

Ultraviolet (UV) Resistance of PEX Tubing



Contact

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The Plastics Pipe Institute

PPI Represents the Plastic Pipe Industry www.plasticpipe.org

- PPI was formed in 1950 to research and develop test methods for plastic pressure pipes
- Today: Non-profit trade association serving North America, based in Irving, TX

PPI Mission

- Improving quality of life today, and for generations to come, by championing the advancement, acceptance, and use of sustainable and resilient plastic pipe systems

PPI Members

- ~200 member firms involved with the North American plastic pipe industry

The Plastics Pipe Institute

PPI Building & Construction Division (BCD)

- BCD is focused on plastic pressure pipe and tubing systems used within buildings and on building premises for applications such as plumbing, water service, fire protection, hydronic heating & cooling, snow & ice melting, district energy heating & cooling, and ground source geothermal piping systems.

BCD Materials: CPVC, HDPE, PEX, PEX/AL/PEX, PE-RT, PE-RT/AL/PE-RT, and PP (PP-R & PP-RCT)

BCD homepage: plasticpipe.org/BuildingConstruction



Ultraviolet (UV) Resistance of PEX Tubing

Outline

1. Introduction to PEX tubing systems for plumbing applications
2. Effects of UV exposure on PEX tubing – Potential risks and solutions
3. PEX plumbing system standards and code compliance
4. Evaluating UV Resistance with ASTM Test Method F2657
5. PPI PEX Labeling Guidelines for UV resistance



1. Introduction to PEX Tubing Systems for Plumbing

PEX History & Overview

- Crosslinking PE into PEX was pioneered and patented in **1960s**
- PEX was introduced for radiant heating in the early **1970s** in Europe
- Introduced to USA and Canada in **1980s*** for heating and plumbing systems
- Adopted into the *BOCA National Plumbing Code* in **1993**
- PEX is a high-temperature flexible pressure piping system
- Today, PEX tubing systems are used for water service lines, hot- and cold-water distribution, residential fire protection, radiant heating & cooling, snow & ice melting, geothermal ground heat exchangers and other demanding applications



Courtesy Viega

* *The original PEX tubing standard **ASTM F876** was first published in 1984*

Introduction to PEX Tubing Systems for Plumbing

PEX Tubing: Poly Ethylene that is Crosslinked (X)

- Formal Definition – “A polyethylene material that has undergone a change in molecular structure through processing whereby a majority of the polymer chains are chemically linked.”

Source: ASTM F412, ASTM F876

- “Crosslinking of polyethylene into PEX for pipes results in improved properties such as elevated temperature strength and performance, chemical resistance, flexibility, and resistance to slow crack growth.” *Source: PPI Technical Note 17*

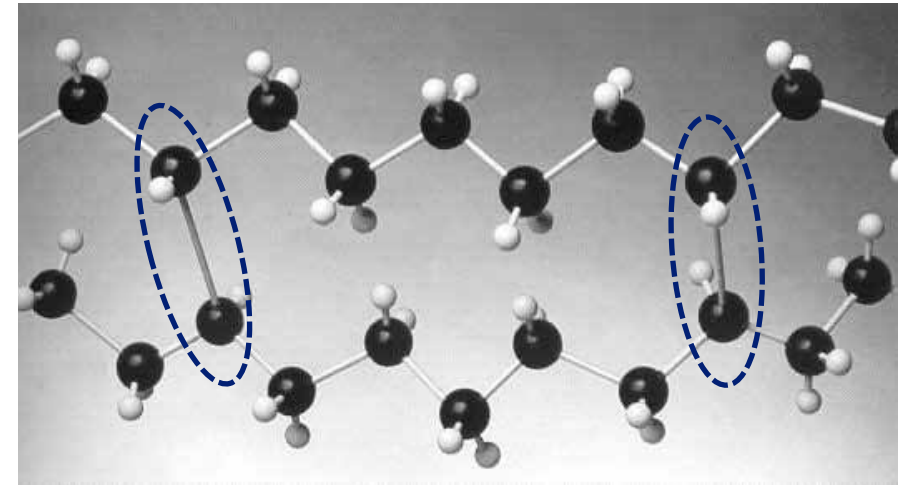


Illustration of a PEX “molecule”

Introduction to PEX Tubing Systems for Plumbing

PEX Tubing Configurations

- PEX plumbing tubing is currently produced in nominal tubing sizes from 1/4 to 4 (copper tube size)
- PEX is available in natural (white) or colors such as red, white, blue, black, orange
- PEX tubing is available in coils or straight lengths, depending on the customer preference and application



Courtesy BOW



Courtesy
REHAU

Introduction to PEX Tubing Systems for Plumbing

PEX Tubing Production Methods

The three common methods of crosslinking polyethylene are known as:

- **Peroxide (PEXa) method**
 - **Silane (PEXb) method**
 - **Electron beam (PEXc) method**
- Letter designations are not related to any type of performance rating system; based on chronological dates
- PEX tubing produced by each of these methods must meet the same technical requirements as specified in the relevant industry standards (e.g., ASTM, AWWA, CSA) and codes (e.g., IPC, NPC, NSPC, UPC)

See *PPI Technical Note 17* for more details about each method

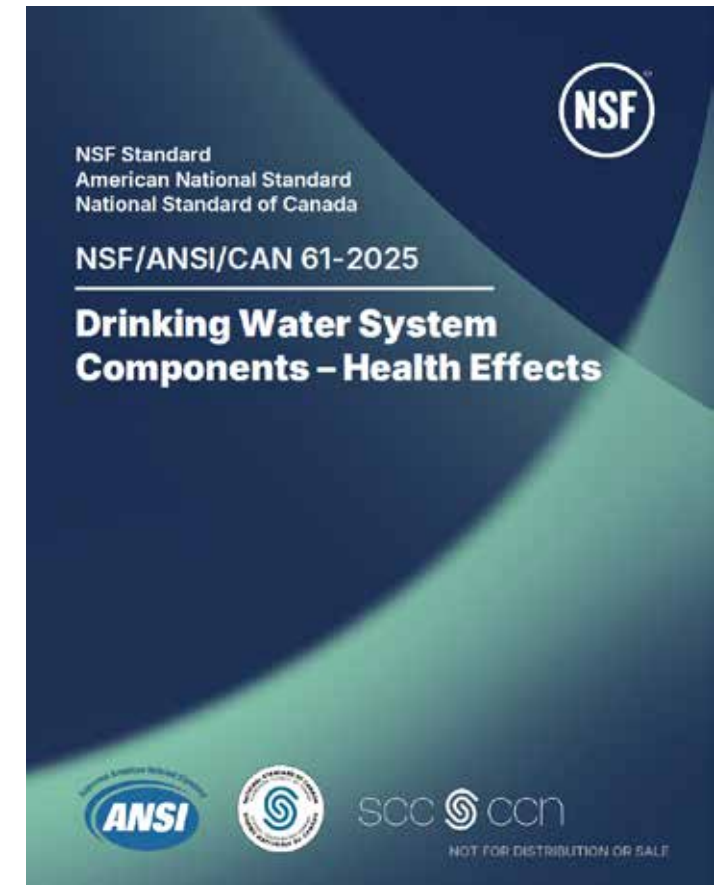
Introduction to PEX Tubing Systems for Plumbing

Drinking Water Safety

- PEX tubing and fittings intended for potable (drinking) water shall meet requirements of **NSF/ANSI/CAN 61** *Drinking Water System Components - Health Effects*

1.1 Purpose “This Standard establishes minimum health effects requirements for the chemical contaminants and impurities that are indirectly imparted to drinking water from products, components, and materials used in drinking water systems.”

NSF/ANSI/CAN 61 is updated regularly with stringent requirements



Introduction to PEX Tubing Systems for Plumbing

Drinking Water Safety

- PEX tubing and fittings intended for potable (drinking) water shall meet requirements of **NSF/ANSI/CAN 372 Drinking Water System Components - Lead Content**

1.1 Purpose “This Standard establishes procedures for the determination of lead content based on the wetted surface area of products.”

1.2 Scope “The standard applies to any drinking water system component that conveys or dispenses water for human consumption through drinking or cooking.”

NSF/ANSI/CAN 372 is updated regularly with stringent requirements

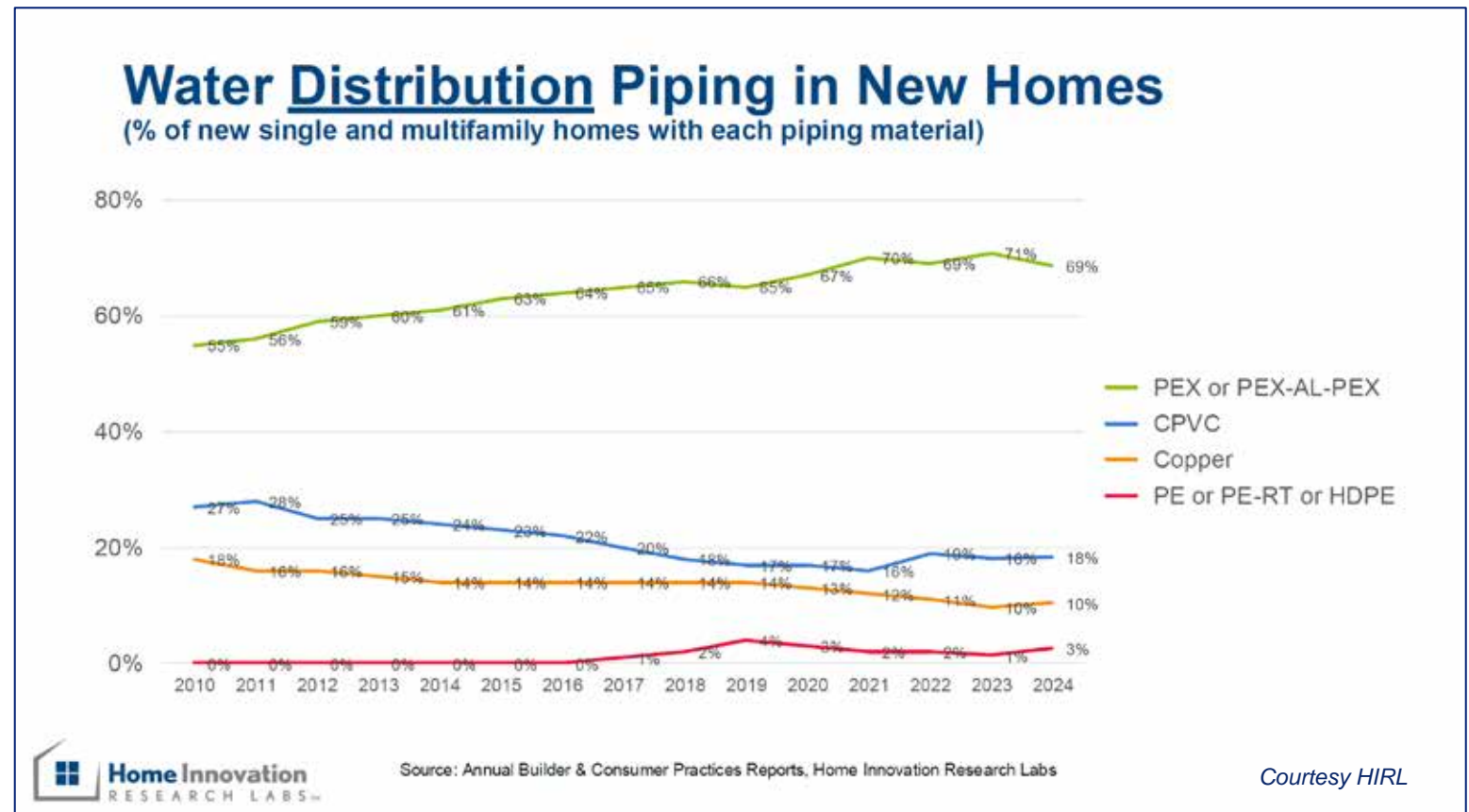




Introduction to PEX Tubing Systems for Plumbing

PEX is a Proven Success

- Since 1997, the usage of PEX tubing in residential plumbing has increased from less than 10% to **more than 65%**
- Source: HIRL Builders Practices Report, Oct. 2025
- PEX plumbing systems are also making steady gains in commercial plumbing systems, often as part of hybrid systems



Introduction to PEX Tubing Systems for Plumbing

Advantages of PEX Plumbing Systems

- Safety of potable water and long-term reliability
- Resistance to scale and mineral buildup
- Smooth wall, excellent flow characteristics
- Resistance to corrosion, erosion, water disinfectants
- Quiet operation, absorbs pressure surges (water hammer)
- Many fitting and joining options; no flame risk
- Flexibility to facilitate faster installations
- Potential for reduced installation costs
- Better heat retention, less condensation
- Freeze-break resistance (see PPI TR-52)
- Water conservation is assisted with reduced heat loss
- Proven long life, rigorous certifications, highly tested



2. Effects of UV Exposure on PEX – Potential Risks

Physical Effects of Excessive Sunlight / Ultraviolet (UV) Exposure

- The long-term performance of PEX tubing will be compromised by **excessive UV radiation** from sunlight
- **Excessive UV exposure** may make the PEX tubing become more susceptible to oxidative failure when exposed to potable hot chlorinated water
- UV damage is **not visible** to the naked eye and may degrade the material and reduce its service life



Effects of UV Exposure on PEX – Potential Risks

UV Resistance: Potential Threats

- The long-term performance of PEX tubing will be compromised by **excessive UV radiation** from sunlight
- PEX **should not** be stored outdoors or installed with exposure to sunlight

Solution:

- Users should keep PEX tubing stored indoors in the original packaging prior to installation for protection against UV/sunlight and other potential hazards

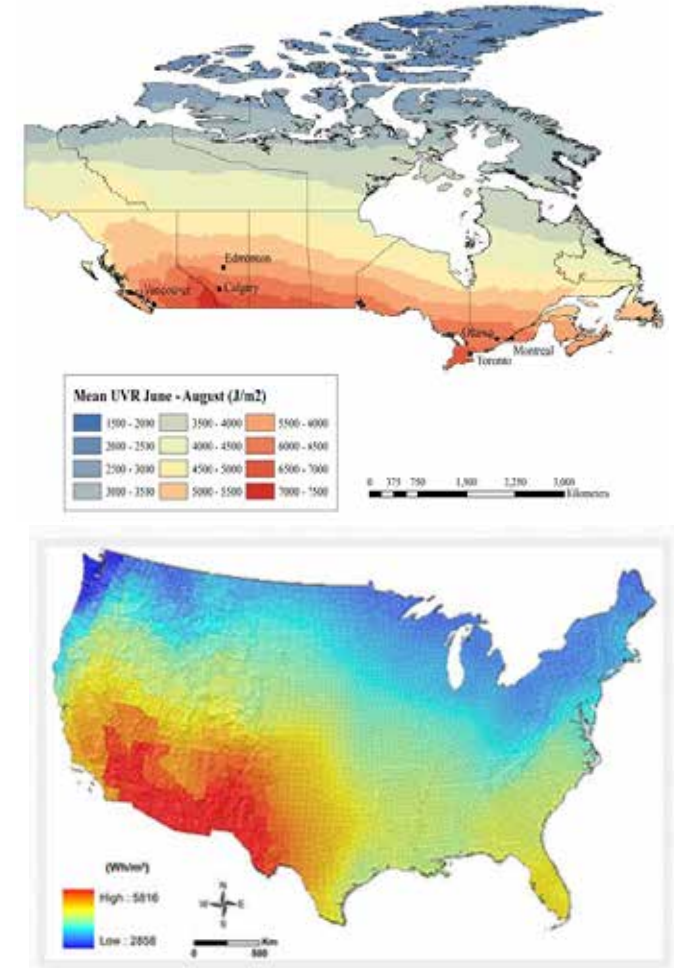
*Storing PEX tubing outdoors is **not permitted!***



Effects of UV Exposure on PEX – Potential Risks

UV Resistance: Potential Threats

- Actual UV intensity varies greatly across the US and Canada
- The risk of overexposure also varies based on location
- **Example Map (US):** *County Level UV Exposure Data for the Continental United States*
- <https://gis.cancer.gov/tools/uv-exposure/>
- **Example Map (Canada):** *Mean ultraviolet radiation for June through August, Canada, 1980-1990*
- <https://www150.statcan.gc.ca/n1/daily-quotidien/170517/mc-b001-eng.htm>



Effects of UV Exposure on PEX – Potential Risks

Excessive Sunlight / Ultraviolet (UV) Exposure due to Outdoor Installation

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight

Solution:

- Installers need to sleeve PEX tubing when installed outdoors to protect it against UV/sunlight and other potential hazards
- Example: PEX tubing used for outdoor hose bib at a dock

*Direct outdoor exposure is
not permitted!*



Effects of UV Exposure on PEX – Potential Risks

Excessive Sunlight / Ultraviolet (UV) Exposure due to Outdoor Installation

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight

Solution:

- Installers need to sleeve PEX tubing when installed outdoors to protect it against UV/sunlight and other potential hazards
- Example: PEX tubing used for outdoor shower at beach house

*Direct outdoor exposure is
not permitted!*



Effects of UV Exposure on PEX – Potential Risks

Excessive Sunlight / Ultraviolet (UV) Exposure due to Outdoor Installation

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight

Solution:

- Installers need to sleeve PEX tubing when installed outdoors to protect it against UV/sunlight and other potential hazards
- Example: PEX tubing used for outdoor water heater (Florida)



*Direct outdoor exposure is
not permitted!*

Effects of UV Exposure on PEX – Potential Risks

Excessive Sunlight / Ultraviolet (UV) Exposure due to Outdoor Installation

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight

Solution:

- Installers need to sleeve PEX tubing when installed outdoors to protect it against UV/sunlight and other potential hazards
- Example: PEX tubing exposed in open walls for unknown time

*Direct outdoor exposure is
not permitted!*





Effects of UV Exposure on PEX – Potential Risks

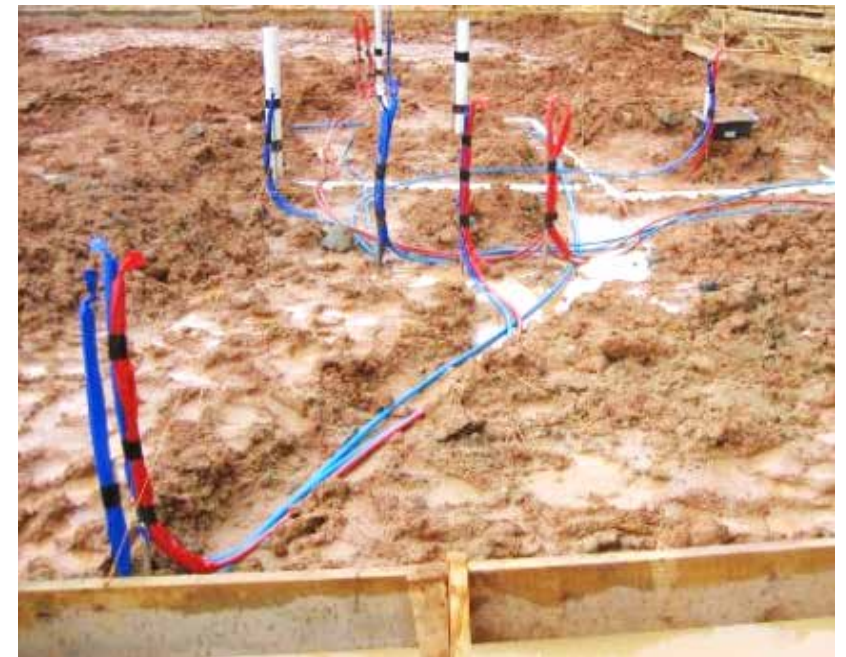
Excessive Sunlight / Ultraviolet (UV) Exposure due to Delays in Construction

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight
- Installed tubing should not be left exposed due to bad weather or other unforeseen construction delays

Solution:

- Installers need to cover installed PEX tubing with UV-blocking material (e.g., an opaque tarp or bags) if construction delays may result in excessive exposure time

If these plumbing pipes are not embedded in concrete within the approved UV exposure time, they should be covered with protective tarps





Effects of UV Exposure on PEX – Potential Risks

Excessive Sunlight / Ultraviolet (UV) Exposure due to Delays in Construction

- PEX **should not** be stored outdoors or installed with excessive exposure to sunlight
- Installed tubing should not be left exposed due to bad weather or other unforeseen construction delays

Solution:

- Installers need to cover installed PEX tubing with UV-blocking material (e.g., an opaque tarp or bags) if construction delays may result in excessive exposure time

If these radiant heating pipes are not embedded in concrete within the approved UV exposure time, they should be covered with protective tarps



Protecting PEX Against UV Exposure – Solutions

Creating a UV-resistant PEX tubing material is achieved through various methods:

- PEX manufacturers protect their PEX tubing from UV damage via several methods
- Formulations: Add UV Stabilizers or carbon black into the PEX compound (material)
- Special stabilizers can inhibit degradation of the polymer by continuously and cyclically removing free radicals that are produced by photo-oxidation of the polymer
- PEX manufacturers also publish the approved time period of UV resistance for their product using an ASTM test method (will be addressed later)



Courtesy Viega

Protecting PEX Against UV Exposure – Solutions

Creating a UV-resistant PEX tubing material is achieved through various methods:

- PEX manufacturers protect their PEX tubing from UV damage via several methods
- Coatings: Add barrier layers to the exterior of the PEX wall to protect the tubing itself
- UV-blocking and UV-absorbing colorants on the outside can protect the PEX material from contact with sunlight
- PEX manufacturers also publish the approved time period of UV resistance for their product using an ASTM test method (will be addressed later)



Courtesy REHAU

3. PEX Plumbing System Standards and Code Compliance

PEX Plumbing Tubing and System Standards

- There are three primary standards for PEX water distribution tubing and systems in North America:
 - **ASTM F876** *Standard Specification for Crosslinked Polyethylene (PEX) Tubing*
 - **ASTM F877** *Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems*
 - **CSA B137.5** *Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications*
- Model plumbing codes such as IPC, NSPC, UPC, and the NPC of Canada refer to these standards



PEX Plumbing System Standards and Code Compliance

PEX Plumbing Tubing Standards

- **ASTM F876** and **CSA B137.5** establish capabilities and test requirements for tubing, such as:
 - Dimensions
 - Degree of crosslinking
 - Quick burst pressures
 - Long-term pressure ratings
 - Chlorine resistance
 - **Outdoor weathering and UV resistance**
 - Excessive pressure-temperature capability
 - Hot-bend and cold-bend tests
 - Marking requirements
 - Even more...



PEX Plumbing System Standards and Code Compliance

Three Key PEX Tubing Properties with Categories for Performance

1. Chlorine Resistance
 2. Outdoor Weathering Exposure (UV) Resistance
 3. Hydrostatic Design Stress (HDS), related to pressure ratings
- Performance categories are defined in **ASTM F876 TABLE A1.1 “PEX Material Designation Codes”**

Property	Test Method	0	1	2	3	4	5	6	7	8	9
Chlorine Resistance (minimum 50 years)	F2023	Not tested or rated	75 % at 73°F and 25 % at 140°F	...	50 % at 73 °F and 50 % at 140 °F	...	100 % at 140°F	...	...	...	...
Minimum UV Resistance	F2657	Not tested or rated	1 month	3 months	6 months	...	...	...	...	...	...
HDS for water at 73 °F	D2837	...	...	...	...	...	...	630	...	800	...

PEX Plumbing System Standards and Code Compliance

UV Resistance: Evaluation

- UV resistance of PEX is evaluated according to **ASTM Test Method F2657**
- Natural exposure is based on worst-case North American location near Phoenix, AZ
- Tubing samples are mounted outdoors, facing **South**
- Samples are left outdoors until the required amount of UV exposure is accumulated (e.g., 30 days, 90 days)
- Then, chlorine testing is performed on exposed samples to detect any degradation in performance, as compared with tubing that was not exposed to sunlight
- Each PEX tubing manufacturer must have its tubing tested and evaluated according to **ASTM F2657**

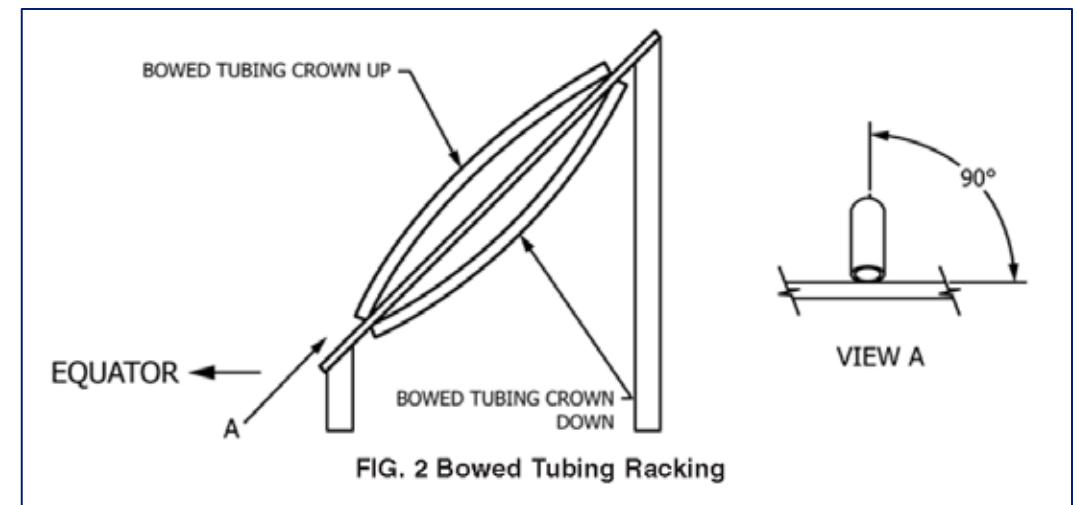


Fig. 2 from **ASTM F2657**

PEX Plumbing System Standards and Code Compliance

UV Resistance: Four (4) Categories of Performance (per ASTM F876/CSA B137.5)

0 = Not tested or not rated

1 = 1 month minimum UV resistance

2 = 3 months minimum UV resistance


3 = 6 months or more minimum UV resistance

- Digit '1' is the **Minimum** requirement for PEX plumbing tubing according to **ASTM F876**
- Look for a label or packaging describing the maximum allowed UV exposure time

4. Evaluating UV Resistance using ASTM F2657

UV Resistance: Evaluation using ASTM F2657

- **ASTM Standard Test Method F2657** provides PEX manufacturers with a recognized test method for establishing proven Outdoor Weathering and UV Resistance
- First published in 2007
- Latest edition 2025
- **ASTM F2657** utilizes actual outdoor UV exposure (no UV lamps) for actual amounts of claimed time
- E.g., A claim of 6 months UV resistance is based on actual 6 months of UV exposure in Arizona



Designation: F2657 – 25

Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing¹

This standard is issued under the fixed designation F2657; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This test method describes the procedure for exposing crosslinked polyethylene (PEX) tubing produced in accordance with Specification **F876** to natural (sunlight) ultraviolet (UV) radiation and evaluating the effects of the exposure. This test method outlines the requirements for specimen size and preparation, exposure orientation, minimum UV exposure energy, post exposure testing and reporting.

2. Referenced Documents

2.1 *ASTM Standards*:²

- D1435 Practice for Outdoor Weathering of Plastics**
- D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure**
- D1600 Terminology for Abbreviated Terms Relating to Plastics (Withdrawn 2024)**³
- F412 Terminology Relating to Plastic Piping Systems**
- F876 Specification for Crosslinked Polyethylene (PEX) Tubing**

Evaluating UV Resistance using ASTM F2657

UV Resistance: Evaluation using ASTM F2657

- UV resistance of PEX is evaluated according to ASTM Test Method **F2657**
- Natural exposure is based on worst-case North American location near **Phoenix, AZ**
- 3.2.6.1 Discussion - *UV Energy for Central Arizona was selected as it represents the worst-case North American location based on a 4-year average of 1998 through 2001. This information was provided by Atlas Material Testing Technology LLC. (ASTM F2657)*



Evaluating UV Resistance using ASTM F2657

UV Resistance: Evaluation using ASTM F2657

- Test samples must be exposed to **Total UV (TUV) Energy** as defined in **Table 1**
- Required UV exposures are based on historical values
- Each month of the year is different
- A month in Phoenix may be equivalent to 2 to 3 months in other locations (e.g., a northern location)
- See **Table 1 of ASTM F2657**

Nominal Exposure Time Period	TUV Solar Radiation MJ/m ²	Highest Consecutive UV Month Range
1 month	40	June
2 months	80	May-June
3 months	119	May-July
4 months	154	May-August
5 months	187	April-August
6 months	218	April-September
7 months	246	March-September
8 months	270	March-October
9 months	289	February-October
10 months	307	February-November
11 months	324	January-November
12 months	339	January-December

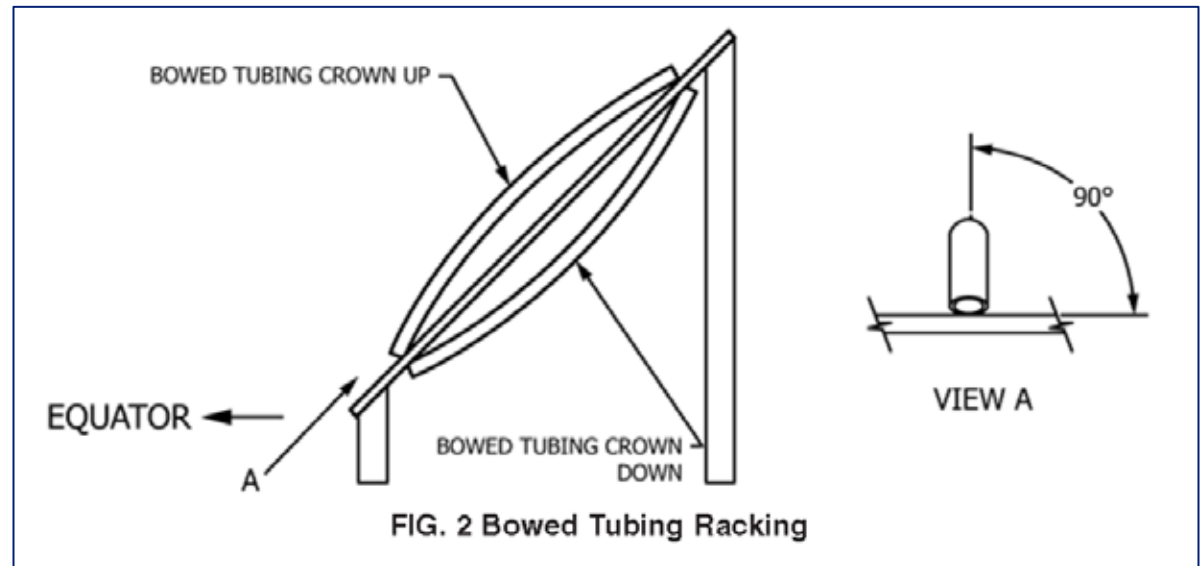
^A Solar UV radiation is based on Central Arizona 5° off horizontal for the 4 year period of 1998 through 2001 as reported by Atlas and Testing and Technology LLC.

Evaluating UV Resistance using ASTM F2657

UV Resistance: Evaluation using ASTM F2657

- PEX tubing samples are mounted outdoors, facing **South**
- The actual UV exposure is measured daily for each set of test samples
- Samples are left outdoors until the desired amount of UV exposure is accumulated (e.g., 30 days, 90 days)
- Outdoor weathering is also an aspect of this test
- A claim of 6 months UV resistance is based on actual 6 months of UV exposure in Arizona

Fig. 2 from ASTM F2657



Evaluating UV Resistance using ASTM F2657

UV Resistance: Evaluation using ASTM F2657

- After exposure, testing to evaluate resistance to hot-chlorinated water is performed on UV-exposed samples according to **ASTM F2023** detect any degradation in performance, as compared with new tubing that was not exposed to sunlight
- Each PEX tubing manufacturer must have its tubing tested and evaluated according to **ASTM F2657**
- All PEX UV-resistance claims are based on rigorous field testing using worst-case conditions for UV followed by worst-case conditions for chlorine

Sec. 9 from ASTM F2657

9. Post UV-Exposure Testing

9.1 Test UV-Exposed Specimens generated in Section 8 to either 9.2 or 9.3. When required, test non UV-exposed specimens in accordance with 9.4.

9.2 *Oxidative Resistance Testing to Test Method F2023*—test the exposed specimens at one temperature and pressure condition in accordance with Test Method F2023. Test all specimens to failure. All failures shall be Stage III brittle oxidative failures. See Specification F876.

Evaluating UV Resistance using ASTM F2657

Achieving UV Resistance Certification for PEX Tubing (Example):

- If *Manufacturer X* wants to claim **6-month UV resistance** for their blue potable PEX, they must:

1. Submit the blue potable PEX samples to **test lab** (e.g., third-party certifier)
2. Lab exposes samples to UV exposure equivalent to **6 months radiation** (218 MJ) according to **F2657**
3. After exposure, lab performs chlorine testing on samples to ensure that performance is maintained, as compared with *unexposed* samples of the same PEX material
4. If chlorine test result is satisfactory, then **6-month** UV resistance claim is verified



Such a PEX would earn a ‘**3**’ for UV Resistance in the **PEX Material Designation Code** (e.g., “x**3**06”)

See **PPI TN-17** for more information about **PEX Material Designation Codes**

5. PPI PEX Labeling Guidelines

PPI TN-32 *UV Labeling Guidelines for Crosslinked Polyethylene (PEX) Tubing and Pipe*

- PPI TN-32 provides recommended UV labeling guidelines for PEX manufacturers, for consistency
- *Originally published in 2004, latest edition 2025*
- Sample label language:

NOTICE

- Keep PEX stored indoors in the original packaging prior to installation for protection against UV/sunlight and other potential hazards.
- Do not store unprotected PEX outdoors.
- The long-term performance of PEX will be compromised by excessive UV radiation from sunlight.
- To prevent UV damage, ensure that exposure to sunlight during installation does not exceed the maximum allowable UV exposure time of **X¹** days.
- UV damage is not visible to the naked eye and may degrade the material and reduce its service life.



ULTRAVIOLET (UV) LABELING
GUIDELINE FOR CROSSLINKED
POLYETHYLENE (PEX)
TUBING AND PIPE

TN-32

2025



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PPI PEX Labeling Guidelines

PPI TN-32 *UV Labeling Guidelines for Crosslinked Polyethylene (PEX) Tubing and Pipe*

- PPI TN-32 provides recommended UV labeling guidelines for PEX manufacturers, for consistency
- *Originally published in 2004, latest edition 2025*
- Actual example of “UV Notice label” on PEX packaging:

CAUTION

REHAU's cross-linked polyethylene (PEXa) pipe is made to the highest standards according to applicable requirements and based on more than forty years of manufacturing experience. In all radiant floor heating, snow & ice melting, plumbing, geothermal, fire protection, service line and other applications, handling and installation procedures are important to successful system operation. Therefore, installers must comply with the following, when using REHAU's PEXa pipe:


Handling:

- Do not store PEXa pipe outdoors.
- Keep PEXa pipe in its original packaging until time of use to protect it from sunlight, dirt, damage, etc.
- Do not store straight lengths of PEXa pipe in racks with sharp edges, or in a way that will cause deformation of the pipe.

UV Exposure:

The following limits apply to UV (sunlight) exposure for REHAU PEXa pipes. Contact REHAU for further information on UV exposure recommendations:

■ RAUPEX Non-Barrier:	Maximum exposure time of 15 days accumulated.
■ RAUPEX O ₂ Barrier:	Maximum exposure time of 90 days accumulated.
■ RAUPEX UV Shield:	Maximum exposure time of 1 year accumulated.
■ MUNICIPEX Pipe:	Maximum exposure time of 1 year accumulated.
■ RAUGEO Pipe:	Maximum exposure time of 1 year accumulated.
■ RAUGEO Helix Coil:	Maximum exposure time of 15 days accumulated.



Installation:


- Installers should be properly trained by REHAU or a REHAU Authorized Representative.
- In addition to all local and national codes, installers must follow all REHAU Technical Guidelines including but not limited to technical manuals, installation guides, technical bulletins and product submittals. The most current and applicable versions of all the technical literature is available on the REHAU North America website at na.rehau.com/resourcecenter.

Specific to handling and installing REHAU's PEXa pipe, the following key technical guidelines must be considered:

**ULTRAVIOLET (UV) LABELING
GUIDELINE FOR CROSSLINKED
POLYETHYLENE (PEX)
TUBING AND PIPE**

TN-32

2025



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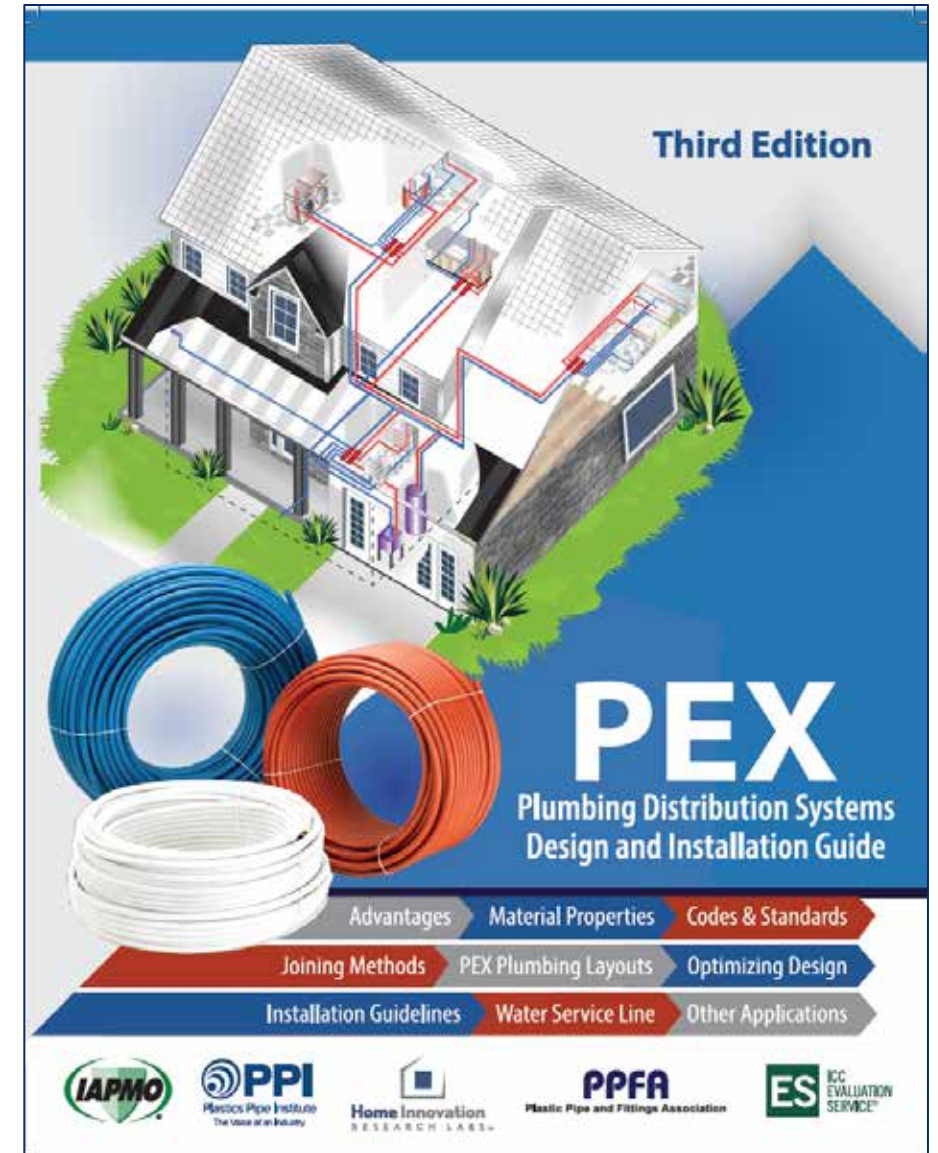
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Additional Information

See *PEX Plumbing Distribution Systems Design and Installation Guide* Third Edition

Free download:

- PPI Building & Construction Division
www.plasticpipe.org/buildingconstruction



Additional Information

See *PEX Plumbing Distribution Systems Design and Installation Guide* Third Edition

- **Outdoor Weathering / Ultraviolet (UV) Exposure** in **Ch. 3** educates about the need for UV caution

Free download:

- PPI Building & Construction Division
www.plasticpipe.org/buildingconstruction

Outdoor Weathering / Ultraviolet (UV) Resistance

Like most plastics, the long-term performance of PEX will be affected by ultraviolet (UV) radiation from sunlight. Although most PEX tubing has good UV resistance, PEX tubing should not be stored outdoors where it is exposed to the sun. PEX tubing should not be installed outdoors unless buried in earth or properly protected from UV exposure, either direct or indirect.

Indirect (diffused) and reflected sunlight also emit UV energy. If PEX will be exposed to sunlight continuously after installation, such as in an unfinished basement, installers should cover the pipe with a UV-blocking sleeve or pipe insulation as approved by the PEX manufacturer.

To ensure the reliability of PEX tubing systems when exposed to sunlight, it is a requirement of the industry standards ASTM F876 and CSA B137.5 that all PEX tubing intended for use with potable water has a minimum UV resistance of 1 month when tested in accordance with **ASTM Test Method F2657 Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing**. ASTM F876-25 states, "PEX tubing intended for use in the transport of potable water shall comply with the requirements for a second digit of "1" or higher in the PEX Material Designation Code." See the previous section "PEX Material Designation Code" for more details about UV resistance requirements.

Each PEX tubing manufacturer publishes the maximum recommended UV exposure time limit based on the UV resistance of each type and color of PEX tubing, as determined in accordance with ASTM F2657 and the requirements published in ASTM F876. Central Arizona is used as the basis of the exposure time limits as it represents the worst-case North American location for UV energy. As part of the test procedure, exposed pipes are then re-tested for chlorine resistance in accordance with ASTM F2023 and must show no significant reduction in pipe lifetime.

Additional Information

See *PEX Plumbing Distribution Systems Design and Installation Guide Third Edition*

- **PEX Tubing Installation Practices**
in **Ch. 9** educates about the need for UV protection

Free download:

- PPI Building & Construction Division
www.plasticpipe.org/buildingconstruction

Like most plastics, the long-term performance of PEX will be affected by ultraviolet (UV) radiation from sunlight. Although most PEX tubing has good UV resistance (see **Chapter 3 Material Properties**), PEX tubing should not be stored outdoors where it is exposed to the sun, or interior locations (i.e., indoors) directly exposed to sunlight (see **Figure 9.1**).

PEX tubing should not be installed outdoors, unless buried in earth or properly protected from UV exposure, either direct or indirect. Indirect (diffused) and reflected sunlight also emit UV energy.

If PEX will be exposed to sunlight continuously after installation, such as in an unfinished basement, installers should cover the pipe with a UV-blocking sleeve or pipe insulation that is approved by the PEX manufacturer.



Figure 9.1 PEX Tubing Stored Outdoors



Figure 9.2 Sharp Objects Can Damage PEX

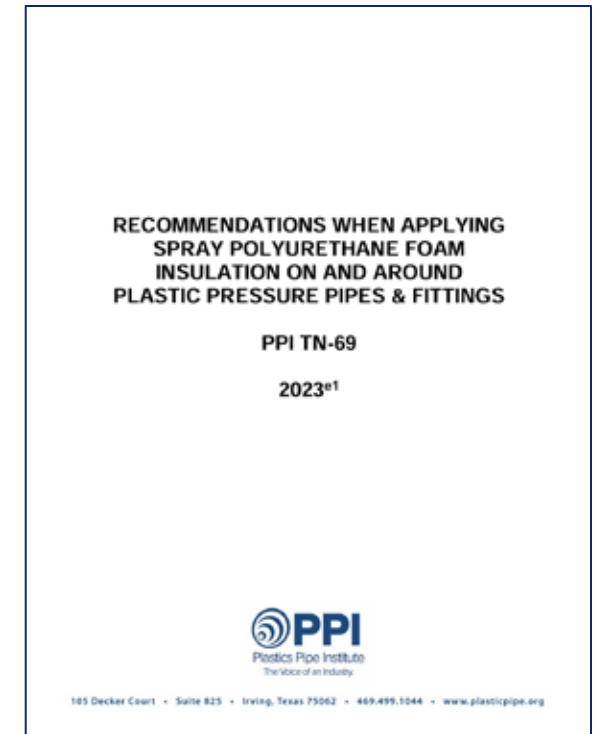
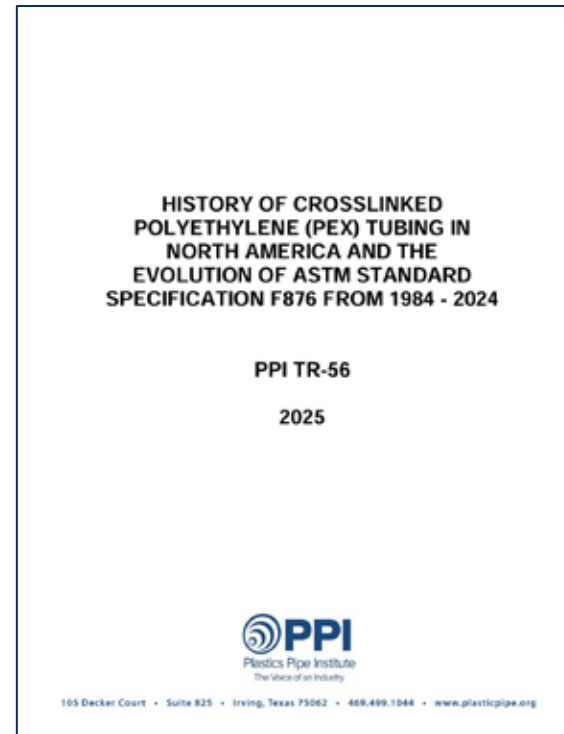
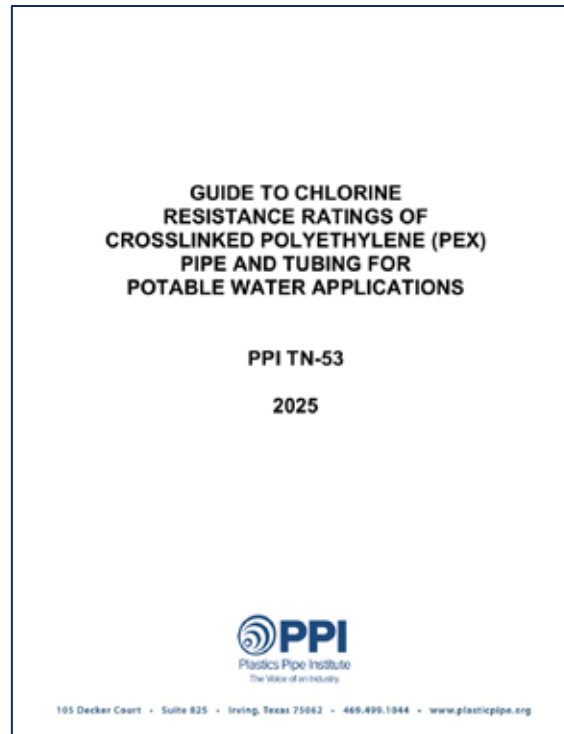
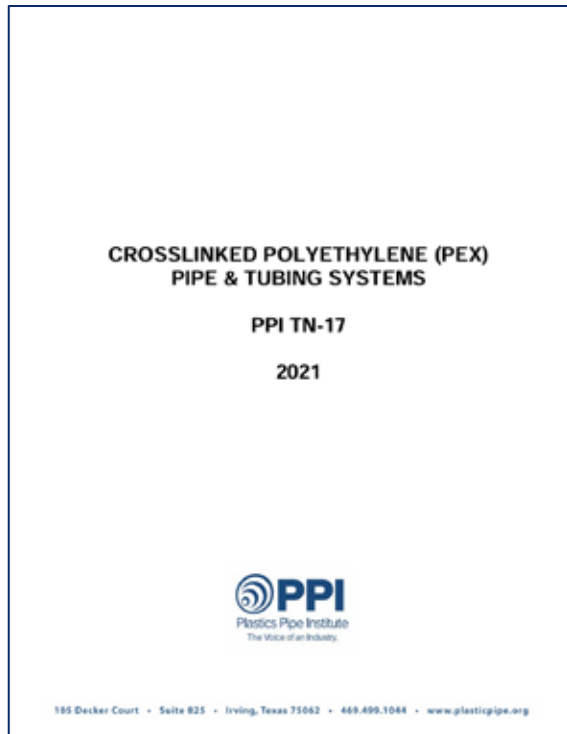


Figure 9.3 Objects that Can Damage PEX

Additional Information on PEX for Plumbing Applications

Other PPI publications on PEX tubing

- Visit PPI Building & Construction Division www.plasticpipe.org/buildingconstruction



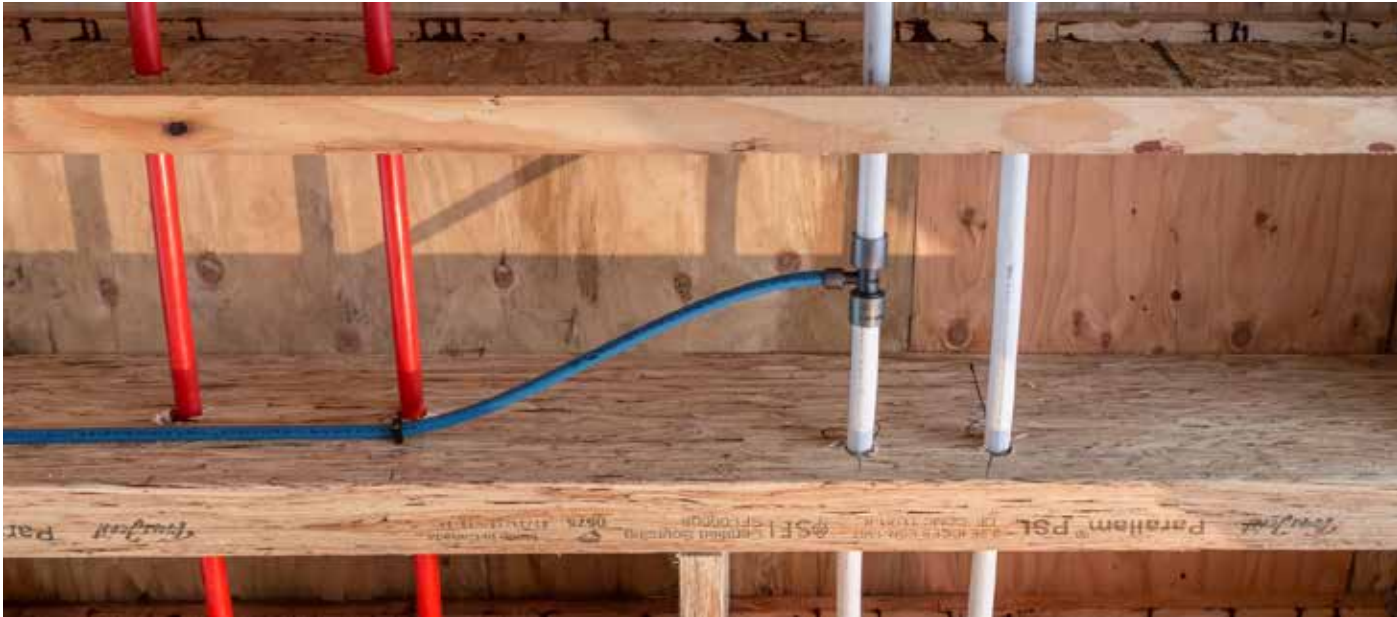
Ultraviolet (UV) Resistance of PEX Tubing

Conclusions

1. PEX tubing systems for plumbing applications were introduced
2. Potential risks of excessive UV exposure on PEX tubing were explained, and various solutions were provided
3. PEX plumbing system standards were described
4. ASTM Test Method F2657 for Evaluating UV Resistance shown
5. PPI PEX Labeling Guidelines for UV resistance were provided



Ultraviolet (UV) Resistance of PEX Tubing



Contact

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