



# Weaver

CONSTRUCTION MANAGEMENT

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## SUBMITTAL TRANSMITTAL

August 17, 2012

**Submittal No: 15060-002**

PROJECT: **Harold Thompson Regional WRF**  
Birdsall Rd.  
Fountain, CO 80817  
Job No. 2908

ENGINEER: **GMS, Inc.**  
611 No. Weber St., #300  
Colorado Springs, CO 80903  
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan  
Sewage Disposal District**  
901 S. Santa Fe Ave.  
Fountain, CO 80817  
719-382-5303 James Heckman

CONTRACTOR: **Mesa Plumbing**  
Gary Cunningham  
[gcunninghamph@qwestoffice.net](mailto:gcunninghamph@qwestoffice.net)

SUBJECT: PEX Water Service Tubing & RO Tubing for Operations Building

SPEC SECTION: 15060: Pipe and Pipe Fittings

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: \_\_\_ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and, unless indicated otherwise, has been found to be in conformance with the intent of the contract documents.

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Contractor's Stamp:

Engineer's Stamp:

Date: 8/17/12

Reviewed by: John Jacob

( ) Reviewed Without Comments

(X) Reviewed With Comments

ENGINEER'S  
COMMENTS: \_\_\_\_\_

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**Project: HDTWRF Project**

**Location: Fountain, CO**

**Supplier: Mesa Plumbing**

**Date: 8/16/12**

**Submittal 15060-002 PEX Water Service Tubing and RO Tubing for Operations Building**

**Additional Submittal Review Comments:**

- 1. Mesa Plumbing shall confirm cold water PEX will be blue color and hot water PEX shall be red color.**

**End of Review by WCM.**

# Uponor

## ENGINEERED PLASTIC (EP) FITTINGS

# Release Your Dependence on Costly Metal Fittings — Switch to Uponor's Engineered Plastic (EP) Fittings

Tired of the ever-rising cost of copper, brass and other metals used for fittings? Now you can forever release your need for metal by switching to Uponor's engineered plastic (EP) fittings.

EP is a broad term covering proven, high-performance plastics (with or without fillers or reinforcements), which have mechanical, chemical and thermal properties suitable for demanding applications.

Proven for over 10 years in plumbing applications, EP is used in installations that require the highest level of confidence, reliability and trust.

And EP fittings are quickly making their way into the professional plumbing sector. Tim Randles, commercial division manager of Monroe Plumbing in Burton, Ohio says after being introduced to EP fittings, his commercial division is sold on the product and all its benefits.

"I first heard about EP fittings while on a jobsite," says Randles. "Since using them, I have been extremely pleased with their durability and low cost."

Uponor offers several EP products designed to outperform and outlast other products because they resist corrosion, pitting, scaling and other issues associated with metal system components.

Featured in Uponor products such as ProPEX® fittings and EP branch and flow-through multi-port tees, EP is the material of choice among plumbing professionals. And when combined with Uponor's Wirsbo AQUAPEX® tubing, you can offer a completely clean, healthy and all-plastic plumbing system.

Gain confidence while watching your bottom line — choose Uponor EP fittings for all your installation needs.



- Resists high chlorine levels
- Resists ultraviolet light
- Millions of fittings in service
- No dangerous torches or smelly solvents and primer
- Holds tight in strength tests at 1,000 pounds of pull tension
- Resists corrosion, pitting, scaling and other issues associated with metal system components
- Visual system confirms tight connections and eliminates guesswork — can't be dry fit like other fitting systems
- Easily withstands hot and cold temperatures and high pressures well above the ASTM standard
- Combines with Uponor PEX tubing to offer a completely clean, healthy and all-plastic plumbing system — releasing the need for costly metals

# EP Fittings Frequently Asked Questions

EP is strong and durable, but without the corrosion problems and hefty price tag of copper and brass. Plumbers in the know are choosing EP because it stands up to harsh conditions and resists pitting, corroding and scaling associated with metal fittings. And since EP is made from plastic, it does not fall victim to the ever-rising cost of metals.

EP has proven itself in over 10 years of plumbing applications. In fact, other industry applications of EP include artificial hearts, kidney dialysis membranes and space suit visors. If EP can work in those situations, it can definitely work in your plumbing system.

Uponor offers a full line of EP products, including the EP Valved, Valveless and Flow-through Valveless (formerly AQUACENTER™) Manifolds, the EP Branch and Flow-through Multi-port Tees, and various elbows, couplings, end caps, plugs and faucet adapters. For a complete listing of our EP offering, refer to the Uponor Product Catalog.

Uponor's exclusive ProPEX connection method is compatible with all Uponor EP products. ProPEX connections are strong, reliable and durable and use the shape memory of PEX to form water-tight, leak-resistant connections.

ProPEX connections are certified to NSF 14 and 61, meet CSA Standard B137.5 and are manufactured to ASTM F1960.

## Uponor AquaPEX® White, Straight Length

Submittal Information  
Revision E: June 8, 2012

### Project Information

Job Name:

Location:

Part No. Ordered:

Engineer:

Date Submitted:

Contractor:

Submitted By:

Manufacturer's Representative:

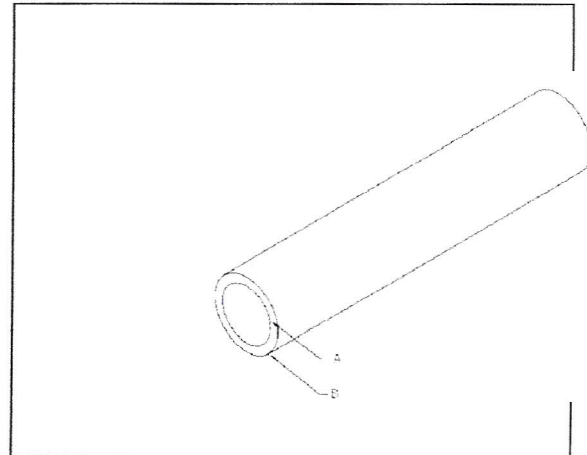
Approved By:

### Technical Data

Material: Crosslinked polyethylene  
PEX-a Engel Method; PEX 5106

Standard Grade  
Hydrostatic Ratings (PPI): 200°F (93°C) at 80 psi (551 kPa)  
180°F (82°C) at 100 psi (689 kPa)  
73.4°F (23°C) at 160 psi (1,103 kPa)  
½", ¾", 1", 1¼", 1½" and 2" Uponor AquaPEX® White  
tubing only: 120°F (49°C) at 130 psi (896 kPa)

Linear Expansion Rate: 1.10"/10°F/100' (27.94mm/5.56°C/30.48m)



### Product Information and Application Use

Uponor AquaPEX White, straight length tubing, is used for hot and cold domestic potable water distribution, residential fire safety and radiant heating and cooling systems containing no ferrous corrodible components or where ferrous components are isolated from the tubing.

✓	Description	Part Number	A	B	Weight
<input type="checkbox"/>	½" Uponor AquaPEX White, 20-ft. straight length, 500 ft.	F1930500	0.475"	0.625"	28.0 lbs.
<input type="checkbox"/>	¾" Uponor AquaPEX White, 20-ft. straight length, 300 ft.	F1930750	0.671"	0.875"	31.0 lbs.
<input type="checkbox"/>	1" Uponor AquaPEX White, 20-ft. straight length, 200 ft.	F1921000	0.862"	1.125"	35.0 lbs.
<input type="checkbox"/>	1¼" Uponor AquaPEX White, 20-ft. straight length, 100 ft.	F1921250	1.054"	1.375"	32.0 lbs.
<input type="checkbox"/>	1½" Uponor AquaPEX White, 20-ft. straight length, 100 ft.	F1921500	1.244"	1.625"	42.0 lbs.
<input type="checkbox"/>	2" Uponor AquaPEX White, 20-ft. straight length, 100 ft.	F1922000	1.629"	2.125"	68.1 lbs.
<input type="checkbox"/>	3" Uponor AquaPEX White, 20-ft. straight length, 60 ft.	F1923000	2.400"	3.125"	77.0 lbs.

### Installation

Use ProPEX® fittings<sup>1</sup> for ¾" through 2" tubing. Use WIPEX™ fittings for 3" tubing. Refer to the Uponor Professional Plumbing Installation Guide, Radiant Floor Heating Installation Handbook or AquaSAFE™ Residential Fire Sprinkler Installation Guide for more information.

### Standards

CSA B137.5; ASTM F876; ASTM F877; ASTM F1960; ASTM-E84; ASTM-E119/UL 263

### Codes

IPC; UPC; NSPC; NPC of Canada

### Listings

\*½", ¾", 1", 1¼", 1½" and 2" UL 1821; \*ULC/ORD - C 199 P; IAPMO; CSA; HUD; WARNOCK HERSEY; NSF; ITS; UL; ICC; ANSI/NSF 14- and 61-certified; AWWA C904<sup>2</sup>; CAN/ULC S102.2 (U.S.: ¾" diameter and smaller; Canada: 1" diameter and smaller)

### Related Applications

PEX-a Plumbing Systems  
AquaSAFE Residential Fire Safety Systems  
Radiant Heating and Cooling Systems

### Contact Information

Uponor, Inc.  
5925 148<sup>th</sup> Street West  
Apple Valley, MN 55124 USA  
Phone: (800) 321-4739  
Fax: (952) 891-2008  
www.uponorpro.com

Uponor Ltd.  
2000 Argentia Rd., Plaza 1, Ste. 200  
Mississauga, ON L5N 1W1 CANADA  
Phone: (888) 994-7726  
Fax: (800) 638-9517  
www.uponorpro.com

<sup>1</sup>ProPEX® is a registered trademark of Uponor, Inc. ProPEX™ is a trademark of Uponor Ltd.

<sup>2</sup>This listing is for ¾" AquaPEX tubing and larger.

# Uponor

Uponor, Inc.  
5925 148th Street West  
Apple Valley, MN 55124  
Toll Free: (800) 321-4739  
Phone: (952) 891-2000  
Fax: (952) 891-2008  
[www.uponor-usa.com](http://www.uponor-usa.com)

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, Inc. and marketed under the names Wirsbo AQUAPEX® tubing and ProPEX® fittings. Revise the section number and title below to suit project requirements, specification practices and section content. Refer to CSI 2004 *MasterFormat* for other section numbers and titles.

**Section 22 11 16**  
**Domestic Water Piping**  
**(Hot and Cold Water 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, Inc. as shown on drawings or as specified. This specification is for Wirsbo AQUAPEX or Wirsbo AQUAPEX plus tubing used with ProPEX fittings. For the purpose of this specification, Uponor, Inc. is hereby referred to as the PEX tubing manufacturer.

- A. Section includes: Potable hot and cold water distribution system, using crosslinked polyethylene (PEX) tubing and ASTM F1960 cold expansion fittings.

Specifier note: omit the following article 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 Cross-linked Polyethylene (PEX) Tubing
  - 5. ASTM F877 Standard Specification for Cross-linked 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 Code Council (ICC)
  - 1. International Plumbing Code (IPC)
  - 2. ICC Evaluation Service (ES) Evaluation Report No. ESR 1099
- G. Building Officials and Code Administrators International (BOCA)
  - 1. 1993 BOCA National Plumbing Code
- H. International Association of Plumbing Officials (IAPMO)
  - 1. Uniform Plumbing Code (UPC)
- I. National Association of Plumbing, Heating and Cooling Contractors (NAPHCC)
  - 1. National Standard Plumbing Code (NSPC)
- J. U.S. Department of Housing and Urban Development (HUD)
  - 1. HUD Material Release No. 1269
- K. Plastics Pipe Institute (PPI)
  - 1. PPI Technical Report TR-4/06
- L. Uponor, Inc.
  - 1. Uponor Professional Plumbing Installation Guide, 2006

Specifier note: In the following article, restrict 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 (PPI) in accordance with TR-3 as listed in TR-4. The following three standard-grade hydrostatic ratings are required.
  - a. 200°F (93°C) at 80 psi (551 kPa)
  - b. 180°F (82°C) at 100 psi (689 kPa)
  - c. 73.4°F (23°C) at 160 psi (1,102 kPa)
2. 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 sizes.
    1. 3/8 inch [9.53mm]
    2. 1/2 inch [12.7mm]
    3. 5/8 inch [15.88mm]
    4. 3/4 inch [19.05mm]
  - b. Tubing is wrapped with 1/2" fiberglass insulation with a flame spread of not more than 20 and a smoke-developed rating of not more than 30 and a nominal density of 4.0 to 4.5 pcf. Tubing can run with three tubes separated by zero inches and then 18 inches between the next group of three tubes for the following sizes.
    1. 3/8 inch [9.53mm]
    2. 1/2 inch [12.7mm]
    3. 5/8 inch [15.88mm]
    4. 3/4 inch [19.05mm]
    5. 1 inch [25.4mm]
    6. 1 1/4 inch [31.75mm]
    7. 1 1/2 inch [38.1mm]
    8. 2 inch [50.8mm]

B. Performance Requirements: To provide a PEX tubing hot and cold potable water distribution system, which is 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. Show compliance with ASTM F877.
4. Show compliance with ASTM E119 and ANSI/UL 263 through certification listings with Underwriters Laboratories, Inc. (UL).



- 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. U372 — 1 hour wood stud/gypsum wallboard wall assemblies
- d. UL Design No. V444 — 1 hour steel stud/gypsum wallboard wall assemblies

Specifier note: The following article 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 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 tubing.
- 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: The following article should include statements of prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate the following article with Division 1 Quality Assurance Section.

#### 1.05 Quality Assurance

- A. Installer Qualifications: 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.

Specifier note: The following paragraph 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. Avoid repetitive statements.

- B. Regulatory Requirements and Approvals: Provide domestic potable system that complies with requirements of the following:
  - 1. International Code Conference (ICC) – International Plumbing Code (IPC)

- a. ICC Evaluation Service (ES) Evaluation Report No. ESR 1099
  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 use skilled workers holding a trade qualification license or equivalent, or apprentices under the supervision of a licensed trades professional.

Specifier note: Retain the paragraph if pre-installation meeting is required.

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

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

#### 1.06 Delivery, Storage and 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 the following article 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. Uponor offers a limited warranty of up to 25 years for its Wirsbo AQUAPEX® tubing and Wirsbo hePEX™ tubing and ProPEX® Fittings when installed by an Uponor-trained contractor and certified plumbing professional. See [www.uponor-usa.com](http://www.uponor-usa.com) for details in the Customer Service section.

**Part 2 Products**

Specifier note: Retain the following article 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 and Cold Potable Water Distribution System**

Specifier note: The following paragraph is an addition to CSI *SectionFormat*. Retain, edit or delete the following paragraph to suit project requirements and specifier practice.

**A. Manufacturer: Uponor**

1. Contact: 5925 148th Street West, Apple Valley, MN 55124; Toll free (800) 321-4739, (952) 891-2000; Fax: (952) 891-2008; website: [www.uponor-usa.com](http://www.uponor-usa.com)

Specifier note: Edit the following article to suit project requirements. If substitutions are permitted, edit the following text. 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: Crosslinked 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. Fire-rated assembly listings in accordance with 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. U372 — 1-hour wood stud/gypsum wallboard wall assemblies
  - d. UL Design No. V444 — 1-hour steel stud/gypsum wallboard wall assemblies
6. Minimum Bend Radius (cold bending): No less than six times the outside diameter. Use a bend support as supplied by the PEX tubing manufacturer for tubing with a bend radius less than stated.
7. Nominal Inside Diameter: Provide tubing with nominal inside diameter, in accordance with ASTM F876 as indicated.
  - a.  $\frac{3}{8}$  inch [9.53mm]

- b. ½ inch [12.7mm]
- c. ¾ inch [19.05mm]
- d. 1 inch [25.4mm]
- e. 1¼ inch [31.75mm]
- f. 1½ inch [38.1mm]
- g. 2 inch [50.8mm]

#### B. Fittings

1. Material: Fitting assembly is 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 consists of the appropriate ProPEX insert with a corresponding ProPEX Ring.

#### C. Manifolds

1. Material
  - a. Type L copper body with UNS 3600 series brass ProPEX outlet connections
  - b. Engineered Plastic (EP) body with ProPEX outlet connections
2. Manifold Type
  - a. Uponor ProPEX 1" Copper Manifold
  - b. Uponor engineered plastic (EP) Manifold
3. All manifolds manufactured with the appropriate-sized ProPEX fittings on the manifold supply inlets.

#### D. Accessories

1. Angle stops and straight stops that are compatible with PEX tubing are supplied by the PEX tubing manufacturer.
2. Bend supports designed for maintaining tight radius bends are supplied by the PEX tubing manufacturer.
3. ProPEX expander tool to install the ASTM F1960 compatible fittings are supplied by the PEX tubing manufacturer.
4. The tubing manufacturer provides clips and/or PEX rails for supporting tubing runs.
5. All horizontal tubing hangers and riser clamps are epoxy-coated material.

### Part 3 Execution

Specifier note: The following article is an addition to the CSI *SectionFormat*. Revise the following article 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, design drawings and the Uponor Professional Plumbing Installation Guide.

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 the following article with manufacturer's recommended installation requirements.

### 3.03 Installation

#### A. Wirsbo AQUAPEX Tubing

1. Install Wirsbo AQUAPEX tubing 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 no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tubing manufacturer.
6. Use grommets or sleeves at the penetration for PEX tubing passing through metal studs.
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. Use tubing manufacturer-supplied bend supports where bends are less than six times the outside tubing diameter.
10. Minimum horizontal supports are installed not less than 32 inches between hangers in accordance with model plumbing codes and the installation handbook.
11. PEX riser installations require epoxy-coated riser clamps installed at the base of the ceiling per floor.
12. A mid-story support is required for riser applications.
13. Pressurize Wirsbo AQUAPEX tubing 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.
14. Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Do not use water to pressurize the system if ambient air temperature has the possibility of dropping below 32°F (0°C).

#### B. Through-penetration Firestop

1. Ensure compliance of one- and two-hour rated through penetration assemblies in accordance with ASTM E814.

2. A list of firestop 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 the following article 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**