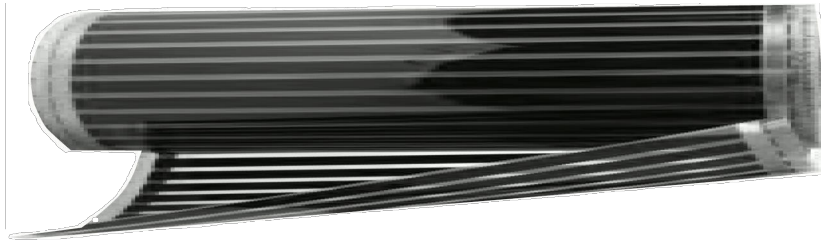


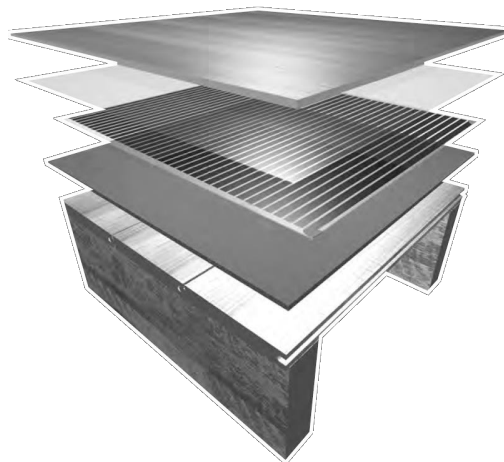
THERMOFILM® – The complete underfloor heating solution for all wood & laminate floors.



THERMOFILM®
underfloor heating

F I L M

**The complete electric underfloor heating solution for
all wood and laminate floors**



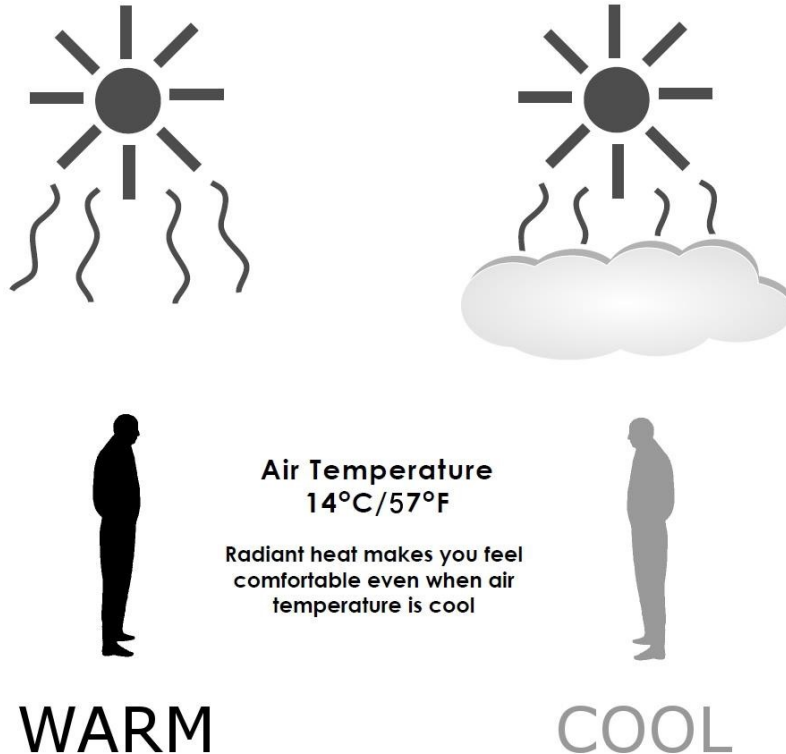
INSTALLATION MANUAL

Congratulations on your purchase of one of the most advanced electric heating systems available today!

WHAT IS RADIANT HEAT?

The **THERMOFILM** radiant floor heating system installed in your home is the most efficient electric heating system available today. The **THERMOFILM** system installed directly below your floor, gently warms the objects and people in the room. These surfaces include walls, windows, floors and ceilings. These surfaces then gently warm the surrounding air, creating more natural warmth with minimal floor to ceiling temperature variation. This means that the air temperature can be lowered in the room while still maintaining comfort level – this results in a reduction in heating bills over other forms of electric heating systems.

This Installation Manual is provided to help you understand how your heating system works and therefore how to operate it to maximum efficiency.



The **THERMOFILM™** underfloor heating system works just like the sun. The heating elements warm the floor surface which then emits energy in the form of infrared heat. This is the same type of heat you feel when out on a sunny but cool spring day. Although the air temperature is cool the infra-red rays from the sun keep you warm.

An **THERMOFILM™** radiant heating system is the most efficient form of heat distribution available. The radiant heat is in the form of Infra-red energy radiant throughout the room. The objects and occupants are heated first and then gently warm the surrounding air. As the body of air in the room is not overheated convection currents are not created. This means that dust is not circulated and drafts are not created. This brings higher levels of comfort, not only to allergy sufferers but to everyone in the room.

The **THERMOFILM™** heating system is completely invisible and unobtrusive and allows more flexibility in creating the perfect living environment. It is reliable, safe and manufactured to last. Being electric with no moving parts it is completely maintenance free.

OPERATING

Operation of your **THERMOFILM** heating system is similar to other conventional heating systems. Your method of control is via the wall mounted room thermostat. Set the thermostat to your desired temperature and the system will warm the room. There are several points to consider when operating your system to ensure economical operation:

- 1) Following installation of your **THERMOFILM** heating system there are several precautions you should take on initial start – up of the heating system. Do not be tempted to turn the system immediately

after laying the finished floor. Depending on the floor covering please allow sufficient time for the wood to acclimate (see manufacturer's guidelines). Bring the system up to temperature gradually in stages over the next few days using the floor limit sensor temperature setting.

- 2) Each room installed with a **THERMOFILM** heating system shall have its own thermostat. This means that you can individually set the room temperature based on the use of the room. If the room is rarely used, turn the thermostat down to a lower level to conserve energy.
- 3) Your **THERMOFILM** heating system is a direct acting system. However, depending on the subfloor and the floor covering installed, there may be a certain amount of thermal lag in the system (heat-up and cool down periods). Please anticipate these when switching your system on and off. Careful time clock control of on/off periods ensures maximum comfort at minimum cost.
- 4) Although your radiant heating system is less affected by air change/ventilation losses than a traditional convection heating system, it is good practice to minimize drafts from open doors or windows as these can make occupants feel cold.
- 5) Set the thermostat to your desired comfort level and leave it. Setting the thermostat to at high temperature will not make the room get to temperature quicker. It will merely overheat the occupants once the set temperature is reached.
- 6) Thermostats are fitted with floor limit sensors. The temperature of the actual floor can be varied to suit different applications and tastes. We recommend a maximum floor temperature setting of 82°F for optimum comfort conditions.

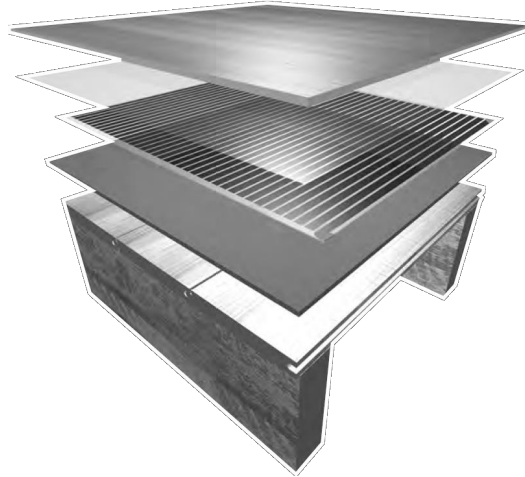
Be Aware

Although your **THERMOFILM** heating system requires no annual maintenance, care should be taken to ensure that the system is not damaged. Additional information for renovating and repairing is available in the system's Installation Manual.

- 1) Never pierce the floor. Piercing an electrically conductive element with a nail or screw can trip the GFCI and cut all power to the system.
- 2) Never cover any heated part of the floor with solid bottomed or permanent floor fixtures or furniture. This could trap heat and potentially cause local overheating.
- 3) Thick rugs, dog beds, bean bags, exercise mats and items with high thermal insulation should not be laid on the heated floor as this may cause localized overheating.

Information for repair or renovation tradesmen

Please inform all repair or renovation tradesmen if they are working in the area of an installed **THERMOFILM** heating system, they should read the information contained within the installation and operating manual before commencing work. Failure to comply with this information may result in risk of electric shock.



IMPORTANT!

This manual shall be fully read and understood before installing your underfloor heating system. Incorrect installation or failure to complete the warranty slip and THERMOFILM installation plan will invalidate the 10 year warranty.

THIS BOOKLET TOGETHER WITH THE THERMOSTAT OPERATING INSTRUCTION, ORIGINAL SALES RECEIPT AND SUPPLIED STICKER SHALL BE PLACED BY THE MAIN POWER PANEL.

If you require assistance call our dedicated technical team now 800-308-8057.

Introduction

Operating Manual

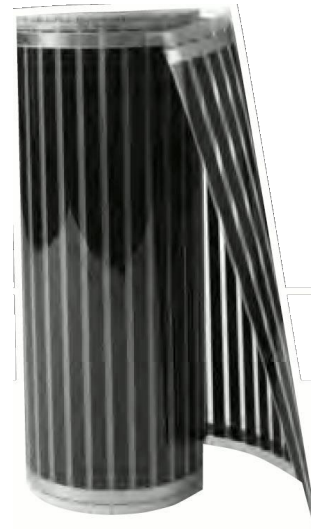
What Is Radiant Heat?	2
Operating Instructions	3-4

Installation

Pre-Installation Checklist	7
Floor Constructions	8
Installation	9-13
Troubleshooting	13

Warranty

THERMOFILM Installation Plan	14
Warranty Certificate	16



Installation is straight forward! However if you require assistance call our dedicated technical team now on 800-308-8057.

Please read the following instructions carefully to ensure easy installation. Remember that the final electrical connections must be made by a qualified electrician and the warranty certificate must be completed and signed by the electrician to ensure warranty coverage.

Thermosoft International Corporation accepts no liability, expressed or implied, for any loss or consequential damage.

This THERMOFILM underfloor heating element shall be installed only by qualified personnel who are familiar with the construction and operation of the product and the risks involved.

The installation of this heating product shall be in accordance with the manufacturer's instructions and the regulations of the authority having jurisdiction.

Attention!

The installation shall be made in accordance with Article 424, Part J, of the NEC, NFPA 70. By following these simple instructions, you will be able to install the THERMOFILM underfloor heating system without any difficulties. The final connection to the power supply **MUST** be carried out by a qualified electrician.

NEVER turn the heater on when is in the roll or layers touch each other. It will destroy the unit, void the Manufacturer's Warranty and may cause fire hazard.

INSTALL ALMOST ANYWHERE

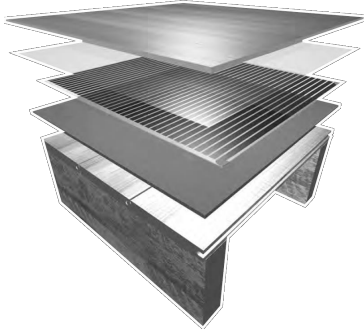
THERMOFILM can be installed on top of plywood or solid concrete floors enabling installation in many dry room types. **THERMOFILM** can also be installed under many floor coverings including: laminate, engineered wood and solid wood floors.

MAINTENANCE FREE, SAFE, OVERALL WARMTH

Safe, under laminate and wood floors, **THERMOFILM's** radiant heat provides overall warmth and comfort without blowing dust or allergens like typical convection heating systems. The large heated area also provides an even heat distribution. Once installed, it is completely maintenance free.

HOW EFFECTIVE IS UNDER LAMINATE HEATING?

THERMOFILM is a highly effective direct acting radiant heating system. It can be used as a substitute to traditional convector radiators by providing primary heating or used to warm a cool floor & provide background heat. If you are using your **THERMOFILM** as a primary or "sole" heat source, make sure that the Watts installed meet your BTU requirements. 1 Watt=3.412 BTU's.



PRE-INSTALLATION CHECKLIST

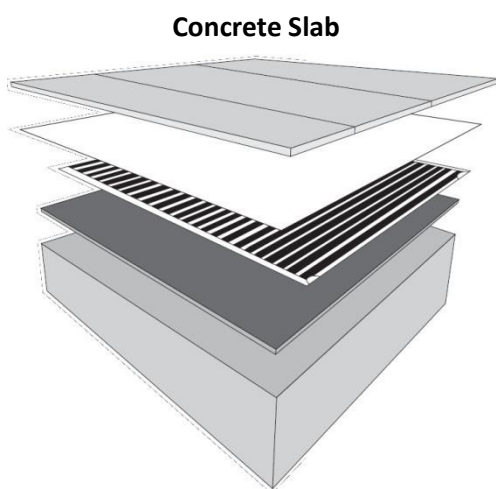
Please take time to read carefully the following notes and instructions before commencing installation:

- **THERMOFILM** underfloor heating systems are designed to be used under laminate, engineered board and solid wood flooring with a maximum thickness of 0.5" (or thickness equivalent to a maximum thermal resistance of 0.85 ft².hr.°F/BTU). When underlay is specified by the manufacturer this may reduce the thickness of flooring permitted. Always check to ensure the final floor covering is suitable for use with electric underfloor heating systems.
 - **THERMOFILM** underfloor heating systems operate on a 120 or 240 Volts AC electrical supply. Please check all elements are the correct voltage and power rating. Maximum loading is 11W/ft² for standard product.
 - **THERMOFILM** underfloor heating systems are designed for simple "do-it-yourself" installation, however all electrical connections must be done by a qualified electrician and the complete installation must comply with the National Electrical Code and all local codes.
 - **THERMOFILM** underfloor heating systems must be protected by a ground fault circuit interrupter (GFCI) if not incorporated into the control device (thermostat) used.
 - **THERMOFILM** must only be installed in dry locations indoors and must not be installed in "hazardous" or "wet" areas, as defined in the National Electrical Code.
 - **THERMOFILM** underfloor heating elements must not be installed below fixed pieces of solid furniture, cupboards, wardrobes, etc. as this could lead to a local increase in temperature.
 - Thick rugs, dog beds, bean bags, etc. must not be laid on the heated floor as this may cause localized overheating and damage the floor covering. Care must be taken to ensure the **THERMOFILM** heating elements are not damaged during installation. It is advisable to lay the floor immediately after installation.
 - **THERMOFILM** heating elements must be protected by a polymer vapor barrier.
 - **THERMOFILM** underfloor heating systems are designed to be controlled by our floor heating thermostats up to a maximum 15A per thermostat. If the installed load exceeds this figure then a suitable contactor must be installed by the electrician.
 - **Duct tape** must be used for installation of the thermal insulation, **THERMOFILM** heating elements and vapor barrier.
- **THERMOFILM Average Power Output is 11 Wt/ft²**
- **THERMOFILM** heating elements should always be rolled copper outermost and should not be handled in temperatures less than 23°F (-5°C).



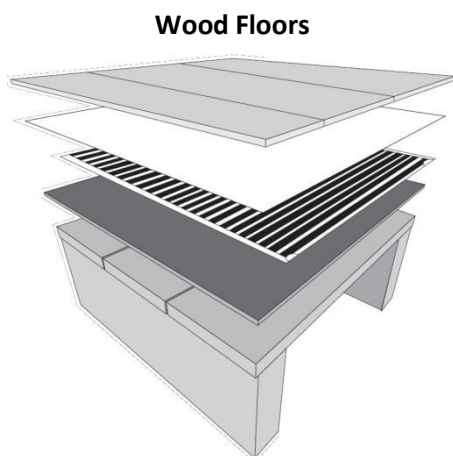
INSTALLATION EXAMPLES WITH DIFFERENT FLOOR CONSTRUCTIONS

THERMOFILM® – The complete underfloor heating solution for all wood & laminate floors.



1. Wood/laminate floor
2. Moisture barrier
3. **THERMOFILM**
4. Thermal insulation/moisture barrier
5. Moisture barrier*
6. Concrete subfloor

*A separate moisture barrier is required if the thermal insulation barrier is not waterproof.



1. Wood/laminate floor
2. Poly moisture barrier
3. **THERMOFILM**
4. Thermal insulation
5. Wood subfloor

PREPARING THE THERMOSTAT

Thermostat

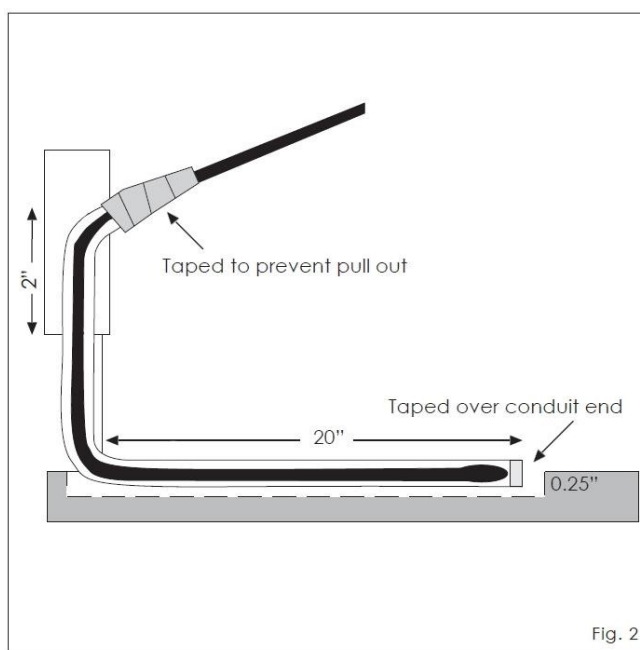
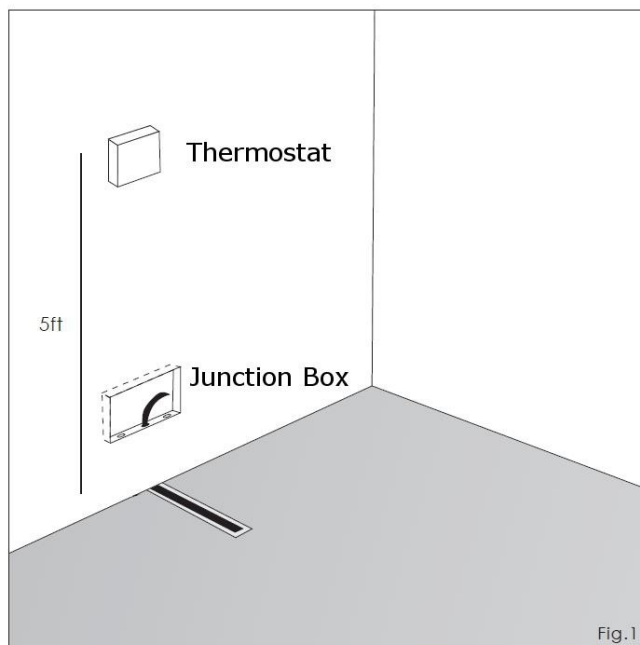
The **THERMOFILM** thermostat should be positioned (fig.1) at a height approximately 5ft from the floor in an area free from drafts, out of direct sunlight and close to the electrical supply. All **THERMOFILM** thermostats have a floor sensor which can be placed in an optional protective plastic conduit and positioned centrally below one of the heating elements at a distance of approximately 20" from the wall. A single gang flush fitting box will be required for the thermostat. A double-gang 4" box or a separate junction box is recommended to provide more room for connections.

Junction Box Installation

A junction box (fig.1), preferably 2-gang x minimum 1" deep) is required for connecting the **THERMOFILM** heating element 15ft long connection leads. It should be located close to the thermostat and in a position to enable all the connection leads and the thermostat sensor conduit to reach the box comfortably.

Floor Sensor Installation

Cut a channel in the underlayment pad or thermal insulation for the sensor or optionally - cut a 0.5" wide by 0.25" deep channel in the subfloor (fig.2) to accommodate a sensor conduit so that top of the conduit will be level with the underlayment pad or thermal insulation surface when installed (see fig. 2). Tape over the end of the conduit using a small piece of duct tape. Place the conduit in the channel and feed the end into the junction box. The conduit can now be cut to length leaving approximately 2" inside the junction box. Slide the sensor into the conduit until the sensor bulb reaches the taped end. Wrap a piece of tape around the conduit and sensor cable to prevent the sensor being accidentally pulled out. Use duct tape to hold the conduit in place in the channel.



LAYING THE INSULATION & THERMOFILM

The Thermal Insulation/Noise Reduction Pads

Use of plain (not foil faced) underlayment padding, minimum thickness (1/4") with a minimum thermal resistance value of 0.97 ft².hr.°F/BTU is recommended (R=1). Thermosoft offers Cerazorb™ synthetic cork and Insulayment™ compressed fiber underlayment pads, which work fine for that purpose. The THERMOFILM™ Film should be placed on top of the underlayment.

Thoroughly clean the existing floor area removing any sharp objects.

Lay the underlayment padding on the sub-floor (fig.3).

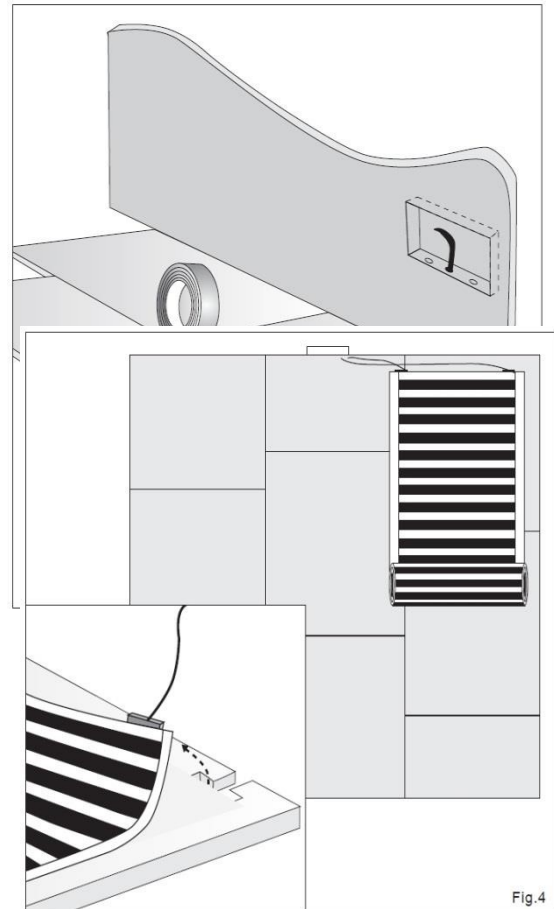
Note: The moisture barrier may be required to be placed directly on **concrete** sub-floors, below the underlayment padding, to prevent moisture accumulation in the floor.

Always remember to cover the total floor area with insulation even unheated areas. Tape along the edges using duct tape. Carefully cut a channel in the insulation at the position of the sensor conduit channel using a sharp knife and straight edge. Tape over the sensor or conduit using

The THERMOFILM heating system is available for use with 120V or 240V supply.

Power output is 11 W/Sq.Ft.

Widths: 1.5ft and 3.0ft overall.



duct tape.

Laying THERMOFILM™ heating elements

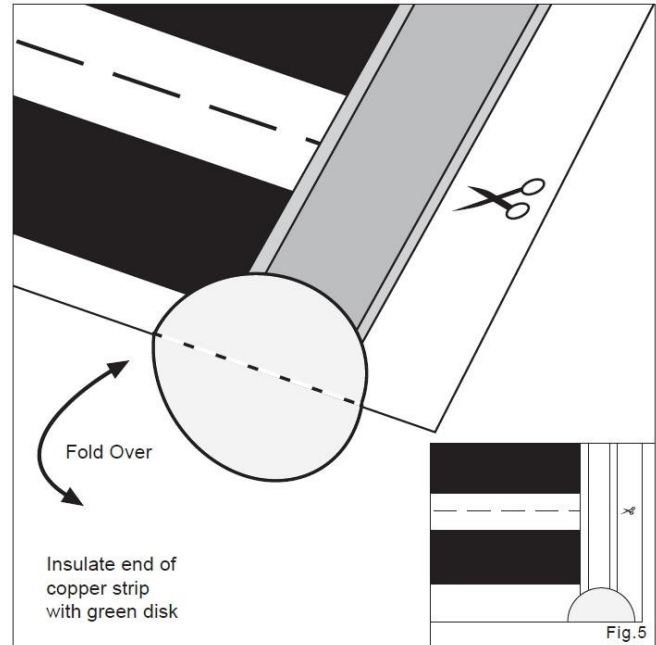
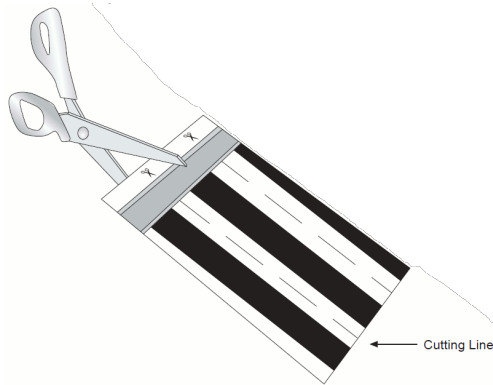
Before commencing the installation of **THERMOFILM**, check the labels on each **THERMOFILM** to ensure they are the correct sizes and power ratings.

Following the plan prepared at the ordering stage and working from one side, roll out the first element **copper buss side down** with the connection leads closest to the thermostat wall and leaving a minimum 2" gap from all walls. Apply light finger pressure on the cable connection covers to leave an imprint on the insulation, move the element to avoid damage and using a sharp knife remove

the insulation to allow the cable connection over to sit flush with the insulation surface (fig.4).

Adjusting THERMOFILM length

THERMOFILM is available in standard or custom lengths up to 60 ft long. Should **THERMOFILM** require to be shortened this can be easily done by cutting along the cutting line using a sharp knife and straight edge or scissors and insulating the ends of the copper strips using the insulating green polyester tape discs as shown in the diagram (fig.5) or 0.75"-1.0" wide electrical tape. Care should be taken not to cut close to the edge of the black heated area. Repeat the



procedure for the remaining elements, butting adjacent elements edge to edge.

Taping THERMOFILM in position

Tape along the edges of **THERMOFILM** using duct tape taking care not to damage the heating elements.

Using a sharp knife, cut a channel in the underlayment or insulation along the connection lead/thermostat wall side to accommodate the connection leads (fig.6). Run the leads in the channel to the junction box and tape over using duct tape. The leads must never be in contact with the **THERMOFILM** heating elements.

WARNING: Risk of electric shock and fire. Damage to supply conductor insulation may occur if conductors are routed less than 2" from this heating product. Refer to above for recommended means of routing supply conductors.

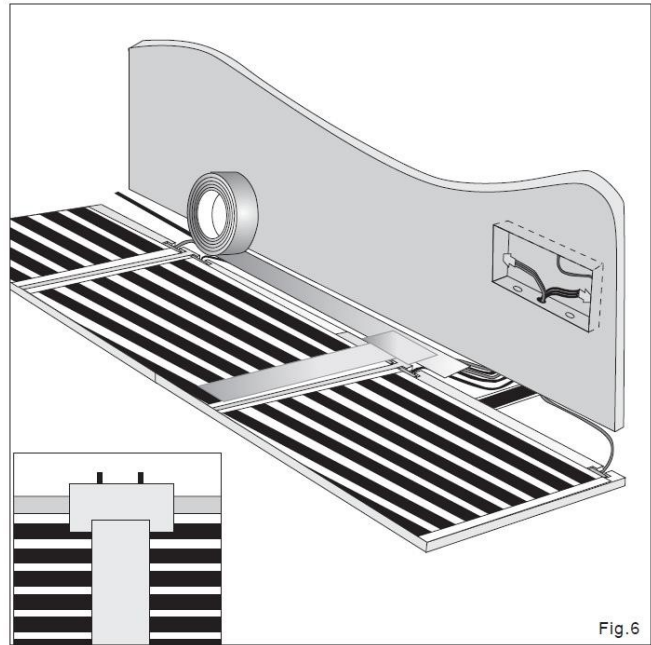


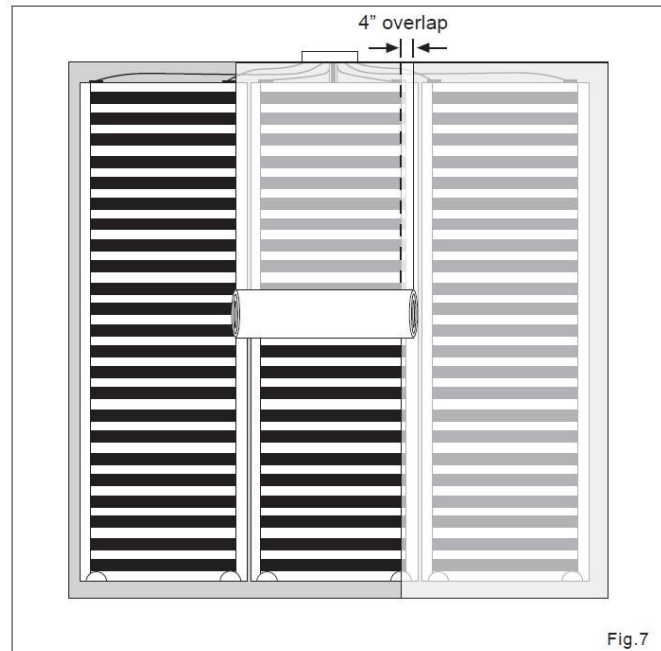
Fig. 6

INSTALLING VAPOR BARRIER & MAKING CONNECTIONS

Laying Poly Vapor Barrier

The installed **THERMOFILM** must be covered with the polymer vapor barrier to provide optimum moisture and additional mechanical/electrical protection.

To install, roll out the vapor barrier, cut to length and overlap adjacent pieces by a minimum of 4" (fig.7). Tape along the entire length of the overlap using duct tape. Always remember to cover the entire floor with the vapor barrier, even unheated areas.



Making The Electrical Connections

Please note the following steps must only be carried out by a qualified electrician.

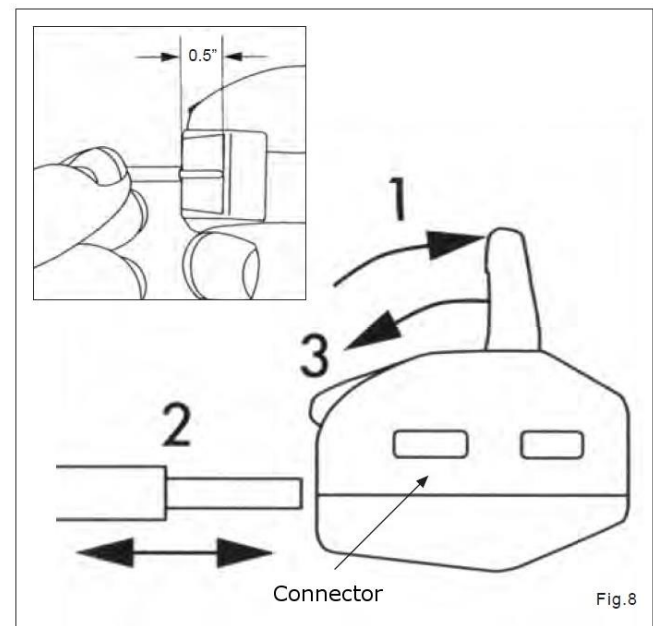
If connecting several mats, all connections must be done in PARALLEL.

Using the graph paper supplied draw a sketch showing the approximate position, width and length of each **THERMOFILM** together with the thermostat sensor position and number each of the elements on the drawing.

THERMOFILM leads can be connected together using Wago connectors. A separate connector is used for the live and neutral connections. A single pair of connectors will connect 4 **THERMOFILM**s to the thermostat (fig.9a).

To connect up to 7 elements, 2 pairs of connectors will be required with each pair being connected together using a suitable link wire.

Cut the lead wires inside the junction box to approximately 4". Carefully strip back 0.5" of the cable insulation taking care to completely remove the clear inner insulation.



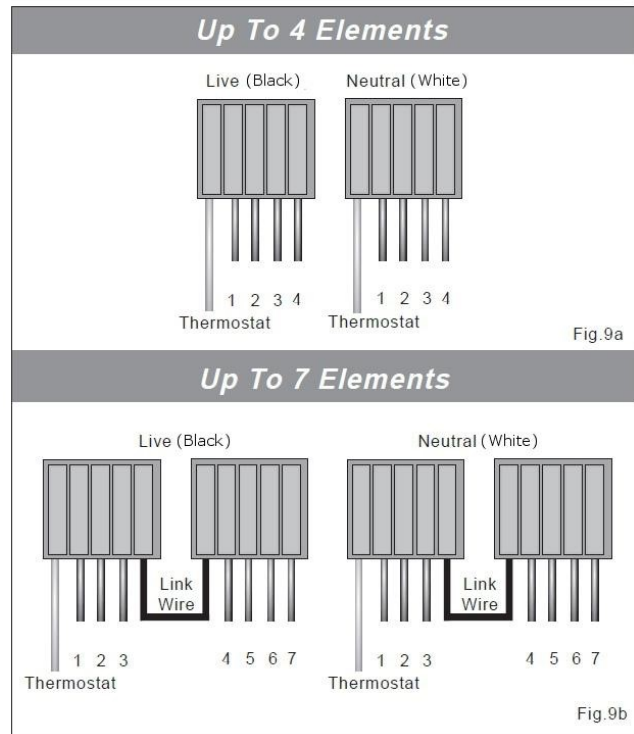
Measure and record on the test sheet the resistance of each element and carefully insert all black and white (red if 240V) cables into separate Wago connectors as shown in the diagram (fig.8). A suitable cable will be required to connect the connector blocks to the output (load) side of the thermostat.

Please note: If the installed load exceeds the thermostat power rating then a suitable power module, contactor/relay must be used.

Measure and record the total installed load resistance and carry out a resistance check to ensure no damage to the elements has occurred during installation. A second resistance measurement should be taken once the flooring has been laid.

Finally, complete the test report and warranty certificate ensuring all measurements are correctly recorded and leave all documentation including the thermostat instructions next to the main electrical supply panel. Remember the warranty must be filled in and kept with a proof of purchase to ensure coverage by our ten year warranty.

Install the thermostat following the manufacturer's instructions and carry out an operational test, taking time to check and adjust the floor sensor limiting temperature if required.



TROUBLESHOOTING

Should you experience any problems with your **THERMOFILM** installation, please carry out the following tests before calling Thermosoft technical support.

Step	Test	Outcome	Action
1	Check for a 120/240V supply to the thermostat	120/240V	If no voltage present, check electric power supply.
2	Set the thermostat to the highest position and test for a 120/240V output. This may take a few minutes	120/240V	Check resistance of the floor sensor (step 3). If normal, the thermostat is faulty. Contact supplier.

3	Turn off power to thermostat and test floor limit sensor resistance	Approximately 8-12KΩ for temperatures 68-86°F	If sensor is faulty, contact supplier for replacement.
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THERMOFILM INSTALLATION PLAN

To ensure the validity of your warranty please provide a layout plan of your **THERMOFILM** underfloor heating installation.

Thermosoft has provided an example (next page) and a **Risk of electric shock. Electric wiring** checklist to ensure this procedure is carried out correctly. **and heating panels contained below the floor. Do not penetrate with nails,**

This sketch should be left next to the main power panel of the **screws or similar devices.** heating system together with thermostat user instructions, *Fix this label to the main panel.* warranty certificate, original sales receipt and supplied sticker (see opposite) for the main power panel to alert users of the

installation. A second sticker should be placed in the room **RADIANT FLOOR HEATING** installed with the **THERMOFILM** heating system. *Fix this label to the thermostat.*

Part 1 - To be completed by the installer

What are the room dimensions? _____ What is the heated area? _____

What is the product code(s) of the THERMOFILM elements installed? _____

Have you marked the position of the junction box on the sketch? _____

Have you marked the position of the thermostat box on the sketch? _____

Have you marked the position of the floor probe on the sketch? _____

Part 2 – To be completed by the electrician

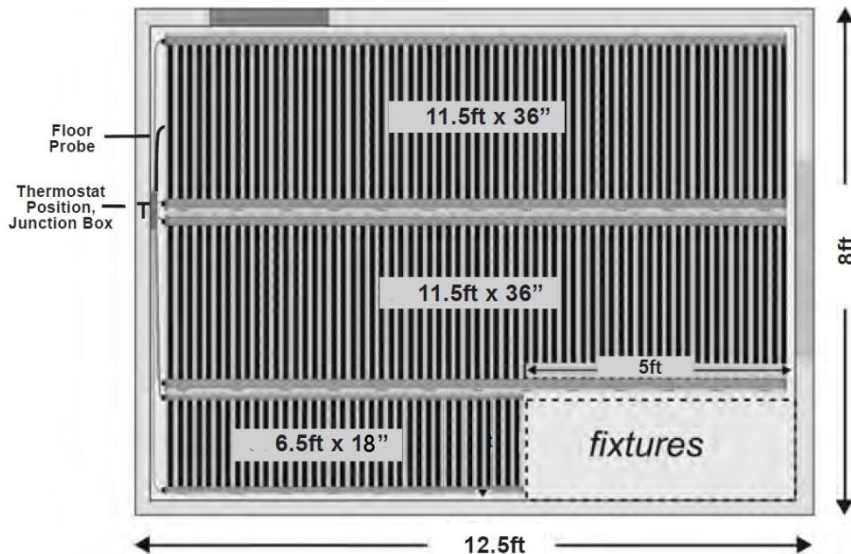
What is the measured resistance of the installed THERMOFILM elements (Ohms)?

SKU# _____	SKU# _____	SKU# _____	SKU# _____
_____ Ω	_____ Ω	_____ Ω	_____ Ω

What is the total power of the installation (W)_____W

Circuit Voltage: _____(V). What is the GFCI rating (mA)_____

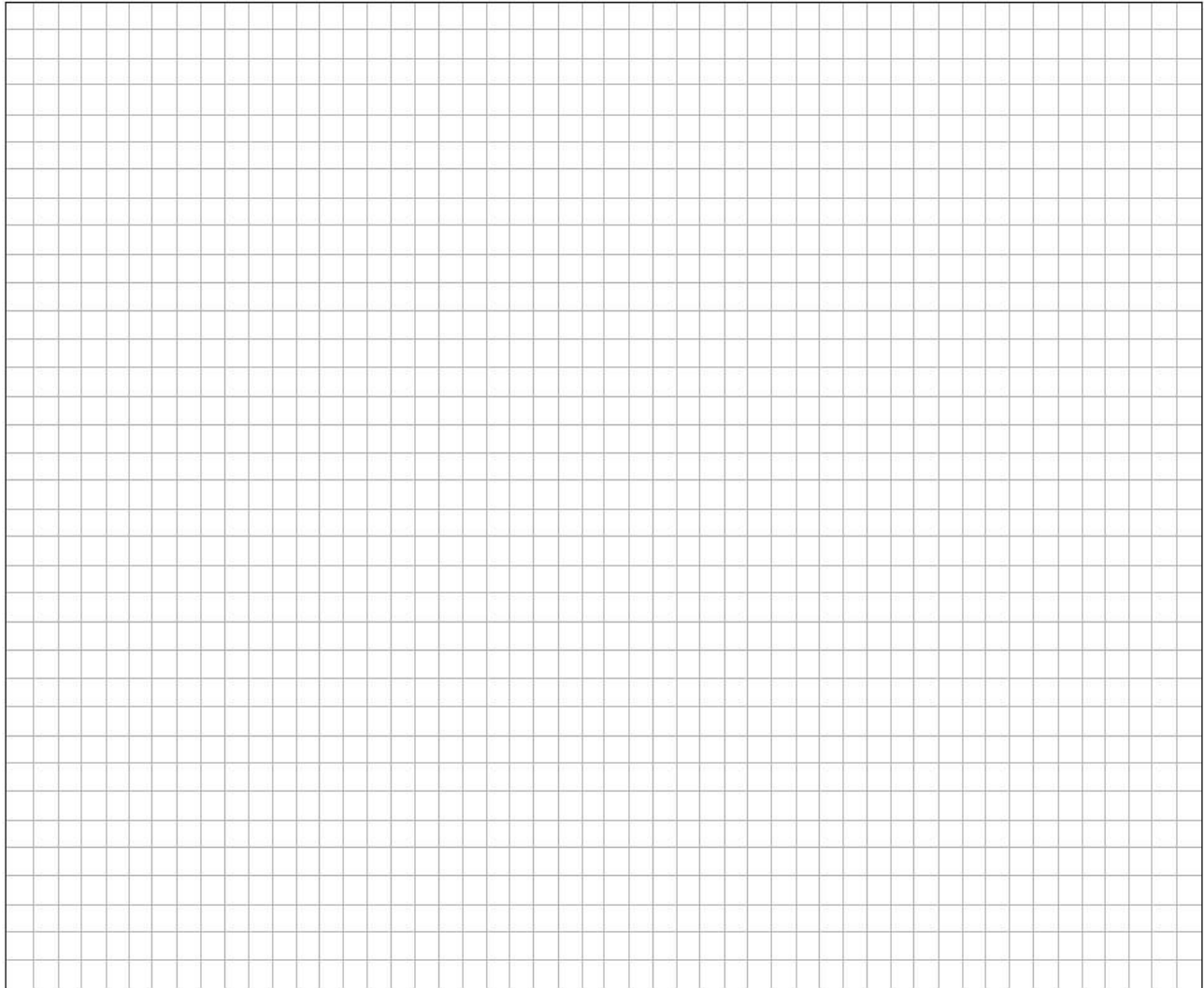
Rated Voltage of the elements _____(V).



Please retain a detailed layout plan using the example to the left as a guide.

Take care to show the following:

- Lengths installed
- Thermostat position
- Junction box position
- Floor probe position
- Any fixed furniture/fittings
- Room dimensions



**10 Year
Warranty**

WARRANTY CERTIFICATE

THERMOFILM®

underfloor heating film

This warranty is only valid under the following conditions:

- All electrical connections were carried out by a qualified electrician.
- The warranty covers faults in material for 10 years for **THERMOFILM** from the date of purchase.
- The completed warranty and proof of purchase must be presented in connection with warranty claims.
- The **THERMOFILM** installation plan has been completed by the installer and the electrician.
- The warranty covers the repair/replacement of floor heating goods found to be faulty due to manufacturing defect and does not cover secondary charges relating to the repair/replacement of any floor covering.
- The Thermosoft International Corporation warranty does not cover faults resulting from installation or damage caused by others.

Please complete this installation completion certificate and retain a copy to validate the warranty.	
Owners Name:	
Address:	
Phone:	Email:
Installer's Name:	Phone:
Email:	
Electrician's Name:	Phone:
Email:	
Electrician's License Number:	
Signed by electrician:	Date Completion Tested:
Thermosoft Intl. Corp. ▪ 701 Corporate Woods Pkwy ▪ Vernon Hills, IL 60061 ▪ 800-308-8057	
This instruction manual must be left at the main power panel along with a copy of the thermostat operating instructions and the original sales receipt. The supplied stickers should be placed near the main power panel and in the room installed with the underfloor heating.	