



Crete-Heat, LLC



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This Manu-Spec® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. A Manu-Spec is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This Manu-Spec specifies interlocking, Expanded Polystyrene (EPS) insulating flooring panels for use with PERT or PEX radiant-heating hydronic-piping installation.

23 83 16.13

RADIANT HEATING HYDRONIC PIPING INSULATED FLOORING PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: This Section specifies interlocking, Expanded Polystyrene EPS insulating flooring panels for use with radiant-heating hydronic-piping installation.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles as recommended by CSI MasterFormat and specifiers practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section [03 54 13 - Gypsum Cement Underlayment].
2. Section [03 54 16 - Hydraulic Cement Underlayment].
3. Section [23 83 16 - Radiant-Heating Hydronic Piping].

1.2 REFERENCES

Specifier Note: Define terms that are unique to this Section and are not provided elsewhere in the contract documents. Include in this Article terms that are unique to the work result specified that may not be commonly known in the construction industry. Delete the following Paragraph if no Definitions are required.

A. Definitions:

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced and update as applicable. Contract Conditions Section 01 42 00 - References may be used to establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

B. Reference Standards:

1. ASTM International (ASTM).
 - a. ASTM C165-[2012], Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
 - b. ASTM C203 - 99 Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation (1.2.1 Procedure A — Designed principally for materials that break at comparatively small deflections.).
 - c. ASTM C272 - 01 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
 - d. ASTM C518-[2015], Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - e. ASTM C578-04, Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.
 - f. ASTM C1338-[2014], Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - g. ASTM D1622 - 03 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - h. ASTM D2126 - 04 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
 - i. ASTM E96/E96M-[2016], Standard Test Methods for Water Vapor Transmission of Materials.
2. US Green Building Council (USGBC).
 - a. LEED NC Version 2.2-[2014], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section [01 33 00 - Submittal Procedures].
- B. Product Data: Manufacturer's standard specifications and descriptive literature, including:
 1. Product characteristics.
 2. Performance criteria.
 3. Material Safety Data Sheets (MSDS).
- C. Layout Drawings: Submit layout drawings showing how piping will be arranged on panels.
- D. Submit 12 × 12 inch sample of insulating panel for [radiant-heating] [ice melt] piping.

Specifier Note: Specify submittals intended to document manufacturer storage, installation and other instructions.

- E. Manufacturer's written Instructions, including:
 1. Delivery, storage and handling recommendations.
 2. Preparation and installation recommendations.
- F. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- G. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.



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- H. Manufacturer's Field Reports: Submit manufacturer's field reports within 3 days of each manufacturer representative's site visit and inspection.

Specifier Note: Coordinate Article below with Contract Conditions and with Section 01 78 36 - Warranties.

- I. Installer's Experience: Submit verification of evidence of work similar to the work of this Section.
- J. Warranty: Fully executed, issued in [Owner's] name, and registered with manufacturer, including:
1. Manufacturer's [1-year] warranty, from date of substantial completion, covering defects in materials.

Specifier Note: Retain the following only if specifying for a LEED project. Specify only the technical submittal requirements necessary to achieve the credits desired for this Project.

- K. Sustainable Design (LEED) Submittals:
1. LEED Submittals: In accordance with Section [01 35 21 – LEED Requirements].
 2. Submit verification for items when appropriate as follows:
 - a. MR 5 - Regional Materials.
 - b. [].

1.4 QUALITY ASSURANCE

- A. Installer: Experienced in performing work similar to that required for this project.

1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in accordance with manufacturer's written instructions.
1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact and product name and manufacturer clearly visible, and sizes to suit project.
- B. Store materials protected from exposure to UV and other harmful environmental conditions, clean, dry, frost-free and at recommended temperature and humidity levels.

1.6 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions.
- B. Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.
1. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes performance characteristics, material standards and descriptions in other Articles as applicable. Use of such phrases as or equal, approved equal or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining or equal products.

2.1 MANUFACTURER

- A. Crete-Heat, LLC.
- B. Contact Information: W3213 Artesian Road, Fond du Lac, WI 54937; Phone: (920) 948-3738; Fax: (866) 213-9739; Email: don@crete-heat.com; Website: www.crete-heat.com.

2.2 PERFORMANCE REQUIREMENTS



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Specifier Note: Retain and edit the following Paragraph. Choose R6 for the 1 inch or 1.25 inch thick panels; choose R10 for the 2 inch thick panels; and choose R15 for the 3 inch thick panels.

- A. Expanded Polystyrene: To ASTM C578-04, Type IX.
- B. Thermal Resistance to ASTM C518: [R6] [R10] [R15] minimum.
- C. Compressive Strength to ASTM C165: 25 psi minimum.

Specifier Note: Retain and edit the following Paragraph. Choose 0.46 perms for the 3 inch thick panels; choose 0.51 perms for the 2 inch thick panels; and choose 0.68 for the 1 inch or 1.25 inch thick panels.

- D. Water Vapor Transmission to ASTM E96/E96M: [0.46] [0.51] [0.68] perms maximum.

Specifier Note: Retain the following Paragraph where applicable to suit project requirements.

- E. Mold Resistance to ASTM C1338.

2.3 DESCRIPTION

- A. Modular interlocking EPS insulating flooring panel system for use with radiant-heating hydronic-piping installation and consisting of EPS panels bonded to polystyrene film vapor barrier.

2.4 MATERIALS

- A. Panel: Solid EPS with grid for [$3\frac{7}{8}$] [$1\frac{1}{2}$] [$5\frac{5}{8}$] inch radiant piping] [$3\frac{3}{4}$ inch ice melt piping]
 - 1. Panel Size: 25 × 49 inches.
 - 2. Effective Area: 24 × 48 inches.
 - 3. Thickness: 1 inch, 2 inch and 3 inch.

Specifier Note: 1 inch thick panels are available with or without sound knobs on bottom depending upon project location. Contact manufacturer directly for further information.

- a. Nominal: [3] [2] [1.25] [1] inches.
- b. Total: [$3\frac{7}{8}$] [$7\frac{7}{8}$] [$2\frac{1}{8}$] [$1\frac{7}{8}$] inches.
- 4. Color: Green.
- 5. Vapor Barrier: 10 mil polystyrene film.
- 6. Sound Reduction: 23 db maximum on 1 inch panel with sound knobs only.

Specifier Note: Retain and edit the following Paragraph to suit project requirements. Contact Crete-Heat, LLC., directly for further information on recycled content.

- 7. Recycled Content: [] %.

Specifier Note: Retain and edit the following Paragraph. Choose the appropriate product for the project requirements.

- B. Acceptable Material: Crete-Heat, LLC., [Insulated Floor Panel System] [Ice Melt System].

2.5 ACCESSORIES

- A. Sound Reduction Knobs: In accordance with manufacturer's written recommendations.
 - 1. Acceptable Material: Crete-Heat, LLC., Standard Sound Reduction Knob on 1 inch panel only.

PART 3 EXECUTION

3.1 INSTALLER

- A. Use only installers who have training and experience of work similar to the work of this Section.

3.2 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for insulated flooring panel installation in accordance with manufacturer's written recommendations.
1. Ensure substrate is smooth, sound, clean, dry and free of contaminants and other deleterious materials.
 2. Visually inspect substrate in presence of Architect.
 3. Inform Architect of unacceptable conditions immediately upon discovery.
 4. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Architect.
 5. Starting installation of insulated flooring panels implies substrate conditions are acceptable for Work of this Section.

3.3 PREPARATION

- A. Fill uneven substrate cracks and holes greater than ¼ inch wide with self-leveling concrete grout .

Specifier Note: Edit the following Paragraph to suit project requirements where applicable.

- B. Make uneven substrate level as directed by Architect and in accordance with panel manufacturer's written recommendations.
1. Use self-leveling cast underlayment where substrate is uneven in accordance with Section [03 54 13 - Gypsum Cement Underlayment] [03 54 16 - Hydraulic Cement Underlayment].
 2. Ensure substrate is level in each direction to ± ¼ inch for every 10 feet.
- 3.4 INSTALLATION.
- C. Install [radiant-heating hydronic-piping] [ice melt piping] in accordance
- D. Lay and interlock insulated flooring panels in accordance with manufacturer's written recommendations.
- E. Cut tongue portion of interlock off of 48 inch dimension of first panel placed against longest edge of substrate, as well as tongue portion of 24 inch dimension for corner of substrate on shorter edge.
- F. Place successive panels with tongue portion of 24 inch dimension removed along short edge of substrate.
1. Ensure panels are interlocked correctly.
- G. Continue trimming, interlocking and placing insulated flooring panels until substrate is completely covered.
1. Trim final row of panels to suit substrate dimensions.
 2. Do not force trimmed insulated flooring panels into space that will cause system to buckle.
- H. Place [PEX] [PERT] piping in panel at required separation points and in accordance with Section 23 83 16 - Radiant-Heating Hydronic Piping.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Manufacturer field reports are included under PART 1, Submittals.

- B. Manufacturer's Services:

Specifier Note: Use the following Paragraphs only when manufacturer's field services are provided and are required to verify the quality of the installed components. Establish the number and duration of periodic site visits required by manufacturer and specify below. Contact Crete-heat, LLC to determine any costs associated with Technical Representatives providing manufacturer's field services. Delete if field services are not required.

1. Coordinate manufacturer's services with Section [01 45 00 - Quality Control].

Specifier Note: Delete the following paragraph if no costs are associated with manufacturer's services.

2. Arrange for payment for manufacturer's services.
3. Have manufacturer review work involved in handling, storage and installation of insulated flooring panels, and submit written reports in acceptable format to verify compliance of Work with Contract conditions.
4. Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for product installation review in accordance with manufacturer's instructions.
 - a. Report any inconsistencies from manufacturer's recommendations immediately to Architect.

Specifier Note: Edit the following Paragraph to meet project requirements. Coordinate site visits with manufacturer or delete the Paragraph and all of its subparagraphs if site visits are not required.

5. Schedule site visits to review work at stages listed:
 - a. After delivery and storage of insulated flooring panels, and when preparatory work on which Work of this Section depends is complete, but before application begins.
 - b. During progress of work.
 - c. Upon completion of Work, after cleaning is carried out.
 - d. Obtain reports within three days of review and submit immediately to Architect.

3.5 CLEANING

- A. Perform daily progress cleaning.
 1. Leave work area clean at end of each day.
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.
- C. Collect recyclable waste and dispose of in accordance with manufacturer's written recommendations and at appropriate recycling facilities.

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Include only statements unique to this Section. Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.6 PROTECTION

- A. Protect installed insulated flooring panels from damage during construction.
- B. Repair or replace adjacent materials damaged by installation of insulated flooring panels.

END OF SECTION