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INSTALLATION INSTRUCTIONS FOR HEATLAY HL SERIES MATS

WARNING

READ ALL OF THE INSTRUCTIONS BEFORE BEGINNING INSTALLATION. FAILURE TO OBSERVE THE WARNINGS COULD RESULT IN DEATH OR INJURY FROM ELECTRICAL SHOCK OR FIRE. MAT FAILURE, IMPROPER OPERATION OR FLOOR DAMAGE MAY ALSO BE A RESULT. A MAT WARRANTY IS PROVIDED (PER NOTED TERMS) BASED ON THE INSTALLATION BEING DONE IN ACCORDANCE WITH THESE INSTRUCTIONS. IMPROPER INSTALLATION MAY VOID WARRANTY.

Inspection

Electrical inspection may be required during and or after heating mat installation. **BEFORE BEGINNING INSTALLATION** contact your local electrical and building inspection authorities for more information. Local codes may require this mat and/or the thermostatic control to be installed or connected by an electrician. Heatlay requires all electrical connections be made by qualified personnel and in accordance with the Canadian Electrical Code (CEC) and all applicable local codes and ordinances.

Application

The Heatlay mat has been designed to warm hard surface materials such as ceramic and porcelain tiles, marble, granite, slate, laminate and engineered wood flooring. Heatlay mats are designed for use inside residential and light commercial buildings.

DO NOT use the Heatlay mat for applications other than for embedded indoor floor warming.

DO NOT use the Heatlay mat with carpet, solid wood, linoleum or vinyl floors.

DO NOT energize the Heatlay mat until it is embedded in thinset masonry and the masonry has cured per manufacturer's recommendations.

DO NOT cut or modify the Heatlay mat to fit the area.

DO NOT overlap Heatlay mats.

DO NOT use staples to hold or secure the mat, cold lead or thermostat sensor wire.

DO NOT attempt to repair a damaged heating mat, call Heatlay for instructions before proceeding further.

DO NOT unroll and install mat when it is colder than 0C (32F).

DO NOT cross construction or expansion joints.

Heatlay mats provide comfort warming. Heatlay mats are approved to standard C22.2 No 130-03 and carry a –X rating, suitable for indoor embedded floor surface heating, dry locations. Residential kitchens and bathrooms are considered dry locations. Use in shower areas is only permitted if the mat is installed beneath a waterproof membrane. Heatlay mats must be connected to a ground fault protection device. Heatlay "TH" series thermostats include ground fault protection, if this thermostat is not used the mat must be connected through a separate ground fault protection device.

Planning Ahead

To reduce the potential for tile cracking ensure the subfloor structure is built strongly enough to accommodate the tile (slate, granite, etc.) and tiling method selected. Your local tile retailer may be able to help with such information. The *Tile Terrazzo Marble Association of Canada* or the *Tile Council of America* have published standards available which provide detail on recommended methods of flooring construction. If using metal mesh always fully cover the mesh with a layer of thinset prior to laying the mat, the metal mesh is sharp enough to damage the heating mat.

If applying the mat to a floor which is over an unheated area it is recommended that the area below the floor be insulated. If left uninsulated the finished floor may not be able to achieve comfort temperatures due to heat loss below.

Heatlay recommends that the mat be installed on a dedicated 20amp circuit. There are instances where the load requirements of the mats installed will exceed the dedicated circuit rating. In these instances contact relays (“commonly known as contactors”), devices designed for the control of multiple mats from a single thermostat, are available. Consult your local electrical inspection authority for the appropriate method of installing and wiring these devices.

Ensure mats powered through a relay are protected by a ground fault protection device such as a ground fault breaker.

Ensure electrical junction boxes are properly positioned.

Tools required

Square notch trowel, 1/4"x1/4" or larger (e.g. 3/8" x 3/8")

Rubber grout float

Tape or hot melt glue

Electrical and construction tools: (screwdriver, wire stripper, etc.)

Digital ohmmeter capable of 20 to 20,000 ohms readings

Materials

Heatlay mat

Tiling materials (latex/polymer modified thinset mortar, waterproof membranes, tile, grout, etc.)

Floor-sensing thermostat

Ground fault protection device (if not part of the thermostat)

External contact relay and ground fault protection device (for multiple mat installations)

Electrical junction box for thermostat (conduit if required)

Subfloor Preparation

Before beginning installation ensure the subfloor is clean and free of loose material, any protrusions such as nails or screw heads sticking above the floor level must be removed and ridges leveled smooth. Review and follow the thinset manufacturer's recommended floor preparation requirements.

Dry Fit

Completely roll out the mat(s) on the floor to ensure it fits the floor space. **DO NOT** cut or modify the Heatlay mat to fit the area, if there is a problem with fit contact Heatlay. The cables are on the bottom of the mat and are embedded against the subfloor, the tile is set on top of the fabric.



Ensure that you have the sensor for the thermostat; it is usually packed in the same box as the thermostat and will be needed prior to tiling or putting on the laminate or engineered wood floors .

Lay out the cold lead and run to the junction box. **DO NOT** run the cold lead on top of the mat, run along the edge of the mat. Use a marker to trace the cold leads and mark the splice locations on the subfloor. The cold lead and splice are slightly thicker than the mat, some removal of sub-floor material may be required where the splice will set or where the cold leads will run to eliminate any possible interference with the tile.

Drill or cut holes at the bottom wall stud plate for routing the cold lead and thermostat sensor wire to the electrical junction box. The braided cold lead may be installed with or without electrical conduit, confirm conduit requirements with your local electrical and building inspection authorities.



Verify the mat voltage is correct; 120V mats have black and white leads, 240V mats have red and black leads. Confirm the leads are long enough to reach the electrical junction box and can extend a minimum of 6" beyond the box.

Electrical Tests

Check the resistance of the mat. The resistance for 120V mats is measured between the black and white conductors; the resistance for 240V mats is measured between the red and black conductors. The resistance value measured should be +/- 10% of the resistance value noted on the rating label.

Test insulation integrity by connecting a resistance meter across the black lead and the ground braid. The value should be infinite; depending on the type of meter used the screen may be blank or display OL.

Measure the resistance across the two conductors of the temperature sensor, the resistance value will change with temperature, as such it may read anywhere from 8-14 k ohms.

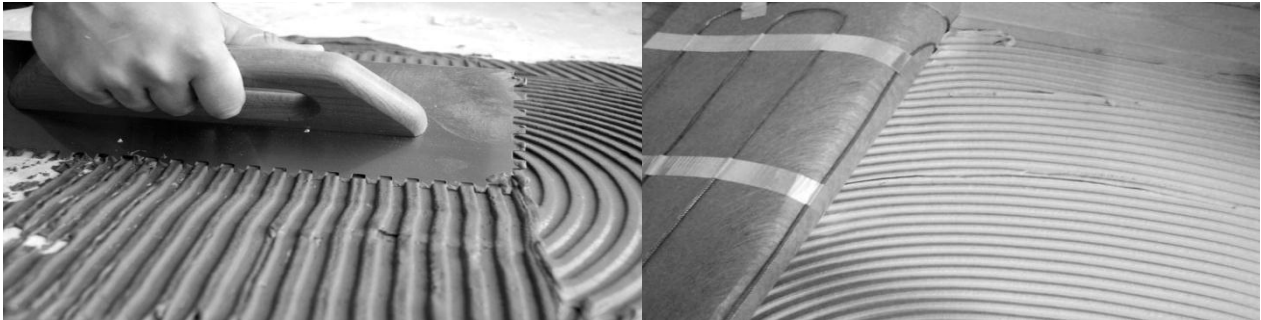
If there are problems with any of these tests contact Heatlay before proceeding further.

Once the above is complete carefully roll the mat back up and have ready for the next step

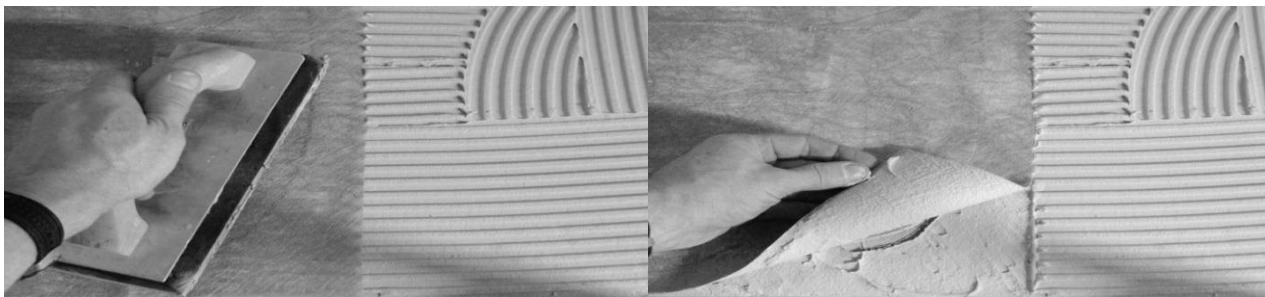
Installing the Mat

IMPORTANT Take care not to damage the mat during installation, avoid placing heavy equipment or pails of mortar on the mat.

Using square notch trowel, 1/4" x 1/4" or larger (e.g. 3/8" x 3/8") apply a layer of thinset to the subfloor area which will be covered by the Heatlay mat. If the subfloor area is particularly large it may be necessary to apply the thinset in sections. Carefully roll the mat onto the thinset layer.



The entire mat must be in contact (embedded) with the thinset layer. To ensure complete contact use a rubber grout float to press the mat into the thinset. To check the bond between the mat and thinset peel up an edge of the mat, the mat should look at least 90% covered with thinset material. Check that the splices and cold leads are in the proper positions.



Level any adjacent thinset areas not covered by the mat with a trowel. To avoid subsequent tiling problems the adjacent areas must be level with the top of the mat surface.

If there is more than one mat being installed ensure the edges of the mats are butted up against each other, this ensures even heating across the floor.

Run the cold leads into the electrical junction box and protect at the sill plate with a guard plate

Conduct electrical tests as previously described. If there are any problems contact Heatlay before proceeding further.

Your installation may require inspection at this point; consult with your local building and electrical inspection authorities.

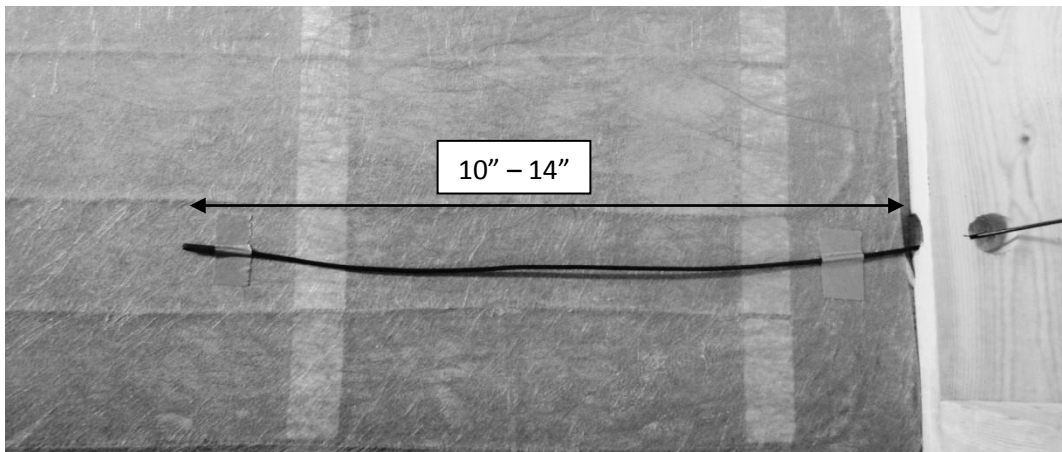
Installing the Floor Covering

1) Tile

Before starting read the tile flooring manufacturer's installation instruction, review any specific instructions they may have with regard to the use of their product with electric radiant heating.

After the mat is secured in the first layer of mortar apply the tile on top of the mat in the normal manner. The thickness of the thinset layer must be in accordance with the tile and thinset manufacturer's recommendations.

IMPORTANT. If a thermostat employing a floor sensing bulb is to be used, the floor sensor must be installed prior to setting the tile in place. Secure the sensor probe on top of the mat with tape or hot melt. The sensor must be positioned in the middle of two heating cable runs. The sensor should be 10" – 14" from the edge of the mat. Run the sensor wire back into the junction box. Don't place the sensor where it will be in direct sunlight.



Clean grout lines carefully, scrapers can penetrate and cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Do not drill into floors with Heatlay mats; drills can cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Conduct electrical tests as previously described, if there are any problems contact Heatlay before proceeding further.

Thinset and grout materials have cure times, review the recommended cure time from each manufacturer and do not energize the mat until the materials have fully cured. This cure time may be as long as 28 days.

2) Waterproofing Membrane

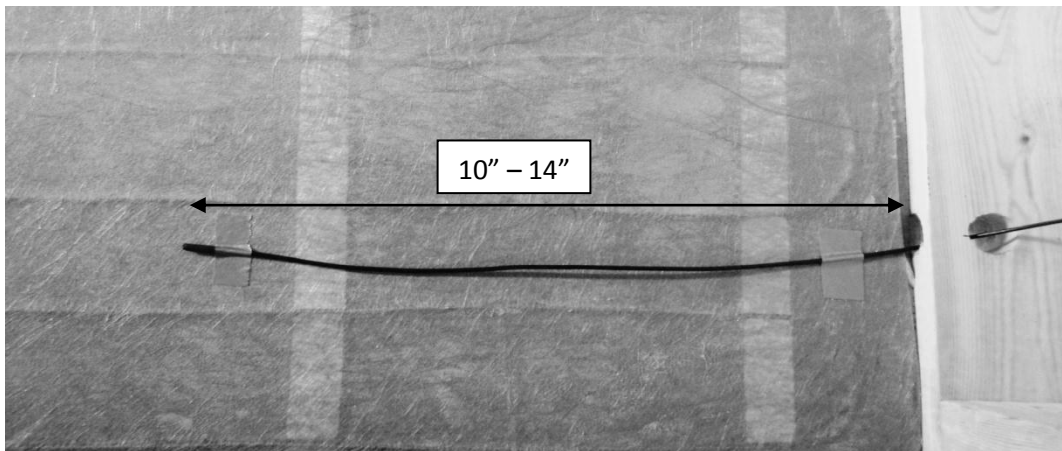
Use Heatlay mats in conjunction with membranes that, as a minimum, meet American National Standard for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installations (ANSI A118.10) and are suitable for the intended application.

Before starting read the waterproofing membrane manufacturer's installation instruction and tile flooring manufacturer's installation instruction. Review any specific instructions either may have with regard to the use of their products with electric radiant heating.

The MAT, consisting of HEATING WIRE, SPLICE CONNECTIONS and COLD LEADS, as well as any THERMOSTAT SENSOR, must be FULLY COVERED by a waterproofing membrane when in wet locations.

After the mat is secured in the first layer of mortar apply a second layer of mortar (minimum 1/4" x 3/16" V-notched trowel or a 1/8" x 1/8" square-notched trowel) to secure the waterproofing membrane. The mat, and any extending cold leads must be fully embedded in this covering layer of mortar.

IMPORTANT. The mats must be installed on a GFCI (personnel protection, 5 milliamp trip level) protected circuit. If a thermostat employing a floor sensing bulb is to be used, the floor sensor must be installed prior to installing the waterproofing membrane. Secure the sensor probe on top of the mat with tape or hot melt. The sensor must be positioned in the middle of two heating cable runs. The sensor should be 10" – 14" from the edge of the mat and must be covered by the waterproofing membrane. Run the sensor wire back into the junction box.



After the mat is secured beneath the waterproofing membrane tile on top as per the manufacturer's recommended method.

Clean grout lines carefully, scrapers can penetrate and cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Do not drill into floors with Heatlay mats; drills can cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Conduct electrical tests as previously described, if there are any problems contact Heatlay before proceeding further.

Thinset and grout materials have cure times, review the recommended cure time from each manufacturer and do not energize the mat until the materials have fully cured. This cure time may be as long as 28 days.

3) Floating Laminate or Engineered Wood Floors

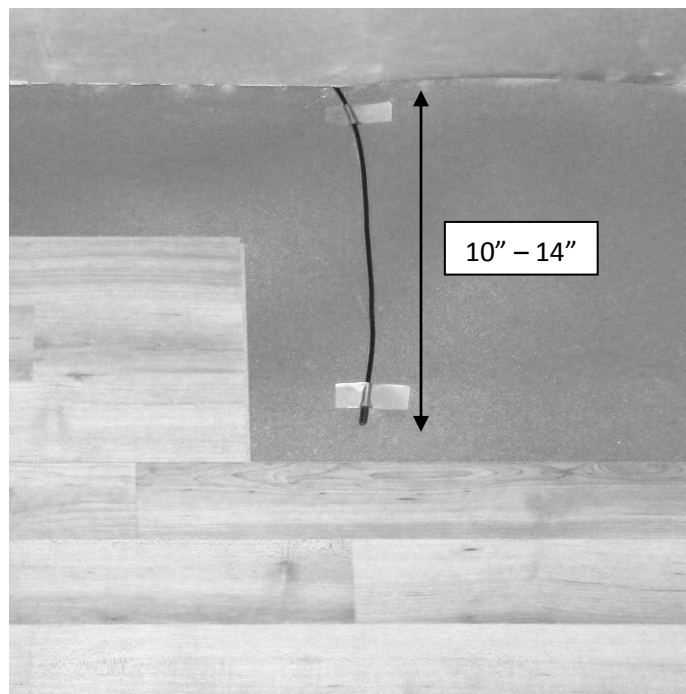
Before starting read the laminate or engineered flooring manufacturer's installation instruction, review any specific instructions they may have with regard to the use of their product with electric radiant heating.

After the mat is secured in the first layer of mortar cover with at least ¼" of thinset or self leveling compound. Ensure the thinset or self leveling compound is smooth and level as an uneven finish may result in a poor floor fit. Allow the compound to cure as per the manufacturer's instructions.

Install a vapour barrier (if necessary) and any under padding as per manufacturer's instructions.

IMPORTANT. It is recommended that a thermostat employing a floor sensing bulb and set to limit the maximum floor temperature to 28C (82F) be used with laminate or engineered wood floor applications.

Secure the sensor bulb on top of the under pad with tape. The sensor must be positioned over the heated area 10" – 14" from the edge of the mat. Run the sensor wire back into the junction box. Don't place the sensor where it will be in direct sunlight.



Thinset and self-leveling materials have cure times, review the recommended cure time from each manufacturer and do not energize the mat until the materials have fully cured. This cure time may be as long as 28 days.

Install the laminate or engineered wood flooring as per the manufacturer's instruction. Allow the floor time to acclimatize to the room's temperature and humidity levels before using the floor heating (1-3 days).

Do not drill into floors with Heatlay mats; drills can cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Conduct electrical tests as previously described, if there are any problems contact Heatlay before proceeding further.

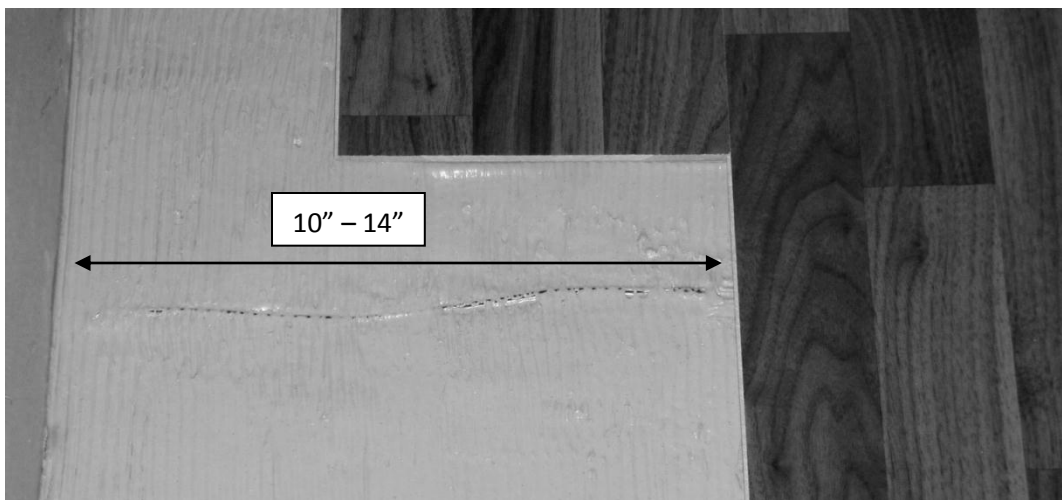
4) Glue Down Laminate or Engineered Wood Floors

Before starting read the laminate or engineered flooring manufacturer's installation instruction, and the adhesive manufacturer's installation instructions. Review any specific instructions either may have with regard to the use of their product with electric radiant heating.

After the mat is secured in the first layer of mortar cover with at least $\frac{1}{4}$ " of thinset or self leveling compound. Ensure the thinset or self leveling compound is smooth and level as an uneven finish may result in a poor floor fit. Allow the compound to cure as per the manufacturer's instructions.

IMPORTANT. It is recommended that a thermostat employing a floor sensing bulb and set to limit the maximum floor temperature to 28C (82F) be used with laminate or engineered wood floor applications.

Secure the sensor bulb on top of mortar layer with tape or hot glue. The sensor must be positioned over the heated area 10" – 14" from the edge of the mat. Run the sensor wire back into the junction box. Don't place the sensor where it will be in direct sunlight.



Thinset and self-leveling materials have cure times, review the recommended cure time from each manufacturer and do not energize the mat until the materials have fully cured. This cure time may be as long as 28 days.

Install the adhesive and laminate or engineered wood flooring as per the manufacturer's instruction. It may be necessary to weigh down the floor in the spot over the sensor to prevent lifting or poor adhesion. Allow the floor time to acclimatize to the room's temperature and humidity levels before using the floor heating (1-3 days).

Do not drill into floors with Heatlay mats; drills can cut into the heating mat below possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Conduct electrical tests as previously described, if there are any problems contact Heatlay before proceeding further.

Thermostat Connection

Consult the thermostat manufacturer's instructions for proper wiring detail.

IMPORTANT. Heatlay requires all electrical connections be made by qualified personnel and in accordance with the Canadian Electrical Code (CEC) and all applicable local codes and ordinances.

Ensure that the cold lead braid is directly connected to electrical ground – **DO NOT** sever the ground braid. If the ground braid is not connected to electrical ground there will be a risk of electrical short circuit, overheating or electrical shock.



A circuit protected by a ground fault protection device must be used to power mats connected through a relay.

Only connect the mat to the rated voltage. **DO NOT** use higher voltages as the increased current will cause the mat to overheat possibly resulting in death or injury from electrical shock or fire, mat failure, improper operation or floor damage.

Thinset and grout materials have cure times, review the recommended cure time from each manufacturer and do not energize the mat until the materials have fully cured. This cure time may be as long as 28 days.

Operational Notes

The wire spacing on each Heatlay mat is custom designed, power output will vary from 12-14.5 W/ft².

Each floor is unique and will heat at a different rate as such it may 1-3 hours to reach the optimum temperature, possibly longer under certain conditions.

Heatlay recommends using a thermostat to regulate floor temperature. Heatlay offers a programmable thermostat which allows the mats to be automatically shut off at night or when you are away from home.

If the overall floor surface feels unusually hot when the system is energized, or if the circuit breaker trips when the system is energized, the mat may be damaged. De-energize the system immediately and contact Heatlay. **Never bypass a tripped ground fault device.**

LIMITED WARRANTY AND LIABILITY

Heatlay Ltd. (the company) warrants its electric floorwarming mats to be free from defects in materials and workmanship for twenty (20) years from the date of purchase by the original purchaser. The maximum liability of the company is limited to the purchase price of the original mat and does not include; labour, removal, installation, incidental, consequential or other costs. This warranty is not transferrable; it is exclusively for the sole benefit of the original purchaser.

If the malfunction of the mat is determined to be a result of defective materials or workmanship by Heatlay Ltd. then a refund of all or part of the original purchase price of the mat will be paid in accordance with the following: 100% for the first five (5) years, then on a declining scale calculated by multiplying the original purchase price by the percentage of remaining warranty (e.g.; a valid claim in year 6 will be able to receive 14/20 of the original mat purchase price).

A refund of the purchase price described above is conditional upon all of the following being provided to Heatlay Ltd.:

- a) Confirmation of proof of purchase.
- b) Confirmation the mat was installed in accordance with the installation instructions.
- c) Confirmation the mat was installed in accordance with the Canadian Electrical Code (CEC) and all applicable local codes and ordinances.
- d) Confirmation the mat was installed by qualified personnel.
- e) Confirmation the mat was not damaged or in any way by activities unrelated to the operation of the mat.
- f) Full details of the installation, operation, and any repairs or modifications that may have been made.
- g) The installation made available for examination by the company's representatives.

A refund of your purchase price as described above shall be your singular and exclusive remedy for a breach of this warranty.

The following are not covered by this Limited Warranty:

- a) Any incidental or consequential damage, loss of time, loss of use or loss of income.
- b) Any labour, materials or freight costs associated with removing, repairing or replacing flooring materials.
- c) Any investigative costs related to the claim.

Heatlay Ltd. makes no claim as to the amount of floor temperature rise, the time to reach a given floor temperature or final floor temperature due to the innumerable variations in building construction and environmental conditions.

Heatlay Ltd. disclaims any warranty not provided herein, including any implied warranty of merchantability or implied warranty of fitness for a particular purpose. Heatlay Ltd. further disclaims any responsibility for extraordinary, incidental, or consequential damages arising from ownership or use of this mat including or loss of use, loss or time or loss of income. Heatlay Ltd. makes no other express warranty regarding any mat beyond this document. Any samples shown are merely for demonstration purposes and do not represent the final product. No employee agent or representative of Heatlay Ltd. has any authority to extend or revise this warranty unless such extension or revision is made in writing by the president of Heatlay Ltd.

Any implied warranties that may not be disclaimed, including implied warranties of merchantability or fitness for a particular purpose are limited in duration to twenty (20) years from the date of purchase, unless prohibited by law, in which case all such implied warranties shall expire at the earliest time permitted by applicable law.

Some states do not allow limitations on how long an implied warranty may last, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To begin the warranty refund process, please send a description of the defect and proof of purchase, postage paid, to Heatlay Ltd. at the address noted herein.

Heatlay Ltd., 41 Shoemaker Street, Unit #1, Kitchener ON, N2E 3G9