SECTION 22 11 16
Domestic Water Piping

PART 1 GENERAL

1.1 SECTION INCLUDES

A. PEX-a tubing and fittings for domestic water piping.

1.2 REFERENCES

A. American National Standards Institute (ANSI)/National Sanitation Foundation (NSF) International (www.nsf.org)

1. ANSI/NSF-14 – Standard 14 Plastic Piping System Components and Related Materials

2. ANSI/NSF-61 – Drinking Water System Components – Health Effects

3. ANSI/NSF-372 – Drinking Water System Components - Lead Content

B. American National Standards Institute (ANSI)/Underwriters Laboratories (UL)

1. ANSI/UL 263 - Standard for Fire Tests of Building Construction and Materials

C. American Society of Mechanical Engineers (ASME)/Canadian Standards Association (CSA)

1. ASME A112.18.1/CSA B125.1 – Plumbing Supply Fittings

D. American Society of Testing and Materials (ASTM) International (www.astm.org)

1. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

2. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems

3. ASTM F876 – Standard Specification for Crosslinked Polyethylene (PEX) Tubing

4. ASTM F877 – Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems

5. ASTM F1960 – Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing

6. ASTM F2023 – Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water

7. ASTM F2657 - Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing

E. Canadian Standards Association (CSA) International (www.csagroup.org)

1. CAN/CSA B137.5 – Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications

F. HeatLink Group Inc. (www.heatlink.com)

1. HeatLink® F1960 PEX-a Potable Water Expansion System Installation Guide (L3240)

2. INFO 5 – PEX Tubing Technical Information (L2305)

3. INFO 23 – Firestop System Ratings – CAN/ULC S115-05 & ASTM E814 (L2323)

4. INFO 24 – Material Properties of Polysulfone (L2324)

5. INFO 33 – Fire Resistance Ratings – CAN/ULC-S101 (L2333)

6. INFO 34 – Fire Resistance Ratings – ANSI/UL 263 (L2334)

7. INFO 37 – Domestic Hot Water Recirculation Systems (L2337)

G. International Association of Plumbing and Mechanical Officials (IAPMO) (www.iapmo.org)

1. Uniform Plumbing Code (UPC)

H. International Code Council (ICC) (www.iccsafe.org)

1. International Plumbing Code (IPC)

I. International Association of Plumbing and Mechanical Officials (IAPMO)/American National Standards Institute (ANSI)

1. IAPMO/ANSI Z1157 – Ball Valves

J. National Association of Plumbing, Heating and Cooling Contractors (NAPHCC)

1. National Standard Plumbing Code (NSPC)

K. Plastic Pipe Institute (PPI) (www.plasticpipe.org)

1. Technical Report TR- 4

L. Underwriters' Laboratories of Canada (ULC) (www.ul.com)

1. CAN/ULC S101 – Standard Methods of Fire Endurance Tests of Building Construction and Materials

2. CAN/ULC S102.2 – 2007/2010 – Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies with, and without, fiberglass insulation

3. CAN/ULS S115 - Standard Method of Fire Tests of Firestop Systems

1.3 SYSTEM DESCRIPTION

A. Design Requirements

1. Standard grade hydrostatic pressure ratings from Plastics Pipe Institute (PPI) in accordance with TR-3 as listed in TR-4. The following standard-grade hydrostatic ratings are required.

a. 200 degree F (93 degree C) at 80 psi (550 kPa)

b. 180 degree F (82 degree C) at 100 psi (689 kPa)

c. 73.4 degree F (23 degree C) at 160 psi (1,102 kPa)

2. Certification of flame spread/smoke development rating of <25/<50 in accordance with CAN/ULC S102.2 – 2007/2010 provided the installation meets one of the following requirements.

a. Tubing spacing is a minimum of 8 inches apart for the following nominal sizes (no insulation required).

1) ½ inch (13 mm)

b. Tubing is wrapped with ½ inch thick fiberglass insulation that is Warnock Hersey listed with a flame spread of not more than 25 and a smoke-developed rating of not more than 50.

1) ½ inch (13 mm)

2) ¾ inch (19 mm)

3) 1 inch (25 mm)

4) 1¼ inch (32 mm)

5) 1½ inch (38 mm)

6) 2 inch (51 mm)

3. Certification of flame spread/smoke development rating of <25/<50 in accordance with ASTM E84 provided the installation meets one of the following requirements.

a. Tubing spacing is a minimum of 18 inches apart for the following nominal sizes (no insulation required).

1) ½ inch (13 mm)

2) ¾ inch (19 mm)

b. Tubing is wrapped with ½ inch thick fiberglass insulation that is ASTM E84 listed with a flame spread of not more than 25 and a smoke-developed rating of not more than 50.

1) ½ inch (13 mm)

2) ¾ inch (19 mm)
3) 1 inch (25 mm)
4) 1¼ inch (32 mm)
5) 1½ inch (38 mm)
6) 2 inch (51 mm)

B. Performance Requirements

1. Show compliance with ANSI/NSF-14.
2. Show compliance with ANSI/NSF-61.
3. Show compliance with ASTM F877.
4. Show compliance with ASTM F2023.
5. Installed through rated walls in compliance with CAN/ULC S115-05 and ASTM E814 through certification listings with Underwriters Laboratories (UL) and Underwriters Laboratories of Canada (cUL), and Warnock Hersey (WH) – See INFO 23 (L2323) for more details.
   a. Canada: Concrete Floor/Wall or Block Wall
      1) cUL System No. C-AJ-2030C – max rating: F = 2h; FH = 2h
      2) cUL System No. C-AJ-2061b – max rating: F = 2h; FH = 2h
      3) WH System No. PHV 120-11 – max rating: F = 2h; FH = 2h
   b. Canada: Wood Ceiling/Floor
      1) cUL System No. F-C-2030C – max rating: F = 1h; FH = 1h
      2) cUL System No. F-C-2045a – max rating: F = 1h; FH = 1h
      3) WH System No. PH 60-04 – max rating: F = 1h; FH = 1h
   c. Canada: Gypsum Wall
      1) cUL System No. W-L-2012C – max rating: F = 2h; FH = 2h
      2) cUL System No. W-L-2061a – max rating: F = 2h; FH = 0h
      3) WH System No. PV 60-02 – max rating: F = 1h; FH = 1h
   d. USA: Concrete Floor/Wall or Block Wall
      1) UL System No. C-AJ-2626 – max rating: F = 2h; T = 2h
      2) UL System No. C-AJ-2567c – max rating: F = 2h; T = 2h
   e. USA: Concrete and Steel Joist Floor
      1) UL System No. F-E-2040 – max rating: F = 1h; T = 1h
   f. USA: Wood Ceiling/Floor
      1) UL System No. F-C-2391 – max rating: F = 1h; T = 1h
      2) UL System No. F-C-2081e – max rating: F = 2h; T = 2h
      3) UL System No. F-C-2334a – max rating: F = 1h; T = 1h
   g. USA: Gypsum Wall
      1) UL System No. W-L-2543 – max rating: F = 2h; T = 2h
      2) UL System No. W-L-2474a – max rating: F = 2h; T = 0h

1.4 SUBMITTALS

A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data

1. Provide manufacturer's product submittal data and installation instructions.

C. Quality Assurance/Control Submittals: Submit the following:

1. Test Reports

a. Upon request, submit test reports from recognized testing laboratories.

2. Certificates

a. Certificate indicating that the installer is authorized to install the manufacturer's products.

D. Closeout Submittals

1. Warranty documents specified herein

2. Operation and maintenance data

1.5 QUALITY ASSURANCE

A. Qualifications

1. Use an installer with demonstrated experience on projects of similar size and complexity and possessing documentation proving successful completion of PEX plumbing installation training by the PEX tubing manufacturer.

B. Certifications

1. Installer is trained by the PEX tubing manufacturer to install the PEX potable water distribution system.

2. Installer will use skilled workers holding a trade qualification license or equivalent, or apprentices under the supervision of a licensed trades professional.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with Division 1 Product Requirement Section.

B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery

1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection

1. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

2. Store PEX tubing in cartons or under cover to avoid dirt or foreign material from being introduced into the tubing.

3. Do not expose PEX tubing to direct sunlight for an extended period of time. If construction delays are encountered, provide cover to portions of tubing exposed to direct sunlight.

1.7 WARRANTY

A. HeatLink offers a limited warranty of up to 25 years for its PureLink® Plus tubing and HPP Fittings (10 years for brass fittings) when installed by a HeatLink-trained contractor and certified plumbing professional.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. HeatLink Group Inc.

1. Contact: 4603E 13th St NE, Calgary, AB, Canada, T2E 6M3; Toll free (800) 661-5332, Fax: (403) 250-1155; web: www.heatlink.com

B. Product Substitutions

1. Substitutions: HeatLink or Approved Equal.

2.2 COMPONENTS

A. PEX-a Tubing (½ inch (13 mm) to 2 in (51 mm) nominal size)

1. Material: Crosslinked polyethylene (PEX) manufactured by PEX-a or Engel method.
2. Type: HeatLink® – PureLink® Plus PEX-a.
3. In compliance with ASTM F876, ASTM F877, ASTM F2023, CAN/CSA B137.5, NSF/ANSI-14, NSF/ANSI-61, NSF/ANSI-372, and tested for compliance by an independent third party agency.
4. Standard grade hydrostatic design and pressure ratings from PPI TR-4.
5. Fire-rated assembly listings in accordance with CAN/ULC S101 and ANSI/UL 263 through certification listings with Underwriters Laboratories (UL) and Underwriters Laboratories of Canada (cUL), and Warnock Hersey (WH) – See INFO 33 (L2333) and 34 (L2334) for more details.

B. Pre-Sleeved Piping (½ inch (13 mm) to ¾ inch (19 mm) nominal size)

1. Material
   a. High Density Polyethylene (HDPE) corrugated sleeve with PEX-a carrier tubing.
2. Type: HeatLink® Pipe-in-Pipe.

C. PEX Expansion Ring

1. Material: Crosslinked polyethylene (PEX) manufactured by PEX-a or Engel method.
2. Type: HeatLink® PEX Expansion Ring.
3. In compliance with ASTM F877, ASTM F1960, CAN/CSA B137.5, and tested for compliance by an independent third party agency.

D. PEX-a Fittings: elbows, couplings, plugs, tees, adapters (½ inch (13 mm) to 2 in (51 mm) nominal size)

1. Material
   a. Modified Polyphenylsulfone.
   b. Polyphenylsulfone.
   c. UNS No. C69300 Eco Brass.
2. Type:
   a. HeatLink® PEX F1960 HPP fittings.
   b. HeatLink® PEX F1960 No Lead Brass fittings.
3. In compliance with ASTM F1960, ASTM F877, CAN/CSA B137.5, NSF/ANSI-14, NSF/ANSI-61, NSF/ANSI-372, and tested for compliance by an independent third party agency.
4. PEX tubing connection to each ASTM F1960 outlet by corresponding PEX expansion ring.

E. Manifolds

1. Material
   a. Polyphenylsulfone.
2. Type:
   a. HeatLink® PEX F1960 HPP Multiport Tees (EX13000 or EX14000 series).
3. In compliance with ASTM F1960, ASTM F877, CAN/CSA B137.5, NSF/ANSI-14, and tested for compliance by an independent third party agency.
4. PEX tubing connection to each ASTM F1960 outlet by corresponding PEX expansion ring.

F. Valves

1. Material

a. UNS No. C46500.

b. UNS No. C69300 Eco Brass.

2. Type: HeatLink® No Lead Ball Valves.

3. In compliance with ASTM F1807, NSF/ANSI-14, NSF/ANSI-61, NSF-ANSI 372, IAPMO/ANSI Z1157, and tested for compliance by an independent third party agency.

4. PEX tubing connection to each ASTM F1960 outlet by corresponding PEX expansion ring.

G. Accessories

1. Bend supports designed for maintaining tight radius bends are supplied by the PEX tubing manufacturer.

2. Press tools to install the Stainless Steel Press Sleeves are supplied by the PEX tubing manufacturer.

3. The tubing manufacturer provides clips for supporting tubing runs.

4. All horizontal tubing hangers and riser clamps are epoxy-coated material.

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions

1. Verify that site conditions are acceptable for installation of the PEX potable water system.

2. Do not proceed with installation of the PEX potable water system until unacceptable conditions are corrected.

3.2 INSTALLATION

A. Comply with manufacturer's product data, including product technical bulletins, installation instructions, design drawings, including the following.

B. PEX-a tubing installation

1. Install piping in compliance with HeatLink® F1960 PEX-a Potable Water Expansion System Installation Guide (L3240).

C. Through-penetration Firestop

1. Ensure compliance of one- and two-hour rated through penetration assemblies in accordance with CAN/ULC S115-05 and ASTM E814.

2. A list of firestop manufacturers that list PEX tubing with their firestop systems is available from the PEX tubing manufacturer.

D. Related Products Installation

1. Refer to other sections listed in Related Sections paragraph herein for related products installation.

3.3 FIELD QUALITY CONTROL

A. Site Tests

B. Manufacturer’s Field Services: Provide manufacturer’s field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer’s instructions.

1. Site Visits

3.4 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace damaged installed products.

C. Clean installed products in accordance with manufacturer’s instructions prior to owner’s acceptance.

D. Remove construction debris from project site and legally dispose of debris.

3.5 PROTECTION

A. Protect installed work from damage due to subsequent construction activity on the site.

B. Manifolds to be wrapped with plastic sheets for protection from dirt/dust, construction chemicals, and/or concrete in the course of construction.

End of Section