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CSI: DIVISION: 22 00 00—PLUMBING  
Section: 22 11 16—Domestic Water Piping  
DIVISION: 23 00 00—HEATING, VENTILATING AND AIR CONDITIONING (HVAC)  
Section: 23 21 13—Hydronic Heating

**Product certification system:**

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

**Products:** Aquatechnik Safety®-Plus PEX-AL-PEX Pipe and Fitting System

**Listee:** Aquatechnik Group s.p.a  
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**Compliance with the following codes:**

2024, 2021, 2018, 2015, 2012, 2009, 2006, and 2003 *International Plumbing Code*® (IPC)  
2024, 2021, 2018, 2015, 2012, 2009, 2006, and 2003 *International Residential Code*® (IRC)  
2024, 2021, 2018, 2015, 2012, 2009, 2006, and 2003 *International Mechanical Code*® (IMC)  
2024, 2021, 2018, 2015, 2012, 2009, 2006, and 2003 *Uniform Plumbing Code*® (UPC)\*  
2024, 2021, 2018, 2015, 2012, 2009, 2006, and 2003 *Uniform Mechanical Code*® (UMC)\*  
2022, 2019, 2016, 2013 and 2010 *California Plumbing Code* (CPC)  
2022, 2019, 2016, 2013 and 2010 *California Mechanical Code* (CMC)  
2023, 2020 and 2017 *City of Los Angeles Plumbing Code*  
2023, 2020 and 2017 *City of Los Angeles Mechanical Code*  
2021, 2017 and 2007 *Code of Massachusetts Regulation 248 CMR 10.00: Uniform State Plumbing Code*  
2021, 2017 *Massachusetts State Building Code 780 CMR Ninth Edition: Chapter 28*  
2017 *Uniform Illustrated Plumbing Code - India*™ (UIPC-I)\*  
2020, 2015 and 2010 *National Plumbing Code of Canada*® (NPC)\*\*

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**Compliance with the following standards:**

ASTM F1281-2023a, Standard Specification for Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Pressure Pipe  
NSF/ANSI 14-2022, Plastic Piping Systems Components and Related Materials  
NSF/ANSI/CAN 61-2022, Drinking Water System Components – Health Effects

*Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.*

CSA B137.10-2023 Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX)  
Composite Pressure Pipe Systems

Identification:

**Pipe:** The Aquatechnik PEX-AL-PEX pipe shall be marked every 5 feet (1.5 m) with the following: company name or trademark, material (PEX-AL-PEX), nominal size (for example, 1216), temperature and pressure ratings, ASTM F1281 designation, production code, pipe intended for the transport of potable water shall also include marking such as “PW” or “potable water”, the ICC-ES PMG listing mark.

**Fittings:** Fittings shall be marked with manufacturer’s name or trademark, and the ICC-ES PMG listing mark.

Installation:

Aquatechnik Safety®-Plus PEX-AL-PEX piping and fittings must be installed in accordance with the manufacturer’s published installation instructions, the applicable codes and this listing. Where differences exist, the instructions in this listing must govern.

**Water Distribution:** Horizontally laid pipe must be secured in such a manner that temperature-induced expansion and contraction are accommodated. In areas using the Uniform Plumbing Code (UPC), piping must not be installed within the first 18 inches (457 mm) of piping connected to a water heater. The system may be installed in concrete in accordance with the manufacturer’s instructions. The piping must be secured to the concrete reinforcement (i.e. “rebar”) to hold it in place while pouring concrete. When embedment is in concrete, installation, including minimum concrete cover, must comply with IBC Section 1907, or IRC Section R506.1, as applicable.

**Water Service:** Buried piping must be installed in such a manner that external loads do not decrease the vertical dimension of the cross section by more than 5 percent. Piping must be installed to provide an allowance for contraction of the line due to temperature change prior to backfilling. In areas with poor soil conditions (plastic clays), the trench bottom must be prepared using granular material to provide a stable base. Potable water service piping must not be located in, under or above cesspools, septic tanks, septic tank drainage fields or pits.

**Water Distribution and Water Service Piping:** Installed piping must be pressure-tested and inspected as required by IPC Section 606.6, IRC Section P2503.6 or UPC Section 103.5.

**Hydronic Piping Systems:** The installation must comply with Chapter 12 of the applicable mechanical code(s) and the manufacturer’s published installation instructions. Details of the design and installation of the hydronic piping system must be submitted to the code official for approval. All circuits must be formed from continuous lengths of piping, from manifold supply to return. No splices are allowed. The system may be installed in either concrete or wood floors. When the system is embedded in concrete floors, a moisture barrier must be laid over a concrete base slab a minimum of 3½ inches (38 mm) thick. Under-floor insulation and reinforcing mesh must then be placed on the slab. The piping must be uncoiled and attached to the mesh using soft steel wire. A concrete topping is then laid over the piping. When embedment is in concrete, installation, including minimum concrete cover, must comply with IBC Section 1906.3, or IRC Section R506.1, as applicable. When the piping is installed over polystyrene boards, the boards must comply with IBC Section 2603, or IRC Section R314, as applicable.

Antifreeze protection may be achieved by the addition of chemicals detailed in Item 1 of the Conditions of Listing, below. The quantity of these allowed chemicals required to achieve a specific freeze protection level is beyond the scope of this listing. Addition of antifreeze to the radiant heating loop must be in accordance with the manufacturer’s installation instructions and the material safety data sheet (MSDS).

Mounting brackets and installation hardware are provided by the manufacturer. Horizontally laid pipe must be secured in such a way that temperature-induced expansion and contraction are accommodated.

**Hydronic Piping:** The piping must be pressure-tested for leaks before installation of covering, as noted in Section 1208 of the IMC, Section 1207 of the UMC, or Section M2103.3 of the IRC, as applicable. The leak test must be witnessed by the code official or the code official's designated representative.

Models:

The pipe and fitting products have a maximum working temperature of 203°F (95°F) and a maximum working pressure of 145 psi (1 MPa). Fittings and pipe must be joined by a method of expansion with a double o-ring and proprietary non back off threads. Flanged, threaded, copper solder, and grooved adapter fittings are available for joining to other materials. Both pipe and fittings were tested as a system and fully meet the requirements of CSA B137.10 and ASTM F1281-2017 including Annex A2.

**Pipe:** Aquatechnik Safety®-Plus PEX-AL-PEX pipe is manufactured from cross-linked polyethylene (PEX) and aluminum materials satisfying ASTM F1281. The pipe is available in nominal pipe sizes from 1/2 inches (1216 mm) to 2-1/2 inches (6075 mm) (6075 mm).

Aquatechnik Safety®-Plus pipe are white in color with longitudinal red or blue stripe for potable water distribution or gray stripe for hydronic heating applications. The blue strip pipe is for cold water applications only. Pipe is also available in violet color for irrigation applications.

COD	Dimensions	Bar Length
74154U	1/2" x 0.08"	13 ft / 19 ft.
74156U	5/8" x 0.08"	13 ft / 19 ft.
74158U	7/8" x 0.12"	13 ft / 19 ft.
74160U	1" x 0.12"	13 ft / 19 ft.
74162U	1 1/4" x 0.14"	13 ft / 19 ft.
74164U	1 1/2" x 0.16"	13 ft / 19 ft.
74166U	2" x 0.18"	13 ft / 19 ft.
74168U	2 1/2" x 0.20"	13 ft / 19 ft.
74170U	3" x 0.28"	13 ft / 19 ft.

COD	Dimensions	Roll Length
74004U1	1/2" x 0.08"	100 ft.
74004U10	1/2" x 0.08"	1000 ft.
74008U3	5/8" x 0.08"	300 ft.
74008U5	5/8" x 0.08"	500 ft.
74010U3	7/8" x 0.12"	300 ft.
74012U1	1" x 0.12"	100 ft.

**Fitting:** Aquatechnik Safety®-Plus PPS Fittings of the following sizes can only be used on Aquatechnik PEX-AL-PEX pipe; fittings cannot be used with pipe from other manufacturer.

COD	Description	Dimension
20002U	THREADED JOINT MALE, safety-plus, with PPS NPT thread	M1/2" - sm1/2"
20006U		M1/2" - sm5/8"
20010U		M3/4" - sm5/8"
20012U		M3/4" - sm7/8"

20013U		M1"-sm $\frac{7}{8}$ "
20016U		M1" - sm1"
20018U		M 1 $\frac{1}{4}$ " - sm 1 $\frac{1}{4}$ "
20028U		M 1 $\frac{1}{2}$ " - sm 1 $\frac{1}{2}$ "
20033U		M 2" - sm 2"
20039U		M 2 $\frac{1}{2}$ " - sm 2 $\frac{1}{2}$ "
20062U	THREADED JOINT FEMALE, safety-plus, with PPS NPT thread	F $\frac{1}{2}$ " - sm $\frac{1}{2}$ "
20066U		F $\frac{1}{2}$ " - sm $\frac{5}{8}$ "
20070U		F $\frac{3}{4}$ " - sm $\frac{5}{8}$ "
20072U		F $\frac{3}{4}$ " - sm $\frac{7}{8}$ "
20073U		F1" - sm $\frac{7}{8}$ "
20076U		F1" - sm1"
20076U		F 1" - sm 1"
20078U		F 1 $\frac{1}{4}$ " - sm 1 $\frac{1}{4}$ "
20088U		F 1 $\frac{1}{2}$ " - sm 1 $\frac{1}{2}$ "
20093U		F 2" - sm 2"
20122U		REDUCER, safety-plus
20126U	sf $\frac{7}{8}$ " - sm $\frac{1}{2}$ "	
20130U	sf $\frac{7}{8}$ " - sm $\frac{5}{8}$ "	
20132U	sf1" - sm $\frac{1}{2}$ "	
20136U	sf1" - sm $\frac{5}{8}$ "	
20138U	sf1" - sm $\frac{7}{8}$ "	
20142U	sf 1 $\frac{1}{4}$ " - sm $\frac{1}{2}$ "	
20144U	sf 1 $\frac{1}{4}$ " - sm $\frac{5}{8}$ "	
20146U	sf 1 $\frac{1}{4}$ " - sm $\frac{7}{8}$ "	
20148U	sf 1 $\frac{1}{4}$ " - sm 1"	
20156U	sf 1 $\frac{1}{2}$ " - sm 1"	

20158U		sf 1½" - sm 1¼"
20166U		sf 2" - sm 1"
20168U		sf 2" - sm 1¼"
20170U		sf 2" - sm 1½"
20178U		sf 2½" - sm 1"
20180U		sf 2½" - sm 1¼"
20182U		sf 2½" - sm 1½"
20184U		sf 2½" - sm 2"
20212U	THREADED ELBOW FEMALE, safety-plus, with PPS NPT thread, with bracket	F½" - sm½"
20216U		F½" - sm <sup>5</sup> / <sub>8</sub> "
20222U	THREADED ELBOW FEMALE, safety-plus, with PPS NPT thread	F½" - sm½"
20226U		F½" - sm <sup>5</sup> / <sub>8</sub> "
20230U		F¾" - sm <sup>5</sup> / <sub>8</sub> "
20232U		F¾" - sm <sup>7</sup> / <sub>8</sub> "
20238U		F1" - sm1"
20282U	THREADED ELBOW MALE, safety-plus, with PPS NPT thread	M½" - sm½"
20286U		M½" - sm <sup>5</sup> / <sub>8</sub> "
20288U		M¾" - sm <sup>5</sup> / <sub>8</sub> "
20290U		M¾" - sm <sup>7</sup> / <sub>8</sub> "
20296U		M1" - sm1"
20332U	THREADED ELBOW FEMALE/FEMALE, safety-plus, with PPS NPT thread and turning cap	F½" - sf½"
20336U		F½" - sf <sup>5</sup> / <sub>8</sub> "
20337U		F¾" - sf <sup>7</sup> / <sub>8</sub> "
20338U		F1" - sf1"
20342U	THREADED ELBOW MALE/FEMALE, safety-plus, with PPS NPT thread and turning cap	M½" - sf½"
20344U		M½" - sf <sup>5</sup> / <sub>8</sub> "

20346U		M <sup>3</sup> / <sub>4</sub> " - sf <sup>7</sup> / <sub>8</sub> "
20348U		M1" - sf1"
20352U	ELBOW 90°MALE/FEMALE, safety- plus, with turning cap	sf <sup>1</sup> / <sub>2</sub> " - sm <sup>1</sup> / <sub>2</sub> "
20356U		sf <sup>5</sup> / <sub>8</sub> " - sm <sup>5</sup> / <sub>8</sub> "
20358U		sf <sup>7</sup> / <sub>8</sub> " - sm <sup>7</sup> / <sub>8</sub> "
20360U		sf1" - sm1"
20362U		sf1 <sup>1</sup> / <sub>4</sub> " - sm1 <sup>1</sup> / <sub>2</sub> "
20382U		ELBOW 90°, safety-plus
20386U	sm <sup>5</sup> / <sub>8</sub> " - sm <sup>5</sup> / <sub>8</sub> "	
20388U	sm <sup>7</sup> / <sub>8</sub> " - sm <sup>7</sup> / <sub>8</sub> "	
20390U	sm1" - sm1"	
20392U	sm 1 <sup>1</sup> / <sub>4</sub> " - sm 1 <sup>1</sup> / <sub>4</sub> "	
20394U	sm 1 <sup>1</sup> / <sub>2</sub> " - sm 1 <sup>1</sup> / <sub>2</sub> "	
20396U	sm 2" - sm 2"	
20398U	sm 2 <sup>1</sup> / <sub>2</sub> " - sm 2 <sup>1</sup> / <sub>2</sub> "	
20402U	ELBOW 90°FEMALE/FEMALE, safety-plus, with turning cap	sf <sup>1</sup> / <sub>2</sub> " - sf <sup>1</sup> / <sub>2</sub> "
20406U		sf <sup>5</sup> / <sub>8</sub> " - sf <sup>5</sup> / <sub>8</sub> "
20408U		sf <sup>7</sup> / <sub>8</sub> " - sf <sup>7</sup> / <sub>8</sub> "
20410U		sf1" - sf1"
20416U	ELBOW 45°, safety-plus	sm <sup>5</sup> / <sub>8</sub> " - sm <sup>5</sup> / <sub>8</sub> "
20418U		sm <sup>7</sup> / <sub>8</sub> " - sm <sup>7</sup> / <sub>8</sub> "
20420U		sm1" - sm1"
20422U		sm 1 <sup>1</sup> / <sub>4</sub> " - sm 1 <sup>1</sup> / <sub>4</sub> "
20424U		sm 1 <sup>1</sup> / <sub>2</sub> " - sm 1 <sup>1</sup> / <sub>2</sub> "
20426U		sm 2" - sm 2"

20428U		sm 2½" - sm 2½"
20432U	ELBOW 45° M/F, safety-plus	sm 5⁄8" - sm 5⁄8"
20433U		sm 7⁄8" - sm 7⁄8"
204234U		sm 1" - sm 1"
20435U		sm 1¼" - sm 1¼"
20436U		sm 1½" - sm 1½"
20442U		PIPE COUPLING, safety-plus
20446U	sm 5⁄8" - sm 5⁄8"	
20448U	sm 7⁄8" - sm 7⁄8"	
20450U	sm 1" - sm 1"	
20452U	sm 1¼" - sm 1¼"	
20454U	sm 1½" - sm 1½"	
20456U	sm 2" - sm 2"	
20458U	sm 2½" - sm 2½"	
20472U	REDUCED PIPE COUPLING, safety-plus	sm 5⁄8" - sm ½"
20480U		sm 7⁄8" - sm 5⁄8"
20522U	NIPPLES FEMALE/FEMALE, safety-plus, with turning cap	sf ½" - sf ½"
20526U		sf 5⁄8" - sf 5⁄8"
20528U		sf 7⁄8" - sf 7⁄8"
20530U		sf 1" - sf 1"
20532U		sf 1¼" - sf 1¼"
20532U		sf 1½" - sf 1½"
20542U	THREADED TEE FEMALE, safety-plus, with PPS NPT thread	sm ½" - F ½" - sm ½"
20546U		sm 5⁄8" - F ½" - sm 5⁄8"
20550U		sm 7⁄8" - F ¾" - sm 7⁄8"

20556U		sm1" - F1" - sm1"	
20592U	ECCENTRIC THREADED TEE FEMALE, safety-plus, with PPS NPT thread, with spacer brackets	sm½" - F½" - sm½"	
20596U		sm⅝" - F½" - sm⅝"	
20662U		sm½" - sm½" - sm½"	
20666U	TEE, safety-plus	sm⅝" - sm⅝" - sm⅝"	
20668U		sm⅞" - sm⅞" - sm⅞"	
20670U		sm1" - sm1" - sm1"	
20672U		sm 1¼" - sm 1¼" - sm 1¼"	
20674U		sm 1½" - sm 1½" - sm 1½"	
20676U		sm 2" - sm 2" - sm 2"	
20678U		sm 2½" - sm 2½" - sm 2½"	
20717U		REDUCED TEE, safety-plus	sm⅝" - sm½" - sm½"
20720U			sm⅝" - sm½" - sm⅝"
20725U	sm⅞" - sm½" - sm⅞"		
20728U	sm⅞" - sm⅝" - sm⅞"		
20732U	sm1" - sm½" - sm1"		
20735U	sm1" - sm⅝" - sm1"		
20736U	sm1" - sm⅞" - sm1"		
20740U	sm1¼" - sm½" - sm1¼"		
20742U	sm1¼" - sm⅝" - sm1¼"		
20744U	sm1¼" - sm⅞" - sm1¼"		
20746U	sm 1¼" - sm 1" - sm 1¼"		
20750U	sm1½" - sm½" - sm1½"		
20754U	sm1½" - sm⅝" - sm1½"		



20756U		sm1½"- sm⅞"- sm1½"
20758U		sm1½"- sm1"- sm1½"
20760U		sm 1½"- sm 1¼"- sm 1½"
20762U		sm 2"- sm1½"- sm 2"
20766U		sm 2"- sm⅝"- sm 2"
20768U		sm 2"- sm⅞"- sm 2"
20770U		sm 2"- sm1"- sm 2"
20772U		sm 2"- sm1¼"- sm 2"
20774U		sm 2" - sm 1½" - sm 2"
20788U		sm 2½" - sm 2" - sm 2½"
20632U	THREADED T FEMALE ANGLE 90°, safety-plus, with no-lead brass thread and bracket	sf16 - F½"-sf16
20902U		sm½"
20906U		sm⅝"
20908U		sm⅞"
20910U		sm1"
20912U	CLOSING CAP M, safety-plus	sm 1¼"
20914U		sm 1½"
20916U		sm 2"
20918U		sm 2½"
20952U		sf½"
20956U		sf⅝"
20958U		sf⅞"
20960U	CLOSING CAP F, safety-plus	sf1"
20962U		sf 1¼"
20964U		sf 1½"

20966U	CAP, safety-plus, PA-M	sf 2"
20968U		sf 2½"
39102U		½"
39106U		⅝"
39108U		⅞"
39110U		1"
39112U		sf 1¼"
39114U		sf 1½"
39116U		sf 2"
39118U		sf 2½"

Conditions of Listing:

1. Where used in radiant heating systems, the pipe and fittings are recognized for use with water, as well as aqueous solutions of ethylene glycol or propylene glycol for antifreeze, up to 100 percent concentrations of either glycol.
2. When installation is in fire-resistance-rated assemblies, evidence of compliance with IBC Section 714 (penetrations) must be provided to the code official for approval.
3. During placement of cover over the piping, the pipe must be maintained at the greater of 1½ times the working pressure or 215 psi (1500 kPa).
4. Each installation must be pressure-tested for leaks in the presence of the code official or the code official's designated representative.
5. Clearances from heat-producing equipment must be in accordance with the applicable code.
6. Hydronic piping systems that utilize a non-potable heat transfer fluid must not be connected to the potable water system except through the use of approved devices such as backflow preventers or double-walled heat exchangers.
7. For jurisdictions enforcing the IPC, for water supply and distribution, heat-fusion joints must be installed in accordance with IPC Section 605.20.1.
8. Pipe and Fittings recognized in this listing are under a quality control program with surveillance inspections two times per year by ICC-ES.