



**UNITED STATES**

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Radiant-Heating  
Hydronic Piping  
23 83 16  
[Project]

**INSULATED RADIANT-HEATING HYDRONIC-PIPING FLOORING PANELS**

**Amvic Insulated Radiant PEX Panel Specification**

*SPEC NOTE: This specification has been numbered, organized and formatted in accordance with the MasterFormat, Section Format and Page Format documents published jointly by Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC).*

*The content of this specification is of general order and must be adapted to the specific requirements of a project. It is offered as a guide to experienced and knowledgeable construction professionals who must assume full responsibility for its interpretation and use. Amvic Building System is a panel material supplier only and does not provide installation services. The name PEX is the term used for Cross-linked Polyethylene which is used for hydronic heating and other water plumbing tubing needs.*

*The square brackets [ ] containing texts indicate an option to be considered/inserted by the specifier. Remove brackets and unused options before printing.*

**Part 1. General**

**1.01 SECTION INCLUDES**

- A. Supply and installation of insulated, interlocking radiant-heating floor panels ready to receive hydronic tubing by others.

**1.02 RELATED REQUIREMENTS**

- A. Smooth, compacted sub-base [Section 32 11 00]

*SPEC NOTE: 1.02B refers to either or both underslab and overslab concrete.*

- B. Cast-in-Place concrete [Section 03 30 00]
- C. Rough carpentry subfloor [Section 06 10 00]
- D. Hydronic piping/tubing [Section 23 83 16]
- E. Finished flooring [Section 09 60 00]

### 1.03 REFERENCE STANDARDS

#### A. Conform to the following:

1. ASTM C578-14 Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.
2. ASTM D1622/1622M-14 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
3. ASTM C518-10 Standard Test Method for Steady-State Thermal Transmission Properties by Means of Heat Flow Meter Apparatus.
4. ASTM 1621-10 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
5. ASTM C203-05a (2012) Standard Test Methods for Breaking Load and Flexural Properties of Block Type Thermal Insulation.
6. ASTM 96/E96M-12 Standard Test Methods for Water Vapor Transmission of Materials.

### 1.04 SUBMITTALS

#### A. Submit the following in accordance with Section [01 33 00 – Submittal Procedures].

1. Shop Drawings: Provide shop drawings showing:
  - a. Dimensioned Floor Layout.
  - b. Layout of EPS insulated radiant floor panels.
2. Test Data from independent laboratory showing physical properties.
3. Product Data: Insulated radiant floor panel manufacturer's printed product literature and Installation Instructions.
4. Samples: Duplicate 7" x 10" (178 mm x 254 mm) samples of pre-engineered floor panels.
5. Warranty Documentation: Manufacturer's standard warranty.

### 1.05 QUALITY ASSURANCE

- #### A. Manufacturer: to have minimum 10 years experience in EPS insulation manufacturing.

## 1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials in original wrappings with manufacturer's seals and labels intact. Protect from damage and environmental conditions in accordance with manufacturer's recommendations.
- B. Neatly stack EPS panels to prevent damage. If panels must be removed from skids for ease of handling or temporary storage on-site prior to installation, stack panels exactly as they were received on the skids.
- C. Handle EPS panels to prevent damage to edges or surfaces. Remove damaged or deteriorated materials from site.

## 1.07 PACKAGING WASTE MANAGEMENT

- A. Separate packaging waste materials such as pallets, bindings, etc. for [reuse] [and] [recycling] at nearest used building materials' facility.

## 1.08 AMBIENT CONDITIONS

- A. Store EPS insulated radiant floor panels in spaces where it is to be installed for 24 hours prior to installation.
- B. Store EPS panels indoors protected from weather and moisture; do not install panels when wet.
- C. Ventilate building spaces as required to remove excess moisture.
- D. In cold weather, maintain continuous, uniform building temperatures of not less than 45°F (7.2°C) or more than 100°F (37.8°C) for a minimum period of 48 hours prior to, during, and following EPS panel installation.

## 1.09 EXTENDED WARRANTY

- A. Provide 15 year warranty to ensure R (RSI) value of EPS insulated radiant floor panels does not vary by more than 10% of published R (RSI) value as outlined in manufacturer's standard warranty.

## **Part 2. Products**

### 2.01 MANUFACTURER

- A. Insulated radiant-heating hydronic-piping EPS flooring panels manufactured by Amvic Building System, 501 McNicoll Avenue, Toronto, ON, Canada M2H 2E2. Tel: 416.410.5674; Fax: 416.759.7402; Toll Free: 1.877.470.9991; Email: info@amvic system.com; Web: www.amvicssystem.com.

- B. Substitutions: Not permitted, however requests for substitutions will be considered providing substitute products and methods of execution are submitted at least 10 days prior to bid closing date.
- C. Accompany requests with evidence substantiating similarity in quality, including technical product data sheet and formal 3-Part specification.

## 2.02 MATERIALS

*SPEC NOTE: Delete items not required.*

- A. AMPEX2015F Floor Panel: Expanded polystyrene (EPS), Type II, 3-3/8" (86 mm) overall thickness including mushroom nubs, 2" (51 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –
  - 1. Density (ASTM D1622/1622M-14): 1.5 lbs/ft<sup>3</sup>
  - 2. Thermal Resistance Value (ASTM C518-10): 10°F.ft<sup>2</sup>.h/Btu
  - 3. Compressive Strength (ASTM D1621-10): 28.0 psi
  - 4. Flexural Strength (ASTM C203-05a (2012)): 51.9 psi
  - 5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 23.8 (ng/Pa.s.m<sup>2</sup>)  
0.42 Perms

Amvic: Can we incorporate actual R (RSI) values in the above list?
- B. AMPEX 2020F Floor Panel: Expanded polystyrene (EPS), Type IX, 3-3/8" (86 mm) overall thickness including mushroom nubs, 2" (51 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –
  - 1. Density (ASTM D1622/1622M-14): 2.2 lbs./ft<sup>3</sup>
  - 2. Thermal Resistance Value (ASTM C518-10): 11°F.ft<sup>2</sup>.h/Btu
  - 3. Compressive Strength (ASTM D1621-10): 45.5 psi
  - 4. Flexural Strength (ASTM C203-05a (2012)): 68.6 psi
  - 5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 17.5 (ng/Pa.s.m<sup>2</sup>)  
0.31 Perms
- C. AMPEX 2515F Floor Panel: Expanded polystyrene (EPS), Type II, 3-7/8" (98 mm) overall thickness including mushroom nubs, 2" (51 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –
  - 1. Density (ASTM D1622/1622M-14): 1.5 lbs./ft<sup>3</sup>
  - 2. Thermal Resistance Value (ASTM C518-10): 12°F.ft<sup>2</sup>.h/Btu
  - 3. Compressive Strength (ASTM D1621-10): 28.0 psi
  - 4. Flexural Strength (ASTM C203-05a (2012)): 51.9 psi
  - 5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 23.8 (ng/Pa.s.m<sup>2</sup>)  
0.42 Perms

D. AMPEX 2520F Floor Panel: Expanded polystyrene (EPS), Type IX, 3-7/8" (98 mm) overall thickness including mushroom nubs, 2.5" (64 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –

1. Density (ASTM D1622/1622M-14): 2.2 lbs./ft<sup>3</sup>
2. Thermal Resistance Value (ASTM C518-10): 13°F.ft<sup>2</sup>.h/Btu
3. Compressive Strength (ASTM D1621-10): 45.5 psi
4. Flexural Strength (ASTM C203-05a (2012)): 68.6 psi
5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 17.5 (ng/Pa.s.m<sup>2</sup>)  
0.31 Perms

E. AMPEX 3015F Floor Panel: Expanded polystyrene (EPS), Type II, 4-3/8" (111 mm) overall thickness including mushroom nubs, 3" (76 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –

1. Density (ASTM D1622/1622M-14): 1.5 lbs./ft<sup>3</sup>
2. Thermal Resistance Value (ASTM C518-10): 14°F.ft<sup>2</sup>.h/Btu
3. Compressive Strength (ASTM D1621-10): 28.0 psi
4. Flexural Strength (ASTM C203-05a (2012)): 51.9 psi
5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 23.8 (ng/Pa.s.m<sup>2</sup>)  
0.42 Perms

F. AMPEX 3020F Floor Panel: Expanded polystyrene (EPS), Type IX, 4-3/8" (111 mm) overall thickness including mushroom nubs, 3" (76 mm) nominal solid EPS thickness; panel size 49.25" x 25.25" (1250 mm x 640 mm), with properties as follows –

1. Density (ASTM D1622/1622M-14): 2.2 lbs./ft<sup>3</sup>
2. Thermal Resistance Value (ASTM C518-10): 15°F.ft<sup>2</sup>.h/Btu
3. Compressive Strength (ASTM D1621-10): 45.5 psi
4. Flexural Strength (ASTM C203-05a (2012)): 68.6 psi
5. Standard Test for Water Vapor Barrier (ASTM E96/E96M-12): 17.5 (ng/Pa.s.m<sup>2</sup>)  
0.31 Perms

## 2.03 FABRICATION

- A. For reflective heat purposes, vacuum and heat apply silver colored polystyrene film facer to the top side of the EPS floor panels using state-of-the-art manufacturing processes.
- B. EPS floor panels to have four-sided tongue and groove interlock system for quick, easy and secure installation.

- C. Floor panel nubs to form “mushroom” shaped projections to lock the PEX piping/tubing firmly in place by simply walking on the piping/tubing.

#### 2.04 DESIGN CRITERIA

- A. Hydronic-Piping Accommodation: EPS Flooring panels to be capable of receiving piping/tubing sizes of 3/8”, 1/2”, 5/8”, 3/4” or 1” (9.5 mm, 12.7 mm, 15.8 mm, 19.1 mm or 25.4 mm) diameter.
- B. Piping/Tubing Centers: EPS flooring panels to accommodate 3” (76 mm) o.c. pattern and multiples thereof.

### **Part 3. Execution**

#### 3.01 EXAMINATION

- A. Before installation, examine alignment, smoothness and evenness of substrate. Notify [Contractor] in writing if substrate does not comply with requirements of EPS floor panel manufacturer. If a concrete structural underslab is to be waterproofed or sealed, ensure coating is sufficiently cured prior to installation of floor panels.
- B. Verify items provided by other trades are properly installed.
- C. Commencement of work will imply acceptance of substrate conditions.

#### 3.02 PREPARATION

- A. Ensure installation area is free of all debris, broom clean, and dry.
- B. If required by building code, install vapor barrier prior to installing EPS floor panels.

#### 3.03 INSTALLATION

- A. General
  1. Install EPS floor panels strictly in accordance with manufacturer’s printed instructions.
  2. Co-ordinate work with related work to ensure proper installation of EPS floor panels.
- B. EPS Floor Panels:

1. Starting in far left corner and working from left to right, lay down first panel so that the exposed interlock is to the right side and forward.
2. Continue to lay panels ensuring they are properly interlocked, snug and aligned.
3. When completing the first row of panels, cut last panel to fit, as required.
4. Start second row of floor panels in staggered fashion to first row by using a half panel against wall.
5. Continue to place rows of panels maintaining a staggered running bond layout.
6. Cut panels as necessary to accommodate columns, walls or other protrusions.
7. If and as required, glue panels in place using construction adhesive that is compatible with the EPS floor panels e.g. LePage PL300 Foamboard Adhesive.

#### 3.04 CLEANING

- A. Upon completion of work, remove excess materials, equipment and debris from site.
- B. Leave work area and adjacent surface in condition acceptable to [Architect].

#### 3.05 WASTE MANAGEMENT AND DISPOSAL

- A. Separate waste materials for [reuse] [and] [recycling] at nearest used building materials facility.
- B. Divert unused adhesive materials from landfill through disposal at hazardous materials depot.

#### **END OF SECTION**