

Uponor Wirsbo



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This specification is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This specification is for PEX hot and cold potable water distribution systems. These products are manufactured by Uponor Wirsbo and marketed under the name AQUAPEX<sup>®</sup> Plumbing System. Revise the section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

**SECTION 15120  
PIPING SPECIALTIES  
(HOT AND COLD POTABLE WATER DISTRIBUTION)**

**PART 1 GENERAL**

1.01 SUMMARY

Specifier Note: The work covered by this section includes materials required to supply, install and pressure test cross-linked polyethylene (PEX) tubing manufactured by Uponor Wirsbo as shown on drawings or as specified. For the purpose of this specification, Uponor Wirsbo is hereby referred to as the PEX tubing manufacturer.

- A. Section Includes: Potable hot and cold water distribution system, using cross-linked polyethylene (PEX) tubing and applicable fittings.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 1 References Section may establish the edition date of standards. This article does not require compliance with standard. It is a listing of all references used in this section.

1.02 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. ASTM International
1. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
  2. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
  3. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
  4. ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
  5. ASTM F877 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
  6. ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing

- C. American National Standards Institute (ANSI)/National Sanitation Foundation (NSF)
  - 1. ANSI/NSF Standard 14 Plastics Piping System Components and Related Materials
  - 2. ANSI/NSF Standard 61 Drinking Water System Components - Health Effects
- D. American National Standards Institute (ANSI)/Underwriters Laboratories, Inc. (UL)
  - 1. ANSI/UL 263 Standard for Safety for Fire Tests of Building Construction and Materials
- E. Canadian Standards Association (CSA)
  - 1. CAN/CSA B137.5: Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications
- F. International Conference of Building Officials (ICBO)
  - 1. ICBO Evaluation Service (ES) Evaluation Report No. 5142
- G. Southern Building Code Congress International (SBCCI)
  - 1. SBCCI Standard Plumbing Code (PST and ESI Report #9661)
- H. International Plumbing Code (IPC)
- I. Building Officials and Code Administrators International (BOCA)
  - 1. 1993 BOCA National Plumbing Code
- J. International Association of Plumbing Officials (IAPMO)
  - 1. Uniform Plumbing Code (UPC)
- K. National Association of Plumbing, Heating and Cooling Contractors (NAPHCC)
  - 1. National Standard Plumbing Code (NSPC)
- L. U.S. Department of Housing and Urban Development (HUD)
  - 1. HUD Material Release No. 1269
- M. Plastics Pipe Institute (PPI)
  - 1. PPI Technical Report TR-4/03
- N. Uponor Wirsbo
  - 1. AQUAPEX Installation Handbook

Specifier Note: Article below should be restricted to statements describing design or performance requirements and functional (not dimensional) tolerances of a complete system. Limit descriptions to composite and operational properties required to link components of a system together and to interface with other systems.

1.03 SYSTEM DESCRIPTION

- A. Design Requirements.
  - 1. Standard Grade hydrostatic pressure ratings from Plastics Pipe Institute in accordance with TR-4/03. The following 3 Standard Grade ratings are required.
    - a. 200 degrees F (93 degrees C) at 80 psi (551 kPa)
    - b. 180 degrees F (82 degrees C) at 100 psi (689 kPa)
    - d. 73.4 degrees F (23 degrees C) at 160 psi (1102 kPa)
  - 2. Certification of flame spread/smoke development rating of 25/50 in accordance with ASTM E84 for the following PEX tubing sizes.
    - a. 3/8 inch (9.5 mm)
    - b. 1/2 inch (12.7 mm)
    - c. 3/4 inch (19.05 mm)
- B. Performance Requirements: Provide a PEX tubing hot/cold potable water distribution system, which has been manufactured, fabricated and installed to comply with regulatory agencies and to maintain performance criteria stated by the PEX tubing manufacturer without defects, damage or failure.

1. Comply with ANSI/NSF Standard 14.
2. Comply with ANSI/NSF Standard 61.
3. Comply with ASTM E119 and ANSI/UL 263.
  - a. UL Design No. L557 — 1 hour wood frame floor/ceiling assemblies
  - b. UL Design No. K913 — 2 hour concrete floor/ceiling assemblies
  - c. UL Design No. V444 — 1 hour steel stud/gypsum wallboard wall assemblies

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Division 1 Submittal Procedures Section.

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit manufacturer's product submittal data and installation instructions.
- C. Shop Drawings: Provide installation drawings indicating of tubing layout, manifold locations, plumbing fixtures supported and schedules with details required for installation of the system.
- D. Samples: Submit selection and verification samples of piping.
- E. Quality Assurance/Control Submittals: Submit the following.
  1. Test Reports: Upon request, submit test reports from recognized testing laboratories.
  2. Certificates: Submit the following.
    - a. Manufacturer's certificate that products comply with specified requirements.
    - b. Certificate indicating that the installer is authorized to install the manufacturer's products.
- F. Closeout Submittals: Submit the following.
  1. Warranty documents specified herein.
  2. Operation and maintenance data.

Specifier Note: Article below should include statements of prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 1 Quality Assurance Section.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having 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.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 1 Regulatory Requirements Section. Repetitive statements should be avoided.

- B. Regulatory Requirements and Approvals: Provide domestic potable system that complies with requirements of the following:
  1. International Plumbing Code (IPC)
    - a. ICBO Evaluation Service (ES) Evaluation Report No. 5142
    - b. SBCCI Standard Plumbing Code (PST and ESI Report #9661)
  2. Building Officials and Code Administrators International (BOCA)
    - a. 1993 BOCA National Plumbing Code
  3. Uniform Plumbing Code (UPC)

- a. IAPMO Files 3558, 3946 and 3960
- 4. National Standard Plumbing Code (NSPC)
- 5. HUD Material Release No. 1269
- C. Certifications: Provide letters of certification as follows.
  - 1. Installer is trained by the PEX tubing manufacturer to install the PEX potable water distribution system.
  - 2. Installer will utilize skilled workers holding a trade qualification license or equivalent, or apprentices under the supervision of a licensed trades person.

Specifier Note: Retain paragraph below if preinstallation meeting is required.

- D. Preinstallation Meetings: [Specify requirements for meeting.]. Verify project timeline requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

Specifier Note: Article below should include specific protection and environmental conditions required during storage. Coordinate article below with Division 1 Product Requirements Section.

**1.06 DELIVERY, STORAGE & HANDLING**

- A. General: Comply with Division 1 Product Requirement Section.
- B. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
  - 1. Store PEX tubing in cartons or under cover to avoid dirt or foreign material from being introduced into the tubing.
  - 2. Do not expose PEX tubing to direct sunlight for more than 30 days. If construction delays are encountered, provide cover to portions of tubing exposed to direct sunlight.

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 1 Closeout Submittals (Warranty) Section. Use this article to require special or extended warranty or bond covering the work of this section.

**1.07 WARRANTY**

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
  - 1. Warranty shall provide for repair or replacement of any tube or fittings that are proven to be defective.
  - 2. Warranty shall be transferable to subsequent owners.

Specifier Note: Coordinate subparagraph below with manufacturer's warranty requirements.

- 3. Warranty Period for PEX Tubing: 25 year non-prorated warranty against failure due to defect in material or workmanship, beginning with Date of Substantial Completion.
- 4. Warranty Period for Fittings: 10 year non-prorated warranty against failure due to defect in material or workmanship, beginning with Date of Substantial Completion.

**PART 2 PRODUCTS**

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 HOT/COLD POTABLE WATER DISTRIBUTION SYSTEM

Specifier Note: Paragraph below is an addition to CSI *SectionFormat*. Retain, edit or delete paragraph below to suit project requirements and specifier practice.

- A. Manufacturer: Uponor Wirsbo.
  - 1. Contact: 5925 148th Street West, Apple Valley, MN 55124; Telephone: (800) 321-4739, (952) 891-2000; Fax: (952) 891-1409; website: [www.wirsbo.com](http://www.wirsbo.com).

Specifier Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

Specifier Note: Specify materials to be furnished. This article may be omitted and the materials can be included with the description of a manufactured unit, equipment, component or accessory.

2.03 MATERIALS

- A. Tubing:
  - 1. Material: Cross-linked polyethylene (PEX) manufactured by PEX-a or Engel method.
  - 2. Type: Wirsbo AQUAPEX.
  - 3. Material Standard: Manufactured in accordance with ASTM F876 and ASTM F877 and tested for compliance by an independent third party agency.
  - 4. Standard Grade hydrostatic design and pressure ratings from PPI.
  - 5. Minimum Bend Radius (cold bending): No less than 6 times the outside diameter. Bends with a radius less than stated shall require the use of a bend support as supplied by the PEX tubing manufacturer.
  - 6. Nominal Inside Diameter: Provide tubing with nominal inside diameter, in accordance with ASTM F876 as indicated.
    - a. 3/8 inch (9.53 mm)
    - b. 1/2 inch (12.7 mm)
    - c. 3/4 inch (19.05 mm)
    - d. 1 inch (25.4 mm)
    - e. 1 1/4 inch (31.75 mm)
    - f. 1 1/2 inch (38.1 mm)
- B. Fittings:
  - 1. Material: Fitting assembly shall be manufactured from material listed in paragraph 5.1 of ASTM F1960.
  - 2. Material Standard: Comply with ASTM F1960.
  - 3. Type: PEX-A cold expansion fitting.
    - a. Assembly shall consist of the appropriate ProPEX insert with a corresponding PEX ring.
- C. Manifolds
  - 1. Material
    - a. Type "L" copper body with UNS 3600 series brass ProPEX outlet connections.
    - b. Polysulfone (PLS) or Engineered Plastic (EP) body with ProPEX outlet connections.
  - 2. Manifold Type
    - a. Wirsbo ProPEX 1" Copper Manifold.
    - b. Wirsbo AQUACENTER EP Manifold.

3. All manifolds manufactured with the appropriate sized ProPEX fittings on the manifold supply outlets.

D. Accessories

1. Angle stops and straight stops that are compatible with PEX tubing shall be supplied by the PEX tubing manufacturer.
2. Bend supports designed for maintaining tight radius bends shall be supplied by the PEX tubing manufacturer.
3. ProPEX expander tool to install the ASTM F 1960 compatible fittings shall be supplied by the PEX tubing manufacturer.
4. Clips and/or PEX rails for supporting tubing runs shall be provided by the tubing manufacturer.

**PART 3 EXECUTION**

Specifier Note: Article below is an addition to the CSI *SectionFormat*. Revise article below to suit project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's product data, including product technical bulletins, installation instructions and design drawings, including:
  1. AQUAPEX Installation Handbook

Specifier Note: Specify actions to physically determine that conditions are acceptable to receive primary products of the section.

3.02 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.

Specifier Note: Coordinate article below with manufacturer's recommended installation requirements.

3.03 INSTALLATION

- A. AQUAPEX Plumbing System:
  1. Install AQUAPEX Plumbing System in accordance with the tubing manufacturer's recommendations and as indicated in the installation handbook.
  2. Do not install PEX tubing within 6 inches (152 mm) of gas appliance vents or within 12 inches (305 mm) of any recessed light fixtures.
  3. Do not solder within 18 inches (457 mm) of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.
  4. Do not expose PEX tubing to direct sunlight for more than 30 days.
  5. Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tubing manufacturer.
  6. PEX tubing passing through metal studs shall use grommets or sleeves at the penetration.
  7. Protect PEX tubing with sleeves where abrasion may occur.
  8. Use strike protectors where PEX tubing penetrates a stud or joist and has the potential for being struck with a screw or nail.
  9. Tubing manufacturer supplied bend supports shall be used where bends are less than six times the outside pipe diameter.
  10. Tubing shall be supported to structural members using support methods required by local plumbing codes and the installation handbook.
  11. Pressurize AQUAPEX Plumbing System with air in accordance with applicable codes or in the absence of applicable codes to a pressure of 25 psi (173 kPa) above normal working pressure of the system.

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- 12. Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 32 degrees F (0 degrees C).
  - B. Through Penetration Firestop.
    - 1. Ensure 1 and 2-hour rated through penetration assemblies have been tested in accordance with ASTM E814.
    - 2. List of manufacturers that list PEX tubing with their firestop systems is available from the PEX tubing manufacturer.
  - C. Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related products installation.

Specifier Note: Specify the tests and inspections required for installed or completed work.

3.04 FIELD QUALITY CONTROL

- A. Site Tests:
  - 1. [Specify applicable test requirements to be performed during and after product installation.].
- 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: [Specify number and duration of periodic site visits.].

Specifier Note: Specify the final actions required to clean installed equipment or other completed work to properly function or perform. Coordinate article below with Division 1 Execution Requirements (Cleaning) Section.

3.05 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.

Specifier Note: Specify provisions for protecting work after installation but prior to acceptance by the owner. Coordinate article below with Division 1 Execution Requirements Section.

3.06 PROTECTION

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

**END OF SECTION**