www.stelpro.com

Installation guide

“CS” series

heating cable

For further information or to consult this guide on line, please visit our Web site.

⚠ WARNING ⚠ WARNING ⚠ WARNING ⚠ WARNING ⚠

Before installing and operating this product, the user and/or installer must read, understand and follow these instructions and keep them handy for future reference. If these instructions are not followed, the warranty will be considered null and void and the manufacturer deems no further responsibility for this product.

The following instructions must be adhered to in order to avoid personal injuries or property damages, serious injuries and potentially fatal electric shocks.

This product must be installed by a qualified person in accordance with this installation guide. All electric connections must be made by a **qualified electrician**, according to the **electrical** (Canadian Electrical Code Part 1 or National Electrical Code) **and building codes** effective in your region.

This cable **must be grounded**.

If the installer or the user modifies the unit, he will be held responsible for any damage resulting from this modification, and the warranty and the CSA certification will be void.

Never energize the cable while it is on the spool. This would lead to overheating that could damage the cable and may cause a fire.

The heating section of the cable must be entirely installed under the floor covering. Do not install it anywhere else (e.g. in a wall) in order to prevent fire hazard.

Never use **STELPRO** floor heating cable for any purpose other than heating a floor INSIDE a building.

Always keep a minimum of 3 inch spacing between cable runs. In default, it may cause a fire or damage the floor covering.

Never install a cable designed for a 120 V power source on a 240/208 V power source.

Very important: never CUT the **STELPRO** floor heating cable. This would change the cable resistance and could lead to a fire.

Avoid folding the heating cable on itself, a radius of curvature smaller than the cable diameter could damage its sheath.

Do not run the heating cable under a wall, from one room to another; an individual cable should not heat more than one room.

TABLE OF CONTENT

THANK YOU FOR CHOOSING STELPRO FLOOR HEATING SYSTEM

This guide has been written to guide you during the installation of your **STELPRO** floor heating system. It has been prepared according to North American construction standards. Because construction standards in your area may vary, consult a certified electrician in your region before installing your **STELPRO** floor heating system.

The **STELPRO** floor heating system is designed to heat a room with a heating cable placed under your floor covering. It can heat floor covering materials such as marble, ceramic and porcelain tiles, slate, granite as well as poured surfaces. Before using **STELPRO** floor heating system under any other floor covering, contact your floor covering manufacturer.

STELPRO floor heating system will heat your house regardless of the size or shape of each room. This product is designed for indoor use only such as: residential, commercial and institutional buildings.

STELPRO floor heating system is available as “cable sets” of 120 volts and 240 volts (see selection tables below).

Recommended heating capacity: 12 W/square foot (0.3 m²) or 9 watts when used as supplementary heating.

To ease the installation, Stelpro Design provides mounting brackets, hot glue sticks and a temperature sensor with this heating cable. You will find installation instructions for these accessories further in this guide. It is important to connect this sensor to a Stelpro Design heating cable thermostat. Please note that you must install the sensor before the mortar, even if you haven’t bought the thermostat yet. It is also recommended to install two sensors (the sensor provided with the thermostat and the sensor provided with the cable) should one of them fail.

1 WHAT YOU SHOULD KNOW

1.1 CATALOG NUMBER DESCRIPTION

The following parameters are encoded in **STELPRO** heating cable part numbers:
area coverage based on 3” (76 mm) spacing, voltage and wattage.

example: cable # CS2W0240S020
Voltage: CS2: 240 V or CS1: 120 V
W0240: Power: 240 watts
S020: 20 square feet coverage based on 3” (76 mm) spacing

120 V SELECTION

CABLE	COVERAGE (SQ.FT.)		CABLE LENGTH (FT)	WATTS	AMPS
	3 IN. (76 MM) SPACING	4 IN. (102 MM) SPACING			
CS1W0120S010	10	13	40	120	1
CS1W0180S015	15	20	60	180	1.5
CS1W0240S020	20	27	80	240	2
CS1W0360S030	30	40	120	360	3
CS1W0480S040	40	53	160	480	4
CS1W0600S050	50	67	200	600	5
CS1W0720S060	60	80	240	720	6
CS1W0816S068	68	91	272	816	6,8
CS1W0900S075	75	100	300	900	7,5
CS1W1020S085	85	113	340	1020	8,5
CS1W1140S095	95	127	380	1140	9,5
CS1W1320S110	110	147	440	1320	11
CS1W1440S120	120	160	480	1440	12
CS1W1620S135	135	180	540	1620	13,5
CS1W1800S150	150	200	600	1800	15

240 V SELECTION

CABLE	COVERAGE (SQ.FT.)		CABLE LENGTH (FT)	WATTS	AMPS
	3 IN. (76 MM) SPACING	4 IN. (102 MM) SPACING			
CS2W0240S020	20	27	80	240	1
CS2W0360S030	30	40	120	360	1,5
CS2W0480S040	40	53	160	480	2
CS2W0600S050	50	67	200	600	2,5
CS2W0720S060	60	80	240	720	3
CS2W0840S070	70	93	280	840	3,5
CS2W0960S080	80	107	320	960	4
CS2W1200S100	100	133	400	1200	5
CS2W1440S120	120	160	480	1440	6
CS2W1620S135	135	180	540	1620	6,75
CS2W1800S150	150	200	600	1800	7,5
CS2W2040S170	170	227	680	2040	8,5
CS2W2280S190	190	253	760	2280	9,5
CS2W2640S220	220	293	880	2640	11
CS2W2880S240	240	320	960	2880	12
CS2W3240S270	270	360	1080	3240	13,5
CS2W3600S300	300	400	1200	3600	15

1.2 REQUIRED TOOLS

- Measuring tape
- Wire stripper
- Hot glue and hot glue gun (optional)
- Multimeter (ohmmeter)
- 1000 V megohmeter (megger)
- Screwdrivers
- T-25 stapler (optional) (See the “warranty card” if using a stapler)

2 VALIDATING YOUR HEATING CABLE SELECTION

• Area to heat

Before installing your new STELPRO floor heating system, first make sure that you have made the right cable selection. Re-measure and recalculate the area that will accommodate the cables. Do not forget to exclude all areas that cannot be heated (cupboards, bathtub, etc.) as well as all areas that you do not want to heat. Compare the area to heat with the total area covered by the selected cable based on the desired density of 9 or 12 watts (see packaging for area coverage). The heating cable must be installed at a distance of 3 inches (76 mm) from the walls of the room. The nominal surface area that the cable will cover takes into account the loss due to the room perimeter, and the radius of curvature of each cable loop at the installation strapping. This surface area may vary from one installation to the next due to the features of each room. Conversely, if the cable covers an area greater than the area to heat, do not install the cable and call your retailer to ask him which cable length you need. Keep in mind that the spacing between cable runs shall never be less than 3” (76 mm).

• Cable layout

In order to facilitate the installation process, you must plan on paper the cable layout and trace it on the subfloor, as well as the thermal sensor and mounting bracket locations.

Cable layout tips

Cable runs exceeding 10 feet (3.05 m)

In order to minimize the conductor thermal expansion and, thus, avoid potential damages, each cable run shall not exceed 10 feet (3.05 m). Accordingly, the layout must be partitioned into 10 feet runs (3.05 m) or less using “U-shaped” loops (see figure 1).

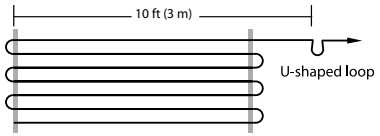

Figure 1

Because it is practically impossible to predict precisely where the cable will end, you must plan the location of a buffer zone. A buffer zone is an area where heating is not essential, typically behind a toilet or beside a door opening. This area could be heated if used to house any excess cable or non-heated, without causing any discomfort (see figure 2).

The **STELPRO** heating cable SHOULD NEVER “overlap” another cable. Overlapping will generate a hot spot (overheating) that could damage the cable.

Never install the **STELPRO** heating cable under kitchen cabinets, kitchen islands, podium bathtubs or any other fixed piece of furniture.

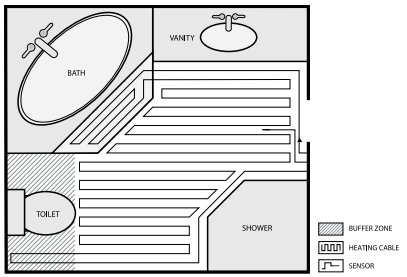

Figure 2

VERY IMPORTANT: Throughout the heating area, always maintain a constant cable spacing of either 3 or 4”. It is also important to install the cable so that it is perpendicular (at 90º) to the brackets, in order to respect the clearance. However, the buffer zone is more permissive with a minimum allowed spacing of 2” (Canada) or 2.5” (USA). Since the closer spacing will result in a higher temperature, it is only to be used if necessary.

A 8” (200 mm) spacing must be maintained between the heating cable runs and all other heat sources (baseboards, fireplaces, etc.).

A 6” (150 mm) spacing must be maintained between the heating cable runs and any plumbing drain.

The spacing between walls and the cable must be greater or equal to the established spacing and should never be less then 3” (76 mm).

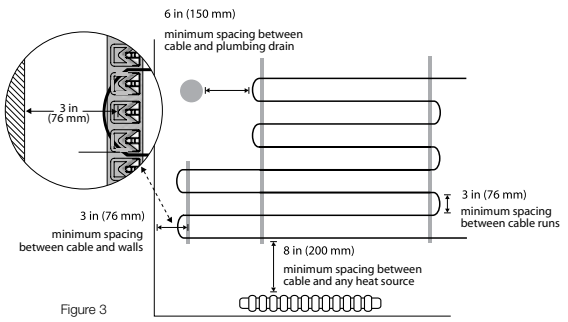

Figure 3

Plan the location of the thermal sensor between two cable runs, at a distance of 12” to 24” (305 to 610 mm) from the wall. The sensor should be installed in an area where temperature reflects the overall temperature of the floor. Thus, it should not be located in areas likely to alter the temperature measurement, like an entrance door, an external heat source, under pieces of furniture or an area exposed to the Sun. Make sure that the sensor wire does not overlap the **STELPRO** heating cable.

3 REQUIRED TESTS AND WARRANTY CARD

Introduction: Importance of the required tests

Each cable is subject to factory quality control. However, several operations, starting from the moment you unpack the cable to the first start up, may compromise the cable integrity. To ensure that the quality of the cable remains unchanged throughout the installation process and for warranty purposes, a set of ohms measurements must first be conducted with the cable still on the spool and subsequently repeated at two (2) later stages of the installation process.

Measurements must be recorded in the warranty card and be compared to initial measurements taken when the cable was on the spool in order to enable you to detect any changes, if any, related to the cable electrical properties.

Since the costs incurred in fixing a cable embedded in cement can be very expensive, it is crucial to detect as soon as possible any break that may occur during the installation process. That is why it is important to conduct the required ohms measurements at the prescribed intervals. If the cable gets damaged during installation, you must call a qualified repair technician referred by **STELPRO**. To do so, call **STELPRO** customer service or consult their website. Any installation-related cable damage is not covered under warranty.

3.1 CHRONOLOGICAL ORDER OF THE REQUIRED TESTS

First set of tests (1, 2, & 3)

Tests to be conducted while the cable is still on the spool.

Second set of tests (1, 2 & 3)

Tests to be conducted after the cable installation on the subfloor, preceding the cement covering.

Third set of tests (1, 2 & 3)

Tests to be conducted after the cement covering is dry.

3.2 TESTS 1, 2 & 3

- Test # 1: Conductor resistance test

This test requires the use of an ohmmeter (multimeter).

N.B. Since all measuring instruments are different, we recommend you to consult the resistance measurement section of your instrument's user guide .

Test # 1: connections

Figure 5

Manual range measurements tips

The selected range must correspond to the multimeter's lowest ohms range that encompasses the cable nominal ohms value.

In the example (figure 4), a 200 ohms range has been selected to measure a 28 ohms cable.

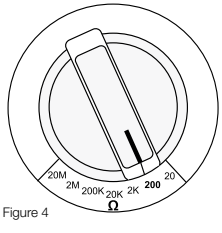

Figure 4

In order to perform the resistance test, you must set your multimeter for resistance measurement and take an ohms reading between your heating cable and the two power leads. If the ohms reading taken on the two power leads varies significantly (10% or more) from the value printed on the spool, it either means that the cable has been damaged, or that the measuring instrument is not set properly, or that it is simply out of calibration. The ohms measurement must be recorded in your warranty card.

• Test # 2: Continuity test between the conductor and the ground braid

This test requires the use of a multimeter.

N.B. Since all measuring instruments are different, we recommend you to consult the continuity test section of your instrument user's guide.

Test # 2: connections

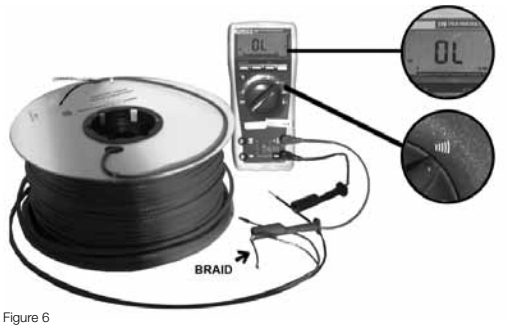

Figure 6

The heating cable is protected by a ground braid. An electrical insulator prevents any contact between the braid and the conductor. To make sure there is no contact between the braid and the conductor, you must perform a continuity test. Using the continuity test (buzzer logo) function of your multimeter, test your cable between the braid and one of the two power leads. If there is no continuity (if the test is successful), the multimeter will display, depending on the instrument used, either "OL" for "over load" or "I" for "infinity". Otherwise, if the test fails, neither "OL", nor "I" will be displayed and a warning tone will be heard. The test result must be recorded on your warranty card.

• Test # 3: Insulation resistance test (capacity of the cable electrical insulator to prevent current leakage)

CAUTION: HIGH VOLTAGE TESTING

This test requires the use of a 1000 V megohmeter.

N.B. Since all megohmeters are different, we recommend you to consult your instrument user's guide.

This test is meant to detect very small breaks throughout the cable insulation. These breaks often remain undetected during the continuity test since they are not necessarily short circuits between the conductor and the ground braid.

Even though they are small, these breaks are likely to cause a current leakage to ground. Such a leakage is usually detected by the mandatory ground-fault circuit interrupter "GFCI" (thermostat with integrated GFCI or panel mount GFCI). When a leakage current is detected, the GFCI trips the circuit, hence disabling the floor heating system.

In order to perform the insulation resistance test, you must, using a megohmeter (Mohm logo), take an insulation measurement between the braid and one of the two power leads. Make sure the megohmeter range is set at 1000 V. The insulation resistance measurement must be equal to or greater than 1 Gigaohms (1 Gigaohms = 1 G ohms = 1000 M ohms = 1000 Mega ohms). The insulation resistance measurement must be recorded on your warranty card.

Test # 3: connections

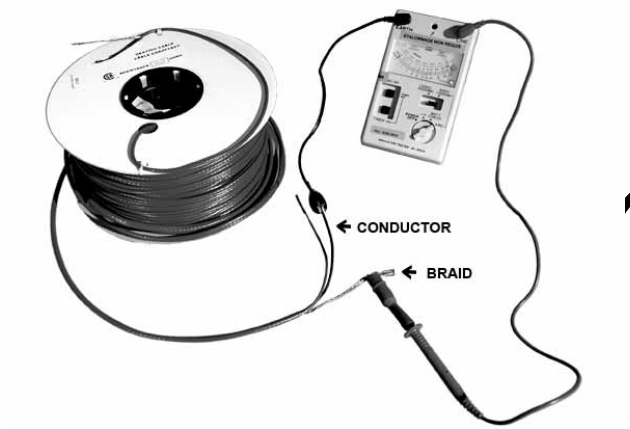

Figure 7

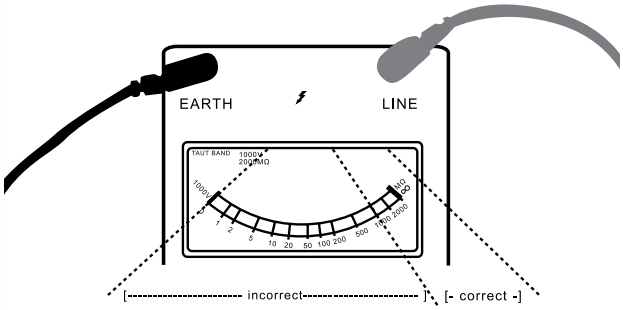

Figure 8

4 GETTING STARTED

4.1 SUBFLOOR PREPARATION

• Plywood subflooring tips

Self-leveling mortar

If self-leveling mortar is used to cover the cables, all subfloor gaps must be filled to prevent liquid mortar leaks. You must choose waterproof plywood (BC fir). Before buying another type of plywood, you should call your cement manufacturer.

Surface preparation

Plywood surface must be clean, solid and dry. Remove any dust, oil, grease, paint, wax, sealant or any other substance that could prevent adequate adhesion. Also, the plywood surface must be free of any debris that may damage the heating cable such as protruding nails and screw heads.

Plywood subfloor strength and strengthening

Each plywood sheet must be secured with screws spaced 8” (203 mm) apart on its center and 6” (150 mm) apart on its perimeter. Plywood sheets must be spaced 1/4” (6.3 mm) from each other to allow room for material expansion.

In order to eliminate all risks of damage to the heating cable resulting from floor covering cracks, it is important to ensure sufficient subfloor rigidity (movement not exceeding 1/360).

Floor joists spaced 16” apart or less on center require a plywood subfloor thickness of at least 1 1⁄4” (2 x 5/8” sheets). Otherwise, if floor joist spacing exceeds 16” on center, the plywood sheets must be strengthened to achieve a total thickness of 1 7/8” (3 X 5/8”).

Besides plywood sheeting, there are other methods available for strengthening a subfloor such as the use of metal lathes, cement boards and others. Seek the advice of a floor covering specialist to make sure that the subfloor is properly strengthened.

• Cement subflooring tips

Surface preparation

Cement surface must be clean, solid and dry. Remove any dust, oil, grease, paint, wax, sealant or any other substance that could prevent adequate adhesion. Also, the cement surface must be free of any debris that may damage the heating cable such as protruding nails and screw heads.

Curing period

Before installing the heating cable, the curing period (typically 28 days) of the cement must be completed. If needed, refer to a cement manufacturer to know the exact curing period of your type of cement.

4.2 MEMBRANES

Waterproof membranes as well as other types of membranes can be used in bathrooms and/or other locations. They are typically unaffected by the heat produced by the heating cable. However, it would be safer to check with the membrane manufacturers if their product are compatible with the radiant floor heating system and to ask them how to properly install the membrane.

5 MOUNTING BRACKET INSTALLATION

5.1 3 OR 4 INCH (76 OR 102 MM) SPACING USING EITHER METAL OR PLASTIC MOUNTING BRACKETS

The **STELPRO** mounting brackets enable the easy installation of the cable at 3” (76 mm) or 4” (102 mm) spacing using their molded hooks.

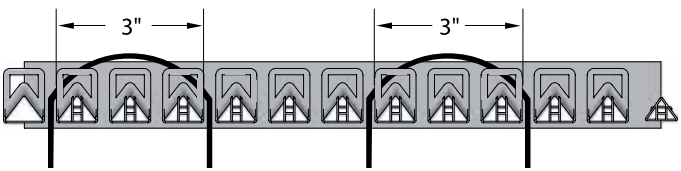

Figure 11

Plastic mounting brackets:
3” spacing for a 12 watts per square foot density

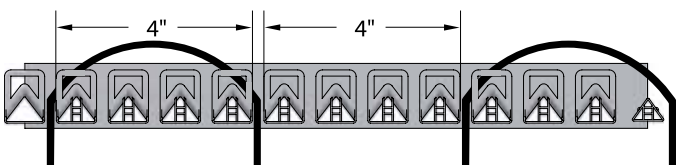

Figure 12

Plastic mounting brackets:
4” spacing for a 9 watts per square foot density

5.2 METHODS FOR SECURING THE MOUNTING BRACKET

You can secure the mounting brackets into the subfloor using one of the following methods.

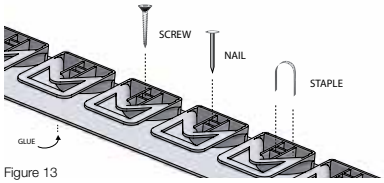

Figure 13

HOT GLUE

Hot glue sticks are included in the installation kit. This hot glue is used to glue the cable's mounting brackets to the subfloor. We recommend the usage of this glue for plywood, pre-stressed concrete and smoothed concrete subfloors. You must use a hot glue gun to heat the sticks and apply the glue between the subfloor and the bracket. Cleaning the surface of the subfloor is necessary before applying the glue. If you don't remove all dust and debris, the mounting brackets won't stick to the subfloor properly.

Be careful not to touch the cable with the tip of the hot glue gun.

It is recommended to sweep and vacuum the subfloor prior to installation. Apply a line of glue of about 3/16" (4.5mm) to spread over a distance of 1 foot. Then, press the bracket against this line to make sure that it is glued properly.

STAPLES

To properly secure the mounting bracket when using a stapler (T-25 stapler), you must staple each of the twin holes for the entire length of the bracket. You must use 3/8" (10 mm) staples, either 1⁄4" (6 mm) or 3/8" (10 mm) in length. Align your stapler to fit each leg of the staple into the twin holes.

N.B. It is important to properly stapled down each staple in order to avoid damages due to the friction of the cable against protruding staples.

SCREWS

Using screws (preferably flat head screws), secure the mounting bracket into the subfloor. Tight one (1) screw per pair of holes for the entire length of the bracket.

N.B. It is important to properly tighten each screw in order to avoid damages due to the friction of the cable against screw heads.

NAILS

Using nails, secure the mounting bracket into the subfloor. Strike one (1) nail per pair of holes for the entire length of the bracket.

N.B. It is important to properly stroke each nail in order to avoid damages due to the friction of the cable against nail heads.

6 INSTALLATION OF THE STELPRO FLOOR HEATING SYSTEM

6.1 FIRST SET OF TESTS

First set of tests: While the cable is still on the spool, perform the first set of tests as described in paragraph 3.2. Measured values must be recorded on your warranty card. If a break or damage is detected during this set of tests, the cable should be returned to its place of purchase.

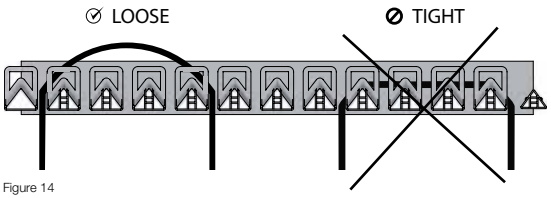

Figure 14


Figure 15

6.2 HEATING CABLE INSTALLATION TIPS

- Avoid dropping objects onto the cable.
- Make sure the shoes you are wearing during the installation are free of any debris that could damage the cable.
- Be very careful not to trip over the heating cable. Tripping may cause injury and could damage the cable.
- Avoid pulling or tightening the cable where it hooks onto the mounting bracket.
- When securing the cable into the mounting brackets, avoid squaring ends. Instead, the cable must be allowed to curve between the molded hooks (see figure 14).
- The cable installation must not be performed at a temperature below freezing point (0°C).
- Use a reel to unreel the cable (see figure 15). It is very important not to unreel the cable by pulling it off one side of the spool because it may produce tension that could damage the cable.

6.3 STEP BY STEP CABLE INSTALLATION

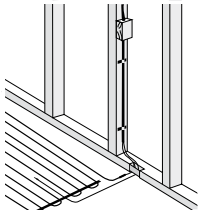

Figure 16

To avoid damaging the **STELPRO** heating cable, handle it carefully and use a reel to unreel it (see figure 15).

Make sure the circuit is not energized.

At floor level, directly below the thermostat housing, drill a hole through the bottom plate to route the cable power lead.

Unreel the power leads and pull them through the bottom plate, up to the junction box (see figure 16).

Figure 17

Make sure the cable's factory splice is secured to the floor. The splice must not be installed inside the wall.

Mark the splice location on the floor. With the appropriate tool, make a groove in the floor large enough to house the cable splice. Once the splice is in the groove, it should be below or level with the heating cable. (Depth to dig can vary from 1⁄4" (6 mm) to 1⁄2" (6 to 13 mm) (see figure 17).

Clean the floor area, put the splice in the groove and set the cable to the floor at both end of the splice. Secure the wires and the **STELPRO** heating cable to the floor using small pieces of the mounting bracket and hot glue.

Using the factory splice as a starting point, secure the cable to the floor in accordance with the pre-established cable layout and the following standard spacing (based on the wattage/square foot selection).

3" (76 mm) = 12 W/square foot = 129 W/m²
4" (102 mm) = 9 W/square foot = 97 W/m²

Figure 18

When reaching the half way indicator on the cable (see figure 18), evaluate what remains and consider these possibilities.

a. If the cable is too long, the excess can be laid in the buffer zone (see figure 2). Buffer zone minimum allowed spacing is 3" (76 mm)
b. If the cable is too short, the buffer zone is considered as a non-heated area.

Pass the remaining cable through the return corridor, toward the starting point (bottom hole). Make another groove to house the second factory splice, which will be secured to the floor in accordance with the pre-established layout. Then, pull the wires to the junction box.

If more than one cable is required, plan the necessary floor space for the location of the factory splices and the return corridor (for the return to the junction box) following the same installation procedure for each cable. The wiring of the thermostat or relay, whichever is used, must be completed accordingly with the thermostat/relay manufacturer recommendations. Make sure not to exceed the thermostat or relay maximum allowable wattage and/or amperage.

Figure 19

Install the thermostat sensor between two cable runs, at a distance of 12" to 24" (305 to 610 mm) from the wall. First, mark the sensor location on the floor and, using the appropriate tool, make a groove in the floor large enough to house the sensor. Clean the floor area, set the sensor in the groove and secure it to the floor using small pieces of the mounting bracket and hot glue. Then, using a path that does not overlap or cross the **STELPRO** heating cable, route the sensor's wire to the junction box.

6.4 SECOND SET OF TESTS

Before performing the second set of tests, lay cardboard over the cable runs to protect them until the cement covering is laid. In order to avoid stepping on the mounting brackets and risking damage to the cable, ensure that the mounting brackets are not covered by the cardboard and are visible at all times.

Second set of tests: With the cable secured to the floor, before preceding with the cement covering, conduct the second set of tests as described in paragraph 3.2. Measured values must be recorded on your warranty card. If a break or damage is detected, the installation should be stopped and the cable should be fixed before continuing the installation.

7 CEMENT COVERING

The **STELPRO** heating cable must always be embedded in cement or covered by a thin cement layer. Two methods are available: SCRATCH COAT (method recommended by **STELPRO**) as well as THIN SET METHOD (alternative method for experienced tile setters only). Please refer to the cement selector table to find out the type of cement recommended for each method.

CEMENT SELECTOR TABLE*

USAGE / SPECIFIC CEMENT PRODUCTS	CABLE EMBEDDING (SCRATCH COAT METHOD ONLY)	CERAMIC TILE ADHESIVE	GROUT	STANDARDS
Self-leveling mortar	Yes	No	No	N/A**
Polymer-modified mortar***	Yes	Yes	No	ANSI A118.4 (A) or ANSI A118.11
Polymer modified grout (with or without sand)	No	No	Yes	ANSI A118.6 (A) or A118.7 (A)
Epoxy grout	No	No	Yes	ANSI A118.3

***TTMAC**: Terrazzo, Tile & Marble Association of Canada*
***ANSI**: American National Standards Institute*

* *For each of these cement products, you must check with the manufacturer to ensure compatibility of their product with floor heating systems and your sub-floor type. Also, the product must be applied in accordance with their recommendations.*

** ***N/A**: Standard not available. Check with the manufacturer to ensure product compatibility with the floor heating system.*

*** *A polymer-modified mortar is obtained following one of these two methods: by adding water to a polymer-modified mortar or by adding a liquid additive containing polymers to a non-polymer-modified mortar.*

7.1 CEMENT APPLICATION GUIDELINES

Initial start up of the floor heating system must be delayed until the end of the curing period (typically 28 days). Otherwise, the cement adhesive properties will be compromised, thus reducing the floor covering adhesion. Contact a floor covering specialist to ensure proper adhesion.

Cement layer thickness must be consistent with the manufacturer's recommendations, which are based on the type of installation as well as the cement specifications. Furthermore, the cement layer must entirely cover the cable, but shall never exceed a maximum thickness of 1" (25.4 mm).

In order to maintain the spacing between cable runs longer than 6 feet (1.8 m) and to prevent the cable to float to the surface during the application of the self-leveling mortar, it is recommended to glue mounting brackets upside down over the cable runs (in the middle) or to glue the cable directly to the floor with hot glue.

N.B. Refer to section 4 of this guide before proceeding to the cement covering.

7.2 SCRATCH COAT (METHOD RECOMMENDED BY STELPRO)

The scratch coat is a thin cement layer in which the **STELPRO** heating cable is embedded. The cement used can be either a polymer-modified mortar meeting A118.4 (A), ANSI A118.11 ANSI standard applied with a trowel, or a self-leveling mortar poured over the heating cable. Subsequently, floor covering can be installed onto this cement layer. Once the concrete is dry, you can proceed with your tile installation by using a two component thin set mortar. This mortar offers the best flexibility possible to adjust with the numerous on and off cycles of the thermostat in a day.

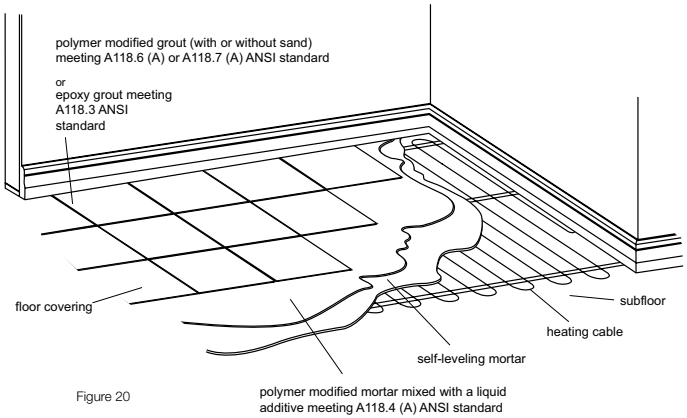

Figure 20

• Primer application

Before applying the scratch coat, check with the manufacturer whether the specific cement used (polymer-modified mortar meeting A118.4 (A), ANSI A118.11, ANSI standard or self-leveling mortar) requires the use of a primer. If a primer is required, it should only be applied after the cables have been secured to the subfloor in order to reduce traffic over the primer to a minimum.

• Applying scratch coat onto the heating cable

Once the cable installation has been completed and the primer has been applied (if required), you must, in order to protect the cables and facilitate eventual repairs, cover them with either a polymer-modified mortar meeting A1184 (A), ANSI A118.11 ANSI standard or a self-leveling mortar. Mix the cement in accordance with the manufacturer instructions. The cable must be completely covered by the cement layer.

<u>Self-leveling mortar</u>

Although self-leveling mortar is by its very nature a self-leveling product, you may have to use a trowel to level the corners of the room.

• Floor covering installation over the scratch coat

Once the cement is dry, you may proceed with the installation of your floor covering. Ask the cement manufacturer about the specific curing period of the cement used.

Lying tiles over the scratch coat

Given the large number of “on/off” cycles dictated by the thermostat, only a highly flexible polymer-modified mortar meeting A118.4(A), ANSI A118.11 and ANSI standard may be used to secure the tiles onto the scratch coat. The polymers comprised in this type of mortar contribute to its strength and flexibility ensuring long term efficiency. STELPRO recommends using a two component mix for a thin-set mortar.

Grouting can begin no sooner than 24 hours after the installation has been completed. Either use a polymer-modified grout (with or without sand) meeting A118.6(A) or A118.7(A) ANSI standard or an epoxy grout meeting A118.3 ANSI standard.

Installing floor coverings other than ceramic tiles onto the scratch coat

Before installing any floor covering other than ceramic tiles onto the scratch coat, always consult your floor covering manufacturer to ensure product compatibility with floor heating system.

N.B. It is not recommended to install hard-wood onto scratch coat.

7.3 THIN SET METHOD (ALTERNATIVE METHOD FOR EXPERIENCED TILE SETTERS ONLY)

Compatibility of the thin set method

Figure 21

This method is only applicable if ceramic tiles or other type of similar tiles are to be installed over a small flooring area by an experienced tile setter.

Using this method, the same cement layer is used to embed the cables and to secure the tiles. This technique will not raise the floor level despite the addition of your new **STELPRO** heating system. Use a 3/8” (10 mm) or 1/2” (13 mm) notched trowel to cover the cable with cement-glue. To ensure a maximum adhesion, lay the tiles on the mortar and apply pressure on it to allow air under the tile to escape.

Warning

Since the trowel comes in close contact with the cables when using this method, you must be very careful when applying the cement to avoid any damages to the cables. Any installation-related cable damages is not covered under warranty.

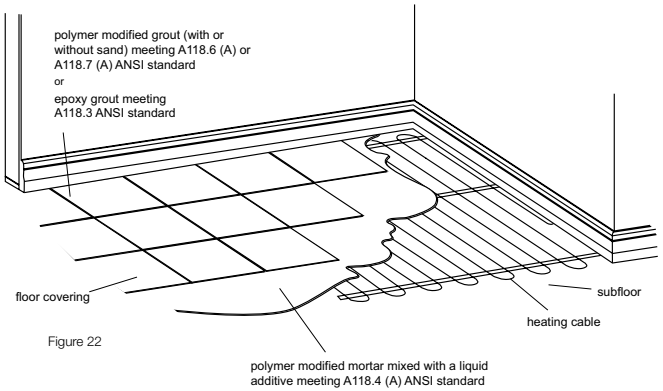

Figure 22

7.4 CURING PERIOD

Initial start up of the floor heating system must be delayed until the end of the curing period (typically 28 days). Otherwise, the cement adhesive properties will be compromised, thus reducing the floor covering adhesion. Contact a floor covering specialist to ensure proper adhesion.

7.5 THIRD SET OF TESTS

Third set of tests: Once the cement embedding the cable is dry, perform the third set of tests as described in paragraph 3.2. Measured values must be recorded on your warranty card. During this set of tests, if a break or damage is detected, you must call a qualified repair technician referred by **STELPRO** to complete the repair. To do so, call **STELPRO**’s customer service or consult their website (www.stelpro.com). Any installation-related cable damage is not covered under warranty.

8 THERMOSTAT SELECTION

Only a thermostat equipped with a floor sensor enables to maximize the **STELPRO** floor heating system efficiency and, therefore, your comfort. All other control methods (e.g. ambient air thermostat or switch) are not recommended since they cannot control the floor temperature. As a result, the floor temperature will always be either too cold or too warm.

Also, the **STELPRO** floor heating system must be connected to a ground-fault circuit interrupter “GFCI” either integrated in the thermostat, or panel mounted.

The maximum thermostat current must correspond to the sum of cable currents wired to it. Also, the voltage of the branch circuit must correspond to the voltage prescribed for the thermostat. All thermostats wired to a **STELPRO** heating cable must be certified by a recognized certification agency and wired in accordance with electrical and building codes applicable in your region.

9 WIRING

Initial start up of the floor heating system must be delayed until the end of the curing period (typically 28 days). Otherwise, the cement adhesive properties will be compromised, thus reducing the floor covering adhesion. Contact a floor covering specialist to ensure proper adhesion.

Preparation before the connection

✓ Make sure that the circuit is not energized.

✓ The CSA identification tag of the **STELPRO** heating cable must be in the junction box. Do not remove it from the cable.

✓ The wiring of the cable to the thermostat or the relay, as applicable, must be completed accordingly with the thermostat/relay manufacturer's recommendations.

✓ Connect the ground wire (copper braided wire) to the junction box.

✓ The **STELPRO** floor heating system must be connected to a ground-fault circuit interrupter "GFCI" either integrated in the thermostat, or panel mounted.

NEL clause 62-214, par. 12 requires that the branch circuit supplying the heating cable be marked by the warning label hereunder, which must be placed on the panel board by the installer.

Stelpro Design	**Stelpro Design**
CS2W1620S135	CS2W1620S135
#Prod. :05-04-07-2-13	#Prod. :05-04-07-2-13
Resistance :33.3 ohms	Résistance :33.3 ohms
This breaker controls a floor heating system in:	Ce disjoncteur protège un système de plancher chauffant dans :

10 OPERATING TIPS

- Do not place pieces of furniture, carpets or rugs over the thermostat sensor because it would compromise the efficiency of your **STELPRO** floor heating system.
- The heat generated by your **STELPRO** floor heating system may modify the latex, rubber or vinyl backing of some carpets. The backing may stain the floor covering or even stick to it. Thus it is not recommended to use them as floor covering.
- Futons, mattresses, floor-level furniture, pillows, etc. should not be placed directly onto the heating floor. They would prevent heat diffusion and could be damaged by the accumulated heat.

Note:

When a part of the product specification must be changed to improve operability or other functions, priority is given to the product specification itself. In such instances, the instruction manual may not entirely match all the functions of the actual product.

Therefore, the actual product and packaging, as well as the name and illustration, may differ from the manual

Make sure the connections were done properly and strong. Pull each of the son to make sure it is not lousse in the connector or terminal block. Failure to comply with this directive could cause a fire..

Limited warranty

This limited warranty is offered by Stelpro Design Inc. ("Stelpro") and applies to the following product made by Stelpro: CS cable. **Please read this limited warranty carefully. Subject to the terms of this warranty**, Stelpro warrants its products and their components against defects in workmanship and/or materials for the following periods from the date of purchase: **25 years (heating cable)**. This warranty applies only to the original purchaser; it is non-transferable and cannot be extended.

Claim procedure

If at any time during the warranty period the unit becomes defective, you must cut off the power supply at the main electrical panel and contact 1) your installer or distributor, 2) your service center or 3) Stelpro's customer service department. In all cases, you must have a **copy of the invoice** and provide the **information written on the product nameplate**. Stelpro reserves the right to examine or to ask one of its representatives to examine the product itself or any part of it before honoring the warranty. Stelpro reserves the right to **replace** the entire unit, **refund** its purchase price or **repair** a defective part. Please note that repairs made within the warranty period must be authorized in advance in writing by Stelpro and carried out by persons authorized by Stelpro.

Before returning a product to Stelpro, you must have a Stelpro authorization number (RMA). To obtain it, call the customer service department at: **1-800-363-3414** (electricians and distributors - French), **1-800-343-1022** (electricians and distributors - English), or **1-866-766-6020** (consumers). The authorization number must be clearly written on the parcel or it will be refused.

Conditions, exclusions and disclaimer of liability

This warranty is exclusive and in lieu of all other representations and warranties (except of title), expressed or implied, and Stelpro expressly disclaims and excludes any implied warranty of merchantability or implied warranty of fitness for a particular purpose.

Stelpro's liability with respect to products is limited as provided above. Stelpro shall not be subject to any other obligations or liabilities whatsoever, whether based on contract, tort or other theories of law, with respect to goods or services furnished by it, or any undertakings, acts or omissions relating thereto. Without limiting the generality of the foregoing, Stelpro expressly disclaims any liability for property or personal injury damages, penalties, special or punitive damages, damages for lost profits, loss of use of equipment, cost of capital, cost of substitute products, facilities or services, shutdowns, slowdowns, or for other types of economic loss or for claims of a dealer's customers or any third party for such damages. Stelpro specifically disclaims all consequential, incidental and contingent damages whatsoever.

This warranty does not cover any damages or failures resulting from: 1) a faulty installation or improper storage; 2) an abusive or abnormal use, lack of maintenance, improper maintenance (other than that prescribed by Stelpro) or a use other than that for which the unit was designed; 3) a natural disaster or an event out of Stelpro's control, including, but not limited to, hurricanes, tornadoes, earthquakes, terrorist attacks, wars, overvoltage, flooding, water damages, etc. This warranty does not cover any accidental or intentional losses or damages, nor does it cover damages caused by negligence of the user or owner of the product. Moreover, it does not cover the cost of disconnection, transport, and installation.

The warranty is limited to the repair or the replacement of the unit or the refund of its purchase price, **at the discretion of Stelpro**. Any parts replaced or repaired within the warranty period with the written authorization of Stelpro will be warranted for the remainder of the original warranty period. This warranty will be considered null and void and Stelpro will have the right to refuse any claims if **products have been altered** without the written authorization of Stelpro and if the nameplate numbers have been removed or modified. This warranty does not cover scratches, dents, corrosion or discoloration caused by excessive heat, chemical cleaning products and abrasive agents. It does not cover any damage that occurred during the shipping.

Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages and some of them do not allow limitations on how long an implied warranty lasts, so these exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state or from province to province.

C SP US

This unit complies with the CSA and UL standards.

Stelpro Design Inc., Saint-Bruno-de-Montarville (Quebec) J3V 6L7

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