

## ICC-ES PMG Listing

PMG-1015

Reissued: November 1, 2009

*This listing is subject to re-examination in one year.*[www.icc-es.org/pmg](http://www.icc-es.org/pmg) | (800) 423-6587 | (562) 699-0543

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CSI: DIVISION: 15—MECHANICAL  
Section: 15180—Heating and Cooling Piping

Products: Viega LLC's ProRadiant line, including ViegaPEX™ Barrier, and FostaPEX® cross-linked polyethylene (PEX) tubing and PEX Press and PEX Crimp fitting systems, for use in radiant heating systems.  
Viega LLC's Climate Panels

Listee: Viega LLC  
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Compliance with the following codes:

2009 *International Mechanical Code*® (IMC)  
2009 *International Residential Code*® (IRC)  
2009 IAPMO *Uniform Mechanical Code*\* (IAPMO UMC)\*

\**Uniform Mechanical Code* is a copyrighted publication of the International Association of Plumbing and Mechanical Officials, 5001 East Philadelphia Street, Ontario, California 91716.

Compliance with the following standards:

ASTM F 876, Standard Specification for Crosslinked Polyethylene (PEX) Tubing  
ASTM F 877, Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems  
LC1004

Identification:

**Tubing:** The Viega LLC ProRadiant ViegaPEX™ Barrier, and FostaPEX® tubing covered by this listing must be labeled at minimum intervals of 5 feet (1524 mm) with the manufacturer's name and/or trademark (Viega), product name (ProRadiant ViegaPEX™ Barrier, and FostaPEX® tubing), nominal tubing size, standard dimension ratio (SDR 9), material designation (PEX 1006), temperature and pressure rating [160 psi at 73°F and 100 psi at 180°F], ASTM F 876/F 877 designation, mark of the inspection agency (NSF International, AA-633), and either the ICC-ES PMG listing number (PMG-1015) or the ICC-ES PMG listing mark.

**Fittings:** The Viega LLC PEX Press fittings covered by this listing must be labeled with the Viega trademark, nominal size, product code, and ASTM F 877 designation. Packages of fittings must bear the Viega LLC name, product name, model number and either the ICC-ES PMG listing number (PMG-1015) or the ICC-ES PMG listing mark.

**Climate Panels:** Climate Panels are labeled with the Viega name and the product name and either the ICC-ES PMG listing number (PMG-1015) or the ICC-ES PMG listing mark.

*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, Inc., express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.*



**Installation:**

**General:** Viega LLC tubing and fittings must be manufactured, identified and installed in accordance with this listing, the applicable code and the manufacturer's published installation instructions. Manufacturer's published installation instructions must be furnished to the code official. Installation must conform with the requirements of the applicable code, and is subject to approval by the code official having jurisdiction. The outer and aluminum layers of Fosta PEX® tubing must be removed with a tool supplied by Viega LLC before a pipe/fitting joint is made. Typical installation details are shown in Figures 1 – 11.

**Inspection:** The tubing must be pressure-tested for leaks before installation of covering, as noted in Section 1208 of the IMC 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.

**Climate Panels:** When the tubing is installed using Viega LLC Climate Panels on top of wood subfloors, in concrete floors or on walls, the Climate Panels must be installed in accordance with the manufacturer's instructions, the applicable code and this listing. After the panels have been installed, the tracks must be vacuumed of debris, and a bead of silicone sealant must be placed in the track prior to installation of the PEX tubing. Batt insulation must be installed beneath the subfloor in the joist cavity. See Figures 1, 2 and 3. When the tubing is installed in a poured gypsum underlayment or in a lightweight concrete pour over a wood subfloor, the tubing must be stapled to the wood subfloor. Batt insulation is installed beneath the floor in the joist cavity. See Figure 4. When the tubing is located between the joists beneath a wood-framed floor, aluminum heat-emission plates can be installed over the tubing. The tubing is inserted into the plates, which are stapled to the underside of the wood subfloor. Batt insulation is installed directly beneath the aluminum plates in the joist cavity. See Figure 5. When the tubing is located between the joists beneath a wood-framed subfloor, the tubing must be suspended beneath the subfloor with plastic clips. The PEX tubing must not come in direct contact with the wood subfloor. Batt insulation is installed in the joist cavity with a 2- to 3-inch (51 to 76 mm) air gap beneath the subfloor. See Figure 6. When the tubing is installed in wood-framed ceilings, the Climate Panels are nailed or stapled in place perpendicular to the ceiling joists. The tubing is then uncoiled and pressed into place in the Climate Panels. Typical installations are illustrated in Figure 7. When the tubing is installed in wood-framed walls, the installation begins at floor level on the exterior wall. The Climate Panels are installed parallel to the floor, six rows high, to avoid interference with window and picture placement. The Climate Panels are screwed to the studs on both sides of the groove. One-half-inch-thick (12.7 mm) spacers must be attached to the remainder of the stud wall to provide an even base for the wall covering. Typical installations are illustrated in Figure 8. Installation and design of the heating system for each type of construction must conform to the manufacturer's instructions and Chapter 12 of the IMC or Chapter 21 of the IRC, and is subject to approval by the code official. The system must be installed by Viega LLC-trained installers. Mounting brackets and installation hardware are provided by Viega LLC. Horizontally laid pipe must be secured in such a manner that temperature-induced expansion and contraction are accommodated. Minimum bending radius is 8 times the outside tube diameter of the PEX tube. The outside tube diameter is the nominal diameter plus  $\frac{1}{8}$  inch (3.2 mm). Tubing must be protected from prolonged exposure to direct sunlight or fluorescent lighting, and must be protected from physical damage with an oversized flexible sleeve at structural mass penetrations and when the tube is uncovered. Loops must always be formed from continuous lengths of tubing.

**Models: Tubing:**

**General:** The ViegaPEX™ Barrier and FostaPEX® tubing products are manufactured from cross-linked polyethylene (PEX) materials satisfying NSF 61, as well as ASTM F 876 and F 877. Viega LLC tube and fitting products are pressure-rated for 100 psi (689 kPa) at 180°F (82°C), for a standard dimension ratio of 9. The standard dimension ratio is the ratio of tube outside diameter to the wall thickness and is constant for all Viega LLC tube sizes.

ViegaPEX™ Barrier is black with a red stripe and is composed of four layers: PEX, an oxygen barrier, a second oxygen barrier, and an outer black layer that sports the red stripe. ViegaPEX™ Barrier is available in  $\frac{5}{16}$ -,  $\frac{3}{8}$ -,  $\frac{1}{2}$ -,  $\frac{5}{8}$ -,  $\frac{3}{4}$ -, 1-,  $1\frac{1}{4}$ -,  $1\frac{1}{2}$ -inch (7.9, 9.5, 12.7, 15.9, 19.1, 25.4, 31.7, and 38.1 mm) nominal diameter sizes in coils ranging from 100 to 4000 feet (30.5 m to 1220 m) in length, and is also available in straight lengths of 20 feet (6.1 m).

FostaPEX<sup>®</sup> tubing has a fully dimensional inner layer of ViegaPEX<sup>™</sup> with the addition of an aluminum layer and an outer polyethylene layer. FostaPEX<sup>®</sup> tubing is silver or red in color and available in 1/2-, 3/4- and 1-inch (12.7, 19.1, and 25.4 mm) nominal diameter sizes. Silver FostaPEX<sup>®</sup> is available in coils ranging from 150 to 400 feet (45.8 to 122 m) in length, and in straight lengths of 20 feet (6.1 m). Red FostaPEX<sup>®</sup> is available in 150-foot (45.8 m) coils.

#### Fittings:

The PureFlow<sup>®</sup> PEX Press fitting system is used with ViegaPEX<sup>™</sup> Barrier and FostaPEX<sup>®</sup> tubing. The outer and aluminum layers of Fosta PEX<sup>®</sup> tubing must be removed with a tool supplied by Viega LLC before a pipe/fitting joint is made. The fittings are bronze, insert-type with either an external or attached, stainless steel press sleeve. The fittings must be installed in the end of the tubing by installation of the stainless steel press sleeve over the tubing and insertion of the bronze insert fitting. The stainless steel press sleeve must then be pressed onto the tube and fitting with a proprietary ratchet-style tool that is supplied by Viega LLC. The tool only releases from the fitting once the full compression is exerted on the fitting. When used with the fittings noted above, PureFlow<sup>®</sup> PEX Press fittings comply with the ASTM F 877. The fittings are illustrated in Figure 9.

#### Climate Panels:

Climate panels are 1/2-inch-thick (12.7 mm) plywood panels backed by an aluminum plate, designed to secure 5/16-inch-diameter (7.9 mm) tubing at 7 or 10 inches (178 or 254 mm) on center.

Clearances from heat-producing equipment must be in accordance with Section 503.7.7 of the 2006 *International Fuel Gas Code*<sup>®</sup>, Section M1306 of the IRC or Section 802.10.5 of the IAPMO UMC, as applicable.

#### Conditions of Listing:

1. Tube and fitting systems must be manufactured, identified and installed in accordance with this listing, the applicable code and the manufacturer's published installation instructions. Tube and fittings must be installed by Viega LLC-trained installers. Manufacturer's published installation instructions must be furnished to the code official. The instructions within this listing will govern if there are any conflicts between the manufacturer's instructions and this listing.
2. Details on the design and installation of the heating system must be submitted to the code official for approval.
3. Any potable water connections must be protected against backflow from the hydronic heating system.
4. The tubing must be maintained at the greater of 1 1/2 times the working pressure or 100 psi (89.4 kPa) during placement of the concrete cover for a hydronic piping system.
5. When installation is in fire-resistance-rated assemblies, evidence of compliance with IBC Section 712 (penetrations), UBC Section 709 (walls and partitions) and UBC Section 710 (floor/ceiling or roof/ceiling), as applicable, must be provided to the code official.
6. Viega tubing and fittings must be protected from exposure to direct sunlight. Tubing and fittings must be protected from physical damage with an oversized flexible corrugated sleeve at structural mass penetrations and when the tube is uncovered. Annular spaces between sleeves and pipes must be filled or tightly caulked in an approved manner.
7. Each installation must be pressure-tested for leaks in the presence of the code official or the code official's designated representative.
8. The use of the tubing is limited to hydronic systems using water as the heat transfer fluid.
9. The tubing must not be used as a source of electrical ground.
10. The minimum cold free-bending radius is eight times the outside diameter, or five times the outside diameter with use of a bend support supplied by Viega LLC. The outside diameter is the nominal diameter plus 1/8 inch (3.2 mm).
11. When the system is embedded in concrete, tubing must be covered a minimum of 3/4 inch (19.1 mm) and installation must comply with IBC Section 1906.3.
12. The tubing is manufactured in McPherson, Kansas, and Ochtrup, Germany, and the fittings are manufactured in Attendorn, Germany, under quality control programs with inspections by NSF International (AA-633).

**CP on Wood Floor Detail**

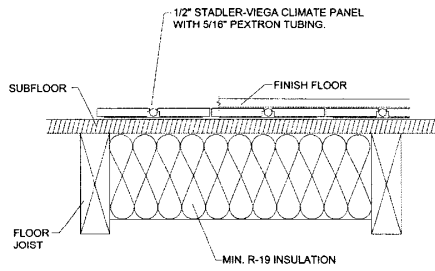


Figure 1

**CP on Concrete (secured) Detail**

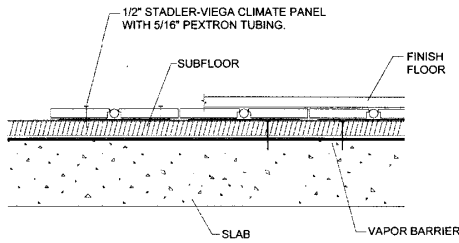


Figure 2

**CP on Concrete (floating) Detail**

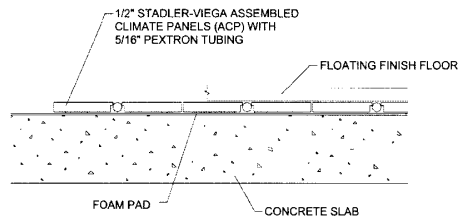


Figure 3

**Poured Underlayment Detail**

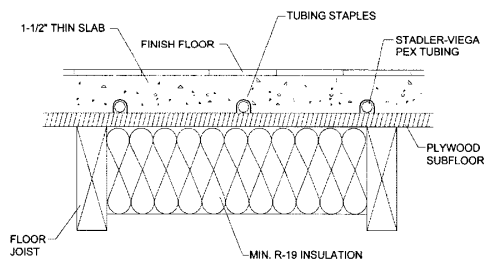


Figure 4

**Heat Emission Plates Detail**

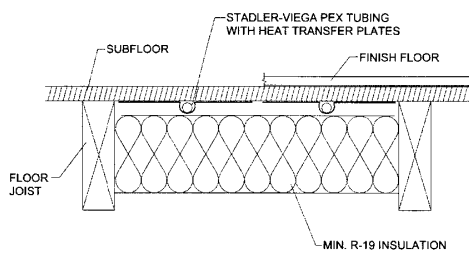


Figure 5

**Joist Heating Detail**

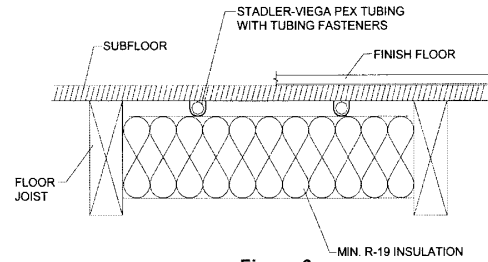


Figure 6

**Radiant Ceiling Detail**

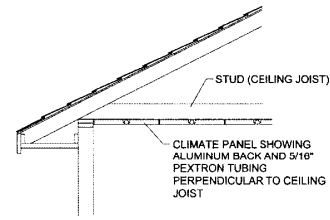


Figure 7

**Radiant Wall Detail**

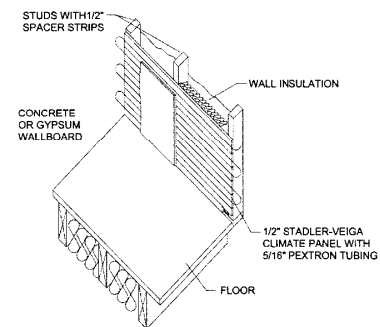


Figure 8

**Press Sleeve Fitting Detail**



Figure 9

**Attached Press Sleeve Fitting Detail**

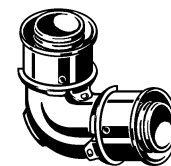
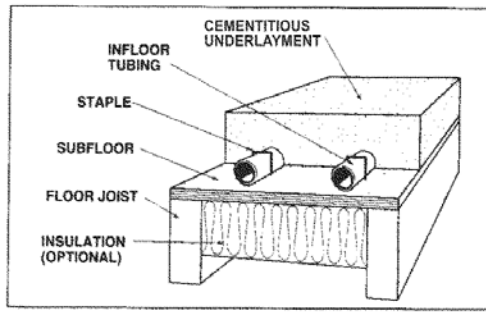
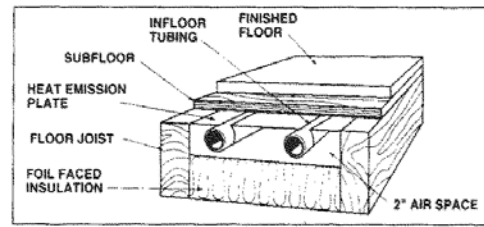


Figure 10

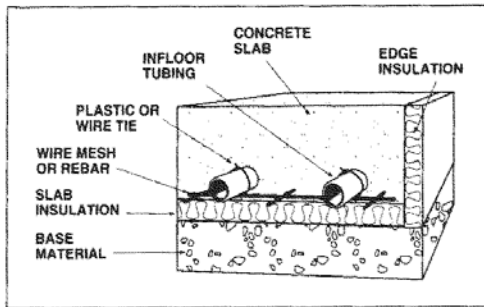
WOOD SUB-FLOOR/CEMENTITIOUS UNDERLAYMENT



UNDER-FLOOR DIAGRAM



CONCRETE SLAB DIAGRAM



CONCRETE SLAB ON SAND BED DIAGRAM

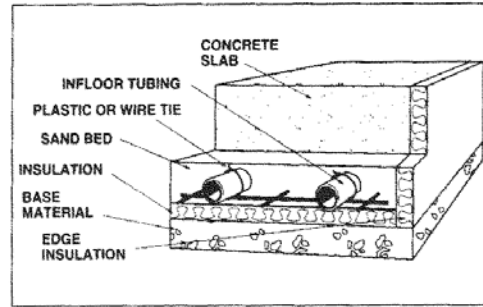


FIGURE 11 — TYPICAL INSTALLATION DETAILS