

1 Scope

This specification covers Series Heating Cable Sets and their installation for surface floor warming application.

2 Applicable documents

2.1 The cable

The cable sets shall comply (certified) with the following standards:

- CAN/CSA-C22.2 NO. 130-03, Requirements for electrical resistance heating cables and heating device sets ; designation G for general use and designation W for wet environment
- UL 1673 – Electric Space Heating Cables;
- IEEE 515.1 – Standard for Testing, Design, Installation and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications.

Writer's notes:

CAN/CSA-C22.2 NO. 130-03, designation G and W: For interior floor usage only, cables need to be drowned in concrete or mortar. Wet environment such as a ceramic floor shower and washroom/laundry room and in Canada, in pool apron.

UL 1673: American standard for the manufacturing and installation of electric heating cables.

IEEE 515.1: American standard for manufacturing and installation of electric heating cables for commercial application.

3 Specifications

3.1 Dimensions

Depending on the required electrical power and installation application, the cable shall be available in different lengths to optimise the floor surface to heat. Make sure to properly plan the products required since they cannot be modified. The cable shall have a nominal diameter of 1/8 inch (3.2 mm) and a maximum of 5/32 inch (3.9 mm).

3.2 Cable structure

HEATING CABLE

Resistance wire made of copper or copper alloy, with a fluoropolymer insulation. The insulated wires are twisted in pairs at a specific lay length so that the electromagnetic fields (EMF) are reduced to a non-significant level at the floor surface (between 0.25 mG and 0.5 mG).

A copper braid covers the heating wires. An external copolymer sheath protects the whole cable assembly. The cable presents little form memory.

NON-HEATING CABLE (or COLD LEAD)

The cold lead is made of 3 conductors TWN75/T90, 14AWG with an overall PVC RoHS jacket.

MECHANICAL JOINT

The heating cable and the cold lead are joined by ultrasonic welding. The splice is encapsulated into a solid plastic shell which is injected with sealant.

3.3 Compatibility with installation surfaces and floor coverings

For an application requiring a surface installation, the cable shall be compatible with installation surfaces and floor coverings as indicated in the following tables.

Writer's notes :

Make the selection according to the specific project.

2 Watt cable

Green Cable Surface 2W optimizes radiant heat and ensures that it spreads evenly over all installation surfaces and under all floor coverings due to its 2" or 3" spacing (5 cm or 7.6 cm).

3 Watt cable

Green Cable Surface 3W is for larger rooms with natural stone or ceramic floors, that guarantee better heat conduction.

| Green Cable Surface 2W | | | | | | | | |
|------------------------------|---|---|---|---|--|---|---|---|
| Installation surface | Floor covering | | | | | | | |
| | Ceramic | Natural stone | Engineered wood ² | Vinyl ² | Floating floor ² | Linoleum ² | Parquet ² | Carpet ² (without rubber backing or carpet padding) |
| Plywood |  |  |  |  |  |  |  | |
| Smooth concrete ¹ |  |  |  |  |  |  |  |  |
| Cement panels |  |  |  |  |  |  |  | |
| Ceramic |  |  |  |  |  |  |  | |
| Acoustic membrane |  |  |  |  |  |  |  | |
| Anti-fracture membrane |  |  |  |  |  |  |  | |
| Scratch coat |  |  |  |  |  |  |  | |
| Mortar bed ¹ |  |  | | | | | | |

 5 cm (2 in) spacing – 129 W/m² (12 W/ft²)

 7.6 cm (3 in) spacing – 86 W/m² (8 W/ft²)

¹ The concrete slab (or mortar bed) must be insulated to avoid heat loss from below. FLEXTHERM also recommends that all rooms supported by the concrete slab be equipped with a FLEXTHERM floor heating system to avoid perimeter heat loss.

² For floor coverings other than ceramic and natural stone, always check with the manufacturer whether its floor covering is compatible with floor heating systems.

| Green Cable Surface 3W | | | | | | | | |
|---|----------------|---------------|------------------------------|--------------------|-----------------------------|-----------------------|----------------------|---|
| Installation surface | Floor covering | | | | | | | |
| | Ceramic | Natural stone | Engineered wood ² | Vinyl ² | Floating floor ² | Linoleum ² | Parquet ² | Carpet ² (without rubber backing or carpet padding) |
| Plywood | | | | | | | | |
| Smooth concrete ¹ | | | | | | | | |
| Cement panels | | | | | | | | |
| Ceramic | | | | | | | | |
| Acoustic membrane | | | | | | | | |
| Anti-fracture membrane | | | | | | | | |
| Scratch coat | | | | | | | | |
| Mortar bed ¹ | | | | | | | | |
| 7.6 cm (3 in) spacing – 129 W/m ² (12 W/ft ²) 10 cm (4 in) spacing – 97 W/m ² (9 W/ft ²) | | | | | | | | |
| ¹ The concrete slab (or mortar bed) must be insulated to avoid heat loss from below. FLEXTHERM also recommends that all rooms supported by the concrete slab be equipped with a FLEXTHERM floor heating system to avoid perimeter heat loss. | | | | | | | | |
| ² For floor coverings other than ceramic and natural stone, always check with the manufacturer whether its floor covering is compatible with floor heating systems. | | | | | | | | |

3.4 Electrical specifications

For an application requiring a surface installation, the cable shall comply with the electrical characteristics as described in the following table.

| Electrical characteristics | | |
|--|--|--|
| | Green Cable Surface 2W | Green Cable Surface 3W |
| Standard voltage | 120 and 240 volts (208 volts available upon request) | 120 and 240 volts (208 volts available upon request) |
| Output | 6.6 W/linear m (2 W/linear ft) | 9.9 W/linear m (3 W/linear ft) |
| Output by type of installation | 5 cm (2 in) spacing – 129 W/m ² (12 W/ft ²) 7.6 cm (3 in) spacing – 86 W/m ² (8 W/ft ²) | 7.6 cm (3 in) spacing – 129 W/m ² (12 W/ft ²) 10 cm (4 in) spacing – 97 W/m ² (9 W/ft ²) |
| Connection to the thermostat | Easy installation: a single cold lead is connected to the thermostat (return feed on the same cable) | Easy installation: a single cold lead is connected to the thermostat (return feed on the same cable) |
| Cold lead | 3 m (10 ft) Two conductors and grounding | 3 m (10 ft) Two conductors and grounding |
| Designations and applications | CSA Canada: Electrical space heating Heating cable set in series type G & W CSA US: Electrical space heating Heating cable set in series type C Dry and wet environments | CSA Canada: Electrical space heating Heating cable set in series type G & W CSA US: Electrical space heating Heating cable set in series type C Dry and wet environments |
| No significant electromagnetic field emission* | | |

* Based on the installation instructions included in the FLEXTHERM installation guide, the recorded EMF measurement is considered insignificant (between 0.25 mG and 0.5 mG).

3.5 Electrical voltage

The cable shall be compatible with electrical installations of 120, 240 VAC or 208 VAC.

3.6 Cable securing system

The cable securing system (installation gauge) shall be manufactured in plastic material in order to prevent any damage to the cable sheath during installation. The installation gauge will have openings at every inch and shall be free from any sharp edges or burrs susceptible to damage the cable sheath during installation and during the useful life of the product. The cable securing system will allow a uniform installation of the cable for an optimum distribution of the heat. The radius of curvature of the cable at point of contact with the gauge shall be equal or greater than 0.5 in (12.7 mm).

The cable securing system is compatible with hot melt glue adhesive, nails, screws and staples.

The Green Cable™ Surface installation is also possible with the FLEXSnap™ installation system. Please refer to the FLEXSnap™ specifications guide and its installation guide.

3.7 Controls

FLP series programmable thermostat or FLK series non-programmable thermostat incorporating a class A certified GFCI, electronic, with low voltage module, including at least one temperature sensor inserted to the floor.

For an installation that requires more than 15A, use the FLE series expansion unit.

Please refer to the guide for installation.

3.8 Product to be specified

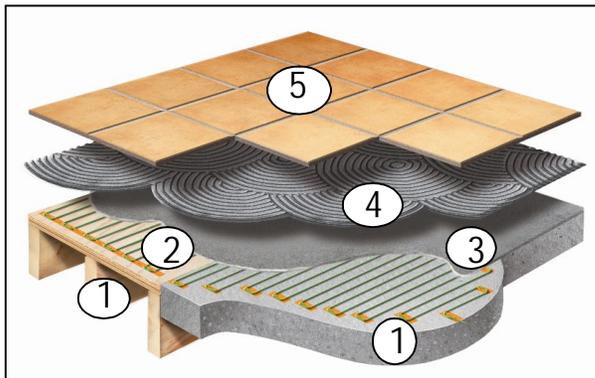
Order according to the surface to cover. The cable cannot be cut or modify.

- Local or room: _____
- Surface to be covered: _____
- Floor covering: _____
- Installation surface: _____
- Green Cable™ Surface: 2W 3W _____
- Green Cable™ Surface model: _____
- Spacing of: _____
- Controls:
(write down the required quantities) FLP FLK FLE _____

4 Installation

- Install heating cable in accordance with the Green Cable™ surface installation guide.
- Secure the gauges in accordance to FLEXTHERM Green Cable™ Surface installation guide; to concrete with hot glue or screws, on plywood using hot glue, screws, 25 mm (1 inch) nails or staples.
- Secure the cable to anchoring devices, 50 mm (2 inches) from edge of wall. Maintain the chosen spacing throughout the installation.
- Place thermostat remote sensing probe in accordance to FLEXTHERM Green Cable™ Surface installation guide.
- Do not cross expansion joints with cable.
- Do not alter heating cable length.
- Ensure cables do not bunch or cross.
- The system can be operated only after the mortar or self-levelling underlayment has completely cured. This waiting period is essential to ensure that the mortar or self-levelling underlayment is properly set. Refer to your manufacturer's instructions to verify the curing time for the product you are using.
- Please refer to the installation guide for complete instructions, available with the product and on our website www.flextherm.com.

5 Application



- 1 Wood structure or concrete slab
- 2 Floor heating system
- 3 Polymer-modified mortar or self-levelling underlayment
- 4 Adhesive (mortar)
- 5 Floor covering

6 Quality assurance

6.1 Warranty

The Green Cable™ Surface shall bear a 25 year limited warranty against any manufacturing defect when it's installed in conformity with the installation guide.

Please refer to the complete warranty card available in the installation guide included with the product or on our website www.flextherm.com.

6.2 General

Each product is inspected at the source, during manufacturing and at the end, in order to ensure compliance with the present specification.

6.3 Product manufacturing history

Every product has a unique serial number that traces the product manufacturing history.

6.4 Repairs

The cable can be repaired if it's damaged during or after the installation. Contact our customer service for a diagnosis and a recommendation for a technician who is qualified to repair FLEXTHERM heating cables.

7 Packaging

The product is shipped in a box clearly identified with its contents. Each box shall include

- One spool of heating cable;
- An appropriate number of installation gauges for the entire surface to be covered;
- An appropriate number of hot melt glue adhesive;
- Installation instructions including testing procedures during installation.

Each spool has a seal in order to ensure the integrity of the product.

8 Lexicon

Spacing: distance between two adjacent strands of cable.

Cable Securing System (Installation gauges): gauges to be used to secure the cable on the surface (as per section 3.6).

Series Heating Cable Sets: combination of heating cable and a cold lead to connect the cable to electrical source, assembled by supplier.