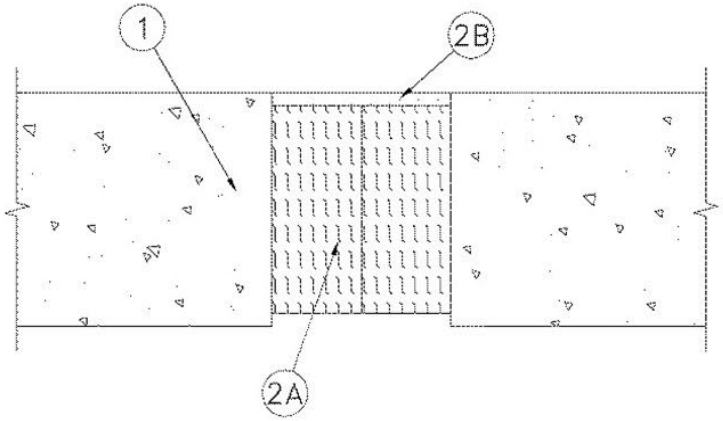
F, FT, FH and FTH Ratings — 3 h

L Rating at Ambient - Less than 1.6 L/s/m

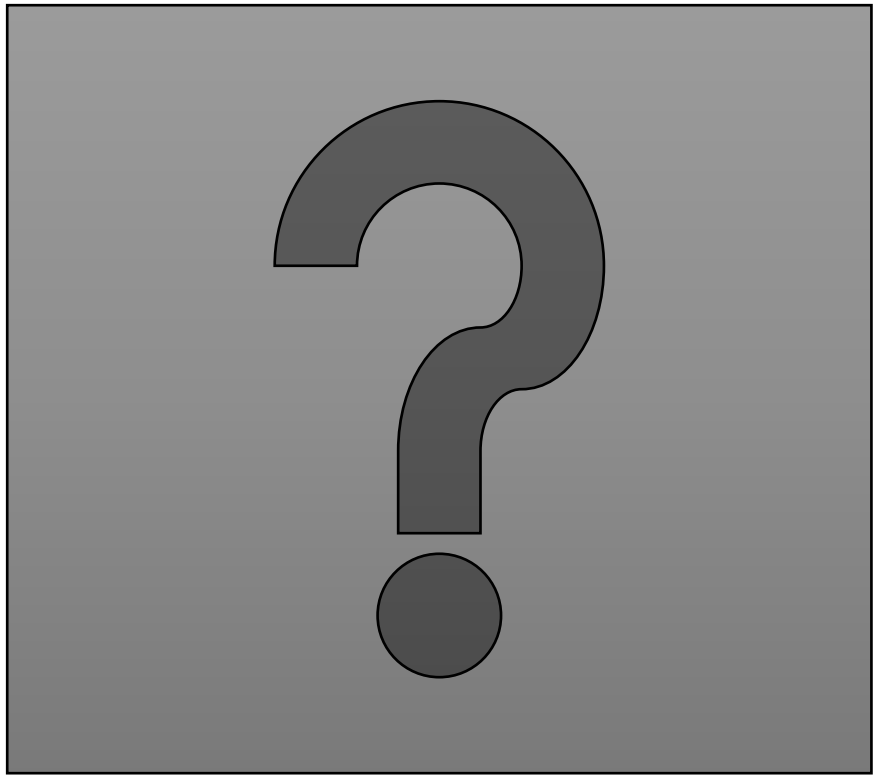
L Rating at 205o C - Less than 1.6L/s/m

Nominal Joint Width - 89 mm

Movement Capabilities - 14% Compression or Extension (based on 500 cycles at a Min of 10 cycles/minute)



Questions??



Thanks for Attending!!!

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