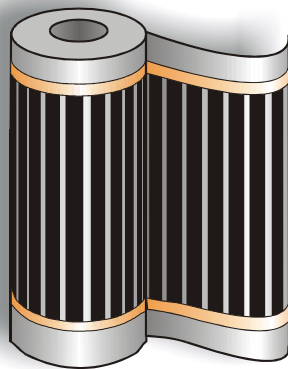


# Safe-t-FLEX Floor Installation Guide

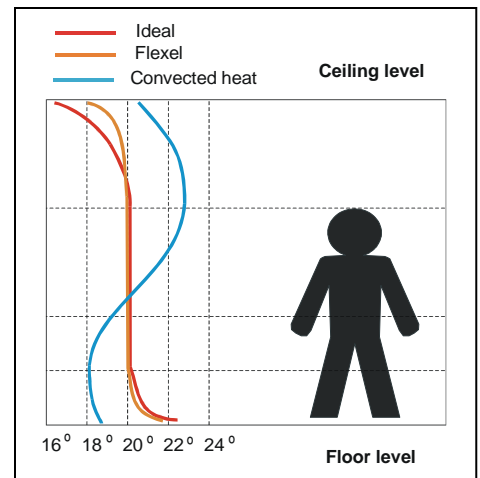
## 1. INTRODUCTION

The principle of **Safe-t-FLEX** heating elements is based on a continuous resistive sheet providing heat evenly over the black surface areas.

**Safe-t-FLEX** consists of a specially formulated semi-conductive medium, coated onto polyester film or impregnated into glass cloth. Power is fed to this resistive coating by way of copper electrodes that are fixed to the longitudinal edges of the heating areas. This structure is insulated by a lamination of polyester based films that totally cover the element and is wider than the conductive heating area, forming strong clear edges that are designed to accept subsequent stapling to sub floor surfaces.



Low temperature **Safe-t-FLEX** floor heating elements produce a gentle heat that evenly warms the whole room. Once the surfaces have been warmed, the heat is reflected resulting in comfortable, natural warmth with minimum floor to ceiling temperature variation.

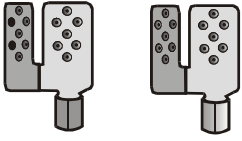


## 2. INSTALLATION PROCEDURE

Before commencement of installation always check on the following:

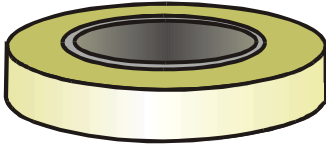
- The building is weather tight, and that the glazing and doors have been fitted.
- Any floor screeds, asphalt etc. have been laid and allowed to dry out.
- All electrical first fix wiring and other mechanical services through floors have been completed.
- No cables must be allowed to come into contact with the **Safe-t-FLEX** heating elements.
- The following tools and components are available from **CBS Radiant Heating Systems**.

### 3. Equipment required for installation



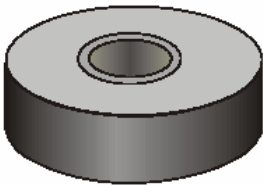
#### Connectors

Use only the AMP “Termifoil” 330716, supplied by **CBS Heating**



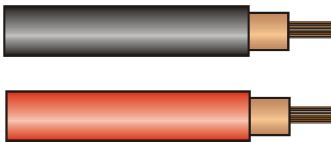
#### Tape

Use only the clear 150C, rated polyester tape supplied by **CBS Heating**



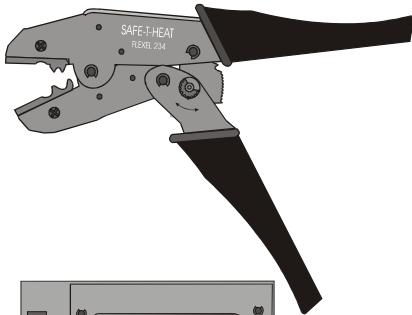
#### Mastic Tape

38mm X 6m Long Rolls Supplied by **CBS Heating**



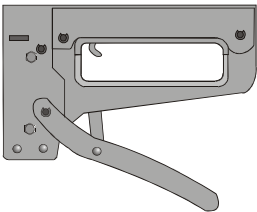
#### Non Heating Leads

Use only 1.5mm<sup>2</sup> single core double insulated flexible PVC/PVC, coloured Red or Black on 100m length drums



#### Crimping Tools

Use only **Safe-t-FLEX 234** Crimping Tool available from **CBS Heating**. Observe carefully the required calibration instructions.



#### Stapler

Use a standard stapler with staple lengths of 8mm or

In addition to the above, the following will also be required: Thermal insulation, personal protection equipment, tape measure, suitable marker pen, scissors or knife, straight edge, additional cable ties, test equipment and other electrical items; where necessary suitable ancillary lighting for working in dark areas etc.

**Note: Electrical test equipment and crimp tools must be regularly calibrated.**

## INSTRUCTIONS FOR USE

**Safe-t-FLEX ELEMENT 370/400mm AND 500/530mm FLOOR HEATING FILM** for installation beneath batten fixed timber floors and floating laminate wood floors

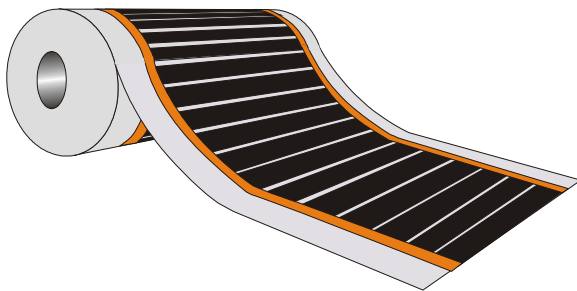
### 4. Basic Technical Data

Element wattage densities are 135 W/m<sup>2</sup>. Thickness 0.5 mm. Wattage rates are 49.95 watts per linear meter for 370/400 and 67.5 watts per linear meter for 500/530. Rolls 530 mm wide have an element width of 500 mm (edges 2 × 15 mm) and rolls 400mm wide have an element width of 370mm (edges 2 x 15mm).

### Level of quality required for laying surfaces

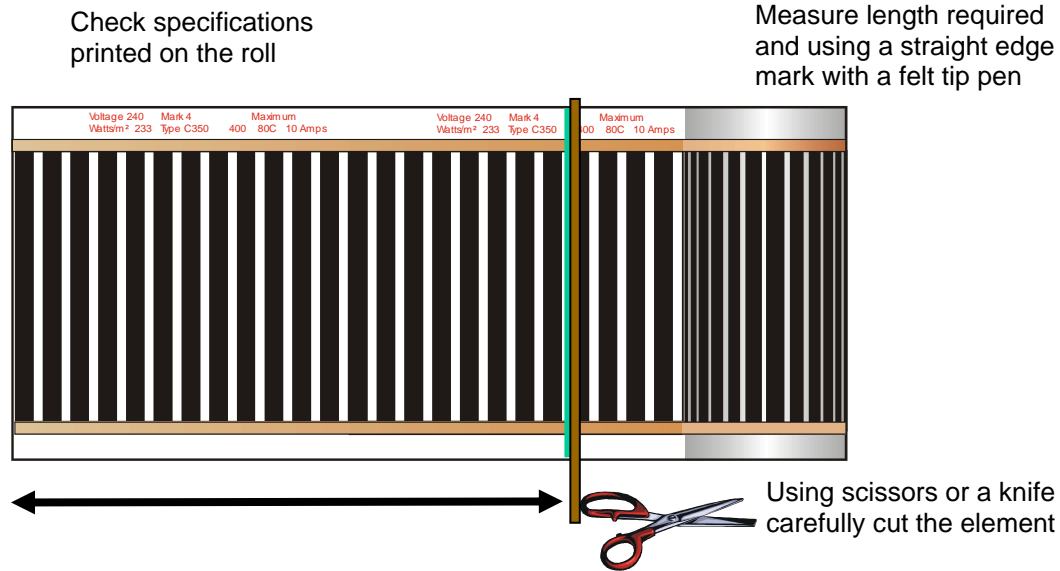
The laying surface must be suitably flat, with no juts, bumps or depressions. It can be a concrete surface or one from other construction materials that can support sufficient loads. The humidity of the laying surface may not exceed 2% (roughly 60% of relative humidity). It is necessary to prevent moisture penetrating the surface. Before starting work you must insulate against moisture. Thermal insulation is advisable, assuming the floor's profile permits it.

### 5. How to prepare the film



Although all **Safe-t-FLEX** elements are visually inspected at the factory before dispatch, the foil should be checked to ensure any rough handling has not damaged the **Safe-t-FLEX** element. Look for creasing or folds that could have been caused by a roll of element being trodden on. Any such damaged areas must be discarded.

## 6. Cutting the Element to size



Verify the tag data on edge of the strip of film. Cut off the length of film that the installation project requires with scissors, at a marked cutting point. Lead the cut through the middle of the cutting point. Insulate the border of the copper strip that this step lays bare **using 25 mm yellow hi temp polyester tape**.

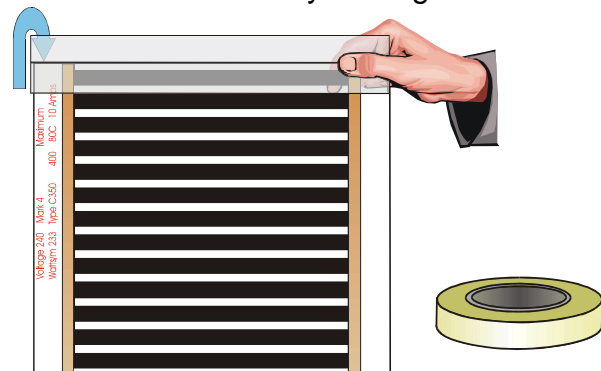
## 7. How to insulate the ends of the film

Unroll the element on a clean working surface and check for any damage.

Mark off the required lengths using any proprietary felt tipped marker.

Using a straight edge cut the elements to length using scissors or a sharp knife.

Seal both ends of the element using only the correct polyester insulating tape provided.



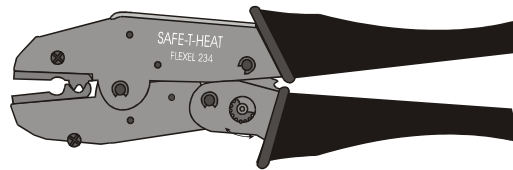
Ensure that the tape is folded over to form a neat continuous seal along the total width of the element.

## 8. Preparing to attach the connector clips to the heating film

Element layout drawings are not normally required for **Safe-t-FLEX** installations, thus enabling elements to be cut and fixed on site to accommodate last minute alterations to joist and floor layouts. Firstly check that the element identification printed on the clear edge selvedge complies with the grade and voltage required for the installation. For Australia unless otherwise stated on the **Safe-t-FLEX** Installation Test Certificate this will be 240 volts.

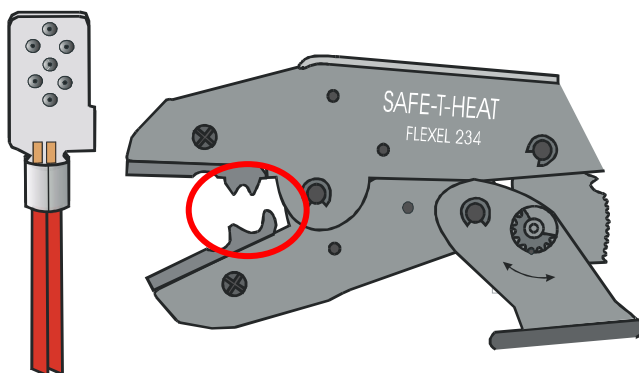
## 9. Checking the Crimping Tool

Before fixing the crimp connectors check that the **Safe-t-FLEX** Crimping tool is correctly adjusted to the required 1.25 - 1.40mm (50-55 thou.) gap when fully closed. If adjustment is required:



1. Remove the retaining ring or the locking screw from the eccentric axle.
2. Where fitted, remove the toothed lock washer and turn the axle to loosen or tighten the tool adjustment.
3. Alternatively, move the toothed washer in the direction indicated to loosen or tighten the tool adjustment.
4. Replace lock washer with retainer ring/bolt or the locking screw.
5. Re check the flat parallel jaw gap with a feeler gauge.

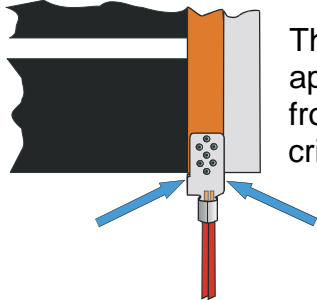
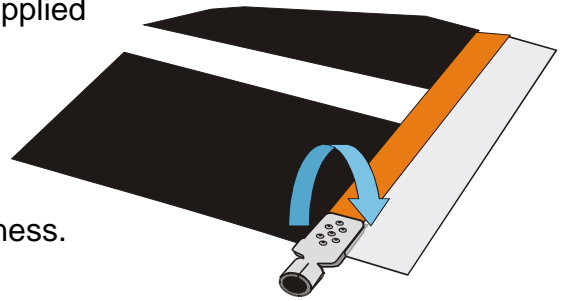
## 10. Attaching cold tails (wiring harness)



Bare connecting leads and insert singly (doubled over) or in pairs into the cylindrical ferrule of the crimp connector. Cold tails from elements to thermostat positions must be securely clipped and positioned so that they cannot come into contact with any heated part of the element.

**Note:** when a single cable is being crimped, bend the cable back to give the same volume of cable to be crimped. Using the recommended "**Safe-t-FLEX 234**" pliers complete the crimp connection with the tool so that the "W" form of the tool is to the seamed side of the cylindrical female of the crimp.

Using only the **Safe-t-FLEX 234** crimping pliers supplied attach metal crimp connectors to both copper conductors at one end of the element. Locate the crimp centrally on the end of the copper strip, then fold shut between thumb and forefinger. Fitting the crimp with the barrel to the same side as the copper electrode will assist locating the wiring harness.



The crimping pliers are now utilized with 2 diagonal applications (firstly from the hinge side of the crimp, and then from the open side) to ensure that the whole area of the crimp in contact with the element is pressed flat. The ratchet mechanism on these pliers prevents the jaws being opened until the correct pressure has been applied.

## 11. Seal crimp connection points with 3M Vinyl/Mastic Tape.

Finally, place 38mm wide x 50mm long mastic pads either side of the connection points. Carry this at least 30mm down the connection wires. Knead the mastic round the cables and all contours. Make absolutely sure that a good effective seal is produced. (Available in 38mm wide x 6-meter rolls)

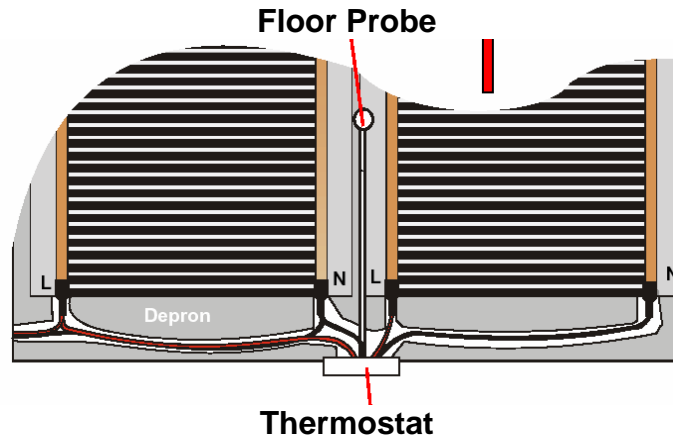


**Note: Normal pliers must not be used for this operation as crimps fitted incorrectly, may overheat due to high contact resistance.**

## 12. How to lay the film and connect it to the grid

Before laying the film, lay out a 3 mm closed cell foam underlay. In the places where you expect to place connection points, and in the places where conductors lead towards the electricity box, you need to make a groove for sinking them into the laying surface. Never lay the strips of film in such a way that their heating surfaces overlap. Lay elements with the copper strips facing upwards and locate in place using tape.

Diagram showing a typical layout



Insert the thermostat remote floor probe between 2 element strips as shown

Never step directly onto the foil during your work without a suitable layer to cushion against your weight.

Heating film may never be placed in spots where dissipation of heat from the floor surface is restricted (low-lying furniture fixings etc.).

A fully qualified electrician should connect the connection cables into an already-prepared electrical box. Individual circuits should be planned to not exceed the 10-amp element rating therefore, the following limits would be:

Maximum length is 48 meters for the 370mm wide element at 49.95w per meter.  
Maximum length is 35 meters for the 500mm wide element at 67.50w per meter.

No conductor should ever pass below the heating film itself. Since the cable is 4.5 mm thick, you must sink it at least 4 mm into the underlay or laying surface (into a groove) and fix it in place with tape.



Once you have laid and connected all strips, check the resistance of the electrical circuits with an ohmmeter.

If all the circuits are functioning right, lay clear polyethylene film at least 0.2 mm thick upon the whole floor surface. The individual strips

must overlap by at least 20 cm. Pull them up by about 3 cm along walls. Alternatively, the moisture barrier supplied in the laminated floor supplier's kit can be laid instead.

The installation must be done so as to allow disconnection at all poles.

### 13. How to lay a floating floor.

When laying a floor made up of individual segments, you must take special care not to damage the now-laid layers and the supply cable. Use a suitable subsurface.

### 14. Final measurements you should make.

Measure individual circuit resistance once again with an ohmmeter. Record the measured data in a schematic drawing and archive it.

Check the insulation resistance of the heating film. This should never fall below 0.5 maxwells.

### 15. Warranty conditions

The manufacturer offers a warranty lasting 10 years from the date of sale for the functionality of **Safe-t-FLEX** floor heating element, provided that you observe the conditions laid out in this guide. Also, you must present the following when you make your warranty claim:

- an invoice,
- a warranty sheet (delivery sheet).

### 16. Electrical considerations with reference to wiring from the room thermostat to heating elements

1.5mm square cable is used for making up the wiring harness. To satisfy the requirements of an acceptable standard, sheathed single core cable to BS.6004 would be acceptable. The manufacturers over many years have supplied a special double insulated flexible PVC cable which experience has shown to be more acceptable for handle ability properties. **Safe-t-FLEX** heating elements are designed to accommodate a current carrying capacity of 10 amps.

### 17. Thermostat Control

Only thermostats equipped with remote probes should be used to control temperatures in timber floor heating systems. **WARNING** temperature must be limited to **28 degrees Celsius** to avoid altering moisture content in the timber floor.

### Finally before leaving site

- 1). Fix or provide mandatory labels for positioning adjacent to the distribution board and any access to trap doors and roof spaces
- 2). Supply a copy of the **Safe-t-FLEX** Installation Test Certificate and controls to the electrical contractor ensuring warning labels are fitted. This warning may already be printed on certain thermostats.
- 3). Remove all surplus material from site.

## 18. LABELS

**Safe-t-FLEX**  
FLOOR HEATING  
DO NOT PIERCE FLOOR

Fit to room thermostats

Fit to consumer panel and access trap to floor.

### WARNING

THIS BUILDING IS FITTED WITH **Safe-t-FLEX** ELECTRIC FLOOR HEATING FOILS

DO NOT PIERCE THE FLOOR WITH NAILS, SCREWS OR OTHER FASTENERS

Do not affix further insulation, facing materials or plastic foam tiles  
above the existing floor surface.

IF ANY FIXING THROUGH THE FLOOR IS NECESSARY CONTACT THE DISTRIBUTOR FOR  
GUIDANCE

CBS RADIANT HEATING SYSTEMS. Tel: no. 0400 709 000 Email: [info@cbsheating.com](mailto:info@cbsheating.com)

Additional information regarding design methods, control equipment, general electrical requirements, flooring specification, can be obtained by contacting:

Carterton Building Services Pty. Ltd.  
P O Box 865,  
Balcatta, WA 6914

Mob: No. 0400 709 000  
Fax 3 No. 0433 145 320

Distributor: