



Radiant Heat Film for Floating Floors

INSTALLATION AND OPERATION INSTRUCTIONS

For use under floating laminate, engineered wood, and floating tile flooring

CAUTIONS:

THIS EQUIPMENT SHALL BE INSTALLED ONLY BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE APPARATUS AND THE RISKS INVOLVED.

THE INSTALLATION OF THIS HEATING PRODUCT SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL AND NATIONAL CODES.

IN CANADA, THE INSTALLATION SHALL BE MADE ACCORDING TO THE PROVISIONS OF SECTION 62 OF THE CANADIAN ELECTRICAL CODE, PART 1.

WARNING - AS DESCRIBED IN THESE INSTRUCTIONS, LEAD WIRES ARE NOT TO BE ROUTED OVER PADS OR COME INTO CONTACT WITH THE HEATING ELEMENTS AS DAMAGE TO SUPPLY CONDUCTOR INSULATION MAY OCCUR IF CONDUCTORS ARE ROUTED TO CONTACT HEATING ELEMENTS. REFER TO INSTALLATION INSTRUCTIONS FOR RECOMMENDED MEANS OF ROUTING SUPPLY CONDUCTORS.

THE TYPE AND THICKNESS OF FLOOR COVERING MATERIALS USED WITH THIS PRODUCT MUST NOT EXCEED A THERMAL INSULATION "R" VALUE OF 2.0.

CAUTION: USE COPPER ONLY AS SUPPLY CONDUCTORS. THERE ARE NO SPECIAL CRIMPING TOOLS REQUIRED FOR THIS PRODUCT.





Radiant Heat Film for Floating Floors

Installation and Operation manual

2500 Old Hadar Road
Norfolk, NE 68702
888-379-9695 • FAX 402-379-9737
info@mpglobalproducts.com

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Radiant Heat Film for Floating Floors

UL RECOGNIZED **C** **UL** **US** UL FILE NUMBER E514043
Conforms to UL 499 and
CSA C22.2 No.72

INSTALLATION AND OPERATION

The Radiant Heat for Floating Floors system works just like the sun. When the thermostat calls for power, the heating element warms the floating floor or laminate finished flooring surface by providing radiant heat, the same type of heat that warms you on a cool spring day. Although the air is cool, the radiant heat from the sun keeps you warm.

The radiant heat warms your floor, and provides clean even heat throughout the room by uniformly warming the objects while providing thermal comfort. There is no need to directly over-heat the air. This is the opposite of how a conventional forced hot air or baseboard heating systems works. 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.



CAUTION:

Read and follow all the installation instructions in this manual before attempting to install the Radiant Heat for Floating Floors. 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.



NOTE:

Upon removing the heating mats from the box, it is important to check and record the resistance of each mat using a digital ohmmeter, and compare those readings with the baseline resistance indicated on the stickers attached to the mats. If any mat shows a resistance reading that varies from the baseline value, call the technical support hotline at 1-888-WARM PAD.



25 YEAR LIMITED WARRANTY

MP GLOBAL PRODUCTS, LLC (THE “MANUFACTURER”) WARRANTS TO THE ORIGINAL PURCHASER (THE “OWNER”) THAT THIS RADIANT HEAT FILM FOR USE UNDER FLOATING OR TILE FLOORS (THE “PRODUCT”) will be free of defects in workmanship and materials and will conform in all material respects to any written specification that the Manufacturer 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 the Manufacturer in writing within 25 years after that customer receives the shipment, including a detailed explanation of the alleged nonconformity and (b) return the shipment to the Manufacturer postage prepaid. If The Manufacturer reasonably determines through examination of the returned shipment that the shipment did not satisfy the above warranty, then AS THE MANUFACTURER EXCLUSIVE LIABILITY AND THE CUSTOMER’S SOLE REMEDY, THE MANUFACTURER 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 THE MANUFACTURER MAY ELECT IN ITS SOLE DISCRETION. If the Manufacturer determines that the function of the Product caused the failure of the overlying finished floor covering, and installation instructions were properly followed during installation, the Manufacturer will repair or replace the finished floor covering at no cost to the customer.

This warranty does not apply if the Manufacturer reasonably determines that the product has been cut improperly, added to or otherwise altered, stored improperly, misused, damaged, or installed not in accordance with the instruction manual supplied by the Manufacturer. The Manufacturer 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 the Manufacturer. Components such as attaching hardware, connecting parts, wire, tape, and other items included in kits or assemblies that are not manufactured by the Manufacturer 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.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS, WARRANTIES, OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF THE MANUFACTURER WHETHER BY STATUTE, CONTRACT, STRICT LIABILITY, TORT OR OTHERWISE.

THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY INCIDENTAL, CONSEQUENTIAL, MULTIPLE, PUNITIVE OR INDIRECT DAMAGES OR LOSS, LOSS OR DAMAGE TO OR LOSS OF USE OF FACILITIES OR OTHER PROPERTY, OR FOR LOST PROFITS OR LOST REVENUE, WHETHER BASED UPON WARRANTY, STATUTE, CONTRACT, STRICT LIABILITY, TORT OR OTHERWISE. THE MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR THE PERFORMANCE OF, OR COST OF PERFORMING, THE REMOVAL OR INSTALLATION OF THE PRODUCT OR ANY PRODUCT OR MATERIAL INTO WHICH IT IS INSTALLED, INCORPORATED OR ADDED. THE CUSTOMER IS RESPONSIBLE FOR THE COST OF LABOR, SERVICE CALLS, INSURANCE, SHIPPING, INSTALLATION COSTS AND ANY OTHER EXPENSE OR DAMAGE INCURRED.

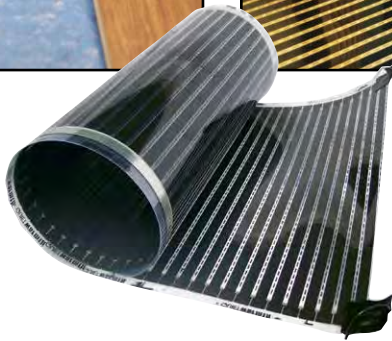
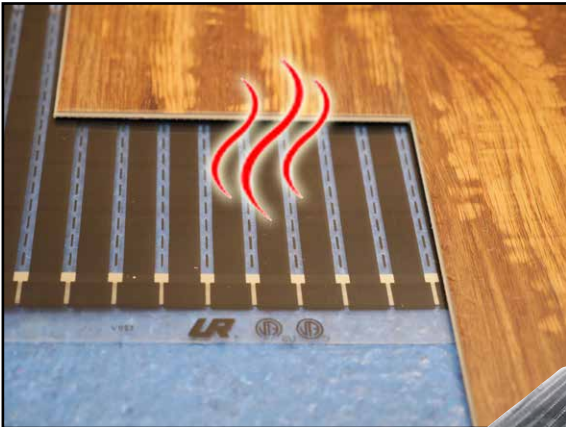
IN NO EVENT SHALL THE MANUFACTURER’S MAXIMUM LIABILITY EXCEED THE PURCHASE PRICE FOR THE RELEVANT SHIPMENT OF PRODUCT, EXCEPT TO THE EXTENT MADE MANDATORY BY LAW.

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SAFETY INFORMATION

Throughout the 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 a safe and functional installation of Radiant Heat for Floating Floors, 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 Radiant Heat for Floating Floors 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.

CAUTION:



Make sure that the jobsite is neat and clean before working with the mats. 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.

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

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

Not for use in wet areas, such as showers. This system is only for use in areas considered dry locations by National Electrical Code.

Do not install mats in walls, under walls or partitions, or in locations where they will be covered by floor hugging furniture or fixtures.

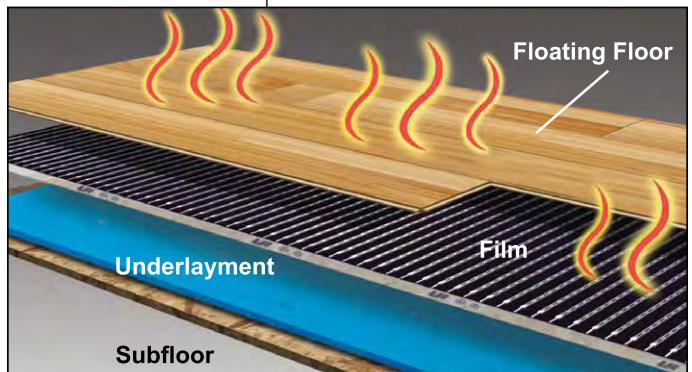
CAUTION:



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

Do not fold or alter the heating mats.

Do not place futons, beanbag chairs, or similar furniture on heated floors.



SECTION 1. Introduction

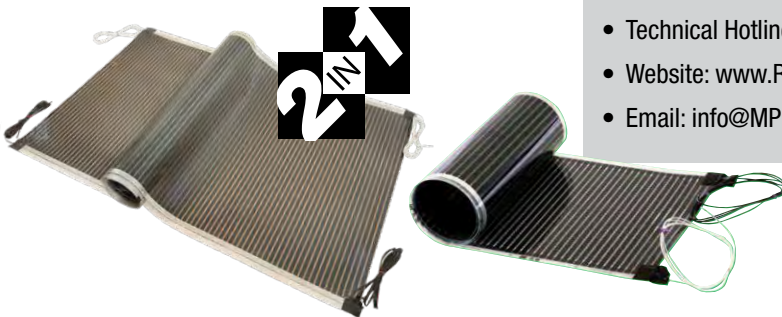
Radiant Heat Film for Floating Floors is a unique heating system that is installed below floating flooring materials to create warm, comfortable floors and provide supplementary or primary heat. Radiant Heat Film consists of low heat density film heating mat sets that cover the majority of the open floor area to ensure optimum thermal comfort. Radiant Heat Film comes as standard kits which may be modified and cut to shorter lengths in accordance with instructions or is available as custom orders. Warranted to be free of defects in manufacture for a period of 25 years.

The Radiant Heat Film System can be installed on any standard sub-floor, so long as it is flat, smooth, and free from protrusions such as nails, screws, etc. When specifying as primary heat, a heat loss calculation must be performed to determine how many watts are required to heat the room or space.

For more information go to www.RadiantHeatFilm.com

Features:

- 12 watts per square foot
- 0.016" thick, Easy to install
- Available in 18" and 36" widths in standard kit lengths or custom lengths
- 2-in-1 Kits are available in 18" and 36" widths and feature factory attached leads on both ends of mat. Designed to be cut apart to desired lengths for less waste and versatile coverage.
- 120V or 240V
- Thermostat controlled
- Warranted to be free of defects in manufacture for a period of 25 years



How to Use This Manual

This manual is organized into five sections:

- Introduction
- Designing the Installation
- Installation
- Inspection and Testing
- Operation

Before You Begin

- Radiant Heat Film 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 Radiant Heat Film Floating Floor Heat mats.
- All wiring, fuses and/or circuit breakers must conform to National Electrical Code requirements.

For Additional Help

- Technical Hotline: 1-888-379-9695
- Website: www.RadiantHeatFilm.com
- Email: info@MPGlobalProducts.com

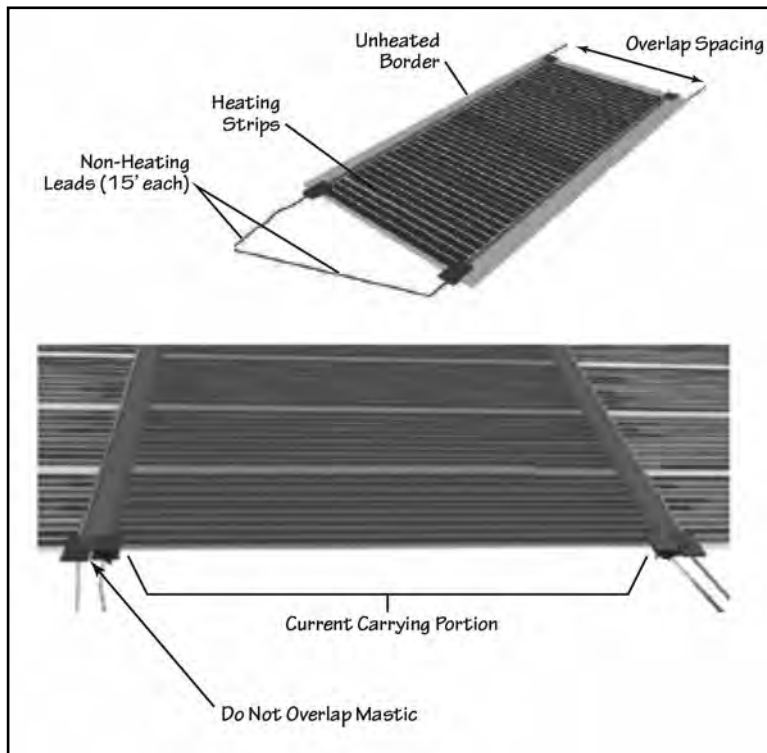
1. Introduction Continued

NEVER Do the Following:

- Install in wet areas such as showers. This system is only for use in areas considered dry locations by National Electrical Code.
- Never fold or alter the heating mats.
- Never install mats under walls or partitions, or in locations where they will be covered by floor hugging furniture or fixtures. Call for instruction before proceeding.
- Never place futons, beanbag chairs, or similar furniture on heated floors.
- Never install in walls.

ALWAYS Do the Following:

Protect the circuit supplying power to the Radiant Heat for Floating Floors mats with a ground fault circuit interrupter (GFCI).

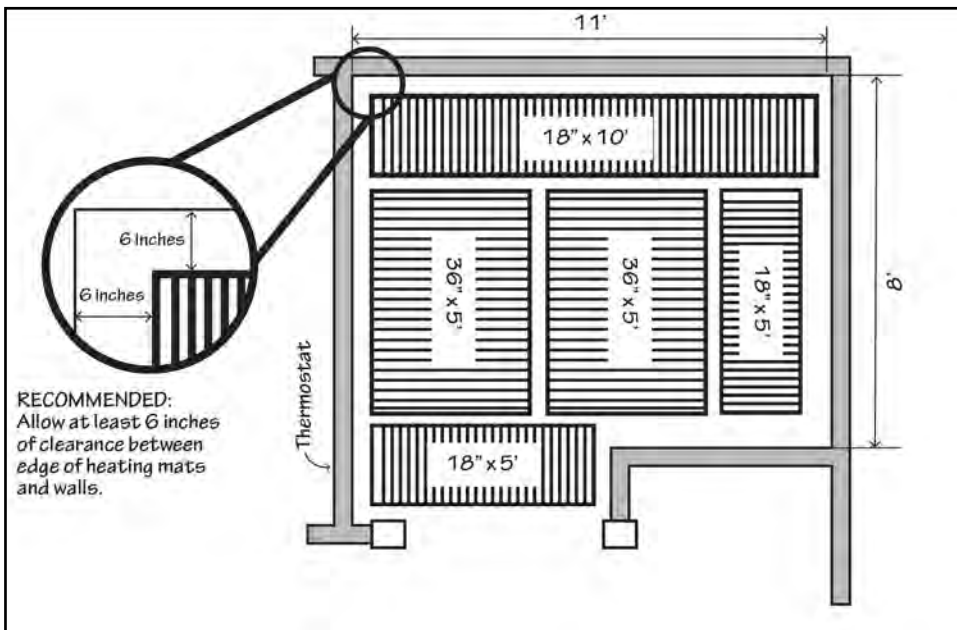


SECTION 2. Designing the Installation

Radiant Heat for Floating Floors is made up of four major components: the heating mats, the wiring, the control device and the floor structure. These components work together to create a system that provides comfortable, trouble free floor warming or as primary heat when appropriately specified. Designing a Radiant Heat Film system is straightforward. The following instructions will ensure a trouble-free design and full compliance with the warranty requirements.

Sketch the System Layout

A sketch of the area to be warmed, including the mat locations and associated wiring is suggested to make installation and ordering as smooth as possible. Use the sketch below as an example. Allow at least 6 inches clearance between the edge of the mats and the wall. Note that the thermostat is located on an interior wall where it will not be subjected to direct sunlight and that the length of the non-heating leads is taken into account. Ensure that non-heating leads will not cross over any heating mats.



2. Designing the Installation Continued

All heated areas must be protected by a GFCI in either the thermostat or at the service panel. The fuse or circuit breaker used to protect the circuit supplying power to the Radiant Heat Film system 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 more than the 16 amperes allowed, 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.

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.

Floor Construction

Radiant Heat for Floating Floors can be installed on any standard sub-floor, so long as it is flat, smooth, and free from protrusions such as nails, screws, etc.

Design Clearances

When designing the heating system, care must be taken to ensure that proper clearance is maintained from fixtures which may be part of the floor.

- For best results, there should be a 6 inch (15 cm) clearance between the edge of the mats and the perimeter of the room or the walls. Clearance may be greater than 6 inches.
- Decorative trim: Mats must be installed so that they will not be covered, even in part, by decorative trim, baseboards or other structures on the floor. Heating mats which are covered by other structures may overheat.
- Wiring: Electrical wiring in the floor, other than that for the heating system, must be at least 2 inches (5 cm) away from the heating mats and/or separated from the heating mats by insulation or the building structure.
- Heat Sources: At least 8 inches (20 cm) of clearance must be maintained between heat sources and the Radiant Heat Film mats. Heat sources include hot water pipes, stoves, fireplaces, wood stoves, hot air vents, etc.



NOTES:

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.

The system must be installed using a thermostat approved by the manufacturer. Use of any other thermostat will void the manufacturer's warranty. For a list of approved thermostat devices, refer to www.RadiantHeatFilm.com.

SECTION 3. Installation

Preparing the Job Site

Make sure that the job site is neat and clean before working with the Radiant Heat for Floating Floors. Nails, screws, and other sharp debris can damage the mats. Any mats which become torn or otherwise damaged must be discarded.

NOTES:

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

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

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

The installation of this product shall be in accordance with Article 424, of the National Electrical Code, ANSI/NFPA 70. ETL listed to UL499.

Note that installations over non-insulated concrete subfloors may require a longer period of time to adjust to your desired temperature.

What You Will Need

- Radiant Heat Film mats
- Kapton Discs and Warning Labels (included in kits)
- Thermostat: A recommended floor-sensing thermostat (go to www.Radiant Heat Film.com for recommended thermostats)
- GFCI Breaker (if not part of the thermostat)
- Junction Boxes: Minimum of two required for each room or area. One box (3") required for thermostat, one box (4") required for electrical connections
- Vapor Barrier (6 mil) (only for concrete slabs when using underlayment without an attached vapor barrier)
- Underlayment
- Duct tape
- Tools: Digital Ohm Meter (multi-meter), wire stripper, screw driver, wood chisel, knife and scissors to cut underlayment
- 12/2 Romex Wire

3. Installation Continued

Electrical Installation

Step 1. GFCI Installation

Radiant Heat Film Radiant Heat for Floating Floor 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. Typical Amperage Requirement: 120 VAC Radiant Heat Film 0.1 amps per square foot, or 10 amps per 100 square foot of mat.

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 Radiant Heat Film system.

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.

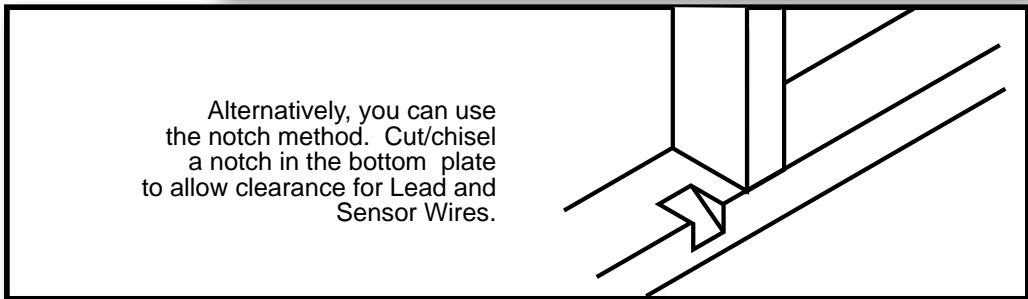
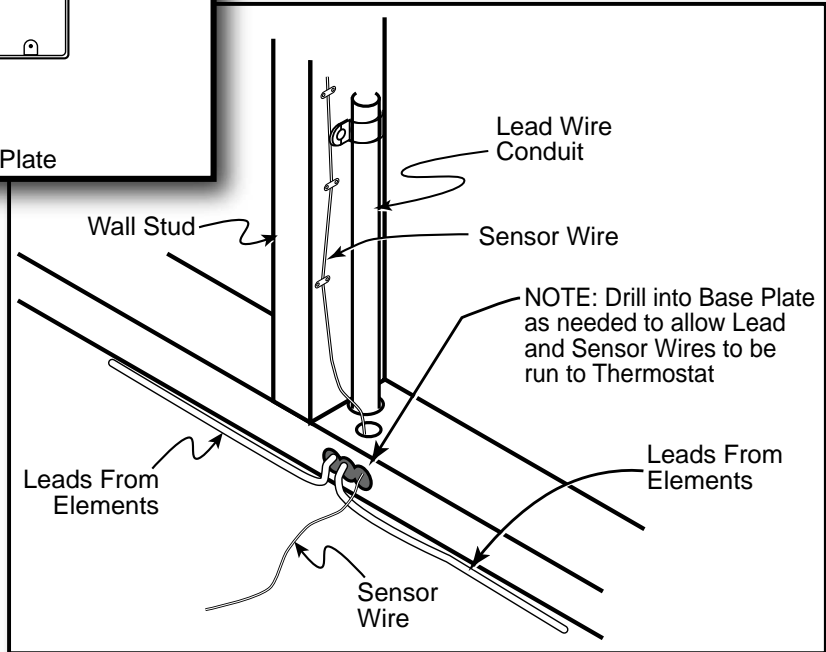
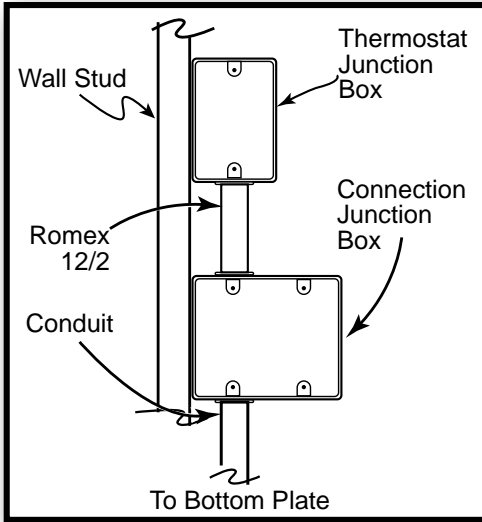
Step 4. Bottom Plate Work

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.

3. Installation Continued



3. Installation Continued

3.3 Installing the Units

Installation Sequence

The sequence of installation should be as follows:

1. Apply lower vapor barrier if installing over concrete slab using underlayment without a built-in vapor barrier.
2. Install insulating underlayment.
3. Install heating mats.
4. Install finished floor covering.

Step 1. Inspect and Test Mats

1. Visually inspect each mat for any signs of damage that may have occurred during shipping.
2. The individual mats provided with each kit have resistance readings (in ohms) on a sticker on the mat. Using an ohm meter, check and verify the resistance of each mat. If any reading is significantly different from the value on the mat, contact the technical hotline at 1-888 WARM PAD.

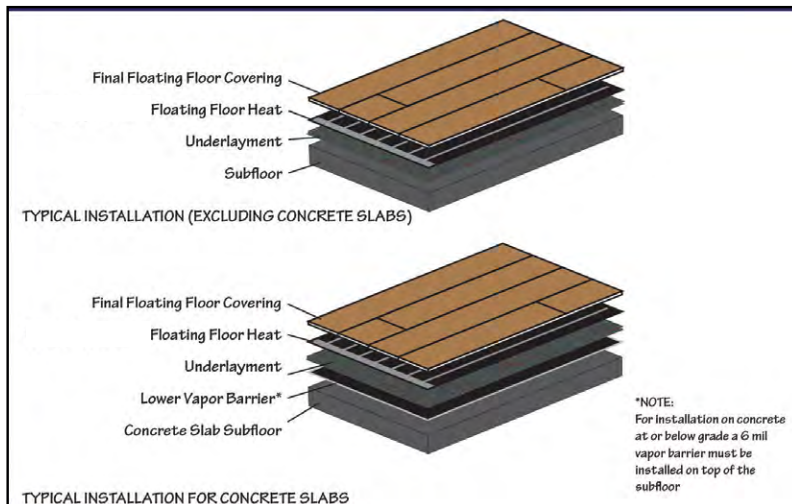
Step 2. Install Lower Vapor Barrier

For installations on concrete slabs, or at below grade, ensure the lower 6 mil (0.15 mm) vapor barrier is completely and properly installed.

Step 3. Install Underlayment

For all floors, install a suitable underlayment over the subfloor and over any vapor barriers that needed installed over concrete or at below grade. Some underlayments provide a suitable pre-attached vapor barrier built into the underlayment. Refer to all flooring manufacturer's underlayment recommendations.

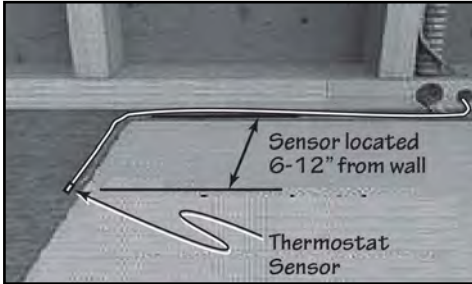
For under floating tile systems, no underlayment is needed. For installations over concrete slabs in cold regions, it is highly recommended that an insulating underlayment be installed over the entire floor. Follow all installation instructions of the underlayment manufacturer. The Radiant Heat Film film mat(s) then install directly on top of the underlayment layers.



3. Installing the Units Continued

Step 4. Install Thermostat Sensor

Cut an area of underlayment to push the sensor down so it is completely level with the mat. Tape the floor sensor to the underlayment in an area at least 1 inches (2.5 cm) from any heated (black stripe) of the heating mat. Do not allow sensor to contact mat.



NOTE:

Sensor is thicker than the heating mat. If necessary, saw a groove in the underlayment between the mats, 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. Prepare Mats

If installing cut-to-length mats, you first need to prepare them for use, as follows:

1. Using the diagram you made earlier, cut the heating element to length using scissors.
2. Do not cut the end with wired connections; only cut the opposite end (without wiring).
3. Insulate the cut ends with Kapton Disks.



NOTE:

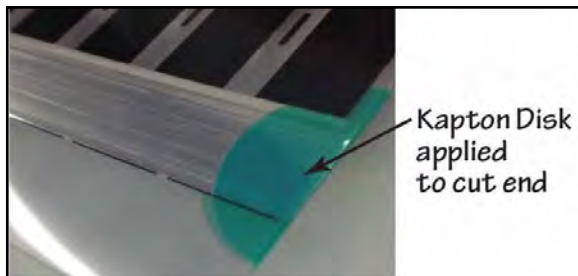
Cut only through the clear area between the heating stripes. NEVER cut closer than ¼ inch (6 mm) to the heating stripes and DO NOT cut into the heating stripes themselves.

Step 5a. Radiant Heat Mats



Since the boxed kit for the 2-in-1 mat is designed to create 2 mats, both ends of the kit length have factory installed lead wires. The end result is it will create 2 mats out of 1 boxed length. The mat MUST be cut into 2 desired lengths in order to operate correctly. Similar as in step 5 you will need to properly prepare the 2-in1 as follows:

1. Using the diagram you made earlier, cut the heating element into 2 desired to lengths using a scissors. Ensure not to cut into black stripe and stay only on the dotted line when cutting to lengths.
2. Insulate the 2 created mat cut ends with the supplied Kapton Disks on the exposed bus bars. There will be 4 bus bars to cover after the cut.



3. Installing the Units Continued

Step 6. Install Mats

1. Clear the floor of all debris, nails, etc. so the floor is smooth, clean and dry.
2. Roll out the mats over the floor surface according to the layout created in Section 1, Designing the Installation.
3. Cut out an area of the underlayment and push the connectors down so they are completely level with the mat. Route the cold leads between sections of the underlayment. If necessary, cut a narrow channel in the underlayment to route the cold leads.
4. Attach the heating mats to the underlayment using a high quality duct tape.

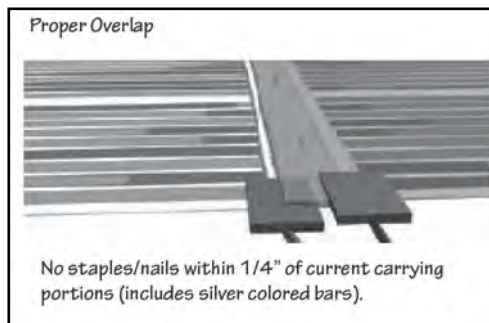
Step 7. Recheck Mat Resistance

Using an ohm meter, recheck the resistance of each mat. If any reading has changed, closely inspect the mat for damage. For additional help contact the technical hotline at 1-888 WARM PAD.

Step 8. Connect the Electrical Leads

Now, depending upon your wire lead installation, run the lead wires from the individual mat(s) along the base of the wall and up to the junction box. Wire the heating mats to the control according to the manufacturer's instructions using the 12/2 Romex wire.

Follow all national and local electric codes for final electrical hook up. Refer to the complete thermostat installation guide. On 120V systems 150 sqft of radiant heat film mats can be wired together for one thermostat to run. On 240V systems 300 sq ft of radiant heat film mats can be wired for one thermostat to run. If additional area coverage is needed, a power module may be added. Each circuit running the radiant heat system must be placed on a dedicated 20 amp circuit from the main electrical box. Follow all installations of the thermostat's installation instructions.



CAUTION:



Elements may be overlapped ONLY as shown in the figure below. Under no circumstances may current carrying portions of the mats overlap. Overlapping warming sections can result in overheating and potential fire danger. When overlapped properly, the mats will be spaced by their nominal width (18 inches or 36 inches).

CAUTION:



Take care not to damage the heating mats while they are on the floor. Do not drop items on mats and avoid unnecessary walking in heating areas before finished flooring has been applied.

SECTION 4. Inspection and Testing

A visual and electrical check must be performed on the heating mats prior to activation. The heating test may be required by the laminate manufacturer based on the type of sub-floor being used (i.e. concrete). Always check with your laminate manufacturer for any restrictions and/or requirements that they have concerning the use of their product in conjunction with floor warming systems.

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 1-888 WARM PAD for advice and/or replacement assistance.

Electrical Test

A resistance check across the supply leads of each mat using a digital ohm meter must be made to detect any short or open circuits. Please refer to the charts on page 12 under the section of low resistance limits and high resistance limits.

If the resistance check is between the low and high resistance limits shown on page 12, the system is connected properly and no further testing is required. If the resistance is LOWER than the indicated low resistance limits on page 12, contact 1-888-WARM PAD.

If the resistance is HIGHER than the indicated high resistance limits on page 12, this indicates a damaged mat. Inspect all wiring for damage or loose connections and retest. If the resistance reading 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.

If the element or film has been cut to shorten the length, to calculate the new resistance, follow the instructions below:

- 18 inch wide film - Each heating bar or stripe = 0.86 Watts. Multiply the number of heating bars or stripes of the newly shortened mat by 0.86 and this will equal the total wattage of the mat.
- 36 inch wide film - Each heating bar or stripe = 1.75 Watts. Multiply the number of heating bars or stripes of the newly shortened mat by 1.75 and this will equal the total wattage of the mat.

4. Inspection and Testing Continued

120V Radiant Heat Film Resistance Values

Tolerances for resistance measurements are -5% and +10%. To determine nominal resistance for 120V, divide 14,400 by the total wattage. This will equal Nominal Resistance for the 120V material. Next, multiply nominal resistance by 1.1 to equal the high limit. Then, multiply the nominal resistance by .95 to equal the low limit.

240V Radiant Heat Film Resistance Values

Tolerances for resistance measurements are -5% and +10%. To determine nominal resistance for 240V, divide 57,600 by the total wattage. This will equal Nominal Resistance for the 240V material. Next, multiply nominal resistance by 1.1 to equal the high limit. Then, multiply the nominal resistance by .95 to equal the low limit.



NOTES:

Record the resistance measurements of each mat after installation. These measurements should be compared to the readings recorded on the product label for each mat to confirm a successful installation. These measurements are required for warranty registration.

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

120V

Size	Amps	Watts	Resistance (Ohms)		
			Low Limit	Nominal	High Limit
1.5x1	0.15	18	760.00	800.00	880.00
1.5x2	0.3	36	380.00	400.00	440.00
1.5x3	0.45	54	253.33	266.67	293.33
1.5x4	0.6	72	190.00	200.00	220.00
1.5x5	0.75	90	152.00	160.00	176.00
1.5x6	0.9	108	126.67	133.33	146.67
1.5x7	1.05	126	108.57	114.29	125.71
1.5x8	1.2	144	95.00	100.00	110.00
1.5x9	1.35	162	84.44	88.89	97.78
1.5x10	1.5	180	76.00	80.00	88.00
1.5x11	1.65	198	69.09	72.73	80.00
1.5x12	1.8	216	63.33	66.67	73.33
1.5x13	1.95	234	58.46	61.54	67.69
1.5x14	2.1	252	54.29	57.14	62.86
1.5x15	2.25	270	50.67	53.33	58.67
1.5x16	2.4	288	47.50	50.00	55.00
1.5x17	2.55	306	44.71	47.06	51.76
1.5x18	2.7	324	42.22	44.44	48.89
1.5x19	2.85	342	40.00	42.11	46.32
1.5x20	3	360	38.00	40.00	44.00
3x1	0.3	36	380.00	400.00	440.00
3x2	0.6	72	190.00	200.00	220.00
3x3	0.9	108	126.67	133.33	146.67
3x4	1.2	144	95.00	100.00	110.00
3x5	1.5	180	76.00	80.00	88.00
3x6	1.8	216	63.33	66.67	73.33
3x7	2.1	252	54.29	57.14	62.86
3x8	2.4	288	47.50	50.00	55.00
3x9	2.7	324	42.22	44.44	48.89
3x10	3	360	38.00	40.00	44.00
3x11	3.3	396	34.55	36.36	40.00
3x12	3.6	432	31.67	33.33	36.67
3x13	3.9	468	29.23	30.77	33.85
3x14	4.2	504	27.14	28.57	31.43
3x15	4.5	540	25.33	26.67	29.33
3x16	4.8	576	23.75	25.00	27.50
3x17	5.1	612	22.35	23.53	25.88
3x18	5.4	648	21.11	22.22	24.44
3x19	5.7	684	20.00	21.05	23.16
3x20	6	720	19.00	20.00	22.00
3x21	6.3	756	18.10	19.05	20.95
3x22	6.6	792	17.27	18.18	20.00
3x23	6.9	828	16.52	17.39	19.13
3x24	7.2	864	15.83	16.67	18.33
3x25	7.5	900	15.20	16.00	17.60

240V

Size	Amps	Watts	Resistance (Ohms)		
			Low Limit	Nominal	High Limit
1.5x1	0.075	18	3040.00	3200.00	3520.00
1.5x2	0.15	36	1520.00	1600.00	1760.00
1.5x3	0.225	54	1013.33	1066.67	1173.33
1.5x4	0.3	72	760.00	800.00	880.00
1.5x5	0.375	90	608.00	640.00	704.00
1.5x6	0.45	108	506.67	533.33	586.67
1.5x7	0.525	126	434.29	457.14	502.86
1.5x8	0.6	144	380.00	400.00	440.00
1.5x9	0.675	162	337.78	355.56	391.11
1.5x10	0.75	180	304.00	320.00	352.00
1.5x11	0.825	198	276.36	290.91	320.00
1.5x12	0.9	216	253.33	266.67	293.33
1.5x13	0.975	234	233.85	246.15	270.77
1.5x14	1.05	252	217.14	228.57	251.43
1.5x15	1.125	270	202.67	213.33	234.67
1.5x16	1.2	288	190.00	200.00	220.00
1.5x17	1.275	306	178.82	188.24	207.06
1.5x18	1.35	324	168.89	177.78	195.56
1.5x19	1.425	342	160.00	168.42	185.26
1.5x20	1.5	360	152.00	160.00	176.00
3x1	0.15	36	1520.00	1600.00	1760.00
3x2	0.3	72	760.00	800.00	880.00
3x3	0.45	108	506.67	533.33	586.67
3x4	0.6	144	380.00	400.00	440.00
3x5	0.75	180	304.00	320.00	352.00
3x6	0.9	216	253.33	266.67	293.33
3x7	1.05	252	217.14	228.57	251.43
3x8	1.2	288	190.00	200.00	220.00
3x9	1.35	324	168.89	177.78	195.56
3x10	1.5	360	152.00	160.00	176.00
3x11	1.65	396	138.18	145.45	160.00
3x12	1.8	432	126.67	133.33	146.67
3x13	1.95	468	116.92	123.08	135.38
3x14	2.1	504	108.57	114.29	125.71
3x15	2.25	540	101.33	106.67	117.33
3x16	2.4	576	95.00	100.00	110.00
3x17	2.55	612	89.41	94.12	103.53
3x18	2.7	648	84.44	88.89	97.78
3x19	2.85	684	80.00	84.21	92.63
3x20	3	720	76.00	80.00	88.00
3x21	3.15	756	72.38	76.19	83.81
3x22	3.3	792	69.09	72.73	80.00
3x23	3.45	828	66.09	69.57	76.52
3x24	3.6	864	63.33	66.67	73.33
3x25	3.75	900	60.80	64.00	70.40

4. Inspection and Testing Continued

Documentation

The System Checklist and Warranty Registration form records vital information about your Radiant Heat Film 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.

Radiant Heat Film System Checklist and Warranty Registration

Installation Location: _____ Name of Installer: _____
 City / State / ZIP / Country: _____ Installer Company Name: _____
 Installation / Inspection Dates: _____ / _____ Street Address: _____
 Purchase Order Number: _____ City / State / ZIP / Country: _____
 Purchased From: _____
 Electrical Permit Number: _____

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 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.).

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.

NAME (please print) _____ SIGNATURE _____ DATE _____

Radiant Heat Film

4. Inspection and Testing Continued

Test for Heating

1. Turn on the breaker and adjust the thermostat so that the system begins heating.
2. After the system has been on for several minutes, run your hand over the heating mats to ensure that they are warm.
3. If the mats do not become warm, double check all wiring and re-perform the electrical tests above (after turning off power at the breaker).

Disclaimer: The mats will generate a low, comfortable warmth, the mats are designed to heat the flooring not the air. If area is cold during installation it is likely that the mats will not feel warm to the touch so you will have to rely on the electrical resistance tests alone or the use of an IR thermometer temperature sensing device.

Troubleshooting

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.

A test of the system to make sure all mats are heating properly is recommended prior to installation of finished flooring. The manufacturer will not be responsible for the replacement of the floor heating system if the system operation was not checked and verified prior to installation of the flooring.



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).

Symptom

Corrective Actions

Symptom	Corrective Actions
Individual 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 Verify that correct voltage is being applied to heating elements rated for 120V Service. Verify that thermostat has not been bypassed. If necessary, reposition floor temperature sensor.
Thermostat GFCI	If the thermostat trips and will not re-set, check the following: 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. 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. 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 888-WARM PAD.
Thermostat Issues	Refer to the thermostat manufacturer's documentation.

4. Inspection and Testing Continued

Complete the Installation

1. Install the finished flooring according to the manufacturer's instructions.
2. Retest the mats to ensure that the mats have not been damaged during the installation process. If they have been damaged, follow guidelines noted to remedy the situation.

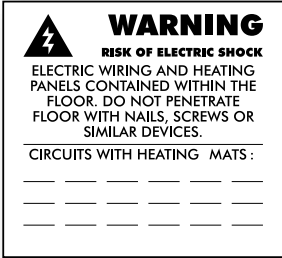




NOTE:

Install baseboards or trim around the perimeter of the room. This ensures that the floor will not lift, exposing the mats. The flooring manufacturer's instructions will have information about installing the baseboard or trim to allow the floor to float properly.

Place Caution Stickers

Apply warning stickers provided with mats in appropriate locations, as shown below. these labels are an integral part of this heating system and must be installed for warranty to be in force.

<p>Affix to the electrical panel box. In the space provided, record the numbers of all circuits to which floor heating mats are attached.</p>	<p>Affix adjacent to points of access to all concealed areas in which installed heating products are accessible.</p>	<p>Affix adjacent to the thermostat.</p>
		

SECTION 5. Operation

Operating the System

Operation of Radiant Heat for Floating Floors 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 Radiant Heat Film 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 and repair technicians is available by calling 1-888-WARM PAD.

Never pierce the floor

- Piercing the electrically conductive portions of a heating mat can result in a potentially dangerous electric shock.
- Piercing the mats will damage them and may present fire hazard.
- If a portion of the floor surface must be replaced, inspect any exposed heating mats for damage that may have occurred while moving the flooring. See “Step 1. Inspect and Test Mats” on 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

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.

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 Radiant Heat Film Mat or main electrical systems. Failure to follow these guidelines may result in a risk of electric shock or fire hazard.

CAUTION:



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

Notes

Date Installed: _____

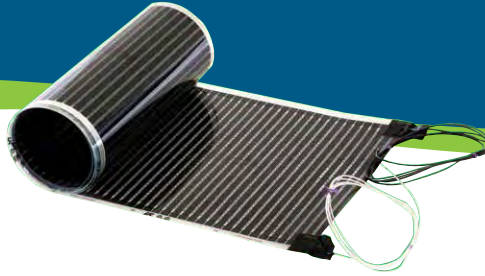
General Contractor: _____

Electrical Contractor: _____

Flooring Contractor: _____

Sketch Grid





Radiant Heat Film for Floating Floors

2500 Old Hadar Road
Norfolk, NE 68702
888-379-9695 • FAX 402-379-9737
info@mpglobalproducts.com

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