



ukwarmfloor.com

the intelligent heating system

## PRODUCT INFORMATION

EPWarmfloor is a low-cost, energy-efficient, maintenance-free heating system developed in Norway to meet the needs of our eco-conscious world.



Ease of installation, self-regulating temperature control and a safe 24 volt delivery makes the product unique.

Low voltage, no maintenance costs, energy-efficiencies afforded by the self-regulating system and the fact that the entire surface of the element is heated, all combine to make it the system with the lowest running costs on the market today.

More than 20 years of continuous research & development have ensured that the advanced technology is durable and easy to use. EP warmfloor has been tested by several international laboratories and is approved for installation even in damp and wet rooms in accordance with normal building practices and regulations. Installation is simple enough to be carried out by any proficient person, although the mains electrical connections must always be done by a certified electrician.

### THE EP WARMFLOOR SYSTEM

The carbon polymer Warmfloor elements are only 1.2 mm thick which makes them easy to fit to existing floors with the minimum of upheaval.

Rather than wires, it is the carbon polymer itself which conducts the current. This means that heat is distributed evenly across the entire surface, making for higher efficiency and easier installation.

Each 34cm wide carbon-enriched polyethylene element has copper braid embedded along both edges to carry the current freely along the entire length, but the flow across the polymer itself is self-regulating. Basically this is because the composition of the carbon polymer is designed so that as the temperature increases, so does the resistance within the mat, which reduces the current flow. This is what produces the self-regulating effect that makes our system so efficient.



## EFFICIENCY

The self-regulating effect of the 'intelligent' carbon polymer means that every section of the element acts as its own thermostat. So every part of the floor is always maintained at the optimum temperature with the minimum use of energy. This nanotechnology (known as Positive Temperature Coefficient) is what makes EPWarmfloor the most efficient electrical heating system in the market today.

### WHAT DOES THAT MEAN?

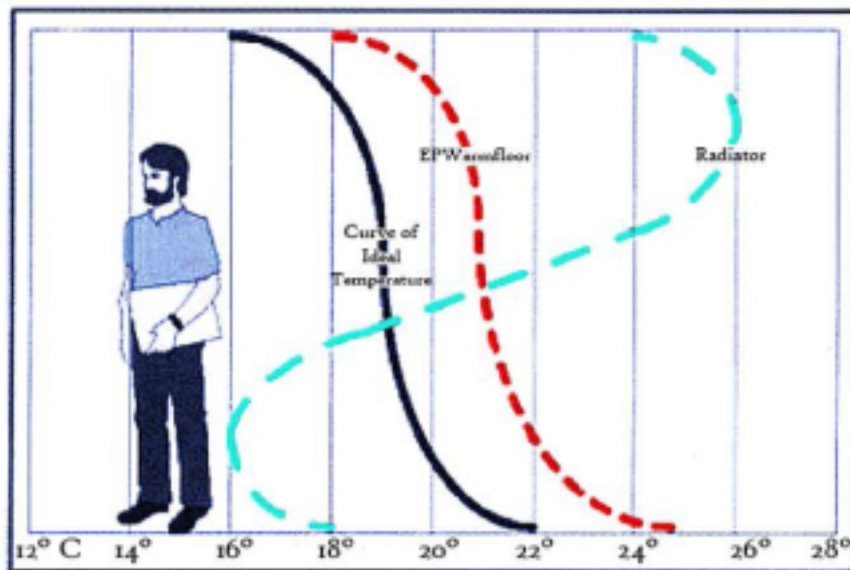
Basically, when the temperature increases in one area the resistance in that area also increases and so the flow of electricity decreases. And of course the reverse is also true - when the temperature of a particular area decreases, then resistance decreases and that area automatically draws more energy to maintain the original temperature.

Not only does this mean that the system always operates with the most efficient energy consumption but it can NEVER overheat. It is impossible to have hot spots within the system as each individual part of the element acts independently of the rest.

So a patch of floor in strong sunlight will automatically draw less energy than a patch of floor in a cold draught. This self-regulating effect gives our system a huge advantage in terms of efficiency of energy usage.



### REGULATED TEMPERATURE



When connected to a 24 Volt supply, the element heats automatically to approximately 27° C giving a floor surface temperature between 25° & 26°C, maintaining a healthy warm temperature within the room with the lowest use of energy.

This gives room temperatures of 22—23 degrees around the feet area and 19°C around the head, which is considered to be the ideal working and living environment. Our research indicates that a floor temperature of approximately 25°C legrees suits most people today.

Different types of heating sources have variable energy efficiencies. A small heating surface (such as a radiator) needs higher a temperature than a bigger area (such as Warmfloor) to obtain the same result. The higher the temperature of the delivery system, the less energy efficient it is. Energy used directly as a heating source (such as Warmfloor) is the most efficient and effective method. There is no boiler to waste flue heat or water transmission wastage, and no cold areas between heated wires or pipes.

Because the whole surface of our elements produce heat, and that heat is directly conducted to the entire floor surface, in effect the whole floor becomes one ultra-efficient self-regulating radiator, automatically using the minimum amount of energy to maintain a constant set temperature.

Welcome to the future of heating.

## RUNNING COSTS



The Intelligent Heating System

**BASICALLY** the simplest way to work out the running costs on any electrical system is to multiply the number of square metres by the wattage of the element. So if we take a handy 10m<sup>2</sup> room as our example and multiply that area by the maximum of 70 watts per m<sup>2</sup> Warmfloor uses per hour we find that heating that room will use 700 watts per hour. (0.7 Kw.)

The current cost of electricity is about 10 pence per kW hour which would make the cost per hour : 0.7 x 10 pence = 7 pence per hour.

### **BUT NOW WE NEED TO FACTOR IN THE EFFICIENCY OF SELF-REGULATION**

The whole point of the Warmfloor system is that it is self-regulating, with each part of the elements only drawing the energy they need to maintain temperature, so those figures actually only apply to the initial warm-up period.

Once the element has reached it's running temperature, power consumption drops by up to 40% so to keep the whole floor of the room heated to a constant 26°C it would only be around 4.41p pence per hour.

### **BUT NOW WE NEED TO FACTOR IN THE EFFICIENCY OF THE KAPRON LAYER**

Every Warmfloor system includes our specially developed Kapron insulation board which we install beneath the elements to prevent downward heat loss and to actively reflect the heat upwards. Just 6mm of Kapron will produce a temperature increase of up to 8°C at a constant energy consumption.

Obviously, that means that the Warmfloor elements will need a lot less less energy to maintain temperature levels.

This is where it starts to become tricky to pin down actual figures for the reduction in running costs as performance will vary depending on the existing floor construction & insulation, and on all those annoying real-world factors such as size of windows and height of room etc. But when run in a test situation, in a room with controlled minimum heat loss, we have seen the running costs of a 10m<sup>2</sup> system drop to well below 1p an hour.

### **THERE'S ANOTHER HUGE FACTOR WHICH MAKES WARMFLOOR SO COST-EFFECTIVE**

When calculating the costs of running any heating system it is easy to forget the big expenses - the cost of initial installation, and the heavy year-on-year cost of maintenance, servicing & repairs.

Because our system is so thin, installation doesn't need any major construction work. No raised floor levels, no pipes or mains wiring to install - installation is quick and inexpensive, compared to every other form of heating.

And with no boiler, no pipes, nothing to corrode or leak or need repair, our system has absolutely NO ongoing maintenance costs whatsoever.

**EPWARMFLOOR HAS MEASURED SAVINGS OF 60 -75% COMPARED TO CONVENTIONAL UK HEATING**

**IT CAN REDUCE THE COSTS OF HEATING BY 40-60% COMPARED TO OTHER UNDERFLOOR HEATING SYSTEMS.**

**THE MOST COST-EFFECTIVE HEATING SYSTEM ON THE MARKET TODAY.**

## INDIVIDUAL DESIGN

To ensure the system will work at optimal efficiency, every installation is tailor-made for the individual room. Insulation standards, type & usage of room, number of outside walls, ceiling heights, position of windows & doors, direction of sunlight, climate etc. are all factors that affect energy consumption and are taken into account.

Once we have worked out the best layout plan for the room, the heating elements are cut to the desired length, clips mounted and a box containing all components are packed for the individual floor.



We supply all relevant instructions to install the system in the correct way, supplying an installation manual showing how to correctly lay the elements and make the required electrical connections and selections.

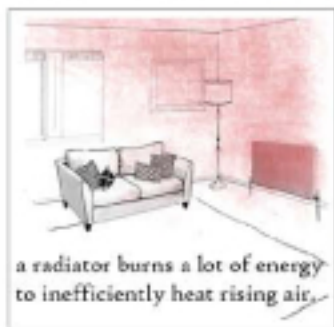
The system can be installed by any proficient person, but under UK regulations the mains electrical connections must always be done by a certified electrician.

## TOTAL HEATING

Warmfloor can be used as a total heating source with sufficient capacity to heat single rooms or the full house.

Normal total heating requirement for sub floor heating is 50 watts /m<sup>2</sup> in a living room. Warmfloor generates between 50 & 70 watts /m<sup>2</sup> (Radiators require double the wattage rating for the same size room)

A small heat source such as a radiator needs a higher temperature than a large heat source like Warmfloor to obtain the same result. The higher the temperature of a delivery system, the less efficient it is.



Central heating systems in the UK have traditionally used a small heat source to heat the air around itself.

Radiators, fireplaces, hot air vents etc., all suffer the same basic inefficiency.

The air they heat around them rises, so that the room tends to be warmed least in just those places where it needs to be warmed most.

By maintaining a constant temperature across the whole floor of the room, Warmfloor ensures that it is the actual living area which is heated, and does so with maximum energy efficiency.

In fact, using the whole floor as a heating source means that you can normally reduce the average room temperature by 2-4 °C and still feel the same comfort level.



## ANCILLARY HEATING

Warmfloor can also be used just to provide added warmth to an existing heating system or to warm a cold bathroom floor etc. By lowering the voltage or adapting the layout of the elements capacity can be reduced to 30-40 watts per m<sup>2</sup> for these situations, which obviously reduces running costs even further.

## INSULATION

The most important consideration when planning a heating system for any property is the efficiency of the thermal insulation of that property. We evaluate each system individually for optimum performance and the simplest possible installation method.

Up to 40 % of heat energy can be lost to heat up the substrate on a poorly insulated floor. On concrete floors in particular it is always beneficial to properly insulate below the Warmfloor heating elements to minimise this loss and to ensure a quicker heat response once turned on.

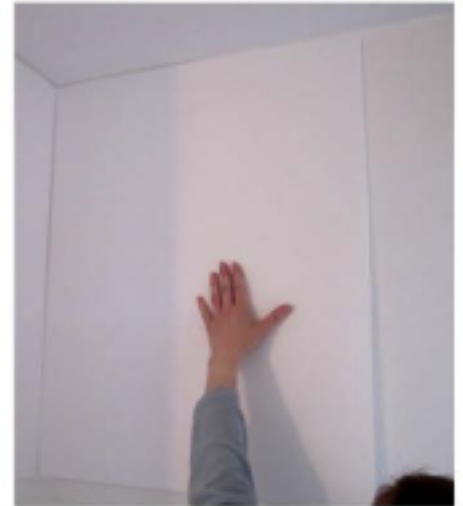
To solve this problem we have developed our own highly efficient, ultra-thin insulation material, Kapron Insulation Board.

### EP KAPRON SOUND & INSULATION BOARD

is extruded polystyrene sheet made of 100 % recyclable material and has a fine, closed cell structure that ensures lasting durability, protecting against draughts, damp penetration and mildew and also provides effective sound insulation.

A 3mm thick Kapron board has the same thermal insulation properties as 14 inches of concrete.

Its extreme thermal efficiency makes it ideal for use anywhere, even without a Warmfloor heating system, as insulation with 6mm Kapron board alone should produce a temperature increase in the room of up to 8°C at a constant energy consumption.



### FOR FLOORS, WALLS AND CEILINGS

Kapron be used in all buildings on internal and external walls, floors & ceilings in order to provide heat and sound insulation and protection against moisture, condensation, mould, and paint cracks.

Because it reflects heat it is, of course, ideal for use under the Warmfloor system, directing all heat upwards and warming the room more quickly. The low voltage Warmfloor elements can be fitted directly onto the Kapron board, and the board itself can be easily fixed to walls or floors using our solvent-free Kapron adhesive.

Its high compressive strength, thinness and ease of installation make it ideal for use under tiles or laminate flooring, and it is probably the very best parquet underlay to be found ! Despite being extremely light-weight, and easy to cut into shape, Kapron can carry any cladding or finishing material easily because of its inherent tensile strength capacity.



KAPRON is environmentally friendly & recyclable, being produced partially from recycled material itself.

100% non-toxic & harmless to people & animals, it is even approved for use in the food & medication packaging sector.

It contains no ozone-depleting substances and is accredited under ISO 9002 and is TÜV- and TSE certified.



## TEMPERATURE CONTROL

Normally the self-regulation in the EP element is sufficient in smaller rooms. The 'intelligent plastic' carbon-polymer elements ensure that the whole floor surface is kept at a constant steady set temperature.

With the system running at 24 volts, this is around 27-28°C, giving a floor surface temperature of about 26°C.

## ADJUSTING THE SELF-REGULATED TEMPERATURE



We can set this temperature higher or lower simply by raising or lowering the voltage at which the system runs.

So for instance, running at 28v the elements would automatically maintain a temperature of around 30 degrees.

This makes no difference to the safety of the system, as the elements can never overheat of course, because they self-regulate at the molecular level. They cannot get any hotter without the conductive carbon molecules expanding, resulting in reduced current flow.

Similarly, by lowering the voltage the set temperature can be lowered if required, which is useful in situations where a minimal permanent heating system is required.

The set temperature can easily be adjusted in this way by use of the voltage adjustment switch on the transformer.



## ADJUSTING INDIVIDUAL ROOM TEMPERATURES

In larger rooms or rooms with large sun facing windows, there may be significant temperature variation due to sunlight. In this case it is recommended that a thermostat is fitted. This will not only keep the temperature at a comfortable level but will reduce energy consumption.

## ADJUSTING HOURS OF OPERATION

Just as with most other central heating systems Warmfloor can be set to switch on or off as needed by setting times of operation on our programmable control units.

In most cases though it is often more economical to simply leave the system running, as the self-regulation makes it so economical that it can actually be more energy-efficient to just to enjoy the steady set temperature 24/7.

## HEALTH & SAFETY

All items within the EP Warmfloor system are fully EC approved where required. European regulations specify that electrical items operating at less than 50 volts AC (or 75 volts DC) are classified as extra-low voltage and safely under the terms of the Low Voltage Directive 2006/95/EC certification.



Even better, at 24 volts EP Warmfloor runs at less than half of even that qualifying value and is therefore super safe under any conditions, for children, pets or any animal, even in wet room areas.

## CREATES OPTIMUM HEALTHY LIVING CONDITIONS

According to medical research the optimum room temperatures for healthy living are around 22-23°C around the feet area and 19°C around the head, which is pretty much the opposite of what most conventional heating systems create. Warmfloor has been developed with creating these ideal conditions specifically in mind.

In some European countries the temperature on the floor in Kindergartens is required by Health Authorities to be between 18 and 26°C, while temperatures above 28°C are regarded to be a health risk.

## DUST, FUMES & ALLERGIES

Modern building and furniture materials contain many chemical ingredients. Heating systems using unregulated high temperature heat sources can release these as toxic fumes into the room space. EP Warmfloor's self-regulating temperature control ensures that the surface temperature of the floor areas are only 25-26°C - too low to trigger any heat related emissions.

Hot spot heating- from radiators or hot air vents will often cause nearby man made fabrics & materials to start to disintegrate. As they break up, these particles are taken into the air as dust and breathed in by the occupants of the room with resulting allergy issues. The growth in child asthma may well be in part due to this phenomenon. Once again, the self-regulation of the EP element ensures fabric dust cannot be created through overheating.

## RADIATION AND MAGNETISM

EPwarmfloor has low, safe radiation and magnetism values. For a technical detail sheet please contact us for more information.

## ENVIRONMENTALLY FRIENDLY

The EP heating elements are made of carbon-enriched polyurethane. The polymer is environmentally-friendly, does not release any toxic fumes and is sunlight biodegradable. In normal working conditions though the life-span of the elements is projected at 50+ years.

It can be recycled and used for other purposes and we do recycle all our cut-offs and waste. All materials used in the EP system are either water based products or can be recycled and are harmless to human beings and the environment.



Of course the main way that EPWarmfloor is friendly to the environment is that it is the heating system with the lowest energy-consumption on the market today, saving energy and money whilst still allowing an increase in comfort levels.

## TECHNICAL SPECIFICATIONS

**EPWARMFLOOR:** Floor warming system, low surface temperature, with self-regulation, to be run on 24 Volt. The system consists of the following parts:

**EP ELEMENT:** 1.2 mm thick and 340 mm wide to be cut to desired length. Polyethylene carbon enriched ("intelligent") with copper braid embedded in both sides for current connection.

Resistance changes with temperature self-regulating (PTC).

Supplied with self-adhesive underside along edges. Can also be supplied with full adhesive underside.

Heating Element Model: EP-342-2 24W-24V

Output Wattage (at 24 Vac): 7.8 W/ft (25.6 W/m) @ 68°F (20°C)

Nominal Resistance: 74 Ω/ft (23 Ω/m) @ 68°F (20°C)

Width: 34 cm Length: Cut to Order Thickness: 3/64" (1.2 mm)

**WIRE SECONDARY:** 2 x 1.5 or 2.5 mm<sup>2</sup> red/black type RKUB or equal, depending on distance and load from heating element to transformer.

**CONNECTING CLIPS:** Crocodile clips for 2.5 mm<sup>2</sup> wire. Crimped on the element by special tool.

**CONNECTING BOX:** on bigger installations we can use a connection box to collect all the wires. From the box to the transformer we use a 6mm<sup>2</sup> BASEC cable.

**TRANSFORMERS:** Safety transformer with galvanic split circuit according to the SELV directives. Extra fuses for safety and normally equipped with Voltages from 20 to 28 V. Normally we locate the transformer in a cupboard, under a staircase, or similar. We can also put it outside in a enclosure box if required.

Transformer: Safety transformer with galvanically split circuit:

EP-8135 135 VA toroidal core with switch 0-24-28 Volt

EP-8301 325 VA toroidal core with switch 0-20-22-24-26-28 Volt

EP-8480 480 VA iron core with connection for 24-28-31 Volt

EP-8960 960 VA iron core with connection for 24-28-31 Volt

## KAPRON THERMAL INSULATION BOARD

Thickness:	3mm	6mm
Density:	40 Kg/m <sup>3</sup>	35-40 Kg/m <sup>3</sup>
Thermal Conductivity:	0.035 W/mk	0.035 W/mk
U Value:	8.9Wm <sup>2</sup> K	5.1 Wm <sup>2</sup> K
Thermal Penetration Value:	0.086 m <sup>2</sup> K/W	0.17m <sup>2</sup> K/W
Water Vapour Resistance:	750	525
Water Absorption:	None	None
Sound Insulation:	16db	17db
Compression Resistance:	0.1N/mm <sup>2</sup>	0.1N/mm <sup>2</sup>
Tensile Strength:	1.3N/mm <sup>2</sup>	0.8N/mm <sup>2</sup>
Temperature Range in Use:	-60 to +70°C	-60 to +70°C

All items are fully EC approved in accordance with required safety regulations.

