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Installation Information

devifoil™ Ceiling Heating

DEVI™

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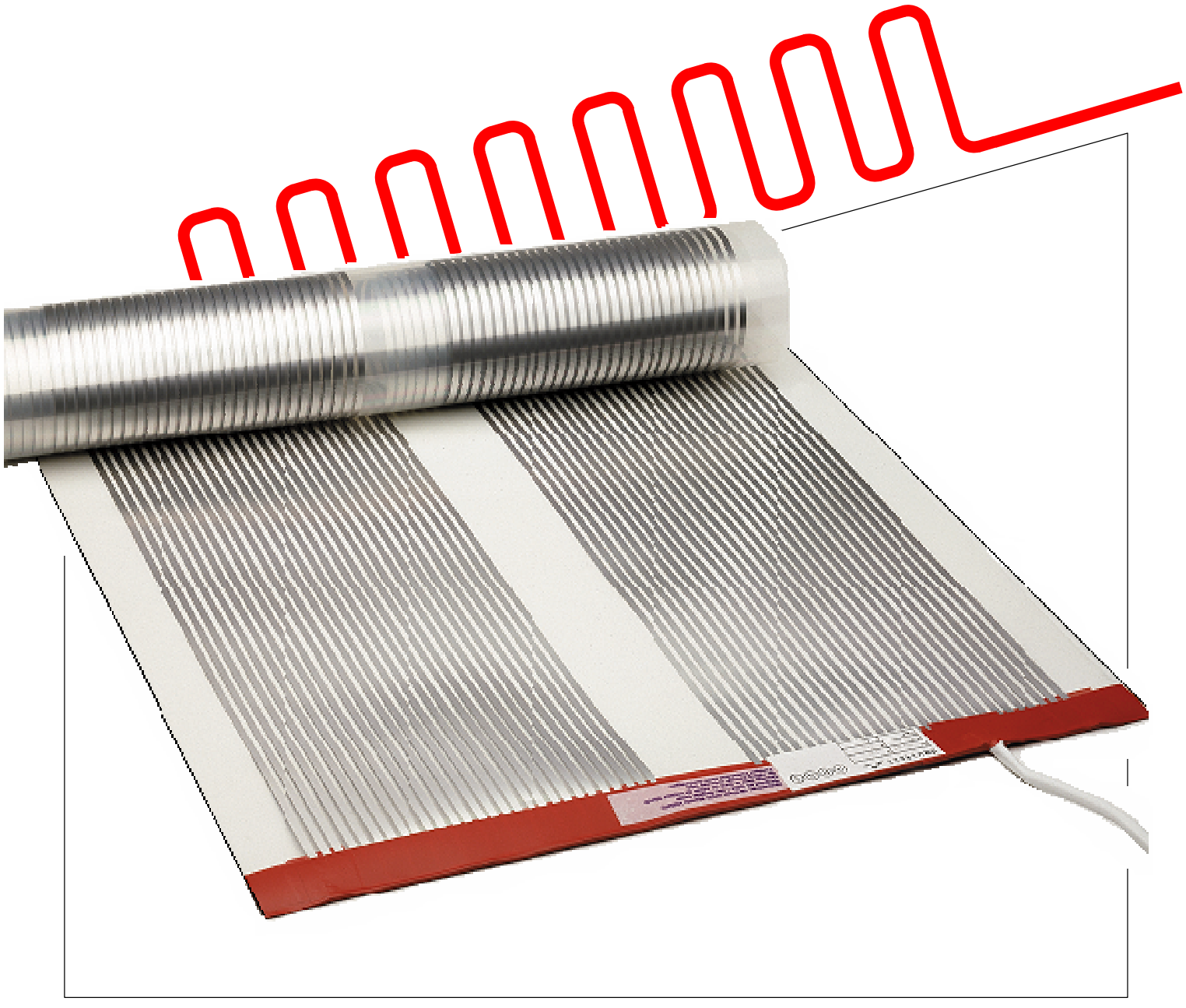


Description

devifoil consists of a thin metallic film, sandwiched between two layers of a transparent high temperature plastic. The metallic film is designed to open circuit below the melting point of the plastic laminate.

devifoil is manufactured in standard lengths, widths and loadings and come complete with cold tail connections and labeling identification.

The standard range of elements shown below are 160W/m^2 at 240V.

Stock Code	Width	Length	Output (Watts)
98931009	0.3 M	1.65 M	82 W ★
98931041	0.3 M	3.30 M	165 W
98931074	0.3 M	4.10 M	200 W
98930613	0.6 M	0.80 M	79 W ★
98930605	0.6 M	1.05 M	105 W ★
98930621	0.6 M	1.35 M	134 W ★
98930639	0.6 M	1.65 M	165 W
98930662	0.6 M	2.05 M	205 W
98930696	0.6 M	2.30 M	225 W
98930720	0.6 M	2.70 M	265 W
98930753	0.6 M	3.10 M	305 W
98930779	0.6 M	3.50 M	345 W
98930803	0.6 M	4.00 M	390 W
98930837	0.6 M	4.60 M	460 W

Stock Code	Width	Length	Output (Watts)
98930002	0.4 M	0.95 M	63 W ■
98930001	0.4 M	1.50 M	100 W ★
98930035	0.4 M	1.95 M	128 W ★
98930068	0.4 M	2.50 M	165 W ★
98930092	0.4 M	2.95 M	195 W
98930126	0.4 M	3.40 M	225 W
98930159	0.4 M	3.90 M	255 W
98930183	0.4 M	4.60 M	305 W
98930217	0.4 M	5.00 M	330 W
98930241	0.4 M	6.00 M	396 W
98930242	0.4 M	8.60 M	568 W
98930902	0.8 M	0.75 M	99 W ★
98930969	0.8 M	1.25 M	165 W ★

★ Series Elements 120V each
■ Series Elements 80V each

NB A 240V set would consist of 2 x 120V or 3 x 80V Elements.

Design and layout

The devifoils can be placed in the ceilings or walls maintaining a minimum of 2.3M above floor level. The foils can also be placed in a sloping ceiling with a minimum of 2M above floor level and with a maximum slope of 45°. The foils may also be built into seats in churches.
A heat load assessment for each heated area is carried out before installation, with approximately 70-80% of the ceiling being covered by heating elements. If the ceiling heating is to be used in conjunction with another heat source, for example; off-peak floor heating, then only 50-60% of the ceiling would be covered.
When planning the layout for a devifoil installation particular notice should be taken to ensure a clear space of 100mm is maintained from all ceiling fixtures such as light fittings, sprinklers, ventilation ducts, cupboards, shelves or any other fixtures that are in contact with the ceiling.

Installation

General

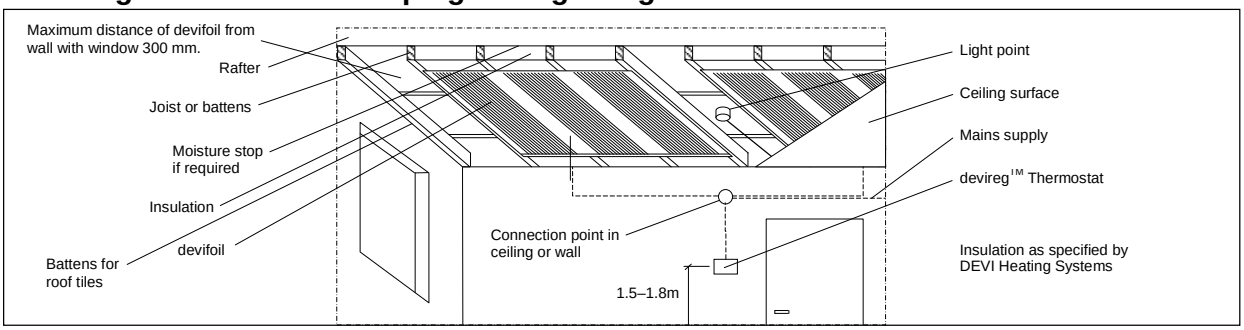
devifoils are only available in 400mm or 600mm widths, all roof trusses, battens or furring channels must be spaced at 450mm or 600mm centres. The following notes assume that the installation will be over 10-16mm plasterboard. Although not limited to this surface, it is suitable for installation over other materials, you should first consult DEVI for information regarding suitability of other materials and any special precautions.

1. The heating units should be installed in direct contact with the continuous flat surface of the ceiling material and be so arranged to prevent any folding, creasing or puckering of the units adjacent to ceiling joists and the like, avoiding contact with existing wiring, lighting fittings or points or any other structural members forming part of any other service, such as water pipes, gas pipes etc., and Telstra Australia cables. In each case, there shall be a minimum clearance of 6mm between any part of the devifoil and joists or other obstructions.
2. If a vapour barrier is required it should not be installed until after the heating system, and all wiring is complete. The barrier must be of a high temperature non-conductive type e.g., Plastic Sheeting.
3. The devifoils should be carefully installed to ensure that they are not damaged during installation. The devifoils must not be creased.
4. Note that Australian approval requires that a warning tape is used in any accessible ceiling space above the devifoils.

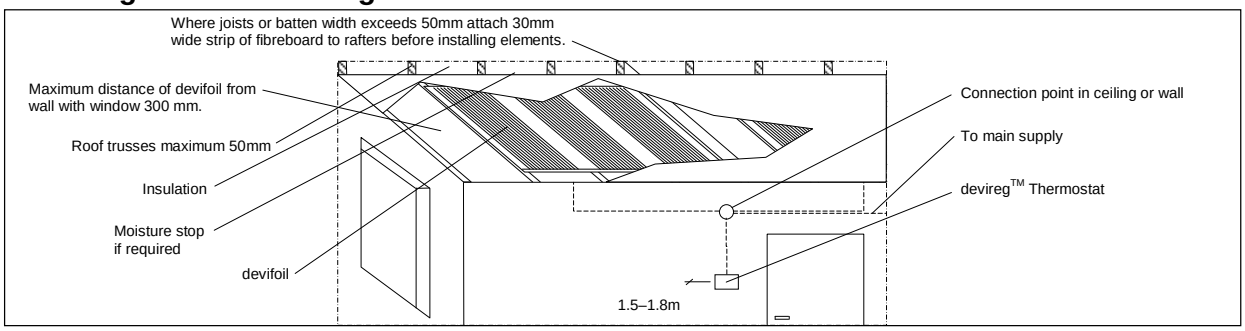
Insulation

Only non-combustible, non metallic thermal insulation must be used, preferably batt type products having a thermal resistance as recommended by DEVI Heating Systems.
The insulation must be fitted so that it is in full contact with the devifoils, ensuring that there are no air gaps, as this can severely affect the efficiency of the system.

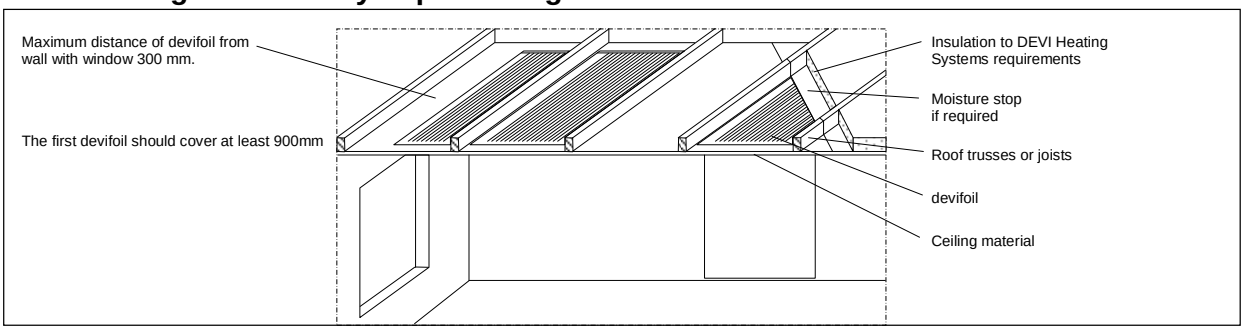
Installing from below for sloping ceilings – figure 1.



Installing from below – figure 2.



When ceilings are already in place – figure 3.



Installing from below – see figures 1 & 2

- Installation of the devifoils should take place as late as possible. The building should be airtight with all windows and doors in place. The ceiling material should be installed without delay, to avoid the possibility of damage.
- When installing from below the building should be pre-wired with all lights, air conditioning ducts, speakers etc. in place. The insulation batts must be installed by friction fit between the ceiling joists or using a string line to hold the batts in place.
- The devifoils must be fixed only through the fixing areas. They must never be fixed through the metallic area or through the tape covering the connecting end. The battens or roof trusses to which the foils are fixed, must not be wider than 50mm so that the metallic film can not be compressed between the ceiling and the battens.

When fixing to timber

The devifoils are each stapled first at one end, then carefully unrolled without kinks and stapled through the non-heating edge support strips to the roof trusses or battens before the ceiling material is fixed. The devifoils must be fastened as smoothly as possible without wrinkling or stretching.

When fixing to metal furring channels

Double sided tape is first placed on the furring channels, the devifoil is then unrolled without kinks and pressed against the tape ensuring that the element is installed parallel and square to the furring channel.

When ceilings are already in place – figure 3

devifoil is also designed to be installed from above after the ceiling material is installed and before the insulation is in place, such as in retro-fits and renovations, or in new installations where it may be the easier method of installation. In all cases the following points must be observed.

- Any existing insulation must be removed.
- Sweep the surface, removing any foreign objects such as nails and lumps of plaster.
- Check for protrusion of any nail points missing the plasterboard supports.
- Check that the underside of all heated areas is unobstructed and not over cupboards.
- The building should be pre-wired with all lights, air conditioning ducts, speakers etc. in place.

devifoil should always be rolled out completely flat over the ceiling. If the distance between the ceiling joists is a little less than the width of the devifoil, some of the edge fixing area of the devifoil may be cut away before installing. The cutting away of the edge fixing area must

be done carefully to avoid damaging the metallic area of the devifoil.
The devifoils must be taped or otherwise secured to the surface of the ceiling so that they cannot roll back before the thermal insulation batts are laid. Insulation over the devifoil should be close fitting to avoid air circulation above the devifoil. Non-combustible non-metallic batt type insulation material must be used. Since the current carrying capacity of any existing wiring will be adversely affected if influenced by the heating, re-clip any such wiring closer to the top of the ceiling joists or beams, to ensure it is above the height of the thermal insulation covering the devifoil.

Ceiling materials.

As the heat produced by the devifoils is transferred through the ceiling material by conduction, only ceiling material with a sufficient heat conduction capacity should be used for covering the devifoil, as the temperature of the devifoil depends on the thermal resistance of the ceiling material. The higher the resistance (that means the more the ceiling material insulates), the hotter the devifoils get.
The thermal resistance of the ceiling material must not exceed the highest advisable value as recommended by DEVI Heating Systems. Avoid therefore porous ceiling materials with a high insulation resistance. Only dry materials should be used as faults or problems may occur if the materials used have too high a moisture content or have not been installed in a professional and tradesman like manner.

Joints

- Plasterboard **must** be fitted to Australian Standard AS/NZS 2589.1 (1997) and AS/NZS 2589.2 (1997) – 'incorporating the back blocking technique and paper taped joints.' Control joints must be used where required and installed to the plasterboard manufacturer's recommendation.

Painting

- When painting you should use plastic based paint, eg. acrylic paint.
- The ceiling material must be fully dry before starting to paint.
- The ceiling heating system must be off before painting, and should not be turned on until the paint is dry.
- It is also recommended to protect thermostats when painting.

Electrical requirements

Under no circumstances shall the devifoils be placed where the general installation wiring could be trapped between the devifoils and the insulation. If this situation arises then the wiring must be re-routed before the devifoils are installed.

In all instances, the installation of circuit wiring used to supply and interconnect heating units must be undertaken by a Registered Electrical Contractor and carried out by a Licensed Electrical Mechanic. The system shall be installed in accordance with the manufacturer's installation instructions and shall be in accordance with SAA AS3000 and any State Electricity Authority requirements.
The devifoils come complete with 1 metre of 1.5mm PVC sheathed cold tails which must not be stretched as damage may occur at the connection point. The cold tails are to be connected to the circuit wiring with a junction box, with the PVC sleaving being extended into the junction box.
All junction boxes and circuit wiring must be away from the devifoils. Heated zones having a circuit loading within the capacity of the devireg™ room thermostat may be directly switched. In other cases, each circuit supply should be switched via a contactor, with the devireg™ room thermostat being used to switch the contactor.
Before the ceiling materials are installed the following tests must be completed:

All devifoils must be tested with an Ohms Meter – the readings noted to ensure that they correspond with the designed load.

The installation should also be tested with a 1000V Insulation Tester to ensure that there is no leakage to earth.

When power is available the devifoils should be energised to ensure that they warm up.

The system should be tested again on completion of the installation of the ceiling materials.

An approved residual current device having a maximum earth leakage current of 30 mill amperes shall be included in the circuit supply, the relay should be mounted on the switchboard and suitably labeled. The operating voltage and the rating in amperes or the loading in watts of the heating units supplied from a final sub-circuit shall be permanently and indelibly marked on the control panel and/or adjacent to the switchboard from which the final sub-circuit originates. The wiring of the electrical installation shall not be subjected to temperature in excess of the temperature rating of the insulation of such wiring. In this regard, the thermal insulation material used to enclose the heating units must not cover the installation wiring. Where the heating foil is laid directly in contact with a metal ceiling, the metal must be effectively bonded to an earthing conductor.
If the devifoils are over any metal channels then these must be bonded to the earthing system.

Controls

The use of devireg™ 132, 532 or 535 Probe/Air Thermostats is essential – this enables the ceiling temperature to be regulated to a maximum of 42°C as per plasterboard manufacturer's recommendations. The resistive end of the sensor probe should be positioned in the ceiling space in hard contact with the ceiling material (between 1 of the devifoils & the plasterboard), and not in direct contact with the metallic heating film of the foil. That is, it should be located along the blank edge of 1 devifoil, thus measuring the surface temperature of the ceiling material, rather than the operating temperature of the devifoil.