



**Perfectly Warm™**  
Tile Floor Heat

# PERFECTLY WARM™ TILE HEAT

*INSTALLATION & OPERATION*

PWT-A 2014



Perfectly Warm™ Tile Heat Installation & Operation Manual  
PWT-A 2014

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2380 Cranberry Highway  
West Wareham, MA 02576

## Limited Warranty

PERFECTLY WARM™ warrants that, at the time of shipment to the customer who directly purchases the Product from PERFECTLY WARM™, the product will be free of defects in workmanship and materials and will conform in all material respects to any written specification that PERFECTLY WARM™ provided to that customer before the purchase.

If that customer believes that a shipment of product fails to satisfy the above warranty, that customer must (a) contact PERFECTLY WARM™ in writing within 10 years after that customer receives the shipment, including a detailed explanation of the alleged nonconformity and (b) return the shipment to Perfectly Warm postage prepaid. If PERFECTLY WARM™ reasonably determines through examination of the returned shipment that the shipment did not satisfy the above- warranty, then AS PERFECTLY WARM™ EXCLUSIVE LIABILITY AND THE CUSTOMER'S SOLE REMEDY, PERFECTLY WARM™ WILL, WITHIN A REASONABLE PERIOD OF TIME, REPAIR THE PRODUCT, REPLACE THE PRODUCT WITH THE SAME OR SIMILAR PRODUCT, OR CREDIT THE CUSTOMER'S ACCOUNT WITH THE PURCHASE PRICE, WHICHEVER PERFECTLY WARM™ MAY ELECT IN ITS SOLE DISCRETION.

This warranty does not apply if PERFECTLY WARM™ reasonably determines that the product has been cut, added to or otherwise altered, stored improperly, misused, damaged, or installed not in accordance with the instruction manual supplied by PERFECTLY WARM™. PERFECTLY WARM™ requires that this product be used ONLY with approved control devices. Use of any other control device will render the provisions of this warranty null and void. This warranty covers only components manufactured by PERFECTLY WARM™. Components such as attaching hardware, connecting parts, wire, tape, and other items included in kits or assemblies that are not manufactured by PERFECTLY WARM™ are excluded from the provisions of this warranty.

Except as expressly provided in this Limited Warranty, the customer is responsible for the cost of labor, service calls, insurance, shipping, installation costs and any other expense or damage incurred.

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West Wareham, MA 02576



# PERFECTLY WARM™ TILE HEAT

## INSTALLATION & OPERATION

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### CAUTION



Read and follow all the installation instructions in this manual before attempting to install the Perfectly Warm™ Tile Heat. Improper installation procedures or techniques can cause potentially unsafe conditions, including overheating and shock hazards.

Failure to comply with the instructions in this manual can void the manufacturer's warranty.

Electrical connections should only be made by licensed contractors.

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The heating product shall not be installed in closets, over walls or partitions that extend to the ceiling, or over cabinets whose clearance from the ceiling is less than the minimum horizontal dimension of the cabinet to the nearest cabinet edge that is open to the room or area.

*Exception: Isolated single runs of cable may pass over partitions where they are embedded.*

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This product is not to be installed in contact with combustible surfaces. The intended use of this product is for floor warming underneath tile, stone and marble floor coverings.

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# Safety Information

Throughout this manual you will see Cautions and Notes. These notices highlight conditions, procedures, or other information that require special attention to prevent damage to the mats, to your flooring, or possible injury. For safe and functional installation of the Perfect Warm™ Tile Heat, read and follow these important safety precautions.

Failure to comply with these items may result in injury or damage to the mats. This information must be read and understood by all technicians who will be working in the area of an installed Perfectly Warm™ Tile Heat or main electrical systems. Failure to follow these guidelines may result in a risk of electric shock or fire hazard.



**Indicates precautions or procedures that should be followed to prevent the possibility of fire.**



**Indicates precautions or procedures that should be followed to prevent the possibility of electrical shock.**



**Indicates an item that you should pay special attention to. For example, notes are used to highlight installation tips.**



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## CAUTION

Make sure that the jobsite is neat and clean before working with the Perfectly Warm™ Tile Heat. Nails, screws, and other sharp debris can damage the mats creating a potential shock hazard. Any mats which become torn or otherwise damaged must be discarded.

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## CAUTION

Ensure that the breaker supplying power to the heating mats has been turned off before making electrical connections.



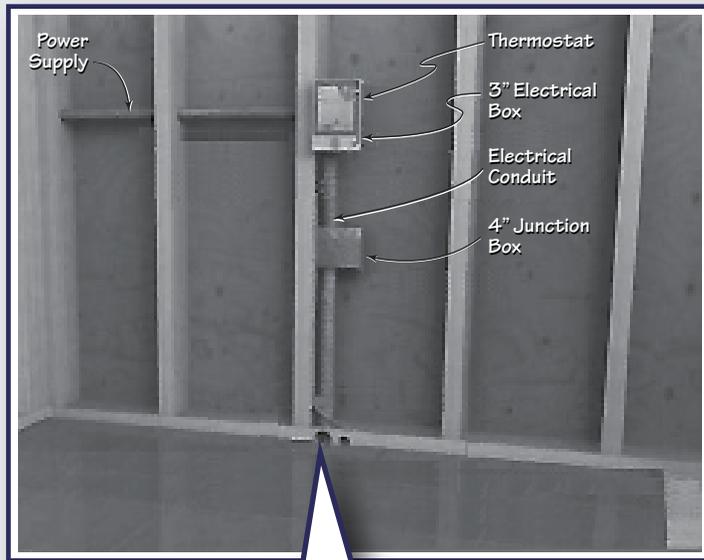
Flooring materials must be rated for use with electric floor warming system.



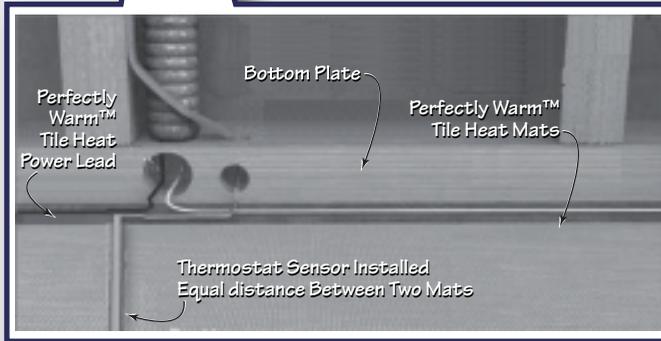
When installing any other materials on or near a heated floor, ensure that no heating elements are punctured by nails, screws, etc.

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## TYPICAL INSTALLATION



## BOTTOM PLATE CUTOUTS



Shows  
Perfectly Warm™  
Tile Heat Installation  
Below Final  
Floor Covering

# Section 1. Introduction

The Perfectly Warm™ Tile Heat mats are a unique floor heating system with anti-fracture membrane installed under thin-set installations of tile, stone, and marble.

Completely unseen, Perfectly Warm™ Tile Heat combines easy release liner installation with anti-fracture protection to provide warmth and comfort to tile, stone, and marble.

Perfectly Warm™ Tile Heat is a safe and efficient electric floor warming product for interior applications. It cannot be used for exterior snow melting applications. It is intended for installation below tile, stone, marble, and other masonry flooring materials in residential and moderate commercial installations.

Perfectly Warm™ Tile Heat can be used to heat a room as well as to warm the floors. Refer to "Heat Loss Calculations" on page 4 for further information.

Perfectly Warm™ Tile Heat is designed to deliver 12 watts per square foot. The floor temperature attainable is dependent upon how well the floor is insulated, the temperature of the floor before start up, and in the case of uninsulated slab applications, the thermal transfer of the underlying materials. Perfectly Warm™ Tile Heat's efficiency is maximized with a well insulated sub floor.

## Features

- < 0.05 inch thick and easy to install
- 3/8 inch crack isolation
- Draws 12 watts per sq. ft.
- Produces 41 BTUs per sq. ft., providing even heat throughout
- Standard 5-foot and 10-foot length kits available in 18", 24", 36", and 48" widths
- 120V and 240V
- Controlled by a thermostat
- Warranted to be free of defects in manufacture for a period of 10 years.

## How To Use This Manual

This manual is organized into four sections:

- Designing The Installation
- Installation
- Inspection and Testing
- Operation

# 1. Introduction - Continued

## Before You Begin

- Perfectly Warm™ Tile Heat should be installed on properly prepared stable sub-floors. Do not use glue, nails, or other mechanical fasteners
- Perfectly Warm™ Tile Heat must be installed on a dedicated 20 amp circuit. Do not connect lights, outlets, or any other electrical device to any branch circuit used with the Perfectly Warm™ Tile Heat.
- All wiring, fuses and/or circuit breakers must conform to National Electrical Code requirements.
- Maximum thermal resistance permitted above Perfectly Warm™ Tile Heat is R-2.
- Materials which may not contact Perfectly Warm™ Tile Heat include any vinyl or linoleum floor coverings.
- All wiring must run through conduits to junction boxes
- NEC approved materials should be used

## NEVER Do the Following:

- Never cut, puncture, or otherwise alter the mats to make them fit. Punctures, cuts or modifications to the heating mats may result in risk of electrical concerns and will void the warranty.
- Never bang a trowel on the mat or heating wire to remove excess mortar from it.
- Never attempt to repair Perfectly Warm™ Tile Heat. If it is damaged, call 1-508-291-2000 for instructions before proceeding.
- Never install in wet areas, such as showers.
- Never install one mat on top of another or overlap the mat on itself. This will cause dangerous overheating.

- Never install without the floor sensor.
- Do not install the mats in any walls.
- Never install mats under cabinets or other built-ins. Excessive heat will build up in these small spaces, and the mat can be damaged by fasteners (nails, screws, etc.) used to install built-ins.
- Never install under nail down wood flooring.
- Never remove the nameplate label from the power leads.
- Never allow solvent based products such as sealers or sealants (including silicone) to come in contact with the membrane.
- Never install mats on floors where hydrostatic or moisture vapor rate emissions exist above 4 lbs per 1,000 square in 24 hours per the Calcium Chloride test method.

## ALWAYS Do the Following:

- Protect the circuit supplying power to the Perfectly Warm™ Tile Heat mats with a ground fault circuit interrupter (GFCI).
- Install floor sensor.
- Completely cover the heating mats and factory connections in mortar (tile and stone) or self-leveling underlayment (laminated and non-masonry) materials.
- Refer to the TCNA Handbook recommendations and ANSI references for proper substrate needed for thin-set tile installations and for recommendations on proper Movement Joints within the plane of the tile per Detail EJ-171.

# Section 2. Designing the Installation

To select the proper size heating mat(s) for your application, measure the area to be heated and determine the heating mat widths and lengths to fit the clear inside dimensions (wall to wall, etc). It is important to allow up to 6" of clearance around the perimeter of the room and from any baseboard heating or permanent fixtures to allow the mats to fit without touching adjacent vertical surfaces or overlapping. Accurate dimensions are required for the proper size selection.



## NOTE

**The heating mats cannot be cut or notched to fit around any obstructions or penetrations such as door openings or floor registers.**

For installation over wooden sub-floors, check floor for deflection. If it flexes when walked on, the addition of another layer of plywood may be required to provide a stable sub floor. (For further information on wood sub-floor design criteria for tile installations, refer to the International Residential Code.)

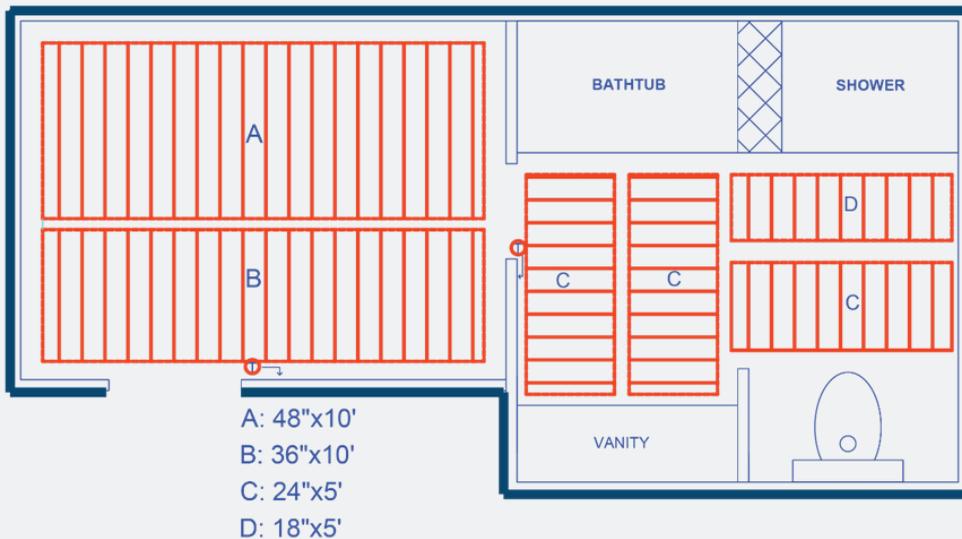
## Sketch the System Layout

A sketch of the area to be warmed, including the mat locations and associated wiring, is recommended to make installation and ordering as smooth as possible. See the example sketch below.

## Multiple Unit Installations

Installations with multiple heating mats will require a junction box to gang the connections together. If a junction box is required, it should be located directly beneath the thermostat, 12" to 18" above the floor. The total number of mats used in a single circuit is limited to 15 amps.

When specifying multiple width heating mats for the same area, make sure that the total power required does not exceed the total power of a single circuit. Add additional 20 amp circuits as required for proper electrical supply to the installation.



## 2. Designing the Installation - Continued

### Input Power Controls

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#### **NOTE**

**The installation of this heating product and listed components shall be in accordance with Article 424, of the National Electric Code, ANSI/NFPA 70. All electrical connections should be made by a licensed electrician.**

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The fuse or circuit breaker used must be rated for a maximum of 20 amperes (no greater than 16 amp load). If a lower rated fuse or circuit breaker is used, it must be rated at least 25% greater than the heating system load attached to it. If an area requires 15 amps or more, additional branch circuits may be used, each having its own overcurrent protection. These branch circuits may all be controlled by a single thermostat if it is used with a system of electric relays or power modules. The National Electrical Code specifies that each branch circuit used in conjunction with a heating system must be for the exclusive use of the heating system. Do not connect lights, outlets, etc. to any branch circuit used with the Perfectly Warm™ Tile Heat.

### Thermostat Requirements

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#### **NOTE**

**The product must be installed using a thermostat which is approved by the manufacturer. For a list of approved thermostat devices, refer to our website: [www.calorique.com](http://www.calorique.com). USE OF ANY OTHER THERMOSTAT OR CONTROL DEVICE WILL VOID THE MANUFACTURER'S WARRANTY.**

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### Locating the Thermostat

Thermostats are usually located near the power leads. However, they can be located almost anywhere, because the power leads and the sensor wire can be routed to electrical junction boxes and extended to a location outside the heated room (such as a utility room or basement).

Location of the thermostat should be approximately 60" (152 cm) above the floor on an inside wall, near the center of the room to allow the connection leads to reach. A 3" deep box is recommended for the thermostat.

### Heat Loss Calculations

For installations where the Perfectly Warm™ Tile Heat is the primary heat source, a heat loss calculation must be performed. For additional help, a heat loss calculator is available at [www.calorique.com](http://www.calorique.com).

The building professional must determine if the output of Perfectly Warm™ Tile Heat is enough heat to match the heat loss of the structure. Make sure that all sources of heat loss (transmission, infiltration and radiant) are taken into account.

A separate heat loss calculation must be done for each enclosed area (room, etc.). A separate control device must be included for each enclosed area.

Include a recovery factor of at least 20% more than the minimum calculated heat requirement to cover unforeseen circumstances.

Some heat loss methods, particularly those designed for gas or oil based systems, provide their answers in BTU's Per Hour. To convert BTU's Per hour to WATTS, multiply each area's total amount of BTU's by 0.293.

All wiring, fuses and/or circuit breakers must conform to National Electrical Code requirements.

# Section 3. Installation

## Preparation



### CAUTION

Make sure that the jobsite is neat and clean before working with the Perfectly Warm™ Tile Heat. Nails, screws and other sharp debris can damage the mats. Any mats which become torn or otherwise damaged must be discarded.



### CAUTION

Use copper ONLY as the supply conductor. Type NM and NMC non-metallic sheathed cable is not suitable for installing this product.



### NOTE

The installation of this heating product shall be in accordance with the manufacturer's instructions, and the regulations of the authority having jurisdiction. Improper installation can result in mats that do not work, poor heating, and can void the manufacturer's warranty.



### NOTE

Heating mats should not be installed at or below 32°F (0°C).



### NOTE

This equipment shall be installed only by qualified personnel who are familiar with the construction and operation of the apparatus and the risks involved.



### NOTE

The heating product shall not extend beyond the room or area in which it originates. The heating product is not to be installed in walls.



### NOTE

Installation of this product and listed components shall be in accordance with Article 424, of the National Electrical Code, ANSI/NFPA 70. Listed to UL1683.

## Preparing the Job Site

1. Ensure the job site is clean before working with the Perfectly Warm™ Tile Heat, free of any nails, screws and other sharp debris that could damage the mats.
2. For uninsulated concrete slabs, it is highly recommended that you install insulation (minimum 1/4-inch extruded polystyrene) over the slab. Cover the insulation with backer board.
3. For wood sub floors, installation must include a minimum 1/4" backer board or cementitious board.

## 3. Installation - Continued

### What You Will Need

- Perfectly Warm™ Tile Heat mats
- Thermostat: An approved floor-sensing thermostat (see [www.calorique.com](http://www.calorique.com))
- GFCI Breaker (if not part of the thermostat)
- Junction Boxes: Minimum of two boxes required for each room or area. One box (2x4 inch) required for thermostat, one box (4x4 inch) required for electrical connections.
- Tools: Digital ohm meter (multi-meter), wire stripper, screw driver, wood chisel, knife
- Tile installation products (3/8" x 1/4" or greater plastic trowel, mortar, backer board, tile, etc.)
- 12/2 Romex

## Electrical Installation

### Step 1. GFCI Installation

Perfectly Warm™ Tile Heat mats must be protected by a ground fault circuit interrupter (GFCI). This can be done either by the internal GFCI in the thermostat (as long as it directly controls the mat), or by a GFCI protected circuit breaker.

Follow all local building and electrical codes.

### Step 2. Install Additional Power Modules

Depending on the amperage requirements of the mat(s), one or more secondary power modules may be required. Do not load the thermostat control with more than 15 amps. The National Electrical Code specifies that each branch circuit used in conjunction with a heating system must be for the exclusive use of the heating system. Do not connect lights, outlets, etc. to any branch circuit used with the Perfectly Warm™ Tile Heat.

### Step 3. Install Electrical Boxes

Install Junction box for the control device (thermostat) according to the manufacturer's instructions. This box should be located, unobstructed, on an inside wall so that the device reads accurately.

Install a 4x4 inch junction box for making electrical connections between the mats and thermostat.

### Step 4. Bottom Plate Work

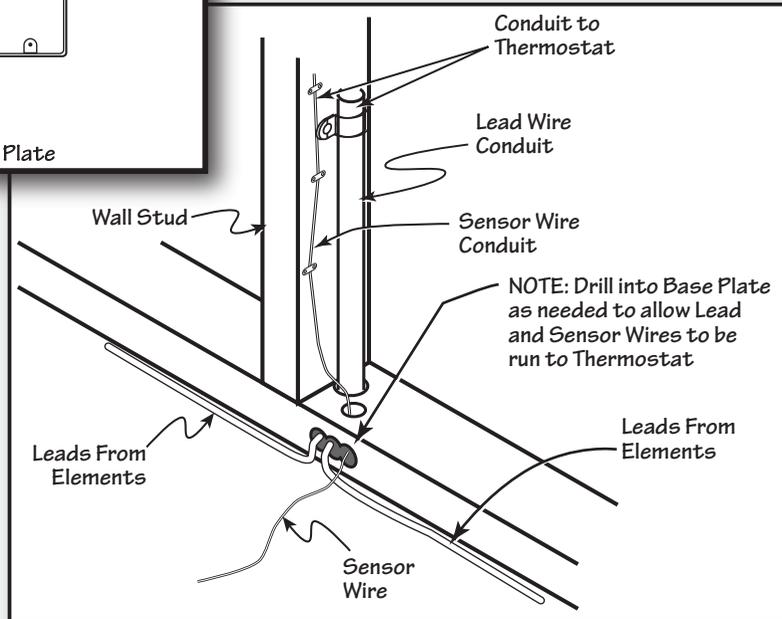
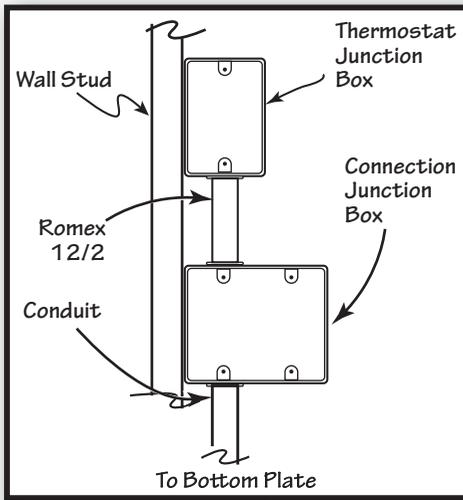
Drill or saw holes at the bottom plate. One hole is for routing power leads or conduit and the other is for the thermostat sensor. These holes should be directly below the electrical box(es). It is recommended that you drill or saw holes at the bottom plate. You may also use a notch technique as an alternative.

### Step 5. Install Power Lead Conduit

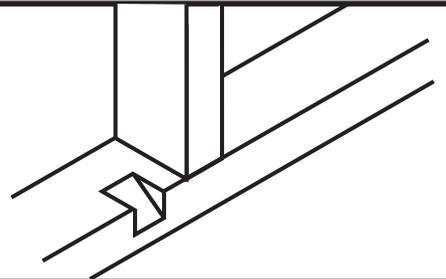
Route the power leads from the thermostat down the wall cavity through opening in the bottom of plate to connect the mats.



**RISK OF ELECTRIC SHOCK AND FIRE. DAMAGE TO SUPPLY CONDUCTOR INSULATION MAY OCCUR IF CONDUCTORS ARE ROUTED LESS THAN 2 INCHES ( 51mm) FROM THIS HEATING PRODUCT. REFER TO INSTALLATION INSTRUCTIONS FOR RECOMMENDED MEANS OF ROUTING SUPPLY CONDUCTORS.**



Alternatively, you can use the notch method. Cut/chisel a notch in the bottom plate to allow clearance for Lead and Sensor Wires.



### 3. Installation - Continued

#### Step 6. Install Thermostat Sensor

A floor sensor comes with the recommended thermostat control. The sensor wire can be installed without a conduit or in a conduit separate from the electrical power leads if conduit is required by code. Open a second knockout in the bottom of the thermostat box. Feed the sensor (and conduit, if including) through the knock-out, down the wall cavity, through the opening in the bottom plate. Temporarily tape the sensor to the slab or subfloor in a

location approximately 6" to 12" from the wall---final location of sensor after mat installation will be taped down at the edge of or in between two mats so that the sensor is not directly above a heating mat. (NOTE: The sensor is located in the thermostat packaging.)

#### Step 7. Rough in the Wiring

Install appropriate electrical wire (conductor) from the power source and breaker protection to the thermostat following all codes. Leave 6" to 8" extra wire at the thermostat box.

## Installing the Mats

#### Step 1. Inspect and Test Heating Mats



#### **NOTE**

It is **EXTREMELY** important to verify the resistance measurements for each mat and to record the readings on the system checklist (see page 14). If a defective mat is adhered to the floor it can be very difficult to remove it.

Verification that the heating mats were received in operable condition is important prior to installation. When the heating mats are removed from the shipping box test the resistance using an ohm meter and record the information. If the resistance reading varies greatly from the recorded readings on each mat do not install the mat and call your supplier for replacement assistance.

#### Step 2. Preparing the Stable Sub-floor



#### **NOTE**

It is very important that the mats be installed **ONLY** after the sub-floor is complete and stable. Adhering the mats to an unstable floor can result in damage to the mats and will void the manufacturer's warranty.

Clear the floor of all debris, nails, etc. so the floor is smooth, clean and dry.

### Step 3. Laying the Mats

Connection leads from the mats are 15 feet long, and can be cut to desired length to connect at the junction box. The heating mats should be laid so the connection leads are running to the wall of the room where the thermostat/junction box is located. The following steps will guide in the installation of the mats:



#### **NOTE**

**It is important to take care in the placement of the heating mats, as once the adhesive side of the heating mat comes in contact with the stable subfloor it will provide a tenacious bond, and will be very difficult to move.**

1. With the release liner still on, position all the mats into place. Make sure the leads are within reach of the junction box and that there are no obstructions or floor penetrations in the way. Make sure the position of ALL mats is satisfactory before the next step.
2. When all the mats are in proper position, roll the end with the connections back far enough to peel back approximately 12" (30cm) of the release paper to expose a portion of the adhesive surface.
3. Press this exposed section of the mat onto the floor then roll the other end back to the point where the release paper was removed.
4. Begin pulling the release liner off and hand smooth the mat into position as it unrolls to achieve a positive bond while avoiding trapping air bubbles.
5. For adjacent mats, follow the same procedure starting with alignment of the side by side mats in a butt joint fashion. Do not overlap mats.
6. Peel off quick release liner and set mat in place, leaving clearance to walls or partitions at the connector end for wiring and final connections.



### 3. Installation - Continued

#### Step 4. Install the Thermostat Sensor

As the mats are installed, locate the thermostat sensor probe. Sensor probe can be held in position with a small amount of tape. The sensor should extend approximately 6" to 12" from wall adjacent to the mat shown. Be careful not to locate the sensor near other heating sources such as a heating duct below the floor.



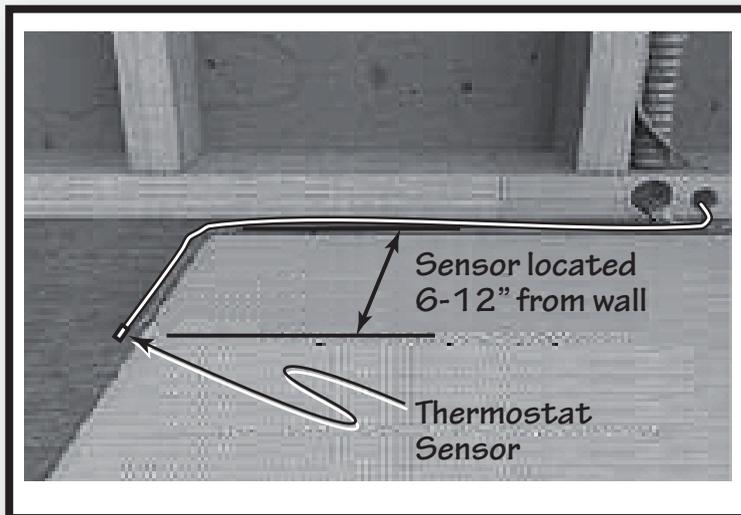
#### **NOTE**

The thermostat sensor is thicker than the heating mat. If thin-setting over backer board or slab, saw a groove to recess the sensor to the level of the mat. Use duct tape to secure the sensor in the groove. Do not damage the sensor. Ensure the sensor is set down so it is level with the mat and not on top of the mat.

#### Step 5. Connect the Electrical Leads

Now, depending upon your wire lead installation, route the lead wires from each of the individual mat along the base of the wall and up to the junction box.

Depending on the thickness of the mortar bed, you may also need to chisel a space under the point where the wires connect with the mat in order to recess the connection. Be extremely careful not to damage the heating mat or connection.



# Section 4. Inspection and Testing

A visual and electrical check must be performed on the heating mats prior to activation.

## Visual Inspection

Also perform a visual check to look for any signs of damage to the mat or electrical leads that may have occurred during installation. When visually checking the mats, look for any signs of damage, wear, or scratching that might have occurred during installation. If any portion of a mat appears damaged, replace the entire mat. If damage is found, call the technical hotline at 1-508-291-2000 for advice and/or replacement assistance.

## Continuity/Resistance Check



### **NOTE**

**Record the resistance measurements of each mat before installation. These measurements are located on the product label for each mat and will be used to confirm a successful installation. These measurements are required for warranty registration.**

### **NOTE**



**If a mat fails the resistance check, it must be retested after any corrective actions.**

Following installation, a second resistance check across the supply leads of each mat using an accurate digital ohm meter must be made to detect any short or open circuits that may have resulted from the installation process.

If the resistance check is the same as the original reading shown on the mat label, the mat is installed properly and no further testing is required. The tolerances for the resistance measurements are -5% or +10%, as indicated in the charts on page 12.

If the resistance readings are higher than the indicated high resistance limit in the chart on page 12, this indicates a damaged mat. Inspect all wiring for damage or loose connections and retest.

If the resistance readings are lower than the indicated low resistance limit in the charts on page 12, call 1-508-291-2000.

If the resistance is ZERO: This indicates a short circuit. Check the path that the wiring is taking and make sure that no wires are pierced or otherwise damaged. Mats with damaged non heating leads must be replaced.

## Perfectly Warm™ Tile Heat Power Ratings (120V)

| Product ID     | Dimensions | Wattage<br>(watts) | Current<br>(amps) | Resistance<br>(ohms) |         |        |
|----------------|------------|--------------------|-------------------|----------------------|---------|--------|
|                |            |                    |                   | High                 | Nominal | Low    |
| PWT18-73W120V  | 18" x 5'   | 73.47              | 0.61              | 215.60               | 196     | 186.20 |
| PWT18-151W120V | 18" x 10'  | 151.62             | 1.26              | 104.47               | 94.97   | 90.23  |
| PWT24-37W120V  | 2' x 2'    | 37.40              | 0.31              | 423.53               | 385.03  | 365.78 |
| PWT24-81W120V  | 2' x 4'    | 81.40              | 0.68              | 194.59               | 176.90  | 168.06 |
| PWT24-103W120V | 2' x 5'    | 103.40             | 0.86              | 153.19               | 139.26  | 132.30 |
| PWT24-125W120V | 2' x 6'    | 125.40             | 1.05              | 126.32               | 114.83  | 109.09 |
| PWT24-169W120V | 2' x 8'    | 169.40             | 1.41              | 93.51                | 85.01   | 80.76  |
| PWT24-213W120V | 2' x 10'   | 213.40             | 1.78              | 74.23                | 67.48   | 64.10  |
| PWT36-94W120V  | 3' x 3'    | 94.50              | 0.79              | 167.62               | 152.38  | 144.76 |
| PWT36-129W120V | 3' x 4'    | 129.50             | 1.08              | 122.32               | 111.20  | 105.64 |
| PWT36-164W120V | 3' x 5'    | 164.50             | 1.37              | 96.29                | 87.54   | 83.16  |
| PWT36-199W120V | 3' x 6'    | 199.50             | 1.66              | 79.40                | 72.18   | 68.57  |
| PWT36-269W120V | 3' x 8'    | 269.50             | 2.25              | 58.78                | 53.43   | 50.76  |
| PWT36-339W120V | 3' x 10'   | 339.50             | 2.83              | 46.66                | 42.42   | 40.29  |
| PWT48-80W120V  | 4' x 2'    | 79.90              | 0.67              | 198.25               | 180.23  | 171.21 |
| PWT48-174W120V | 4' x 4'    | 173.90             | 1.45              | 91.09                | 82.81   | 78.67  |
| PWT48-221W120V | 4' x 5'    | 220.90             | 1.84              | 71.71                | 65.19   | 61.93  |
| PWT48-268W120V | 4' x 6'    | 267.90             | 2.23              | 59.13                | 53.75   | 51.06  |
| PWT48-362W120V | 4' x 8'    | 361.90             | 3.02              | 43.77                | 39.79   | 37.80  |
| PWT48-456W120V | 4' x 10'   | 455.90             | 3.80              | 34.74                | 31.59   | 30.01  |

## Perfectly Warm™ Tile Heat Power Ratings (240V)

| Product ID     | Dimensions | Wattage<br>(watts) | Current<br>(amps) | Resistance<br>(ohms) |         |         |
|----------------|------------|--------------------|-------------------|----------------------|---------|---------|
|                |            |                    |                   | High                 | Nominal | Low     |
| PWT18-73W240V  | 18" x 5'   | 73.47              | 0.31              | 862.39               | 783.96  | 727.66  |
| PWT18-151W240V | 18" x 10'  | 151.62             | 0.63              | 417.89               | 379.90  | 360.90  |
| PWT24-37W240V  | 2' x 2'    | 37.40              | 0.16              | 1694.12              | 1540.11 | 1463.10 |
| PWT24-81W240V  | 2' x 4'    | 81.40              | 0.34              | 778.38               | 707.62  | 672.24  |
| PWT24-103W240V | 2' x 5'    | 103.40             | 0.43              | 612.77               | 557.06  | 529.21  |
| PWT24-125W240V | 2' x 6'    | 125.40             | 0.52              | 505.26               | 459.33  | 436.36  |
| PWT24-169W240V | 2' x 8'    | 169.40             | 0.71              | 374.03               | 340.02  | 323.02  |
| PWT24-213W240V | 2' x 10'   | 213.40             | 0.89              | 296.91               | 269.92  | 256.42  |
| PWT36-94W240V  | 3' x 3'    | 94.50              | 0.39              | 670.48               | 609.52  | 579.05  |
| PWT36-129W240V | 3' x 4'    | 129.50             | 0.54              | 489.27               | 444.79  | 422.55  |
| PWT36-164W240V | 3' x 5'    | 164.50             | 0.69              | 385.17               | 350.15  | 332.64  |
| PWT36-199W240V | 3' x 6'    | 199.50             | 0.83              | 317.59               | 288.72  | 274.29  |
| PWT36-269W240V | 3' x 8'    | 269.50             | 1.12              | 235.10               | 213.73  | 203.04  |
| PWT36-339W240V | 3' x 10'   | 339.50             | 1.41              | 186.63               | 169.66  | 161.18  |
| PWT48-80W240V  | 4' x 2'    | 79.90              | 0.33              | 792.99               | 720.90  | 684.86  |
| PWT48-174W240V | 4' x 4'    | 173.90             | 0.72              | 364.35               | 331.22  | 314.66  |
| PWT48-221W240V | 4' x 5'    | 220.90             | 0.92              | 286.83               | 260.75  | 247.71  |
| PWT48-268W240V | 4' x 6'    | 267.90             | 1.12              | 236.51               | 215.01  | 204.26  |
| PWT48-362W240V | 4' x 8'    | 361.90             | 1.51              | 175.08               | 159.16  | 151.20  |
| PWT48-456W240V | 4' x 10'   | 455.90             | 3.80              | 138.98               | 126.34  | 120.03  |

## 4. Inspection and Testing - Continued

### Test for Heating

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#### **NOTE**

**AFTER TESTING, DO NOT TURN ON THE SYSTEM FOR 28 DAYS TO ALLOW THE THIN-SET AND GROUT TO CURE. FAILURE TO DO SO MAY COMPROMISE INSTALLATION AND CAUSE CRACKING OR OTHER DAMAGE.**

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#### **CAUTION**

**Ensure that breaker supplying power to the heating mats has been turned off before making electrical connections.**

---



#### **NOTE**

**The mats will generate a low, comfortable warmth. If area is cold during installation it is likely that the mats will not seem warm so you will have to rely on the electrical tests. If the mats do not become warm, double-check all wiring and again perform the electrical tests above (after turning off power at the breaker).**

---

1. Install control device and connect to electrical panel box. Install and wire the control device according to manufacturer's instructions.
2. Wire the heating mat(s) to junction box, and wire the junction box to the thermostat according to the manufacturer's instructions.
3. Turn on the breaker and adjust the thermostat

to call for heat. Refer to the installation sheets provided with the controls for proper setting. After all controls are installed, do not energize the system, except to briefly test operation of all components.

4. After the system has been on for several minutes, run your hand over the heating mats to ensure that they are warm. The system should now operate as designed. Please leave the instruction sheets for the thermostat in a safe place for future reference.
5. Once heating has been verified, turn off the system.

### Final Floor Installation

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#### **CAUTION**

**Flooring materials must be rated for use with electric floor warming systems.**

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The mats are now ready for tile installation using a latex modified thin-set with a maximum thickness of 3/8" after the tile is embedded. It is recommended to use a plastic notched trowel to help prevent damage to the heating mat surface. Take care during the troweling process to not nick or cut into the mat.

We recommend working with professional flooring installers to make sure proper materials are used and proper installation techniques are followed. Install the floor covering according to the manufacturer's instructions.

Use a digital ohm meter to check the resistance of the mat(s) and sensor(s) before, during and after the installation of the finished floor covering. Record the readings on Heating System Checklist & Warranty Registration Form, continuing to check for short circuits caused by nicks or pinches. If possible, take photographs of the mat installation before installing the flooring.

## Tile, Stone, and Marble Installation

### CAUTION



Flooring materials must be rated for use with electric floor warming system.

When installing tile, stone, or marble over Perfectly Warm™ Tile Heat, we highly recommend Tile Council of North America (TCNA) guidelines or ANSI specifications for minimum standards of installation. We recommend latex-modified or epoxy modified mortar and grout, instead of water-based multi-purpose materials.

Select the proper size PLASTIC trowel for the installation of tile or stone. We recommend a minimum 3/8" x 1/4" trowel. This trowel works best for most 1/4" tile.

### CAUTION



Never bang a trowel on the mat to remove excess mortar from the trowel. This could damage the mat.

### NOTE



When installing tile, stone or marble over Perfectly Warm™ Tile Heat, it is important to maintain a thin-set thickness of 3/8" or less after the tile is embedded, even if the mortar manufacturer allows for thicker installations. Thicker mortar beds can potentially provide sufficient moisture to cause some natural stones to warp or crown.

If you need more information on tile installation, contact TCNA at (864) 646-8453 or visit their Web site at [www.tileusa.com](http://www.tileusa.com).

### Place Caution Stickers

Apply caution stickers provided with mats in appropriate locations, as shown below.

Affix to the electrical panel box. In the space provided, record the numbers of all circuits to which floor heating mats are attached.



#### WARNING

##### RISK OF ELECTRIC SHOCK

ELECTRIC WIRING AND HEATING PANELS CONTAINED WITHIN THE FLOOR. DO NOT PENETRATE FLOOR WITH NAILS, SCREWS OR SIMILAR DEVICES.

CIRCUITS WITH HEATING MATS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Perfectly Warm™

PW1015

Affix adjacent to points of access to all concealed areas in which installed heating products are accessible.

#### CAUTION

RADIANT HEATING PRODUCTS INSTALLED IN THIS AREA. AVOID ACTIONS WHICH MAY RESULT IN MECHANICAL DAMAGE TO THE PRODUCT.



Perfectly Warm™

PW1009

Affix adjacent to the thermostat.



Perfectly Warm™  
RADIANT FLOOR  
HEATING PW1011

## 4. Inspection and Testing - Continued

### Documentation

The System Checklist and Warranty Registration form records vital information about your installation. Fill out all requested information on BOTH copies. One copy is returned to the manufacturer to register the installation, and the second copy is for the homeowner's records. This manual must be attached to the service panel so that it is easily accessible to the homeowner and any repair technicians.


**Perfectly Warm™**

### System Checklist and Warranty Registration

Installation Location: \_\_\_\_\_

City / State / ZIP / Country: \_\_\_\_\_

Installation / Inspection Dates: \_\_\_\_\_ / \_\_\_\_\_

Purchase Order Number: \_\_\_\_\_

Purchased From: \_\_\_\_\_

Electrical Permit Number: \_\_\_\_\_

Name of Installer: \_\_\_\_\_

Installer Company Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City / State / ZIP / Country: \_\_\_\_\_

Heat Loss Calculated by: \_\_\_\_\_  
Floor warming systems being used as primary heat require heat loss calculation.  
 Floor warming systems used as supplemental heat do not require heat loss calculation.

Electrical Inspector: \_\_\_\_\_

**Provide All Requested Information For Each Room / Area**

| Design Criteria                                  |                          |                        |                                 | Inspection   |                     |                       |         |             |  |
|--|--------------------------|------------------------|---------------------------------|--|---------------------|-----------------------|---------|-------------|--|
| Primary Heat: yes no<br>If "yes": Heat Loss +20% | Product Model Number (s) | Number of Mats & Sizes | Total Number of Installed Watts | Visual Inspection*   | Product Date Code** | Number of Thermostats | Voltage | Ohm Reading |  |
| Living Room                                      |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Dining Room                                      |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Entrance   |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Kitchen  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Family Room                                      |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Bedroom 1  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Bedroom 2  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Bedroom 3  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Bathroom 1                                       |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Bathroom 2                                       |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Den  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Other  |                          |                        |                                 | A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> |                     |                       |         |             |  |
| Panel Box ***                                    |                          |                        |                                 | D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> |                     |                       |         |             |  |
| Total  |                          |                        |                                 |  |                     |                       |         |             |  |

\* Visual Inspection: A — No Installation Damage such as creasing, punctures, cuts or abrasions.  
 B — Control / Thermostat Warning Label has been installed.  
 C — Insulation Type and Thickness corresponds to specifications.

\*\* Date Code: The product date code is a 3 letter, 6 number code printed in the center of the element (except tile mats).

\*\*\* Panel Box: D — Warning Label is attached to panel box. E — All Circuits Properly Labeled.  
 F — Each Heating System Circuit For Exclusive Use of the Heating System (no outlets, etc.).

Completely fill out information and return one (1) copy to:

The undersigned represents that the above installation has been performed in accordance with the installation instructions and all applicable codes and that all of the above statements are true, correct and complete. A copy of this form must be kept on site as a permanent record.



**Perfectly Warm™**  
 2380 Cranberry Highway  
 West Wareham, MA 02576

NAME (please print) \_\_\_\_\_
SIGNATURE \_\_\_\_\_
DATE \_\_\_\_\_

## Troubleshooting

The heating elements used in the individual Perfectly Warm™ Tile Heat mats for under tile, stone or marble are laminated within the membrane. All Heating Element connections and terminations are crimped, insulated and well protected within the lamination making Perfectly Warm™ Tile Heat one of the most durable heating mat systems on the market. Problems with the system operation that are the result of a damaged or modified mat are not covered under warranty.

It is important that this manual be followed during the installation procedures and that all warnings be followed. Wiring should be performed by a licensed electrician in accordance with all applicable building and electrical codes during the installation as well as for any trouble shooting of the system. Failure to do so voids warranty.

The individual mats provided with each system have ohm readings written on the mat. It is important that these readings be checked, verified and recorded upon receipt of the product and again after the mats have been installed (prior to tile installation). A test of the system to make sure all elements are heating properly is recommended prior to installation of tile. The manufacturer will not be responsible for the replacement of the floor tile if the system operation was not checked and verified prior to installation of the tile.

| Symptom           | Corrective Actions  |
|-------------------|---|
| Floor Not Warming | Verify power is connected to the system and that the GFCI is not tripped at the thermostat or the breaker is not tripped at the main service panel.   |
| Mat Not Warming   | Verify that all leads from all mats are connected together to power source. Areas within a mat that are not heating could be the result of damage and will require the mat to be replaced.  |
| Slow to Heat      | Installations on concrete slabs can require a period of several days to warm up to desired temperature especially if the slab is uninsulated in a cold climate. Set Thermostat to maximum heat to allow system to continue running until it becomes warm. Then adjust thermostat down if needed. Verify floor temperature sensor is not directly on top of heating element causing the thermostat to shut off more frequently.  |
| System Too Hot    | Adjust thermostat<br>Verify that correct voltage is being applied to heating elements rated for 120V Service.<br>Verify that thermostat has not been bypassed.<br>If necessary, reposition floor temperature sensor.  |
| Thermostat GFCI   | If the thermostat trips and will not re-set, check the following:<br>System MUST be on a dedicated branch circuit separate from any other electrical devices which could overload the circuit or create interference issues resulting in the GFCI to trip.<br>Check electrical connections to verify leads from all mats are wired in parallel (black to black / white to white / red to red) and all connections are tight and properly insulated against grounding.<br>Check leads from mats to verify no nicks or cuts have occurred during construction that may be causing a short. For further assistance with GFCI problems call 1-508-291-2000. |
| Thermostat Issues | Refer to the thermostat manufacturer's documentation.   |

# Section 5. Operation

## How the System Works

The radiant heat warms your floor, and provides clean, even heat throughout the room by uniformly warming the objects while providing thermal comfort for occupants. There is no need to directly over-heat the air. This is the opposite of how conventional forced hot air or baseboard heating systems work. In other types of heating systems, the large mass of air in a home is heated while the objects (and especially the outside walls) remain relatively cool.

## Operating the System

Operation of Perfectly Warm™ Tile Heat is the same as other heating systems. Just set the thermostat to the desired temperature and the system warms your finished floors and the room.

Keep the following things in mind:

- Since each room has its own thermostat, you can individually tailor room temperatures based on activity or occupancy. For instance, if a room is rarely used, you can set its thermostat lower to conserve electricity.
- Before you leave your home for an extended period of time, lower the temperature settings to reduce the power consumption.
- Setting the thermostat to a very high temperature will not make a room warm up faster – it will merely result in the occupants being too hot when the set temperature is ultimately reached.
- High airflow velocities (from open doors or windows or extreme drafts) may make occupants feel cold.
- Routinely test thermostats according to their manufacturer's instructions.

## Precautions

Although the Perfectly Warm™ Tile Heat system requires no maintenance, there are some things that must be taken into account to ensure that the systems are not damaged. Additional information for remodeling or repair is available by calling 1-508-291-2000.

- Hitting the electrically conductive portions of a heating panel can result in a potentially dangerous electric shock.
- Piercing the elements will damage them, may present fire hazard and may cause electrical shock.
- If a portion of the floor surface must be replaced, inspect any exposed heating mat for damage that may have occurred while removing the flooring. See page 8 for complete instructions on inspecting the mats.
- Never cover any heated portion of a floor with walls or other permanent structures. This may trap heat and create a potential for overheating.
- If new walls or partitions are added over heating portions of a new floor, the heating mats located under the walls or partitions must be disconnected from power to avoid a potential for overheating.

## 5. Operation - Continued.

### Repair/Remodel Information

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#### **CAUTION**

This information must be read and understood by all repair and remodeling technicians who will be working on the house structure in the area of an installed Perfectly Warm™ Tile Heat or main electrical systems. Failure to follow these guidelines may result in a risk of electric shock or fire hazard.

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#### **CAUTION**

When installing any other materials on or near a heated floor, ensure that no heating elements are punctured by nails, screws, etc.

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Before performing any remodeling work near a heated floor, carefully read Sections 1 through 3 of this manual. These sections detail the clearances, procedures, and materials involved as well as the testing procedures required to ensure system safety.



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