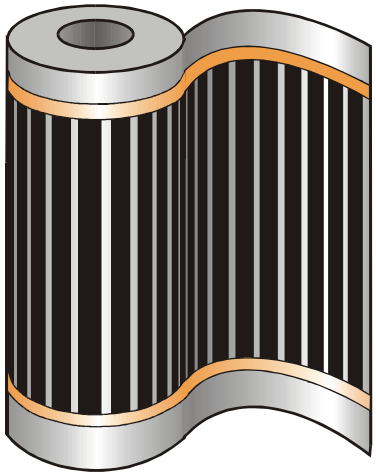
FLEXEL the proven radiant heating system (since 1965)

UK Ceiling Heating Installation Instructions

INTRODUCTION

The **Flexel** Heating Element

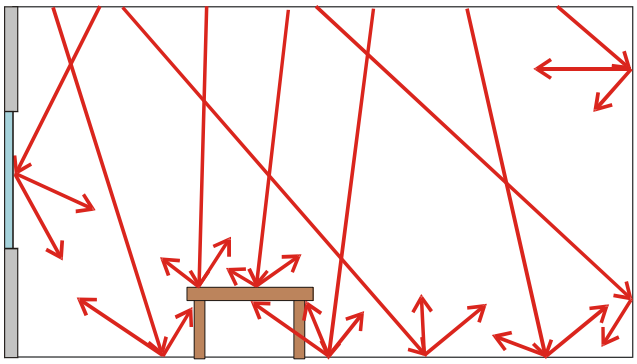
The principle of **Flexel** heating elements is based on a continuous resistive sheet providing heat uniformly over the entire surface areas.



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 stapling to ceiling joists.

For ceiling heating installation, elements are normally supplied at an output of from 140 W/m² to 200 W/m² over the heated area of element and supplied in standard overall widths of 400mm, 450mm and 600mm (16", 18" and 24") to accommodate standard joist centers. Other widths and outputs are available on request.

Low temperature Flexel ceiling 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.



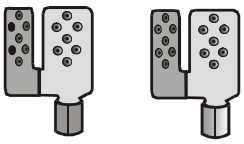
INSTALLATION PROCEDURE

Before commencement of installation always check on the following:

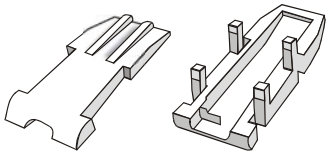
a) The building is weather tight, and that the glazing and doors have been fitted.
b) Any floor screeds, asphalt etc. above heated ceilings have been laid and allowed to dry out.
c) All electrical first fix wiring and other mechanical services through ceilings have been completed. No cables must be allowed to come into contact with the **Flexel** heating elements.
d) Joists, battens and cross noggins (where fitted) have been positioned at accurate and agreed spacing.
e) A minimum of all the following tools and components are available.

Equipment required for installation

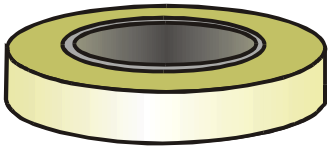
Components



Connectors
Use only the AMP “Termifoil” 330716, supplied by **Flexel**

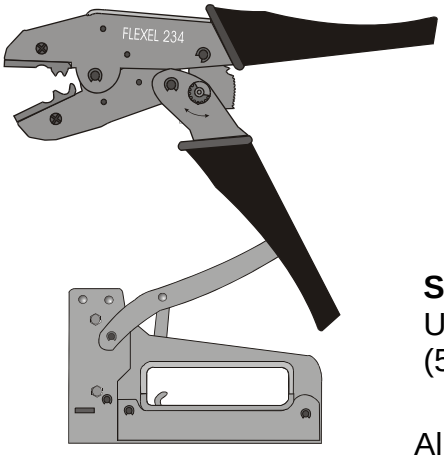


Connector Covers
Use only **Flexel** “t” type connector covers with additional securing cable ties



Tape
Use only the clear 150C, rated polyester tape supplied by **Flexel**

Non Heating Leads
Use only 1.5mm² **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.

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

All the above equipment (NOT stapler) is available through **Flexel International Ltd**

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; steps and where necessary suitable ancillary lighting for working in roof spaces etc.

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

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

1.5mm² cable is used for making up the wiring harness. 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 handle ability properties.

Flexel heating elements are designed to accommodate a maximum current carrying capacity of 10 amps.

Consideration must be given by the Electrical Contractor in respect of the individual ceiling heating circuit ratings relative to thermostat rating, circuit breakers and the need for switching contactors where time clock control is incorporated. Normal good wiring practice must be observed and the wiring must comply with the I.E.E. 16 Edition regulations.

Holes for carrying the cables must be drilled at least 50mm below the top of the ceiling joists where the cables cross over joists which would support floorboards, the cables must be positioned so that they can not come into contact with any heated part of the element. It is recommended that all main distribution boards incorporate an RCCB device. Check that the total specified length required is easily installable against the joist layout. Allowance must be made to ensure that a minimum distance of 12mm is maintained between the edge of the copper electrode and joist or battens and a gap of at least 150mm on either side of electrical fittings, noggins or other transverse obstructions.

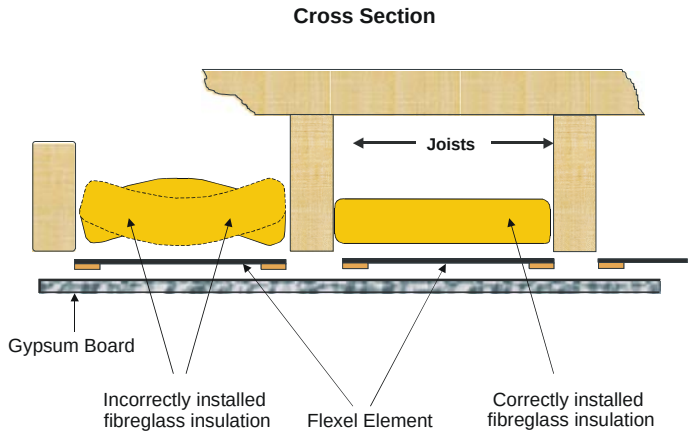
Consult with the builder regarding possible ceiling access traps, partitions, full height cupboards or false beams that may be fitted after the Flexel installation has been connected.

Thermal Insulation.

This will normally be glassfibre or mineral wool quilt and be 80mm or 100mm thick to intermediate ceilings and 150mm or 200mm thick in roof spaces. Polystyrene based materials must not be used. Where 50mm x 50mm battens are fitted below a beamed floor this insulation may be reduced to 60mm thickness. **Foil faced material should not be used next to the heating element** be it to form a vapour check or as part of the insulation.

Vapour checks should only be used where considered absolutely necessary. But where specified by the architect, these must cover the entire room with joints overlapped and taped, and are best provided in the form of a clear polythene membrane, positioned between the **Flexel** ceiling heating elements and the ceiling board.

The insulation quilt should be positioned to lie firmly onto the **Flexel** element so as to minimise the air space between the element and the insulation.



In some instances, insulation can be installed after the **Flexel** elements have been fixed, for example in the roof space in bungalow type constructions or pitched roof two storey dwellings.

When positioning insulation in the roofspace, care must be taken not to block the eaves opening, thereby restricting ventilation into the roof void. All heated and unheated areas of the ceiling must be suitably insulated.

Element Preparation and Installation

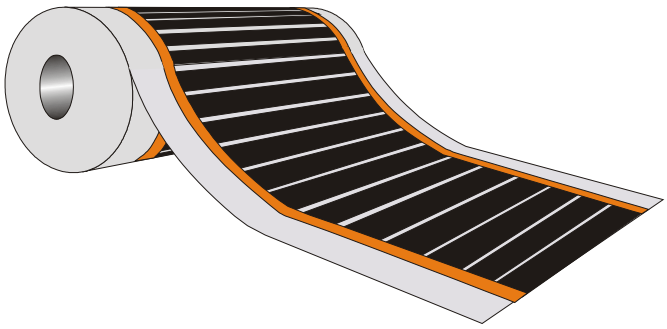
Element layout drawings are not normally required for **Flexel** installations, thus enabling elements to be cut and fixed on site to accommodate last minute alterations to joist and service layouts. Firstly check that the element identification printed on the clear edge selvedge complies with the grade required for the installation. Within the United Kingdom unless clearly otherwise stated on the **Flexel** Installation Test Certificate this will be 230 volts.

40 Watts/ metre for **300** mm joist centers. (Active heating width of 200mm).

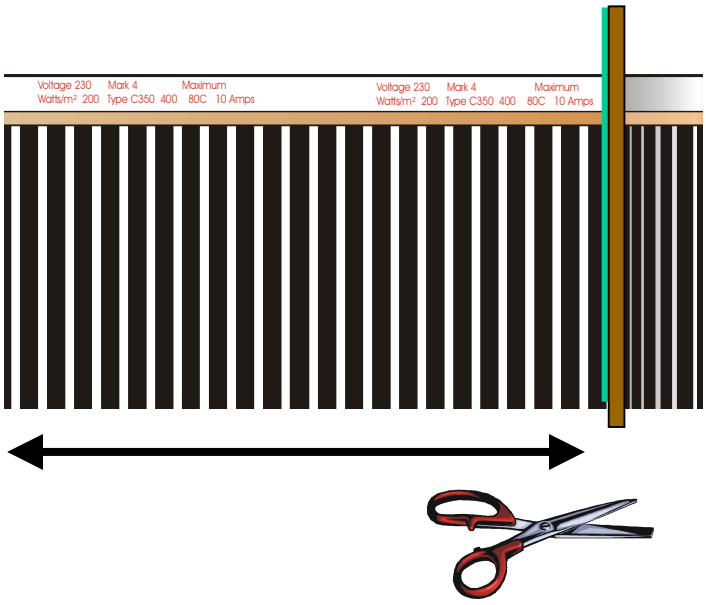
60 Watts/ metre for **400** mm joist centers. (Active heating width of 300mm).

66 Watts/ metre for **450** mm joist centers. (Active heating width of 350mm).

100 Watts/ metre for **600** mm joist centers. (Active heating width of 500mm).



Although all **Flexel** is visually inspected at the factory before dispatch, the elements should be checked to ensure the element has not been damaged in transit or on site. Look for creasing or folding, any such damaged areas must be discarded.



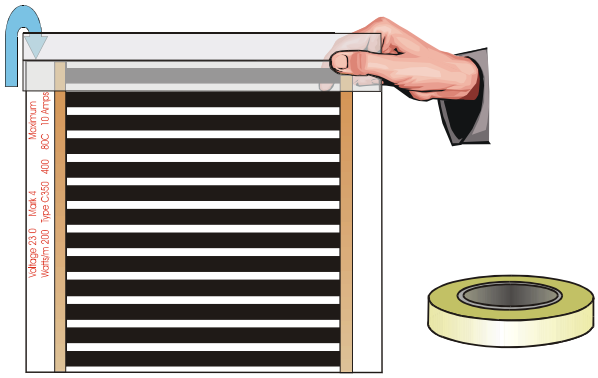
Unroll the element on a clean working surface and check for any damage.

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

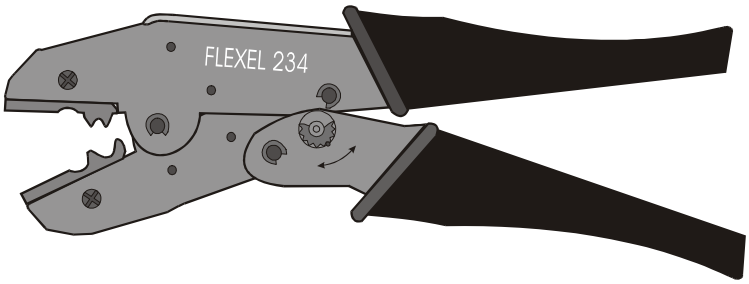
Using a straight edge cut the elements to length using scissors or a sharp knife.

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.

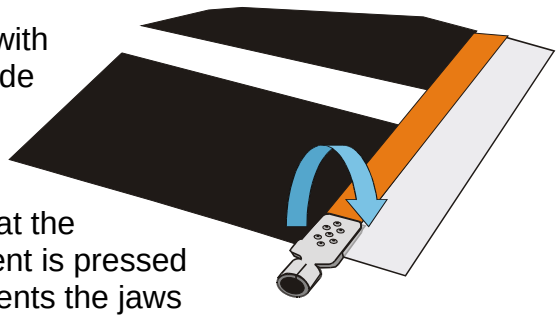


Before fixing the crimp connectors check that the **Flexel** Crimping tool is correctly adjusted to the required 1.25 - 1.40mm (50-55 thou.) gap when fully closed. If adjustment is required:



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.

Using only the **Flexel 234** crimping pliers supplied attach the 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 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. Normal pliers must not be used for this operation as crimps fitted in this way may overheat due to high contact resistance.

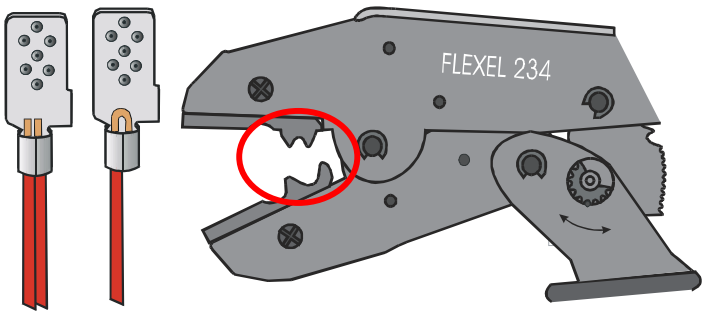


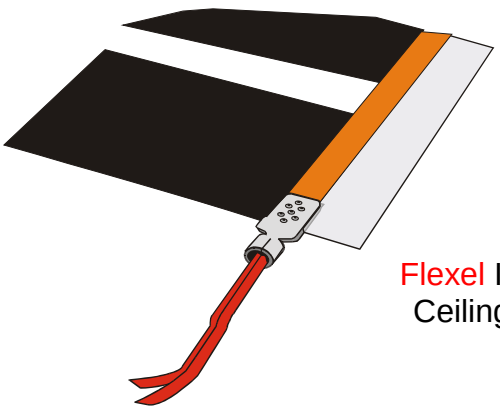
Safety Hat and Safety Glasses must be worn at all times

Elements should be fitted with the copper conductor strip facing downwards and care must be taken to ensure that only the clear selvedge cover is in contact with the joists and must maintain a minimum 12mm clearance from the element. Position the crimped end of the element close to the wiring harness to allow fixing of cold tails. Staple element to joist on one side through the clear fixing edge and unroll approximately 1 metre in order to align direction. Unroll element, stapling both sides at spacings of approximately 40cm (16") keeping the element taught and smooth to prevent any creasing.

Attach cold tails (wiring harness).

Bare connecting leads and insert singly 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 over to give the same volume of cable to be crimped.

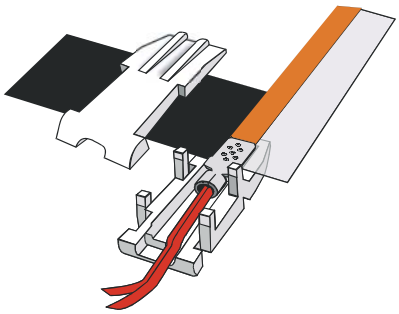




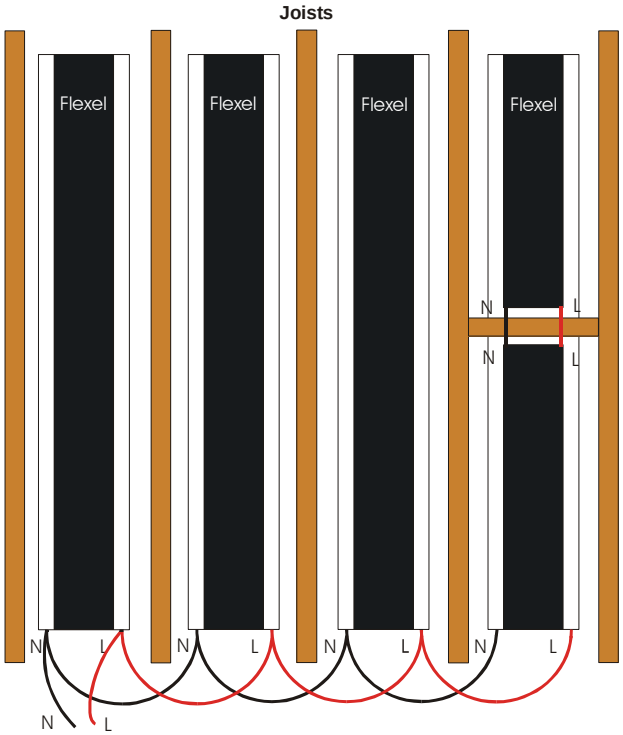
Using the recommended "**Flexel 234**" pliers complete the crimp connection with the tool so that the "W" form of the tool is to the seamed side of the cylindrical ferrule of the crimp.
If crimped in reverse the crimp cover may not fit.

Fit the Crimp Covers.

When connection has been made to each individual element, **Flexel** plastic crimp covers MUST be fitted to insulate each crimp connection. Supplied in two halves, the open end allows access for the conductor wire to the crimp and the two small pegs locate in mating holes when closed with finger pressure. Finally secure a cable tie securely around the crimp cover.



Installation from above



In certain cases where access to the ceiling is available, **Flexel** elements can be installed from above. Where cross noggins, light fittings or other obstructions occur, the element must be bridged as shown, in the illustration on the left. A minimum 150mm space either side of any obstruction must be maintained.

If not already supplied at the pre-defined width, the stapling border can be trimmed back along either side. Do not cut the border closer than 12mm from the copper electrode. Ensure that the area in which the elements are to be laid is free from debris and any sharp objects that may puncture the element. Staple the element to the ceiling board.

Testing Procedure.

In order to protect the **Flexel** elements, ceiling boards should be installed immediately after the heating elements are installed. Before this and referring to the Installation Test Certificate a cold resistance test should be carried out at each thermostat position using an accurate ohm meter. This should be recorded and if within the tolerance of +10 -5% can be taken as correct. Recheck the individual circuit loads do not exceed 2.3 Kw (10 Amps).

A further continuity and insulation test must be carried out by the electrical contractor after erection of the ceiling board and decoration. It should be noted that in the presence of damp ceiling boards, temporary low capacity impedance created by the **Flexel** element may give rise to low insulation readings. This will clear by allowing the ceiling boards to dry out naturally.

15). Finally before leaving site.

RECOMMENDED LABELS

To be stored adjacent to the main distribution board

WARNING

THIS BUILDING IS FITTED WITH **FLEXEL** ELECTRIC CEILING HEATING PANELS

Disconnect all heating circuits from electrical supply before entering the roof space.

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

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

IF ANY FIXING THROUGH THE CEILING IS NECESSARY CONTACT THE MANUFACTURER FOR GUIDANCE

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

Distributor:

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 manufacture'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

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