



GREEN CABLE
SURFACE XL®

Installation and User Guide

HAND THIS GUIDE TO THE USER AS IT CONTAINS IMPORTANT INFORMATION



INS-HGS_0523

Thank you for your purchase!
Need help? Contact STELPRO Technical service.

flextherm.com
elec.tech@stelpro.com
1-844-STELPRO (783-5776)



HEATING CABLE,
SERIES TYPE G, W CANADA
UNCLASSIFIED LOCATIONS USA

1 IMPORTANT INSTRUCTIONS

Please read the following manual BEFORE you begin to ensure a proper and safe installation and use of the product.



- This guide contains instructions regarding safety as well as important precautions to ensure a compliant and successful installation. Please pay special attention to this symbol and follow all instructions given.
- This heating system is an electrical appliance and **MUST BE** installed in accordance with this document and regulations of the authority having jurisdiction including the National Electrical Code (NEC), NFPA 70 and CAN/CSA-C22.1, Canadian Electrical Code, Part I (CEC). Its installation must be entrusted to duly qualified personnel where required by law.
- This heating system is designed and approved for indoor floor embedded heating in dry (G) or wet (W) environments in Canada and Unclassified Locations in the USA, subject to local electrical standards.
- A permanent Class A GFCI (5 mA) protection is required to protect the cable and the occupants in case of a fault.

2 INTRODUCTION

This installation guide covers the installation of Green Cable Surface XL (HGS series) for residential, commercial, and institutional applications using two (2) methods:

- With an uncoupling membrane
- With the Universal Snap-in Gauges®

POWER PER SQUARE FOOT ACCORDING TO INSTALLATION METHOD AND CABLE SPACING

	UNCOUPLING MEMBRANE				UNIVERSAL SNAP-IN GAUGES		
	STELPRO		OTHER BRAND		3"	Alternating 3"-4"	4"
CABLE SPACING	2-1/2" and 3-3/4" Alternating 2-3 studs	3-3/4" 3 studs	2-3/8" and 3-1/2" Alternating 2-3 studs	3-1/2" 3 studs			
POWER	13.8 W/ft ²	11.5 W/ft ²	14.4 W/ft ²	12 W/ft ²	14.4 W/ft ²	12.4 W/ft ²	10.9 W/ft ²



- Under no circumstances can the spacing be less than 6 cm (2-3/8 in.) on-centre.
- Under no circumstances can the power output of the installation be more than 14.4 W/ft².
- The use of a soft or wood flooring requires alternate spacing in an uncoupling membrane.
- This product can be used as a main source of heating (provided the heat loss of the room falls below the energy installation capabilities) or as an auxiliary heating for the comfort of your feet.
- The ambient and floor temperatures that can be achieved are dependent on the exterior temperature, the insulation of the room including that of the floor, the window coverage, the flooring used, etc. For more information on how the system can heat the room, refer to a construction professional, an architect or an engineer.

MATERIALS AND TOOLS

- FLEXTHERM floor warming and heating cable kit including heating cable, one (1) glue stick, one (1) floor temperature sensor and the Installation and User Guide
- STELPRO thermostat (expansion units available for installation greater than 15 A), sold separately
- Uncoupling membrane (sold separately) or Universal Snap-in Gauges, included
- Hot glue gun
- Thermostat connection box and appropriate device cover
- Protective plate for the wall bottom plate (if required)
- Appropriate multimeter
- Megohmmeter capable of a 1000-volt test
- Various tools: measuring tape, calculator, marker, screwdriver, tools to groove the substrate (if needed), fish cord, fish tape, shears, electrical tape and a 2.5 cm (1 in.) diameter and 40 cm (16 in.) long stick or pipe for the dispenser box
- Vacuum cleaner, broom, water bucket and sponge
- Cardboard or other light material on which to lay the tool
- When required by the electrical code, conduit* and fittings* to run the cold lead from the floor to the thermostat

*All conduits, fittings, and electrical accessories must be listed (UL) for the US and certified (CSA) for Canada.

3

COMPATIBLE SUBSTRATES



WARNING!

- The floor structure must meet local building codes, all construction standards and manufacturers requirements for ceramic, porcelain, stone tile, thinset mortar or self-leveling underlayment installations. Refer to the Tile Council of North America publications (www.tcnatile.com) or Terrazzo Tile & Marble Association of Canada (www.ttmac.com) for installation standards.
- Refer to the uncoupling membrane installation guide for their installation instructions and limitations.

SUBSTRATE COMPATIBILITIES

INSTALLATION METHOD	Plywood	OSB	Cement board	Structural concrete slab	Concrete slab on grade	Gypsum base underlayment	Existing ceramic, porcelain, stone floor	Existing vinyl floor	Acoustic membrane	Anti-fracture membrane	Mortar bed	Diamond mesh with scratch coat
UNCOUPLING MEMBRANE	√	√	√	√	√	√	√	√		√	√	√
UNIVERSAL SNAP-IN GAUGES	√	√	√	√	√	√	√	√	√	√	√	√

Check with the substrate manufacturer/association to ensure compatibility with floor heating systems.

The selected substrate must be clean, flat, smooth, structurally sound and free from any substance that can reduce the bonding properties of the adhesive, or protruding nails, screw heads or other materials that may damage the cables.

NOTE ABOUT DIMENSIONAL STABILITY

Floor stability will vary according to the type of flooring installed and its components. Follow tile mortar and self-leveling underlayment manufacturers, Tile Council of North America (TCNA) and Terrazzo Tile and Marble Association of Canada (TTMAC) guidelines to provide movement joints at obstacles and across the room and its perimeter (reference TCNA detail EJ-171 and TTMAC 301M).

NOTE ON THERMAL RESISTANCE RSI VALUE (R-VALUE) FOR SUBFLOORS

The maximum allowable thermal resistance of building insulation under subfloors is RSI 5.5 (R-31).



- The use of a soft or wood flooring requires alternate spacing on an uncoupling membrane.
- In no case can stapled, nailed or screwed flooring be used over this heating system.
- The flooring installed above this heating system shall cover the entire heated area.

Ceramic, porcelain and stone floor coverings are an ideal choice for radiant in-floor heating.

Many other types of flooring can also be used as long as their manufacturer approves them over heated floors.

FLOOR COVERING COMPATIBILITIES										
INSTALLATION METHOD	Floor tiles			Soft floor covering*				Wood floors*		
	Ceramic	Porcelain	Stone	Vinyl	Linoleum	Carpet	Cork	Floating floor	Engineered wood	Natural hardwood
UNCOUPLING MEMBRANE	✓	✓	✓	✓	✓	✓		✓	✓	
UNIVERSAL SNAP-IN GAUGES	✓	✓	✓	✓	✓	✓		✓	✓	

* Validate the compatibility of the product with the manufacturer.

FLOORING THERMAL RESISTANCE (RSI/R-VALUE)

The thermal resistance of the flooring installed above this heating system shall be less or equal to RSI 0.18 (R-1).

The table below outlines common thermal resistance values per flooring thickness.

MATERIAL	RSI/R
Vinyl 1/8" (3 mm)*	RSI 0.04 / R-0.20
Ceramic 3/8" (10 mm)	RSI 0.06 / R-0.34
Engineered wood 1/2" (13 mm)*	RSI 0.09 / R-0.50
Floating floor 3/8" (10 mm)*	RSI 0.09 / R-0.50
Carpet without rubber backing 3/8" (10 mm)*	RSI 0.18 / R-1.00

*Check the flooring's actual RSI/R value with the manufacturer.



- Make sure the circuit dedicated to the heating cable is of the same voltage as the cable specification. Never connect a cable designed for 120 volts on a 208/240-volt circuit, nor a 208/240 volts cable on 120 volts.

CIRCUIT

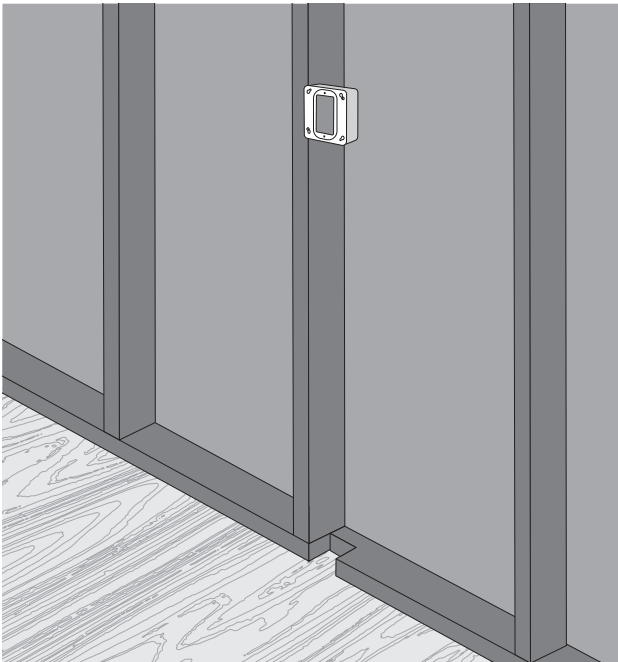
Floor heating systems must be connected to electrical circuits dedicated to heating. The heating power (Watts) of the cable, as indicated on the cold lead label, will determine the required circuit intensity (Amps). Please take note that the maximum load that can be connected to a STELPRO thermostat is 15 A.

For a load greater than 15 A, it must be distributed to an expansion unit, a relay or an additional thermostat.

CONNECTION BOX

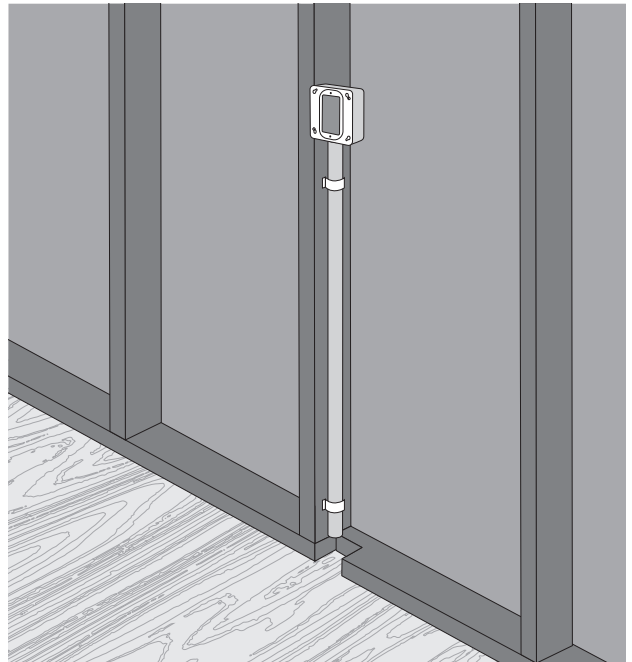
Determine the thermostat (and expansion units if needed) location.

- The thermostat should be in an accessible location in the room where the system will be installed and at an appropriate height.
- The expansion unit(s) might be located elsewhere but must remain accessible.
- Use expanded connection boxes such as a 4 in. x 4 in. box, with conduit knockout holes and appropriate device cover.



CONDUIT

Install a Listed/certified electrical conduit between the floor and the thermostat's connection box when required by your local electrical code.





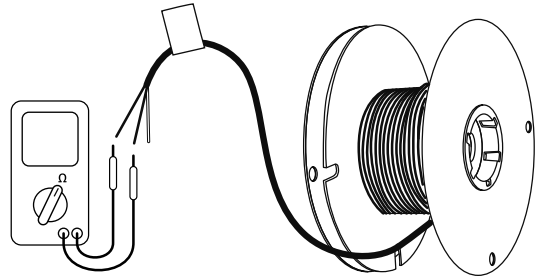
WARNING!

- Never connect a cable while it is on the spool. To test the cable, use the following procedure.
- Before removing the seal on the spool, the cable insulation and its resistance must be verified to validate the cable conformity. A cable whose seal has been broken cannot be returned.

HEATING CABLE RESISTANCE VERIFICATION

Use an appropriate multimeter to measure the resistance between the black lead wires. The resistance value of the cable is indicated on the label attached to the end of the cold lead.

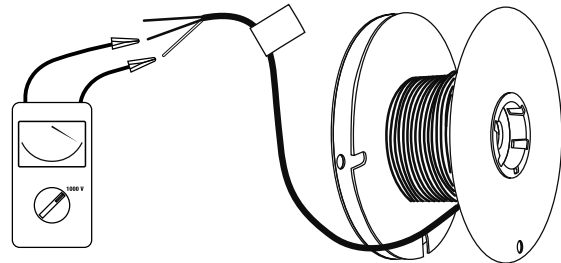
The test result should be $\pm 10\%$ the resistance indicated on the label. Record the results in the Test Log.



HEATING CABLE INSULATION VERIFICATION

Use a megohmmeter to check the cable's insulation integrity. Set the test voltage at 1000 V and apply tension between the green wire and one of the black lead wires for at least six (6) seconds.

The test result should be infinite resistance (I, OL). Record the results in the Test Log.



FLOOR TEMPERATURE SENSORS RESISTANCE CHECK

Two (2) floor temperature sensors are available for your system installation. One is included with the heating cable, and the other with the thermostat. It is recommended to install both sensors on the floor in different locations as a backup in case one of them fails or does not give satisfactory results.

Each time you test the cable's integrity, measure the resistance of the floor temperature sensors between the two wires and report the results in the Test Log.

If the measured values do not correlate with the table, call STELPRO Technical service.

AMBIENT TEMPERATURE	OHM (Ω) +/- 10%	KOHM (Ω) +/- 10%
5°C (41°F)	22,200	22.2
10°C (50°F)	18,400	18.4
15°C (59°F)	14,800	14.8
20°C (68°F)	12,400	12.4
25°C (77°F)	10,100	10.1
30°C (86°F)	8,400	8.4

Check the heating cable and floor temperature sensors three (3) more times as a system integrity control measure: once the cable is secured to the floor, after the cable has been covered with tile mortar or self-leveling underlayment and after the flooring installation. Report all test results in the Test Log included in this installation guide.

If the results obtained in any of the tests do not comply with the labeled cable specifications, contact STELPRO Technical service.



- Accurate measurements are the key to a successful installation. Check your measurements to ensure that you have the proper cable length for the project. A measurement guide is available on FLEXTHERM's website.

GENERAL INSTRUCTIONS

Before the installation, take note that:

- The cable must be installed at a minimum distance of:
 - 5 cm (2 in.) from fixed furniture, cabinets (toe kick), patio doors, bath or shower steps.
 - 5 cm (2 in.) from walls.
 - 10 cm (4 in.) from non-heating conduits such as tubes, pipes or vents.
 - 15 cm (6 in.) from the centre of toilet drains and 5 cm (2 in.) from toilet bases.
 - 20 cm (8 in.) from receptacles, switches and electrical outlets.
 - 20 cm (8 in.) from heating devices.
 - 20 cm (8 in.) from heating tubes, pipes, vents or ducts.
- Each enclosed area where a floor heating system is installed must have a thermostat to control the temperature.
- The heating cable may extend to adjacent rooms and be controlled by a single thermostat.
- The heating cable cannot be crossed, cut, shortened or modified.
- The only authorized anchoring devices for the Green Cable Surface XL are uncoupling membranes manufactured for this purpose and the Universal Snap-in Gauges.
- The floor temperature sensors and the entire heating portion of the cable, including the mechanical joint and heating cable end, must be secured to the floor and covered with tile mortar or self-leveling underlayment.
- The heating cable must never be installed under, in or over walls or partitions.
- The system must not be installed under fixed furniture or where air does not flow freely.
- The system should never be installed in closets (USA only).
- Avoid installing heating cables in a closet where objects may trap heat to the floor (Canada only).
- The heating cable must never cross a movement joint such as an expansion or control joint.
- The minimum bending radius of the heating cable is 13 mm (1/2 in.).
- The system should not be installed in conditions below 0° C (32° F) ambient air temperature.
- To maintain a uniform floor temperature, ensure that the entire area controlled by the heating cable thermostat is covered with the same type of flooring.
- Despite what was mentioned earlier, it is possible to install a short section of heating cable, less than 2 feet in length, on a vertical surface such as a wall or partition to heat another horizontal surface, such as a shower bench, a shower threshold, or a stair step. It is imperative that the cable be coated with mortar and protected against any penetration. When transitioning from one surface to another, it is necessary to adhere to the minimum bending radius by transferring the cable diagonally between the planes. It is important to note that such applications must be approved by the relevant inspector in your area.

WET ENVIRONMENT INSTALLATION

The heating cable can be installed in a wet environment* such as a shower floor with a ceramic, porcelain or stone flooring. However, additional precautions must be observed:

- The thermostat must be at least 1 m (3 ft. 3 in.) away from a wet zone (bathtub, shower stall, etc.) so a person in that area cannot reach it.
- The shower must have its own cable.
- The heating cable must be installed under a waterproofing membrane (ANSI A118.10) with a permeance value between $5.7 \text{ ng} / \text{s} \times \text{m}^2 \times \text{Pa}$ and $57 \text{ ng} / \text{s} \times \text{m}^2 \times \text{Pa}$ (0.1 and 1 US perm).

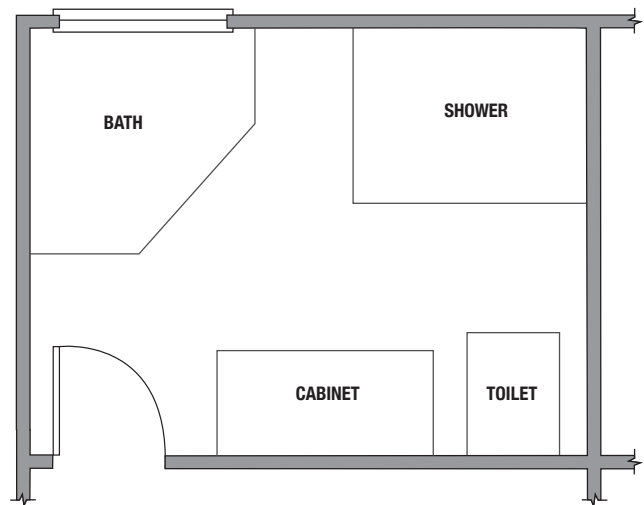
* Applications must be validated with local and/or national electrical codes.

PLANNING THE INSTALLATION

It is recommended to make an installation plan to foresee direction changes, obstacle skirting, buffer zones, etc. Buffer zones are areas that don't need to be heated (i.e., toilet sides, behind a door, under the stove or low traffic areas).

Draw the obstacles to be bypassed directly onto the substrate or on the uncoupling membrane.

Plan to end your installation in a buffer zone to use any excess cable while respecting the installation guidelines.



To view examples of heated cable installations, please visit our website at flextherm.com

Jump to the appropriate section

- **UNCOUPLING MEMBRANE, page 9**
- **UNIVERSAL SNAP-IN GAUGES, page 10**

UNCOUPLING MEMBRANE

INSTALLING THE MEMBRANE

1. Install the uncoupling membrane on the floor according to the product manufacturer's instructions.

COLD LEAD

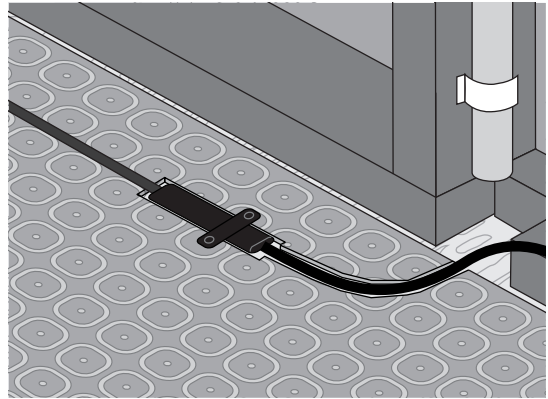
The cold lead is flat and black, 2.4 m. (8 ft.) long and connected to the heating cable with a mechanical joint. Just like the heating cable, the mechanical joint must be installed on the floor and covered with the selected tile mortar or self-leveling underlayment.

1. Cut the membrane to the dimensions of the mechanical joint and the cold lead in order to route the latter into the conduit to the thermostat connection box.. Screw the mechanical joint to the subfloor into the designated holes and secure the cold lead into the groove using hot glue.



WARNING!

- Keep the stripped end of the cold lead dry before, during and after the installation.



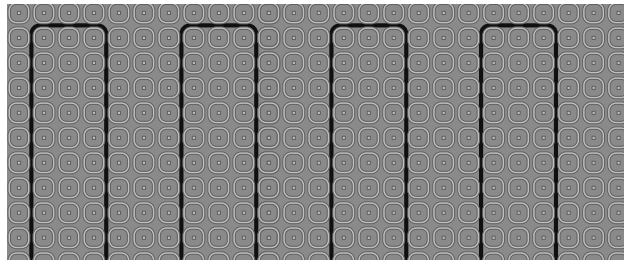
INSTALLING THE CABLE IN THE MEMBRANE

1. Align the cable between the studs and push it in the membrane with a wooden trowel, grout float, tapestry roller or similar tool that will not harm the heating cable.

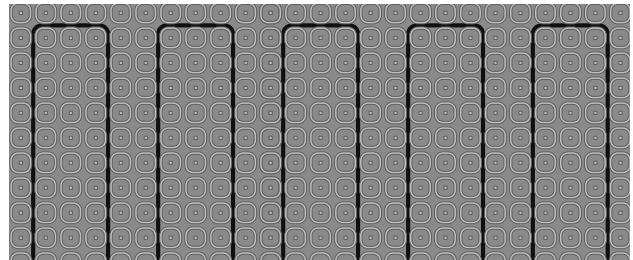


WARNING!

- The use of a soft or wood flooring requires alternate spacing on an uncoupling membrane.



Regular spacing

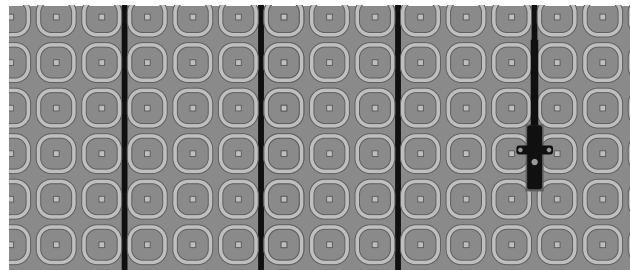


Alternate spacing

END OF THE HEATING CABLE

Note: The cable end is rigid and has a larger diameter than the heating cable.

1. To complete the installation, cut the membrane to accommodate the cable end so that it is flush with the heating cable.
2. Secure the cable end using hot glue or screws in the holes provided.



UNIVERSAL SNAP-IN GAUGES

COLD LEAD

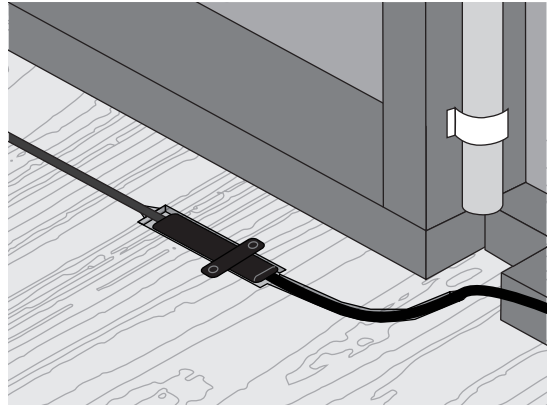
The cold lead is flat and black, 2.4 m. (8 ft.) long and connected to the heating cable with a mechanical joint. Just like the heating cable, the mechanical joint must be installed on the floor and covered with the selected tile mortar or self-leveling underlayment.

1. Cut a groove in the subfloor to the dimensions of the mechanical joint and the cold lead in order to route the latter into the conduit to the thermostat connection box. Screw the mechanical joint into the designated holes and glue the cold lead into the groove using hot glue.



WARNING!

- Keep the stripped end of the cold lead dry before, during and after the installation.



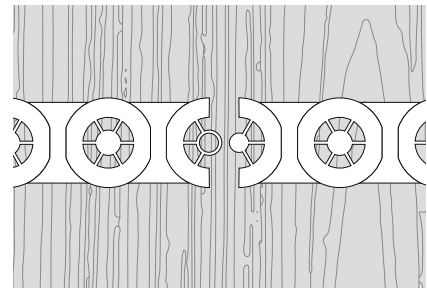
INSTALLING THE GAUGES

1. Install the gauges as the work progresses by joining them together.
2. Use a hot glue gun to secure the gauges to the substrate (gauges can also be nailed, stapled or screwed). For maximum adherence, apply hot glue uniformly under the gauges.



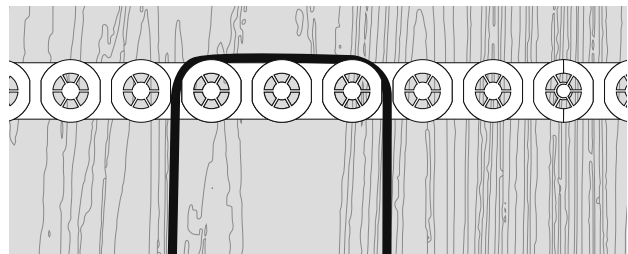
WARNING!

- Do not staple the cable
- Never touch the cable with the tip of the hot glue gun.



INSTALLING THE CABLE IN THE GAUGES

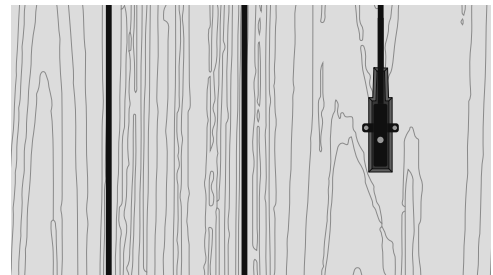
1. Slide the cable between the circular shapes. Apply moderate tension on the cable allowing the cable runs to remain parallel.
2. The cables should be stabilized at approximate one (1) metre (3 ft.) intervals with hot glue. This will prevent the cable from floating or moving when the cable is covered with self-leveling underlayment or tile mortar.



END OF THE HEATING CABLE

Note: The cable end is rigid and has a larger diameter than the heating cable.

1. In order to finish the installation, make a groove in the subfloor with a depth of approximately 3 mm (1/8 inch) to accommodate the end of the cable. Ensure that the height of the cable does not exceed that of the heating cable.
2. Secure the cable end using hot glue or screws in the holes provided.

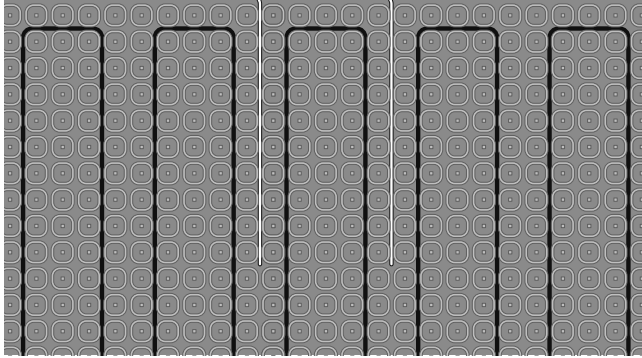


FLOOR TEMPERATURE SENSORS INSTALLATION

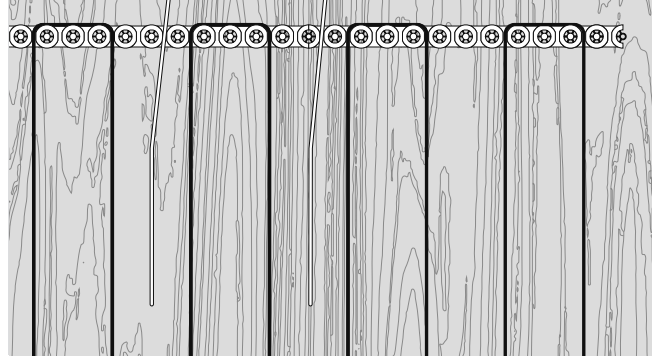
1. Install the two (2) floor temperature sensors in different locations. Center the sensors between the heating cable runs using hot glue.



- The sensors should be installed in the center of a heated floor diameter of at least 60 cm (24 in.). The sensors should be placed in a representative area of the usual floor temperature, as close as possible from the flooring, far from any other heating or cooling sources or potential objects preventing the air to flow freely on the floor.
- If soft or wood flooring is to be installed, center the temperature sensors between the closest cables.
- Do not cross the sensor's cable over the heating cable.



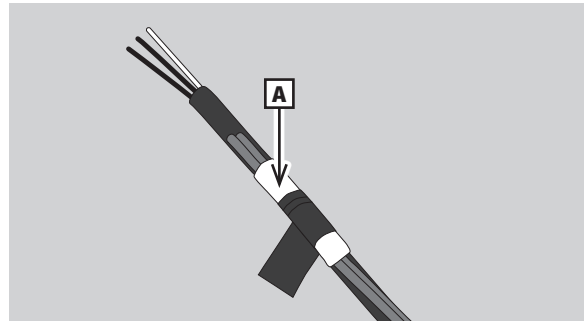
Sensor installation in a membrane for soft and wood flooring



Sensor installation with gauges

FISH THE CABLES TO THE THERMOSTAT CONNECTION BOX

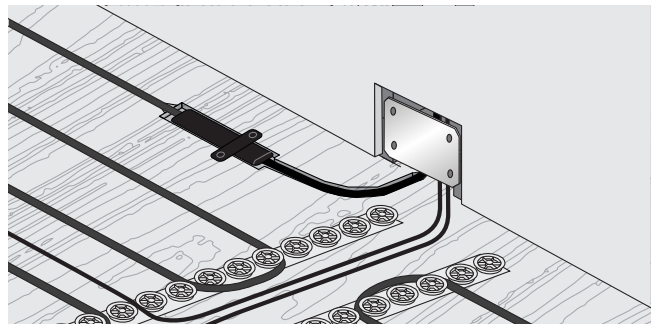
1. Pull the cold lead and floor temperature sensor cables in the thermostat connection box using a fish tape, if required.
2. To maintain the identification label **[A]** in place, wrap and tape the label around the cold lead before fishing the cold lead to the connection box.
3. If necessary, cut any excess of cold lead but keep the product identification label intact and attach to the remaining wires so it stays accessible in the connection box.



- The cable identification label must remain on the cold lead cable. Removing it will void the cable's limited warranty.

INSTALLING THE PROTECTIVE PLATE

1. Install a protective plate, if required, at the wall bottom plate.



8

HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK AFTER INSTALLATION

Once the cable installation is completed, check cable and floor temperature sensors integrity as described in the “HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK” section on page 6. Record the results in the Test Log.

Do not install the flooring if the cable is damaged during installation. Contact STELPRO Technical service.



- **PROTECT THE CABLE:** Reduce to a minimum the time between the cable installation and flooring installations. Protect the cable with cardboard or similar soft material and restrict access to the area. A hard material (such as a plywood sheet) could damage the cable.
- **DOCUMENT YOUR CABLE INSTALLATION:** Take photographs of the installation before the cable is covered. These pictures should show that your installation meets all the standards and written instructions and will be a useful reminder for future renovations.

9

CABLE COVERING TECHNIQUES AND FLOORING INSTALLATION

Once the cable has been installed and tested, proceed to the application of the tile mortar or self-leveling underlayment .

Please note that the following instructions do not represent a complete technical installation guide. They only pinpoint the specificities to be observed when a floor heating cable is covered with cementitious materials.



- **Precautions must be taken while covering the heating cable and installing the flooring.**
- **Trowels are sharp and can damage the cable. Be careful not to hit the heating cable during the covering of the cable and the flooring installation process. Use a wet sponge to remove excess tile mortar in the tile grout lines as you lay the tiles: do not use a utility knife or the edge of your trowel.**
- **Do not lay tools and materials (buckets, trowels, grinders, tile boxes, etc.) directly on the cable.**
- **Depending on the chosen method, one or two more heating cable and floor temperature sensors checks will be necessary: after the cable has been covered and/or after the flooring has been installed. Check the cable's integrity, as described in the “HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK” section, page 6. Floor temperature sensors resistance must also be tested. Record the results in the Test Log.**

Jump to the appropriate section

- **UNCOUPLING MEMBRANE, page 13.**
- **UNIVERSAL SNAP-IN GAUGES, page 15.**

UNCOUPLING MEMBRANE



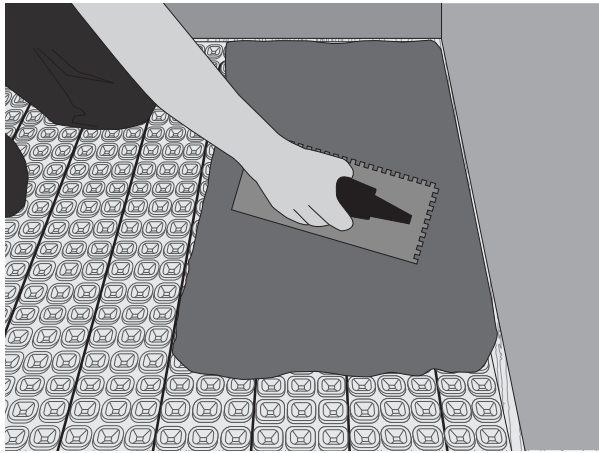
- Consult your tile mortar manufacturer for proper mortar selection, product compatibility, curing time, and instructions for your specific installation.

INSTALLATION WITH TILE MORTAR (CERAMIC, PORCELAIN AND STONE FLOORING ONLY)

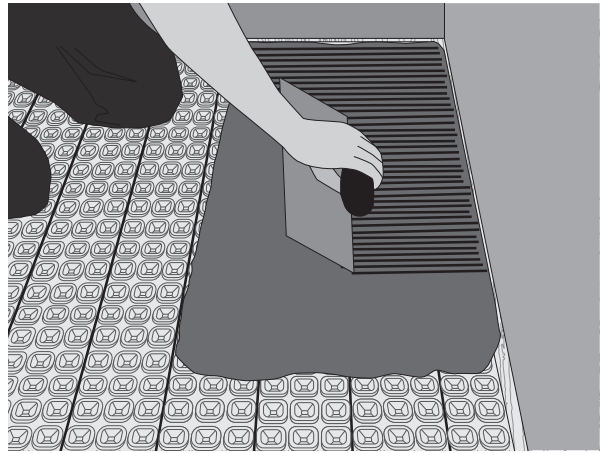
Tiles can be immediately laid after the heating cable installation is completed.

1. Using the flat side of the trowel, fill with tile mortar the cavities of the membrane.

Both modified (ANSI A118.11) or non-modified (ANSI 118.1) tile mortars can be used when installing tiles on the uncoupling membrane.

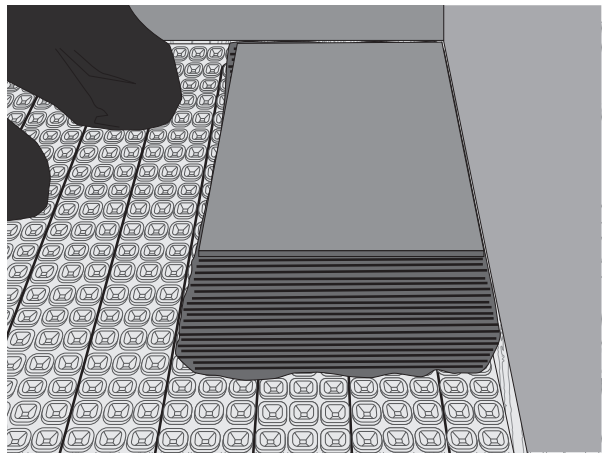


2. Apply more of the same tile mortar with a suitable notched trowel according to the tile size.



3. Lay the tile(s) in accordance with ANSI A108.5 or A108.12 and applicable TCNA or TTMAC installation guidelines. A 2.4 mm (3/32 in.) minimum thickness of tile mortar must be present above the membrane studs.

Back-butter the tile to achieve full contact with both the tile and the membrane.



4. Check cable integrity and floor temperature sensor resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.

INSTALLATION WITH SELF-LEVELING UNDERLAYMENT



- No primer is required on the uncoupling membrane.

1. As recommended by the manufacturer of the self-leveling underlayment, install a compressible strip around the perimeter of the room and around vertical projections.
2. Seal any gaps where the underlayment could creep out of the room, such as the bottom edges of walls and plumbing holes in the floor.

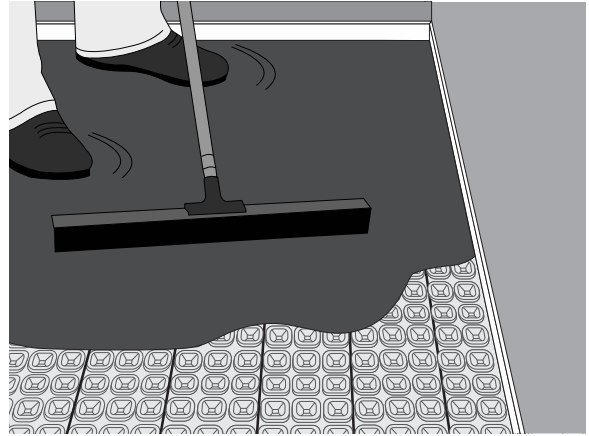
3. Spread the self-leveling underlayment with a rake for this purpose.

Ceramic, porcelain and stone

- Cover the uncoupling membrane with a minimum thickness of 6 mm (1/4 in.) and a maximum of 13 mm (1/2 in.) above the studs.

Soft and wood floor

- Cover the uncoupling membrane with a thickness of 13 mm (1/2 in.) above the studs.
4. Allow to dry.
 5. Check cable integrity and floor temperature sensors resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.

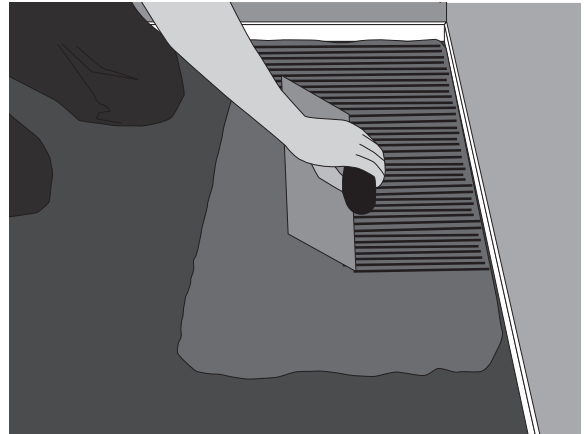


Tile installation over self-leveling underlayment

6. Apply tile mortar with a suitable notched trowel according to the tile size. Modified (ANSI A118.11) tile mortars can be used when installing tiles on the self-leveling underlayment.
7. Lay the tile(s) in accordance with ANSI A108.5 or A108.12 and applicable TCNA or TTMAC installation guidelines. A 2.4 mm (3/32 in.) minimum thickness of tile mortar must be present above the self-leveling underlayment.

Back-butter the tile to achieve full contact with both the tile and the self-leveling underlayment.

8. Check cable integrity and floor temperature sensors resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.



Soft and wood floor installation over self-leveling underlayment

1. Follow the flooring manufacturer's installation instruction. Pay special attention to moisture content before the flooring installation.

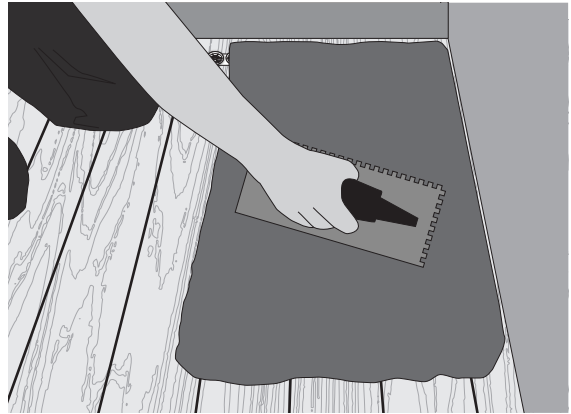
UNIVERSAL SNAP-IN GAUGES

FLEXTHERM's floor heating system with gauges is compatible with polymer-modified tile mortars (ANSI A118.11 or A118.4/A118.15) and can also be covered with a self-leveling underlayment.

You can choose from two (2) cable-covering techniques: the **POLYMER-MODIFIED TILE MORTAR TECHNIQUE** and the **SELF-LEVELING UNDERLAYMENT TECHNIQUE**.

POLYMER-MODIFIED TILE MORTAR TECHNIQUE (CERAMIC, PORCELAIN AND STONE FLOORING ONLY)

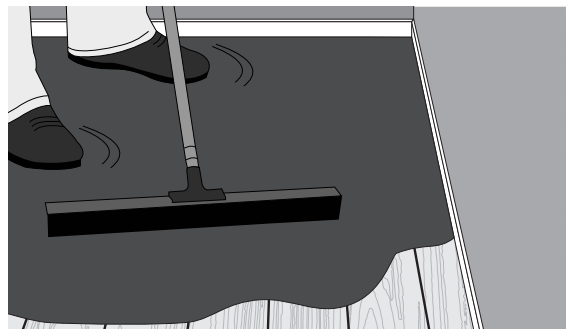
1. Using a polymer-modified tile mortar (ANSI A118.11 or A118.4/A118.15) and the cable as a thickness gauge, hold a flat trowel at an angle perpendicular to the cable. Evenly spread a layer of tile mortar (in the same direction as the heating cable) to fill the space between the cable runs. Finish flush with the height of the heating cable. The total tile mortar thickness should be a minimum of 5 mm (3/16 in.).
2. Allow to dry.
3. Check cable integrity and floor temperature sensors resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.
4. Once the tile mortar is set, proceed with the tile installation.



Jump to **FLOORING INSTALLATION** section, page 16

SELF-LEVELING UNDERLAYMENT TECHNIQUE (PREFERRED METHOD FOR ALL TYPES OF FLOORING)

1. As recommended by the manufacturer of the self-leveling underlayment, install a compressible strip around the perimeter of the room and around vertical projections.
2. Seal any gaps where the underlayment could creep out of the room, such as the bottom edges of walls and plumbing holes in the floor.
3. Apply a primer coat according to the instructions provided by the manufacturer of the self-leveling underlayment. Using a brush or cloth, wipe away any buildup near the heating cables. Allow it to dry as per the manufacturer's recommendations. This step can be performed prior to the installation of the heating cable.
4. Spread a minimum layer of 8 mm (5/16 in.) of appropriate self-leveling underlayment on the floor.
5. Allow to dry.
6. Check cable integrity and floor temperature sensors resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.
7. Once the underlayment is set, proceed with the flooring installation.

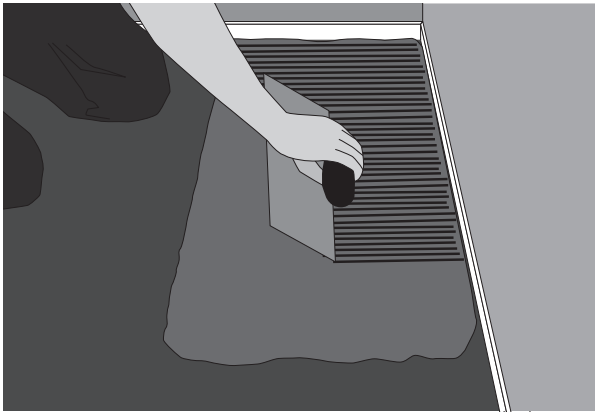


NOTE: It is recommended to apply a minimum layer of 13 mm (1/2 in.) of self-leveling underlayment above the heating cable when installing a floor covering other than ceramic, porcelain or stone.

FLOORING INSTALLATION

Tile installation with polymer-modified tile mortar (ceramic, porcelain and stone flooring only)

1. Follow the flooring manufacturer's recommendations and all applicable standards and methods from ANSI A108.5, A108.12 and TCNA or TTMAC Handbook and Specifications. There should be a minimum tile mortar thickness of 2.4 mm (3/32 in.).

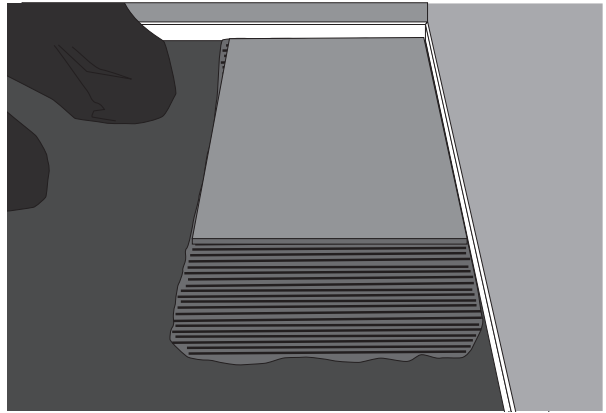


2. Carefully lay the floor covering and press it on the layer of tile mortar.
3. Check cable integrity and floor temperature sensors resistance, as described in the "HEATING CABLE AND FLOOR TEMPERATURE SENSORS CHECK" section, page 6.



WARNING!

- Consult your tile mortar manufacturer for proper tile mortar selection and proper curing time for your specific installation.



Soft and wood floor installation

1. Follow the manufacturer's recommendations and installation procedures.

10

THERMOSTAT CONNECTION



WARNING!

- A permanent Class A GFCI (5 mA) protection is required to protect the cable and the occupants in case of a fault.
- Use STELPRO thermostats to operate the floor heating cable. These thermostats are designed to operate radiant floors and are equipped with a built-in Class A (5 mA) Ground Fault Circuit Interrupter (GFCI).
- **RISK OF ELECTRIC SHOCK AND FIRE.** Turn off the power of the designated electrical circuit prior to connecting the system control units.
- The circuit(s) supplying the heating system must be clearly marked and referenced with the supplied label at the electrical panel.

1. Connect the green ground wire from the system to the terminal in the junction box.
2. For instructions on how to connect the heating cable to the thermostat, refer to the thermostat installation guide.
3. Connect a single floor temperature sensor cable to the thermostat, while leaving the second sensor cable inside the electrical box for future purposes.



- Do not turn the system on immediately. The system can be operated only after the tile mortar and/or self-leveling underlayment has completely cured. This waiting period is essential to ensure that the cementitious material is properly set.
- Refer to the manufacturer's instructions to comply with the required curing time of the product (between 7 and 28 days).

CURING PERIOD

Before starting the system, respect the appropriate curing period. Refer to the preceding section (System Start-up).

AREA RUGS AND FURNITURE

Do not lay down a rug on a floor equipped with a heating system. The heat that would be trapped could damage your rug, the flooring or the heating cable. The use of a bath mat is acceptable; as long as it is taken off the floor once the bath period is over.

For the same reason, do not lay down on the floor permanent furniture or large objects under which air does not flow freely.

Avoid placing objects trapping heat on the heated floor of a closet.

FLOOR TEMPERATURE LIMITATION

Be aware that floor coverings other than ceramic, porcelain and stone may have temperature limitations by their manufacturer. Use the floor temperature limit feature of the thermostat.

FLOOR PENETRATION

Any renovation and/or modification to the floor may damage the cable if proper care is not taken. Floor penetration with nails, screws or similar devices is prohibited.

FLOORING REPAIR

Should the flooring need repair, proceed with caution. Turn off the power supply to the heating system and carefully remove the piece of flooring that needs to be repaired without damaging the heating cable.

CABLE REPAIR

Should the cable be damaged and/or the thermostat GFCI be activated, the system must be deactivated and must not be operated. Turn off the power supply to the heating system. THE CABLE CAN BE REPAIRED. A repair kit (product code: FSK-03) is available from your FLEXTHERM dealer.

Never attempt to repair a cable located in a wet area; contact STELPRO Technical service.

Do not use a heated floor if a section of the floor covering is missing.

MAINTENANCE

FLEXTHERM's Floor Warming and Heating System is maintenance free.

TROUBLESHOOTING

Should you experience any problems with your floor heating system, first call your installer. If you cannot get satisfactory results, call STELPRO Technical service from 8 a.m. to 5 p.m. EST at 1-844-STELPRO (783-5776); make sure you have the thermostat and cable model number(s) and all test results from the Test Log.



- **The Test Log must be COMPLETED and RETURNED to STELPRO to activate the warranty, failing which: THE WARRANTY WILL NOT BE ACTIVATED AND, CONSEQUENTLY, WILL NOT BE VALID. All required information and test results must be entered in the Test Log, as indicated in this guide.**

STELPRO Design Inc. (hereinafter “STELPRO”) warrants to the original purchaser that the floor heating cable (hereinafter the “Product”) as designed and manufactured by STELPRO, and once installed in conformity with the instructions of STELPRO, shall be free of defects, in either materials or workmanship as described in this document.

COVERAGE PERIOD

This limited warranty becomes effective on the date of purchase of the Product by the first owner and shall remain effective for a period of twenty-five (25) years (three hundred [300] consecutive months) from the date of original purchase for the cables. This limited warranty is valid for Products bought and installed in Canada and the United States only.

LIMITED LIFETIME WARRANTY

For the Limited Lifetime Warranty to apply, the product must be installed by a FLExpert or FLExboutik through an installer certified by STELPRO, and a completed Test Log must be submitted and must include all the results of the insulation and resistance verification tests carried out before and after the cable is installed, after the floor levelling and after the floor covering is installed.

CONDITIONS

This limited warranty is only applicable to new and unused products purchased from STELPRO, or its authorised re-sellers, provided the installation requirements contained in the product installation guide are met. Claims made for coverage under this limited warranty must be addressed in writing, within seventy-two (72) hours from an event giving rise to a claim, or the appearance of a defect, to STELPRO Inc.

Email: elec.tech@stelpro.com, or

Mail: **STELPRO Technical service, 1041, rue Parent, Saint-Bruno-de-Montarville, (Québec) J3V 6L7 Canada.**

Persons making claims for coverage must present STELPRO with proof of purchase as well as proof of installation in accordance with the installation requirements (pictures recommended), the completed Test Log and any documents STELPRO may require.

Any parts replaced under the terms of this limited warranty become the property of STELPRO.

WHAT STELPRO WILL/WILL NOT DO

STELPRO’s obligations under this limited warranty are limited to, at its sole discretion, repairing or reimbursing the cables originally supplied in the Product that STELPRO has determined to be defective in materials or workmanship.

STELPRO shall repair or reimburse, at its sole and entire discretion, the defective cables goods free of charge. Repair or replacement will only be made for defective parts; and no allowance or reimbursement shall be made for wages, labour and freight costs. Should STELPRO chose to reimburse the cost of the cable, it will do so at the lesser of the value of the purchase price or the suggested retail price for the same item. With respect to the parts not manufactured by ourselves, we shall only warrant for these to the same extent as our suppliers undertake a warranty obligation towards ourselves.

Because of our ongoing commitment to product quality and innovation, STELPRO reserves the rights, at any time and without incurring any obligations, to revise, change, modify or discontinue any specifications, features, designs or components.

INSTALLATION REQUIREMENTS

In addition to the requirements included in the current STELPRO Installation Guide, which is incorporated herein by this reference, the Product must be installed in accordance with accepted standards, with STELPRO thermostats (or a suitable equivalent, as determined by STELPRO) and with adhesives that are compatible with an electrical floor heating system.

- **WARNING:** Failure to install the Product with controls and protection systems (including ground fault circuit interrupters) in conformity with your local electrical codes, as well as indicated in the installation guide, may cause fires.
- **WARNING:** Failure to install the Product with the appropriate cable/wire installation gauges or membrane may damage the cables/wiring and lead to Product failures, which are not covered under the limited warranty.
- **WARNING:** Failure to install the Product with a good quality polymer-modified tile mortar or polymer-modified self-levelling underlayment may lead to failures and defects, which are not covered under this limited warranty.

WARRANTY EXCLUSIONS

- Failures resulting from improper installation.
- Damage caused by abuse, improper installation, repairs, service, maintenance and/or storage, modifications or use of parts not manufactured or supplied by STELPRO.
- Damage caused by abuse or neglect of the Product.
- Use of thermostats other than STELPRO thermostats or suitable equivalents.
- Damage caused by water, submersion, accident, fire or any act of God.
- Incidental, consequential or other damages (including labour costs, inconvenience, loss of time or loss of income).

LIMITATION OF LIABILITY

THIS WARRANTY IS EXPRESSEDLY GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT ANY LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS OR A PARTICULAR PURPOSE. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESSED LIMITED WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS LIMITED WARRANTY. SOME STATES AND PROVINCES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE; AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS WHICH MAY VARY FROM ONE STATE OR PROVINCE TO ANOTHER.

Neither STELPRO products re-sellers, installers or any other person is entitled or authorized to make any affirmation, representation or warranty other than those contained in this limited warranty.



PRODUCT INFORMATION (SEE IDENTIFICATION LABEL)

Model number	
Length	
Resistance (Ω)	
Voltage (V)	
Rated output (W)	
Production number	

Example

HGS120K0191	MODEL NO.
58.2 m (191 ft/pi)	LENGTH
58 Ω	RESISTANCE
120 V	VOLTAGE
645 W	RATED OUTPUT
203192401461	PRODUCTION NO.

Commissioning date (yyyy/mm/dd) _____ Purchase date (yyyy/mm/dd) _____

Room _____ New construction Renovation

CONSUMER

First name _____ Last name _____

Address _____

Email _____ Phone number _____

RETAILER

Company name _____

Address _____

CABLE INSTALLER

First name _____ Last name _____

Company name _____

Address _____

THERMOSTAT INSTALLER

First name _____ Last name _____

Company name _____

Address _____



Test Log

The Test Log must be COMPLETED and RETURNED to Stelpro to activate the warranty, failing which: THE WARRANTY WILL NOT BE ACTIVATED AND, CONSEQUENTLY, WILL NOT BE VALID.
All required information and test results must be entered in the Test Log, as indicated in this guide.

	FACTORY SETTINGS	BEFORE BREAKING THE SECURITY SEAL	AFTER INSTALLATION	AFTER CABLE LEVELLING	AFTER FLOOR COVERING IS INSTALLED
DATE YEAR: MONTH: DAY:					
HEATING CABLE RESISTANCE (Ω)					
INSULATION RESISTANCE ($M\Omega$)	INFINITE				
FLOOR TEMPERATURE SENSOR #1 RESISTANCE ($K\Omega$)	10: $K\Omega$ @ $25^{\circ}C / 77^{\circ}F$				
FLOOR TEMPERATURE SENSOR #2 RESISTANCE ($K\Omega$)	10: $K\Omega$ @ $25^{\circ}C / 77^{\circ}F$				
INSPECTOR'S NAME					

Keep a copy of this Test Log and email a copy to: elec.tech@stelpro.com
or mail a copy to: **STELPRO Technical service, 1041, rue Parent, Saint-Bruno-de-Montarville, (Québec) J3V 6L7 Canada**
To make a warranty claim, submit this Test Log along with the purchase invoice.