



**FLEXEL** the proven radiant heating system (since 1965)

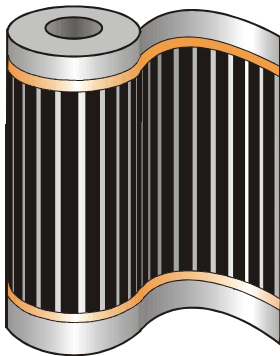
## Installation Instructions for Flexel Heating Elements Under Laminate Flooring Systems

### 1). Introduction

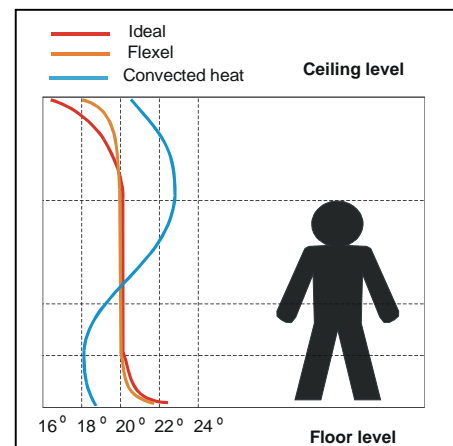
#### The **Flexel** Heating Element

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

**Flexel** consists of a specially formulated semi-conductive medium, coated onto polyester film. 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 fixing to sub floor surfaces.



Low temperature **Flexel** floor heating elements produce a gentle heat that evenly warms the entire 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

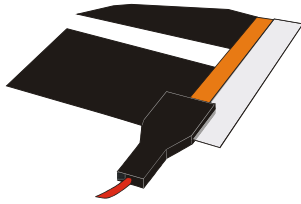
Before commencement of installation always check on the following:

- 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 **Flexel** heating elements.
- The following tools and components are available from **Flexel**.



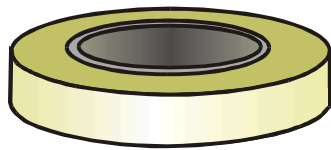
### 3). Equipment required for installation.

#### Element



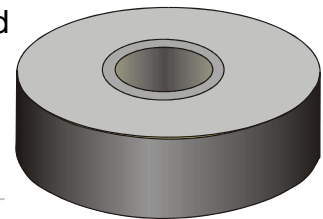
Element is supplied complete with tails fitted and for on site final connection. Element can also be supplied with factory fitted, riveted crimps for on site final connection. The connections are covered in mastic to insulate the crimps or solder joints.

#### Tape



Use only the clear **TF 104**, 150°C rated polyester tape supplied by **Flexel**

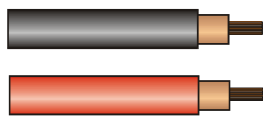
Black Electrical Insulating Tape supplied by **Flexel**



#### Mastic

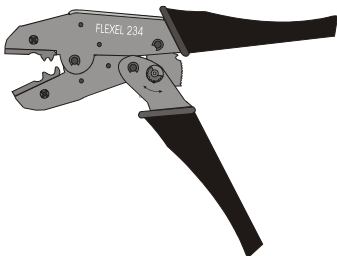
3M

3M (company name) Mastic supplied by **Flexel**



#### Non Heating Leads

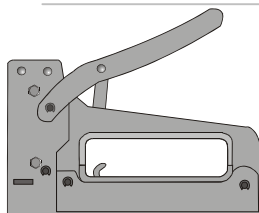
Use only 1.5mm<sup>2</sup> **Flexel** supplied single core double insulated flexible PVC/PVC, coloured Red or Black on 100m length drums



#### Crimping Tools

Use only **Flexel** 234 Crimping Tool available from **Flexel**. Observe carefully the required calibration instructions. (Use only AMP Termifoil 330716 crimps supplied by **Flexel**).

*All the above equipment (NOT the stapler or Heat Gun) is available through **Flexel International Ltd.***



#### Stapler

Use a standard stapler with staple lengths of 8mm or 9.5mm (5/16" or 3/6").

#### Heat Gun

Standard heat gun for shrinking the Heat Shrinks.

In addition to the above, the following will also be required: Thermal insulation, tape measure, suitable marker pen, scissors or knife, straight edge, 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.**



## **FLEXEL ELEMENT : FLOOR HEATING FILM**

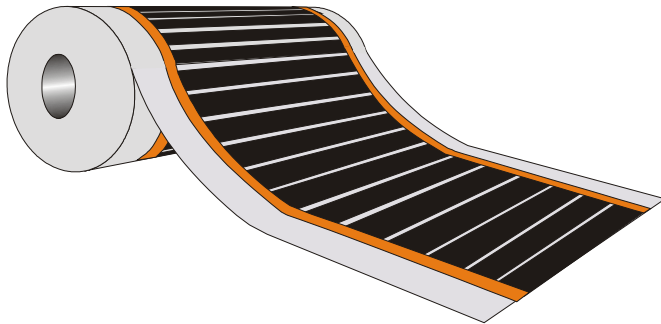
for installation beneath laminate, wooden and floating floors

### **4). Basic Technical Data.**

Element is usually supplied at 130 W/m<sup>2</sup>. Other specifications are available with the suitability for purpose checked and confirmed by **Flexel** technical staff.

Element is normally supplied fully prepared, cut to size, tails fitted and insulated ready for installation. The following instructions are for qualified **Flexel** installers only.

### **5). How to prepare the film.**



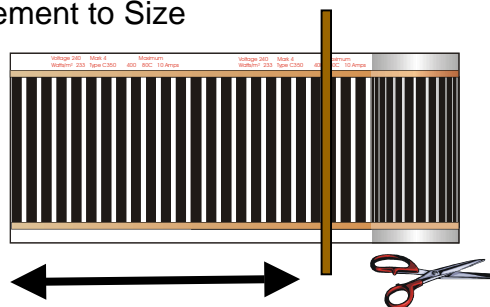
Although all **Flexel** element is visually inspected at the factory before dispatch, the elements should be checked to ensure any rough handling has not damaged the **Flexel** element. Look for creasing or folding that could have been caused by a roll of element being trodden on. Any such damaged areas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

### **6). Cutting the Element to size.**

Element layout drawings are not necessarily required for **Flexel** installations, thus enabling elements to be cut and fixed on site to accommodate last minute alterations to floor layouts.

Check that the element identification printed on the clear edge selvedge complies with the grade required for this application. (Normally 130 W/m<sup>2</sup> at 230 volts within the United Kingdom). 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 transparent polyester tape supplied by **Flexel**.

#### Cutting the Element to Size



Measure length required and using a straight edge mark with a felt tip pen

Using scissors or a knife carefully cut the element

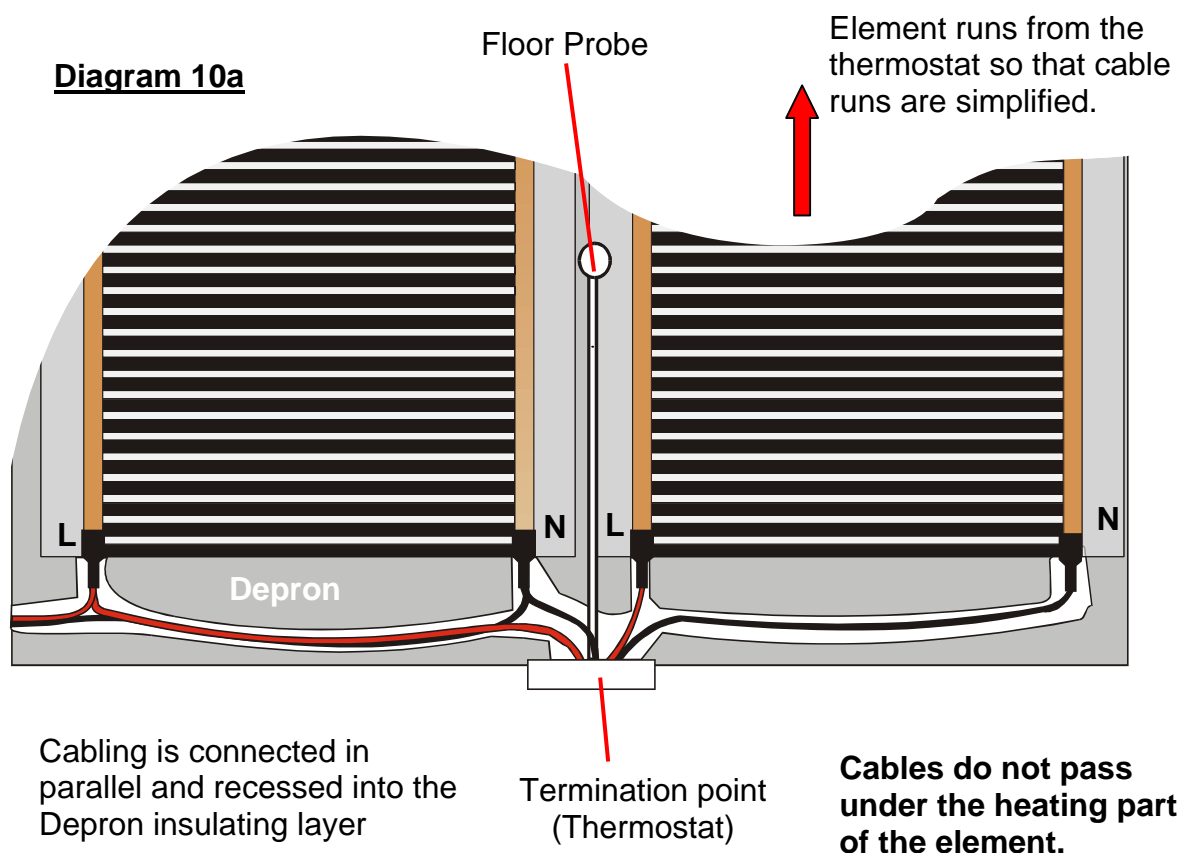




### 9). How to lay the film and connect it to the grid.

Before laying the film, lay out a 6mm layer of Depron insulation. Other options for insulation are available such as Marmox. The layer of insulation also acts as sound deadening that is a requirement for laminate floors. Locate the suitably fused, low level, connection box. Create channels in the Depron insulation to accommodate the return of the cables to the connection box. Element should be laid with the copper strips facing upwards. Never lay the strips of film in such a way that their heating surfaces overlap. You can fix the strips in place using tape.

### 10). Over view of a typical layout.



#### **NOTE:**

As illustrated lay the elements and recess the cables by cutting channels into the insulation underlay (Depron) **taking care not to allow the cables to pass under the heating element.**



Insert the thermostat floor temperature probe between 2 element strips adjacent to the control position.

Individual circuits should be fed back to local low level fused spur termination boxes (provided by the electrician) and planned not to exceed the 10-amp element rating.

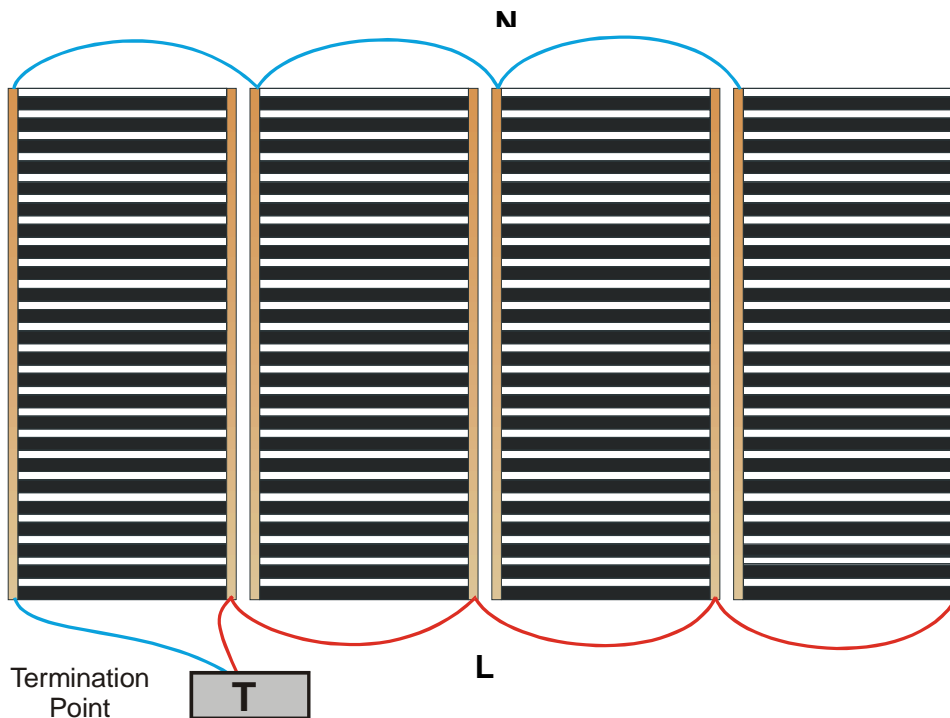
For standard under floor heating elements this would be:  
Heated width 300 or 330 mm - 43 Watts/ linear metre - maximum length 53 metres.  
Heated width 500 mm - 65 Watts/ linear metre - maximum length 35 metres.

When calculating layouts avoid running heating element under any fixed furniture such as kitchen units. Most other furniture normally provides a suitable air space over the heated floors but any other excessive thermal blocking of the floor will cause overheating and may affect the integrity of the flooring.

**On site connections are only to be carried out by qualified FLEXEL installers.**

### Alternative System for Connection of Element to Termination Point

**Diagram 10b**





## **12). Electrician Requirements**

### **12a). Resistance Check**

Once all the strips are laid and interconnected check the resistance value of each circuit using an ohmmeter applying the formula :

$$\frac{52900 (v^2)}{\text{Watts}} = \text{Resistance (ohms)}$$

***Alternatively refer to the table provided on page 10 of these installation instructions.***



If all the circuits are functioning satisfactorily, lay clear polyethelene film at least 0.2 mm thick upon the whole floor surface. The individual strips must overlap by at least 20 cm. This can be replaced with the laminate floor manufacturers preferred or recommended covering.

### **12b). Thermostat**

Provide a 43mm deep recessed thermostat-mounting box (normally sited 1.5m from floor level and directly above the element termination box(es) and away from the local heat sources and large windows).

**NOTE: Should the total connected load in any area exceed the rating of the controller the electrician should provide a suitable switching contactor (normally located adjacent to the distribution board) with a switching feed to the controller. An option is to fit two controllers, however this may create a temperature imbalance and is generally avoided.**

Provide a connection feed from the thermostat to the termination box(es). Fix the controls as supplied and carry out a further resistance test. An insulation to earth test should also be made and recorded on the customers electrical completion certificate and held for future reference. (Initial dampness in the floor may show a low reading but a figure of 20 megohms or less can be taken as correct).

### **12c). Record of data**

The electrician should record the measured data on the completion certificate provided on page 9 and stored adjacent to distribution board. This certificate forms part of the guarantee requirements.



**12d). Electrical considerations with reference to wiring from the room thermostat to heating elements.**

1.5 mm<sup>2</sup> double insulated cable must be used for making up wiring harnesses. To satisfy the requirements of an acceptable British Standard sheathed single core cable to BS.6004 would be acceptable. For many years **FLEXEL** International Ltd. have supplied a special double insulated flexible PVC cable which experience has shown to be more acceptable for its handling properties.

**Flexel** heating elements are designed to accommodate a current carrying capacity not exceeding 10 amps on individual circuits.

**13). Laying a floating floor.**

The Laminate floor must be laid according to the manufacturers recommendations. When laying a floor you must take special care not to damage the element and the supply cable.

**14). Guarantee conditions.**

- **Completion certificate from the electrician to be returned to Flexel International Ltd.**

**Guarantee conditions (on Page 11 of these instructions) are adhered to.**





**15). Finally before leaving site.**

**RECOMMENDED LABELS**

To be stored adjacent to the main distribution board

**WARNING**

THIS BUILDING IS FITTED WITH **FLEXEL** DIRECT ACTING UNDER FLOOR HEATING

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

IN THE EVENT OF FLOODING OR WHEN CARRYING OUT ANY REPAIRS OR ALTERATIONS  
DISCONNECT THE UNDER FLOOR HEATING AND CONTACT YOUR ELECTRICIAN OR  
MANUFACTURERS FOR ADVICE

Flexel International Ltd., Scotland.

Tel: no. 01592 757 313 Fax no. 01592 754 535

Details of electrician carrying out installation:

Name. \_\_\_\_\_ Signature. \_\_\_\_\_

Company Name  
& Address

Room(s) installed:

Final Test readings:

Date: \_\_\_\_\_

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

Flexel International Ltd., Queensway Industrial Estate,  
Glenrothes, Fife, Scotland,  
KY7 5PZ

Tel. No. 01592 757 313  
Fax No. 01592 754 535



**16). Flexel under laminate floor heating element installation table.**

230 volts 130 Watts / m<sup>2</sup>

Output KW	Element Length (metres)		Cold Resistance (Ohms)	Live Current (amps)
	330 - 400	500 - 530		
0.05	1.17	0.77	1058	0.22
0.10	2.33	1.54	529	0.43
0.15	3.50	2.31	353	0.65
0.20	4.66	3.08	265	0.87
0.25	5.83	3.85	212	1.09
0.30	6.99	4.62	176	1.30
0.35	8.16	5.38	151	1.52
0.40	9.32	6.15	132	1.74
0.45	10.49	6.92	118	1.96
0.50	11.66	7.69	106	2.17
0.53	12.35	8.15	100	2.30
0.60	13.99	9.23	88	2.61
0.65	15.15	10.00	81	2.83
0.70	16.32	10.77	76	3.04
0.75	17.48	11.54	71	3.26
0.85	19.81	13.08	62	3.70
0.89	20.75	13.69	59	3.87
0.90	20.98	13.85	59	3.91
0.95	22.14	14.62	56	4.13
1.00	23.31	15.38	53	4.35
1.10	25.64	16.92	48	4.78
1.20	27.97	18.46	44	5.22
1.30	30.30	20.00	41	5.65
1.40	32.63	21.54	38	6.09
1.50	34.97	23.08	35	6.52
1.60	37.30	24.62	33	6.96
1.70	39.63	26.15	31	7.39
1.80	41.96	27.69	29	7.83
1.90	44.29	29.23	28	8.26
2.00	46.62	30.77	26	8.70
2.10	48.95	32.31	25	9.13
2.20	51.28	33.85	24	9.57
2.30	53.61	35.38	23	10.00
2.40	55.94	36.92	22	10.43



# GUARANTEE

## **FLEXEL INTERNATIONAL LIMITED**

FLEXEL CEILING AND UNDERFLOOR HEATING ELEMENTS ARE SUBJECT TO THEIR

### **NATIONWIDE 10 YEAR GUARANTEE**

Valid from the date of installation, these products are guaranteed to be free from defect in material and workmanship for a period of 10 years. If during this period the products are found to be defective, either elements will be repaired or replacement materials will be supplied to the approved agents (at the manufacturer's discretion). Such repair or replacement will be free of charge (save in respect of any re-installation costs).

This GUARANTEE requires: -

1. That the product has been installed only under the direct supervision of this manufacturer's appointed agents, and in accordance with the manufacturer's published instructions, using only specified fixing methods.
2. That the elements have been connected to suitable electrical supply in accordance with the current electrical regulations applying, to the intended supply voltage and using only control systems that have been supplied or approved by **Flexel**.
3. That on completion of the installation, the required INSTALLATION TEST documentation is completed, in full and held by the appointed agent for the duration of the guarantee. This information must also be made available to the manufacturer at any time.
4. That the elements have not been modified repaired or used in a way or for a purpose for which they have not been designed.
5. That in the unlikely event of any faults occurring in the installation, these failings are first reported to **Flexel** for investigation.
6. That all terms and conditions stated on invoices and quotations from **Flexel** are adhered to. All associated equipment also supplied by **Flexel** will be subject to their specific manufacturers standard terms and conditions of guarantee and cover from the date of supply a period of 10 years for underfloor heating cables and 1 year for controls.

This guarantee does not affect the purchaser's Statutory Rights.

**Flexel International Ltd.**, Queensway Industrial Estate, Glenrothes, Fife, Scotland. KY7 5QF  
Tel. 1592 757 313 Fax 01592 754 535

April 2001.