

1 Scope

This specification covers Series Heating Cable Sets and their installation in a concrete slab for a 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
- 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 environments such as a ceramic shower floor or washroom/laundry room and in Canada, in pool apron.

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 7/32 inch (5.6 mm) in order to assure a good impact resistance during embedding.

3.2 Cable structure

HEATING CABLE

Resistance wire made of copper or copper alloy, with polyolefin 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 polyolefin sheath protects the whole cable assembly.

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

Heat shrink tubing covering the welded splice (ultrasonic weld) between the heating cable and the non-heating lead wire. Heat shrink tubing making an electrical insulation barrier between the heating conductors and the copper braid.

3.3 Compatibility with installation surfaces and floor coverings

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


Writer's notes :

Make the selection according to the specific project.

Green Cable Concrete		
Floor covering	Spacing/Power	
	10 cm (4 in) 161 W/m ² (15 W/ft ²)	15 cm (6 in) 108 W/m ² (10 W/ft ²)
Ceramic	✓	✓
Natural stone	✓	✓
Engineered wood ¹		✓
Vinyl ¹		✓
Floating floor ¹		✓
Linoleum ¹		✓
Parquet ¹		✓
Carpet ¹ (without rubber backing or carpet padding)		✓
¹ For floor coverings other than ceramic and natural stone, always check with the manufacturer of the floor covering first, to make sure its product is compatible with FLEXTHERM floor heating systems.		
Installation environment		
Concrete slab ¹	✓	
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.		

3.4 Electrical specifications

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

Electrical characteristics	
Standard voltage	240 volts (208 volts available upon request)
Output	16.4 W/linear m (5 W/linear ft)
Output by type of installation	10 cm (4 in) spacing: 161 W/m ² (15 W/ft ²) 15 cm (6 in) spacing: 108 W/m ² (10 W/ft ²)
Connection to thermostat	Simple installation: a single cold lead is connected to the thermostat (return feed on the same cable)
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
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 240 VAC or 208 VAC.

3.6 Cable securing system

The cable securing system is an adhesive tape chosen specifically to secure the cable on the mesh and to avoid any damage to the cable during the installation. The radius of curvature of the cable at point of contact shall be equal or greater than 1.75 in (4.5 cm).

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 probe that needs to be inserted into a conduit specially planned for concrete burial application (FLS1260T).

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

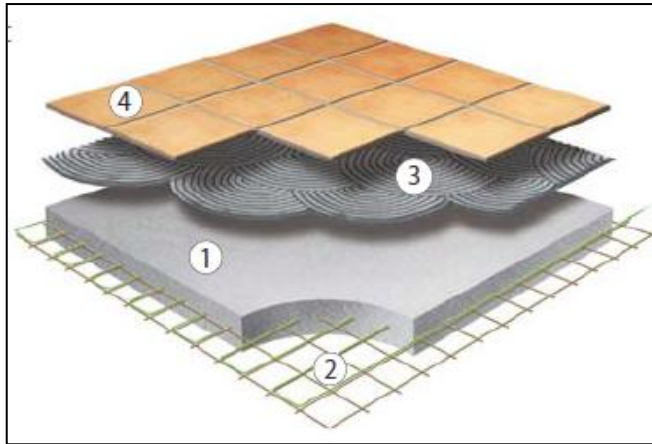
Order according to the surface to cover. The cable cannot be cut or modified.

- Local or room: _____
- Surface to be covered: _____
- Floor covering: _____
- Green Cable *Concrete* model: _____
- Spacing of: _____
- Controls:
(write down the required quantities) FLP [] FLK [] FLE []
- Conduit for thermal probe:
(write down the required quantities) FLS1260T []

4 Installation

- Install heating cable in accordance with the Green Cable™ *Concrete* installation guide.
- Secure the cable to the mesh using the FLEXTHERM adhesive tape as the work progresses. To do so, wind the tape around the cable and the mesh in a spiral fashion. Always respect the pre-determined spacing.
- Insert the thermostat remote sensing probe into the conduit specially planned for concrete burial application in accordance to FLEXTHERM Green Cable™ *Concrete* installation guide.
- Do not cross expansion joints with cable.
- **Do not alter heating cable length.**
- Ensure cables do not bunch or cross.
- Do not turn your system on, nor proceed with floor covering installation, immediately after the concrete is poured. The system can be operated only after the concrete has completely cured. Refer to the instructions of your construction professional to verify the curing time: this curing period is essential so that the concrete reaches its full hardness.
- Please refer to the installation guide for complete instructions, available with the product and on our website www.flextherm.com.

5 Application



- 1 Concrete slab
- 2 Floor heating system fixed to the mesh
- 3 Polymer-modified mortar (optional)
- 4 Floor covering (optional)

6 Quality assurance

6.1 Warranty

The Green Cable™ Concrete shall bear a 10 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 amount of FLEXTHERM adhesive tape required for the installation;
- 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: system to be used to secure the cable to the mesh (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.