

## About Tech-Mat™

The BRITECH Tech-Mat provides warmth and comfort in all residential and commercial areas in which ceramic tile, marble, slate, vinyl, carpet, laminate, hardwood or virtually any type of flooring is being installed. This includes any area from bathrooms to kitchens and atriums, breakfast and dining areas, foyers, sun rooms, basements and a variety of spaces where warm floors make a welcome addition. Only your imagination limits your use of the Tech-Mat.

The heating mat is so thin that it will add little more than 1/8 inch additional depth to the finished installation.

The BRITECH Tech-Mat consists of a solid copper resistance wire wrapped in a layer of thermoplastic insulation. The insulated element is further protected by a tinned copper grounding shield. The armored heating element is then woven to a 1/2" open fiber mesh that can be easily formed and adapted to almost any geometrical floor shape, to suit your room. This design utilizes the most advanced materials and is the most simply installed mat available for residential or commercial renovation and new construction.

Tech-Mat is CUL listed FOR INDOOR FLOOR HEATING APPLICATIONS. It is warranted to be free from manufacturer's defect for 20 years (see written Limited Warranty for details), maintenance free, safe, silent, energy efficient and, once installed, is totally out-of-sight.

While a variety of controls can be used with the Tech-Mat system, we strongly recommend using a thermostat with a remote floor temperature sensor. This form of control affords the greatest comfort and control of the temperature in your home.

These features are only a few of those which make the BRITECH Tech-Mat the most versatile, easy to install and reliable floor warming system available.

The following pages will provide you with an overview of how the Tech-Mat works, how it is installed and maintained, as well as the benefits of this complete floor warming system. Take a few moments to review this information.

If you have further questions, one of our floor-heating professionals will be happy to assist you — call 1-877-335-7790 or visit [www.britech.ca](http://www.britech.ca) for more product information.

## Homeowner's Information & General Instructions

The electrical connection of the Tech-Mat must be performed by a qualified electrician in accordance with Section 62 CAN/CSA-C22.1 part 1, of the Canadian Electrical Code (CEC). The installer has been instructed to provide you with a plan of the system installation. The plan shows where the heating element is installed, the location of the optional floor temperature sensor and the electrical description of the system. Keep the plan for your system and a copy of these instructions for future reference. Future homeowners should also receive this information. No penetrating fasteners (such as nails or screws for doorstops, toilets, etc.) may be installed through the area covered by the Tech-Mat.

To optimize the comfort efficiency of the Tech-Mat system, area rugs thicker than 1/2" and with an R value of more than 1.0 should not be used over the heated area. Additionally, built in cabinets, appliances and other furniture with solid bases should not be placed on warmed areas of the floor. Make sure your installation is planned to use the heating mat only in the areas of the room on which persons will walk and with a minimum distance of 3" to 4" from the walls.

### Maximum R Value of Floor Covering:

Carpet:	1.0
Ceramic/Mosaic tile:	0.675
Laminate flooring:	0.675
1/2" Plywood:	0.63
Natural Stone:	0.38-0.114
Wood flooring:	0.80

### Temperature Control:

A thermostat which monitors and controls the floor temperature through a remote sensor, mounted in the floor at the time of installation, is a recommended option.

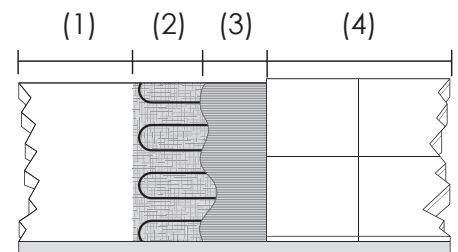
### Maintenance:

Periodically, the GFCI (Ground Fault Circuit Interrupter) should be tested to ensure its continued operation. Tech-Mats have no moving parts. The system is virtually maintenance free. If the system does not appear to be heating properly, refer to the troubleshooting guide in this manual or call your installer.

## Installer's Guide to Installation & General Instructions

These instructions must be followed when assembling and installing the Tech-Mat system. Make them available to the installer working on the project and when finished turn them over to the homeowner for future reference. Failure to follow these instructions may void the warranty on the installed system.

Figure 1.



(1) Sub-floor - (2) Cable  
(3) Adhesive - (4) Flooring

### Important Installation Considerations:

The electrical connection of the heating system and the thermostat should be done only by a qualified electrician in accordance with the Canadian Electrical Code and with local codes. To assure safety, the Tech-Mat floor warming system must be connected to the electrical service via a listed GFCI (Ground Fault Circuit Interrupter).

The heating system may be installed over concrete, wood or any existing, sub-floor. Do not walk on the unprotected Tech-Mat.

Penetrating fasteners such as nails or screws may not be installed through the areas of the heating mat.

The Tech-Mat heating element should not be laid across expansion joints of the sub-floor. While installing the BRITECH Tech-Mat, avoid crimping or bending the heating element wire.

The BRITECH Tech-Mat must not be installed under cabinets, appliances or plumbing fixtures which are permanently installed and attached to the floor. Use special care when designing systems for bathrooms, kitchens, saunas or other rooms in which permanent fixtures will be installed.

### Planning the Installation:

The BRITECH Tech-Mat must not be installed under cabinets, appliances or plumbing fixtures which are permanently installed and attached to the floor. Use special care when designing systems for bathrooms, kitchens, saunas or other rooms in which permanent fixtures will be installed.

Built-in cabinets and other furniture and fixtures with solid bases must not be placed on the heated portion of the Tech-Mat system. Plan the installation to cover only those areas of the floor which will be walked on.

Placing carpets thicker than 1/2" (13mm) on the Tech-Mat heated area should be avoided. Such carpets and throw rugs will act as insulators over the heated area, reducing the warming efficiency of the installation. Check R value on all products.

**NOTE: To avoid damage to the heating element during installation, care must be taken that tools or tiles with sharp edges or points are not dropped or used carelessly on the element.**

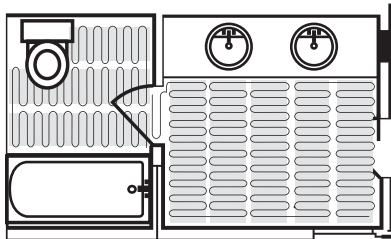


Figure 2.

**NOTE: Mats can be cut and shaped to suit layout. Do Not cut the cable.**

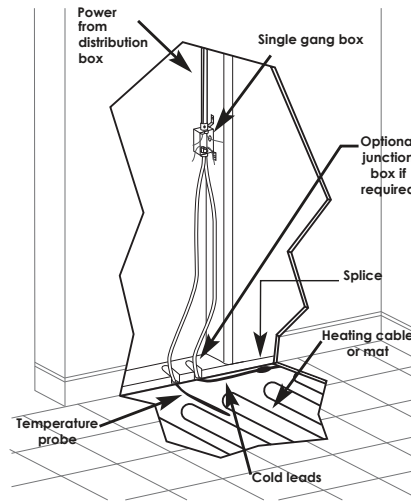
Before laying the Tech-Mat, a flush mounted electrical box must be installed for the thermostat. This is where the cold lead from the heating element and the floor temperature sensor from the thermostat can be run to (see Figure 3).

For electrical connections use 14 AWG.

The Tech-Mat warming system requires a circuit which includes an approved GFCI.

**IMPORTANT: Cold leads and floor temperature sensors should be inserted into the electrical box without extensions or splices. Extensions or splices are not permitted. Consult your local representative if extensions or splices are required. All junction boxes must be visible and accessible.**

Figure 3.



The Canadian Electrical Code (CEC) requires that heating mat cold leads must be protected in a listed conduit when they extend above the floor (see also local codes). Cold leads should not be placed in the same conduit as the sensor. Plastic bushings should be used where cold leads and sensors enter conduit to protect the wires.

**IMPORTANT: The floor sensor should be secured in the sub-floor only after heating mat has been secured to the subfloor. This will allow you to place the sensor properly between the heating element wires.**

### Positioning the Tech-Mat:

Start to layout the heating mat from an area adjacent to the thermostat. Ensure cold leads and temperature sensor can reach the flush mounted electrical box where the thermostat will be installed.

### Laying Out the Tech-Mat:

Lay the heating Tech-Mat with its sticky side down to the sub-floor (heating element wire facing up). Ensure that the Tech-Mat is positioned over the area to be warmed before applying adhesive.

As needed, cut the mesh backing between the heating elements wire to create the desired layout shape (see Figure 5).

While cutting, be sure to cut only the mesh and to avoid nicking or damaging the heating element wires. Refer to Figure 4.

The mesh may be stapled to the floor, do not staple heating cables.

Maintain minimum 3" distance from walls and cabinets.

Ensure entire element is encased in thinset.

**IMPORTANT: At no time may the heating element wire be cut.**

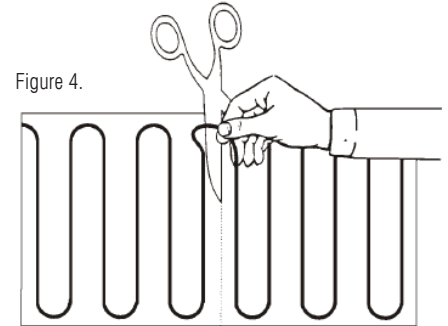
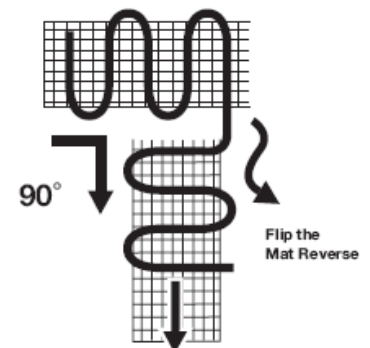
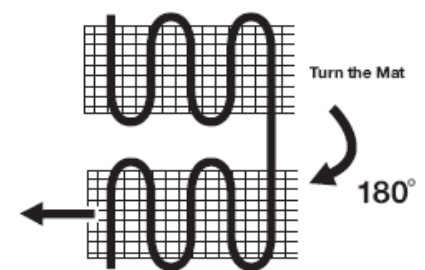


Figure 4.

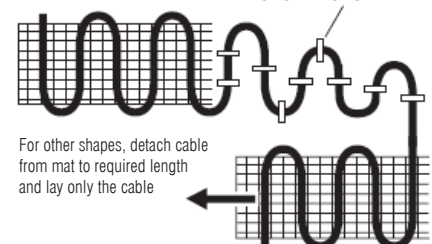
Figure 5. For 90 Degree Turn



For 180 Degree Turn



Means of attachment may vary project to project.



**Element Spacing:**

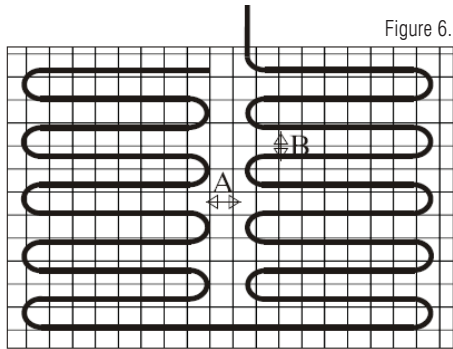
Refer to Figure 6. Dimension A and B should be equal when possible. Dimension A Should never be less than 60% of dimension B.

**IMPORTANT: The mesh may overlap but the heating element wire must never overlap.**

Lay the Tech-Mat over the entire floor area to be heated,. After the mat is laid, the cold leads of the system are laid into the floor, either in a small groove in the concrete sub-floor (as per CEC Code as well as all local codes) or in the thinset. Insert the cold lead into the junction box.

Minimum bend radius of the cables is 5 cm (2 inches). Do not install the mat below -15° C (5° F).

If thermal insulation boards of adequate thickness are used, ensure they do not have an insulation R value of 0.027 or less.



**Testing the System Resistance:**

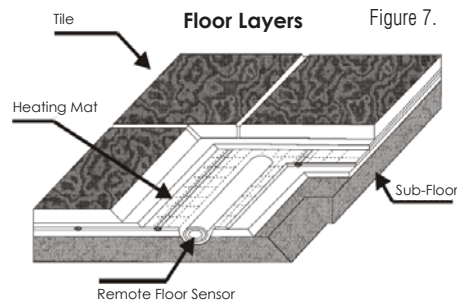
Before setting the Tech-Mat, measure the resistance with an Ohmmeter (see resistance charts on page 4) and note the value on the system installation sticker that should be attached to the distribution panel. After completing the heating system installation, measure the system's resistance again with the Ohmmeter. Compare the new reading with the first measurement to assure they are identical and no damage has occurred to the Tech-Mat during installation. Mark the measured resistance on the attached card and fasten to the circuit breaker box (distribution panel).

**IMPORTANT: The system warranty is not valid without evidence that the system resistance has been tested.**

**Securing the Heating Cable:**

Follow the Tile Council of America recommendations when planning how you will secure the Tech-Mat. Selected adhesives (tile setting mortar) should be applied to the floor according to the manufacturer's instructions. The heating mat should be laid, strip by strip, with its sticky side down. While laying the Tech-Mat, take note of where you will position the floor sensor (see Figure 7).

The system's cold lead wires, as well as the wire from the remote sensor, are run to the junction box either through a groove prepared in the sub-floor or through listed conduits (as local electrical code requires).



**NOTE: Be sure the cold leads neither cross nor touch the heating element wires.**

After securing the Tech-Mat to the sub-floor, measure the system's resistance again with the Ohmmeter. Compare the new reading with the first measurement to assure they are identical and no damage has occurred to the Tech-Mat during installation.

Never cut or alter the length of the cable. This will void warranty and may cause fire!

When the installation is complete, the tile or stone surface can be laid directly over the protective layer without further preparation, using any TCA approved setting mortar.

When applying the various layers be sure to follow the manufacturer's directions for the mortar product.

Measure the system's resistance with an Ohmmeter. Compare with previous readings to assure no change has occurred. **Resistance charts are located on the following page.**

**NOTE: Be sure to observe recommended cure times for your installation. Ceramic tile installation may require 10 to 14 days to cure before the Tech-Mat floor warming system may be operated.**

**Choice of Floor Covering:**

The BRITECH Tech-Mat system is specially designed to be used with hard floors such as ceramic tile, marble or other stone floorings. Discuss its use with any other floor coverings with your BRITECH representative.

**Mounting the Output Plate:**

After completing the Tech-Mat floor warming system installation, mark the final measured resistance on the output plate. Mark the mat location on the installation plan which should be given to and kept by the homeowner with the homeowner instructions and installation manual.

**System Control Options**

A wall mounted thermostat (line voltage) with remote sensor, or a wall mounted thermostat with a remote sensor which can be mounted in the floor (see figure 7), offers the best way to regulate your system.

The sensor should be installed at least 8" into the heating sheet's width, while ensuring that it does not cross any of the heating wires.

By controlling the actual floor temperature, the system can be adjusted to the temperature which is the most comfortable for the situation. Through this method, the floor temperature can be controlled as desired with little variation. The line voltage thermostat connects to the junction box, as marked in Figures 8 and 9, on the following page.

Should multiple mats be installed observe total amps. Do not connect load greater then thermostat capacity. Do not connect in series. Connect in parallel only.

Heating mat must be fully installed in the room, do not run through thresholds or into adjacent areas.

**NOTE: The thermostat requires a listed single gang box with a minimum width of 2.25"** (available from your local electrical wholesaler or from your BRITECH distributor)

### TROUBLE SHOOTING

**CAUTION: TURN OFF ELECTRICITY BEFORE TROUBLESHOOTING SYSTEM**

1. If the system fails to heat, make sure the GFCI (Ground Fault Circuit Interrupter) has not been tripped. If it has, find the fault and rectify.
2. Check for continuity with an Ohmmeter. Compare the reading with the resistance marked on the Output Plate. Lack of or reduced continuity may indicate a break in the system.
3. Make sure the breaker or fuse is delivering power to the system.

If your system fails to heat after these checks call your installer. Be sure to tell the installer the Model Number of your system. This will be found on the warranty card attached to the circuit breaker box door.

The schematics on the right are meant as a preliminary guide only. Refer to the instructions provided with the thermostat, GFCI, and timer. All electrical work should be performed by a licensed electrician.

**WARNING: THE TECH-MAT SYSTEM IS DESIGNED TO BE INSTALLED WITH A GFCI (GROUND FAULT CIRCUIT INTERRUPTER). FAILURE TO DO SO MAY RESULT IN INJURY.**

This system may not be energized unless the system is installed according to the enclosed instructions. The installation must meet or exceed all local and national electrical codes.

### TECH-MAT™

120 VOLT | 12 watts per square foot

CODE	POWER (WATTS)	LOAD (AMPS)	LENGTH (FT)	WIDTH (FT)	AREA (SQ FT)	RESISTANCE (OHMS)
FHM120-60	60	0.5	3.3	1.5	5	240.0
FHM120-120	120	1.0	6.7	1.5	10	120.0
FHM120-180	180	1.5	10.0	1.5	15	80.0
FHM120-240	240	2.0	13.3	1.5	20	60.0
FHM120-300	300	2.5	16.7	1.5	25	48.0
FHM120-360	360	3.0	20.0	1.5	30	40.0
FHM120-420	420	3.5	23.3	1.5	35	34.3
FHM120-480	480	4.0	26.7	1.5	40	30.0
FHM120-540	540	4.5	30.0	1.5	45	26.7
FHM120-600	600	5.0	33.3	1.5	50	24.0
FHM120-720	720	6.0	40.0	1.5	60	20.0
FHM120-840	840	7.0	46.7	1.5	70	17.1
FHM120-960	960	8.0	53.3	1.5	80	15.0

### THERMOSTAT WITH INTEGRAL GFCI – 120 Volts

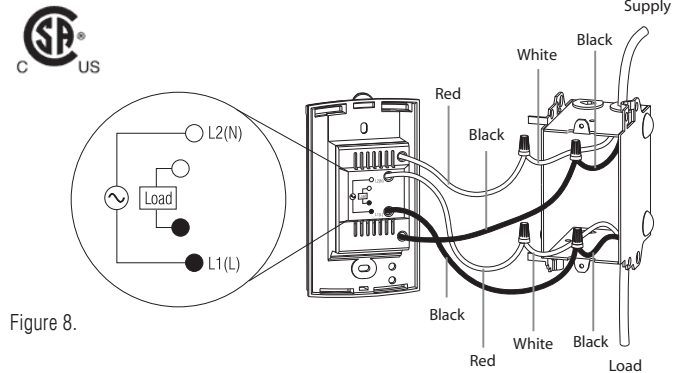


Figure 8.

### THERMOSTAT WITH INTEGRAL GFCI – 240 Volts

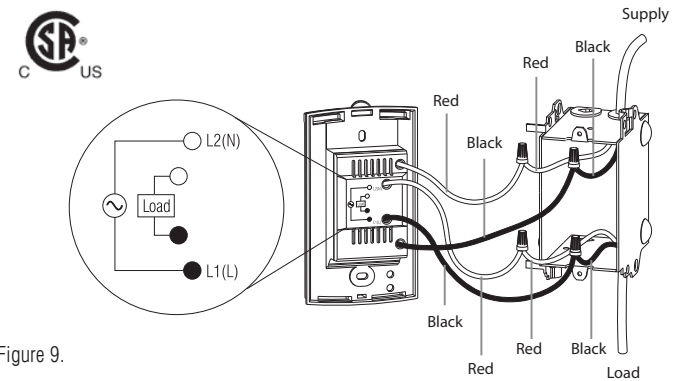


Figure 9.

**NOTE: The thermostat requires a listed single gang box with a minimum width of 2.25" (available from your local electrical wholesaler or from your BRITECH distributor)**

### TECH-MAT™

240 VOLT | 12 watts per square foot

CODE	POWER (WATTS)	LOAD (AMPS)	LENGTH (FT)	WIDTH (FT)	AREA (SQ FT)	RESISTANCE (OHMS)
FHM240-120	120	0.5	6.7	1.5	10	480.0
FHM240-240	240	1.0	13.3	1.5	20	240.0
FHM240-360	360	1.5	20.0	1.5	30	160.0
FHM240-480	480	2.0	26.7	1.5	40	120.0
FHM240-600	600	2.5	33.3	1.5	50	96.0
FHM240-720	720	3.0	40.0	1.5	60	80.0
FHM240-840	840	3.5	46.7	1.5	70	68.6
FHM240-960	960	4.0	53.3	1.5	80	60.0
FHM240-1080	1080	4.5	60.0	1.5	90	53.3
FHM240-1200	1200	5.0	66.7	1.5	100	48.0
FHM240-1440	1440	6.0	80.0	1.5	120	40.0