

HYDRONIC RADIANT FLOOR HEATING SYSTEM

SECTION 23 83 16

RADIANT-HEATING HYDRONIC PIPING

This guide specification has been prepared by HeatPly, in printed and electronic media, as an aid to specifiers in preparing written construction documents for Hydronic Radiant Flooring Systems. HeatPly systems offer turnkey solutions for wall to wall hydronic system up to the mechanical room. HeatPly systems include radiant panels; pex tubing, manifolds, material list, design layout, and design assist from project drawings for an entire system that is easy to install, compatible, and properly laid out.

Edit entire master to suit project requirements. Modify or add items as necessary. Delete items which are not applicable. Words and sentences within brackets [_____] reflect a choice to be made regarding inclusion or exclusion of a particular item or statement. This section may include performance, proprietary and descriptive type specifications. Edit to avoid conflicting requirements. Editor notes to guide the specifier are included between lines of asterisks to assist in choices to be made. Remove these notes before final printing of specification.

This guide specification is written around the Construction Specifications Institute (CSI) Section Format standards.

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PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes radiant floor heating systems, consisting of panels manufactured to accept polyethylene tubing for hydronic heating systems
- B. Distribution manifolds and compatible fittings.
- C. Fasteners approved by manufacturer.

1.2 REFERENCES

- A. ASTM F876-Standard Specification for Crosslinked Polyethylene (PEX) tubing.
- B. ASTM F1281- Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure tubing.
- C. Applicable Plumbing Codes: Construction codes applicable to radiant heating systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product Submit manufacturer's data sheets on each product to be used.

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1. Include data for panels, manifolds, tubing and accessories
- B. Shop Drawings: Submit manufacturer's layout drawings detailing the location, layout and pattern of panel and tubing installation.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide materials and installation patterns from manufacturer specializing in radiant panels. Approve radiant tubing, fasteners, and secondary materials to be installed in conjunction with the radiant flooring system.
- B. Installer Qualifications: Related plumbing connections required by the work listed in this section shall be performed by a contractor or subcontractor licensed or otherwise authorized to install radiant heating systems.

1.5 WARRANTY

- A. Manufacturer Warranty: Refer to manufacturer website for warranty information

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. HEATPLY INC. 825 Petaluma Blvd. South, Petaluma CA, 94952 Phone: 1 (855) HeatPly Fax: (707) 766-6289 Email: customerservice@heatply.com

2.2 SYSTEM MATERIALS

- A. Radiant Panels: Pre-scribed Plywood Panels - CCX-Formaldehyde Free 5ply Exterior Grade
 1. Panel Dimensions: 1'x4'
 2. Panel Thickness: 5/8"
 3. Panel Weight: 6.67 lbs
 4. Channel Space: 6 inch on center
 5. Heat Transfer: Convection/Conduction

Specifiers Note: Every square foot. of HeatPly panels, will require 2 linear feet of 3/8 inch PEX tubing.

- B. Tubing: Designed for use with 3/8" ID nominal ASTM F-876 PEX (cross-linked polyethylene) with a 1/2" OD for transmission of hot water
 1. 3/8 inch PEX Tubing with oxygen barrier [600] [1000]

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- C. Manifolds:
 - 1. HeatPly Manifold Panels
 - 2. [3/8 inch] Copper with 12 Pex Branch
- D. Accessories:
 - 1. Pex Fittings: As required for Pex Tubing.
 - 2. Pex Clamps: As required for Pex Tubing.
 - 3. Pex Bend Supports: As required.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing substrate is acceptable to receive panels.
- B. Before installing HeatPly underlayment system, be sure to contact the local building department to determine the necessary permit, installation and inspection requirements for the local jurisdiction. The installation of HeatPly panels must be performed in compliance with all applicable building and safety codes. HeatPly panels are intended for installation by a qualified and licensed contractor.
- C. Subfloor Requirements: The subfloor system should be designed for a deflection limit of $L/360$ for the span. The subfloor should be APA Span-Rated Plywood or OSB with an Exposure 1 classification or better with T&G or back-blocked at the unsupported edges.
- D. Surface Test for Dryness: Subfloor and/or Concrete slab must be dry before installing HeatPly underlayment panels. Ensure that construction conforms to local building codes for that area.

Subfloor and or slab should be tested for dryness by one of the following methods: Tape an 18" x 18" (457 mm x 457 mm) section of plastic (as per ASTM D4263) to the surface of the underlayment. Lay a 24" x 24" high-density, smooth rubber mat on the underlayment surface and weigh down. Lay a piece of 6-mil vinyl plastic on the underlayment surface, weigh down, and seal the edges. The underlayment is considered dry if there is no discoloration (darkening) of the underlayment or condensation on the test covering after 16 hours. Perform additional tests if necessary. When subfloor or concrete slab has passed the dryness test described above, HeatPly can be installed.
- E. Note: HeatPly should be installed over subfloor or concrete only. Do not use HeatPly panels over existing vinyl flooring with heavy cushioning or thick foam backing.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation

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- B. Prepare surfaces using methods recommended by the manufacturer for achieving best results for installation
- C. Verify that fasteners are flush with or slightly below the floor surface.
- D. Ensure that subfloor is completely dry and concrete has (no more than 12% moisture prior to installation).

3.3 MATERIALS FOR INSTALLATION

- A. Select galvanized or clear coated staples with a minimum of 18 gauge shank, 1/4" crown (maximum 3/8" crown.) The length of staple should be no longer than the combined thickness of the sub-floor and underlayment.
- B. Staples should not protrude through subfloor if possible and should be countersunk just below the panel's surface, but no more than 1/8" below the surface. Do not use divergent staples of any kind.

3.4 INSTALLATION

- A. Refer to manufacturer's most current installation instructions.
- B. Layout each room with equivalent tubing lengths (no more than 250 linear feet max). Be sure not to exceed 250 feet per circuit including runs to and from the manifold locations. For areas with heat loss greater than 25,000 btu/sq.ft the maximum should be kept to 200ft. The following calculation can be used to determine the number of circuits and circuit lengths for a given room: Total sqft x 2 results in total linear feet of tubing required. Then divide the total evenly into circuits that are at max 250 linear feet. Example: a 20' x 25' room is a total of 500sqft. $500 \times 2 = 1000$ linear feet of tubing. And $1000/4 = 250$ linear feet per circuit and 4 circuits are required.
- C. Work one room at a time. Start by laying out the panels from the manifold location and layout circuits until all panels are laid out in the room.
- D. When room layout is complete and panels are in place, cut short 12-16" inch PEX tubing lengths and insert them into panels at junctions to align the tubing slots. This can be done one section at a time as to not waste PEX tubing. The lengths of the PEX can be reused for the entire job.
- E. Working one section at a time, flip HeatPly panels over and apply Liquid nails to backs of panels, piece by piece (refer to Materials Section for amount). Then replace the adhesive backed panels into place and push them down securely to the floor. Next insert the alignment tubing and secure each panel into place with appropriate fasteners (see Fastener Section of manual). Continue this process until the entire room is glued and fastened to the subfloor or slab.

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- F. Once the panels in the entire room have been secured, remove the alignment tubing pieces and thoroughly clean debris from the radiant tubing channels. Vacuuming works best for this.
- G. Next the PEX Tubing can be inserted into the slots. Work on one circuit at a time to press and secure PEX tubing into the tubing channels. Use rubber mallet if necessary.
- H. Fasten HeatPly panels to subfloor using staples, screws, or nails spaced 8" o.c., with perimeter fasteners ½" from ends and edges. Make sure that fasteners are flush or slightly below the panel surface.
- I. Fasten HeatPly panels to concrete using Tapcon or Hilti type fasteners. Be sure to have adequate penetration into slab. See fastener manufacturer instructions for recommended specifications. This procedure should be performed by a qualified Contractor. Make sure that fasteners are flush or slightly below the panel surface.
- J. Floorcovering should be installed immediately after the installation of HeatPly panels to avoid damage or environmental influences. Prolonged exposure to foot traffic will impact the performance of the HeatPly panels. Prior to installation of final floor covering, avoid heavy traffic and moving heavy items across panels.
- K. Follow the floorcovering manufacturer's instructions carefully before installing the floorcovering. Use only adhesives recommended by the floorcovering manufacturer for use over wood underlayment.
- L. Avoid fastening into radiant heat tubing lines.

3.5 FIELD QUALITY CONTROL

- A. Pressure-test the tubing lines for leaks. Leave the system pressurized for 24 hours to check for leak-down.

END OF SECTION 238316