



Radiant Heating Film
„Calorique“ (USA)

For floor, walls and ceiling.

Mirror defogging heating

INSTALLATION AND OPERATING INSTRUCTIONS



www.calorique.info

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The system Calorique® is a unique heating system that can be installed under all floor types, for example such as wooden floor, laminate, ceramic tiles, linoleum, parquet, carpet, and can be used as primary or secondary heating in built-in ceilings or behind mirrors.

The system includes sets of Calorique® foil panels with low temperature which are created for the optimal thermal comfort inside, hidden under floors and ceilings.

Operating Principle of the Panel Heating

The Calorique® heating system is a surface- and low-temperature heating with the functioning similar to this of the sun warmth.

Heating elements behind the ceiling or the floor radiate radiant heat exude a pleasant warmth you feel during a fresh spring day. The air is comfortably cool, while the radiant heat from the sun takes care of your well-being.

While the radiant heating is distributed in the space, objects get warmed and the air masses remain cool. It is not necessary to warm the air, since it is not really effective for space heating. This method differs from the traditional heating radiators and hot air heating systems, where the air is heated and the objects and outer walls remain cold. In the course of this, the cool objects withdraw the heat from the air which makes the temperature decrease.

Floor surfaces can be used as a giant radiator. Since the difference between the floor and room temperature is very low, the majority of the heat, in contrast to the conventional heat transfer through the air, is transmitted as infrared radiation heat in slow convention.

Dry and overheated by conventional methods air is poles apart from the comfort of gentle radiant warmth of a wall or floor. The Ministry of Construction and Living recommends the floor heating system as an ideal in combination with alternative energy sources.

Usually a temperature of about 24 ° C at the surface of the floor suffices even during times with very low outdoor temperatures to create a comfortable indoor climate. In addition to heating the room, the floor feels comfortably warm, but not uncomfortably hot in contact with skin or bare feet.

Before any control equipment, the heat output of the floor heating is regulated by a natural physical effect.

The heat output of the heating surface in the room is almost proportional to the difference between the temperature of the heating surface and the air in the room. The floor temperature of the floor heating in an insulated residential building during the heating season is in average about 22 ° C. As the temperature difference between the floor surface and the air in the room is almost insignificant, the power output of floor heating is automatically reduced. In reverse, a setback of the room temperature causes an increased heat output.

For example, if the temperature in the room with the floor heating set on 22° increases due to the solar radiation from 20 ° C to 21 ° C, the heating output will be reduced automatically by half. In reverse, lowering of the room temperature causes an increase in heat dissipation.

Through individual room control the temperature difference between the heating surface and the room is reduced. The lower the temperature difference, the better is the impact of the self-regulating – you will achieve the best results by combining it with individual room control.

This floor heating system does not only guarantee maximum comfort, but also takes care of the environment and of your purse.

The energy saving effect of the surface heating is based on its optimal temperature level: The floor temperature averages around 22 to 23 ° C. Even with temperatures ranging from minus 15 ° C, the floors with surface temperature of 24 ° C manage to provide pleasant warmth.

While with the surface heating the average temperature of the floor and walls is higher, the room temperature can be lowered down about 1° to 2°. And every degree of temperature reduction saves about 6% of energy.

The intelligent individual room control with a clock-thermostat also contributes to cost and energy savings.

The heating foil panel system is perfectly suitable for new construction or renovation. The thinness of the Calorique Heating system is especially beneficial for the modernization of existing rooms. By heating with the foil 99% of the energy will be converted into heat, just where you need it the most.

Advantages of the Foil Heating

Easy Installation

The installation of the heating foil is simple, does not take much time and does not require a specialist. The film heater does not need concrete painting and is the ideal solution in that case, if it is too late to apply a concrete coating (for example during redecoration). You can install the foil heater quickly and enjoy the comfortable warmth immediately.

Universal utilization

The foil heating system can be combined with any type of flooring material such as laminate, linoleum, carpet, hardwood, and tile. With this heating foil you can easily create comfortable warm floor anywhere in the house under any surface. The application of the heating foil is limited only by your imagination - you can install hidden heating behind the ceiling, heat your mirror in the bathroom or warm up a small rug beside the bed for your favorite pet.

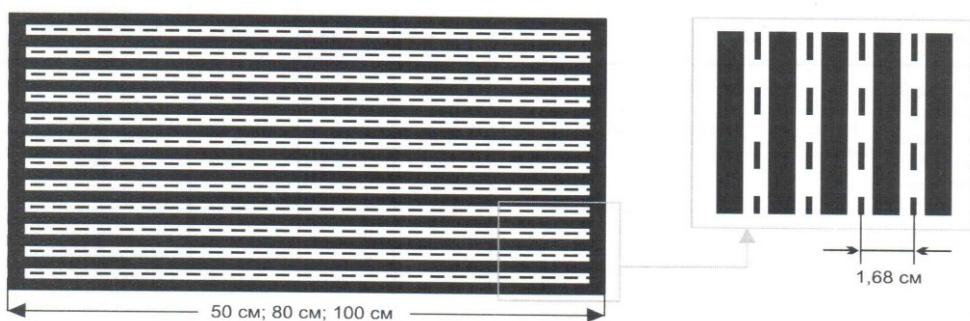
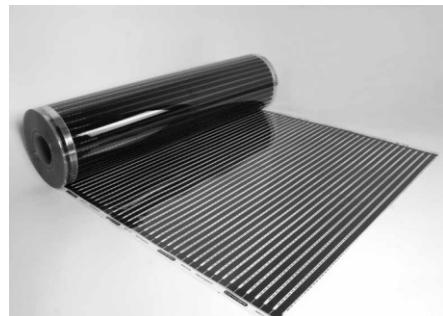
Reliability

The heating foil will not corrode, in case of mechanical damage; it is also possible to replace only the damaged part. The durability of the heating foil Calorique® is 30 years.

Technical data of the Calorique® Systems

The heating foil Calorique® is made of carbon heating elements, silver-plated contacts and copper bus bars, which are laminated with polyester film on both sides.

- Power Supply 220-240V
- Power density: 90 W/m²; 150 W/ m²; 220 W/m²
- measurements of the foil: 50cm; 80cm; 100cm
- width of the elements: 1,68 cm (60 elements per m);
- Components of the heating elements: carbon paste, silver; rails: tinned copper.



Picture 1

Article	Description	Width, cm	Output, W/m ² , 230V	Length of the roll, m	Panel max. Length, m	Floor type	Heating
US50-150	Radiant Heating foil	50	150	150	12	Laminate carpet Parquet Tiles Wood	Comfort heating; Main heating; Mirror defogger
US80-150	Radiant Heating foil	80	150	75	15	Laminate Carpet Parquet Tiles Wood	Comfort heating; Main heating; Mirror defogger
US100-150	Radiant Heating foil	100	150	75	11	Laminate Carpet Parquet Tiles Wood	Comfort heating; Main heating; Mirror defogger
US50-90	Radiant Heating foil	50	90	150	22	Laminate Carpet Parquet Tiles Wood	Floor- Main heating; Comfort heating
US80-90	Radiant Heating foil	80	90	75	25	Laminate Carpet Parquet Tiles Wood	Floor- Main heating; Comfort heating
US100-90	Radiant Heating foil	100	90	75	20	Laminate Carpet Parquet Tiles Wood	Floor- Main heating; Comfort heating
US50-220	Radiant Heating foil	50	220	150	9	All types of flooring with temperature Limitation; Tiles	Floor- main heating; Ceiling- main heating
US80-220	Radiant Heating foil	80	220	75	10	All types of flooring with temperature Limitation; Tiles	Floor- main heating; Ceiling- main heating
US100-220	Radiant Heating foil	100	220	75	8	All types of flooring with temperature Limitation; Tiles	Floor- main heating; Ceiling- main heating

Installation of the floor heating Calorique®

WARNING! Before installation, read the instructions carefully.

Important information

The installation of this product must be accomplished exactly according to the manufacturer's instructions

Before installation, read the instructions carefully. On our homepage www.calorique.info there is a video with examples of the system design for you to look at.

It is strictly recommended to let the electricity connection be installed by a qualified electrician. A RCD with fuse is required in circuit for protection against residual current or short circuit.

The film may not be installed under a temperature of 0 ° C.

Please check whether all materials, including laminate suit, vapor barrier and insulation for underfloor fit the heating system.

Do not twist, bend or damage the heating elements.

The heated surface shall remain uncovered; this means that no furniture without feet is allowed on the area of application. After installing a good visible sticker must mark the heating area: No drilling! No piercing!

Electric floor heating/ceiling heating!

Necessary tools and materials:

- A set of Calorique ® system (the heating foil and the accessories for each strip);
- Thermostat;
- Scissors, Pliers;
- Universal test device;
- Adhesive tape;
- An electrical cable with an internal wiring of at least 1mm²;
- Heat-resistant polyethylene film with a density of not less than 140g/m²;
- Heat-insulating material (polyethylene foam);
- Plywood panels (for installation under laminate, parquet, carpet, linoleum);
- Gypsum fiber boards (for installation under tiles);
- Clamps stapler;
- Furniture nails and screws.



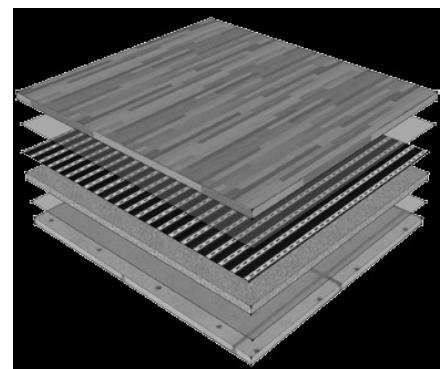
Picture 3

Picture 2

SETUP OF THE FLOOR HEATING

Laminate, parquet board, wooden board

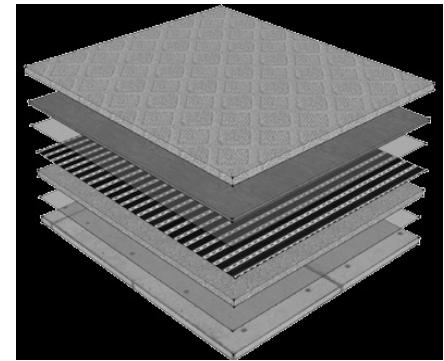
- Underfloor with no sharp elements such as nails, screws, etc.;
- Thermal insulation layer of foam material which is at least 3mm thick;
- Heating foil Calorique ®;
- Moisture barrier of polyethylene film;
- Alum foil protective shielding optionally;
- Laminate, Parquet board, wooden board.



Picture 4

Carpet, Linoleum, Parquet

- Underfloor with no sharp elements such as nails, screws, etc.;
- Thermal insulation layer of foam material which is at least 3mm thick;
- Heating foil Calorique ®;
- Moisture barrier of polyethylene film;
- Alum foil protective shielding optionally;
- Laminate, Parquet board, wooden board.
- Plywood boards, fiber plates evened out for the final layer;
- Carpet, linoleum, parquet.

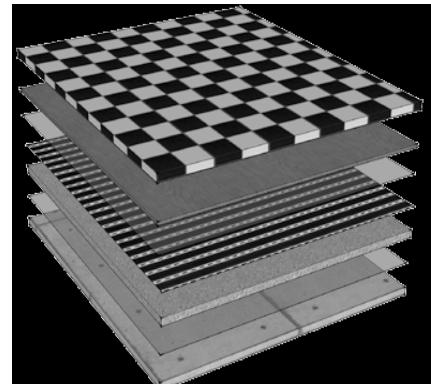


Picture 5

Note: If no furniture will be placed on the heated surface, the final layer can be directly applied on the heating film without requiring a layer of plates.

Tiles

- Underfloor with no sharp elements such as nails etc.;
- Thermal insulation layer of foam material which is at least 3mm thick;
- Heating foil Calorique ®;
- Moisture barrier of polyethylene film;
- Alum foil protective shielding optionally;
- Laminate, Parquet board, wooden board.
- Plywood, fiber plates evened out for the final layer;
- Tile Adhesive, Tiles.



Installation under tiles, laminate, parquet, linoleum, carpet

1. Determine the area and the shape of the floor that is supposed to be heated.

During the measuring one should take great care that there is no furniture or household appliances without feet on the heated surface. The panels of Calorique ® film should not be even partially covered by skirting boards, assemblies or other decorative pieces. The covering of heating strips can lead to overheating. The heat panels should be laid alongside the room in order to avoid frequent cuts and cable connections. Warm water pipes which are laid above the floor surface should

maintain distance of at least 50mm from the heating foil, making sure that this space in between is filled with thermal insulation material.

The distance between foil strips and heat sources should be kept at least 200mm. Heat sources meant here are for example heat conduction, chimney, fireplace, smokestack, oven, etc.

2. The preparation of the heating elements Calorique ®.

The heating film should be cut on the dotted line with scissors. It is prohibited to cut the film in a different way (picture 7).

Attach the connector clamps to the prepared foil strips. (Picture 8).



Picture 7



Picture 8

Attach the clamp with a pair of pliers, a hammer or a special clamping tool. Check the good hold of the clamp. (Picture 9).

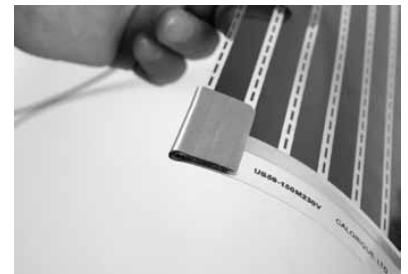
Insulate the bus bars from the other side of the heating panel with electrical insulating tape from the Calorique ® set. (Pictures 10, 11).



Picture 9

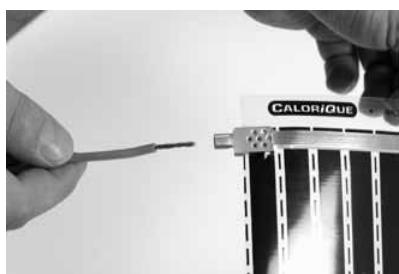


Picture 10



Picture 11

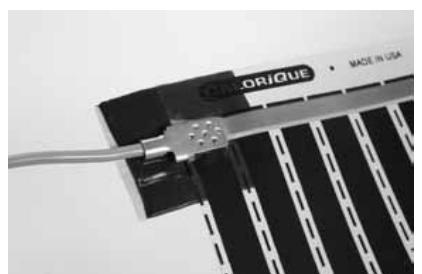
Prepare the electrical cables with a cross section of at least 1.0 mm² from the Calorique set. (Pictures 12, 13, 14)



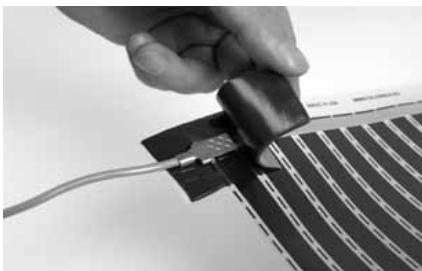
Picture 12



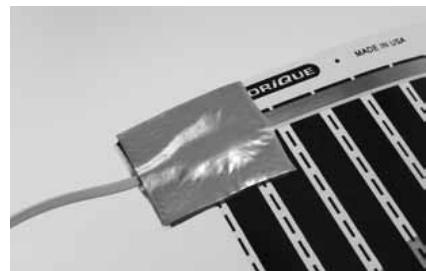
Picture 13



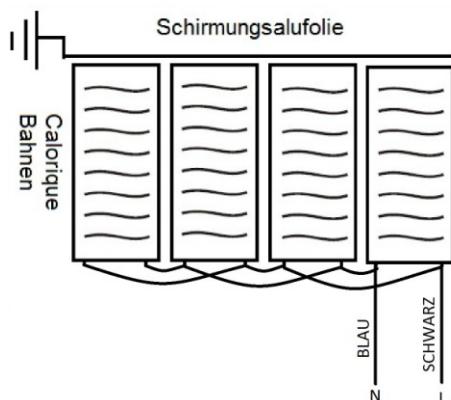
Picture 14



Picture 15



Picture 16



Picture 17

Attach the end of the stripped wire to the connector terminal with a pair of pliers. Isolate the electrical connection with the self-welding insulating tape from the Calorique ® set. (Pictures 15, 16).

Heating elements should be connected in parallel. The phase and the neutral connections to adjacent panels must always change sides in order to prevent the induction effects. The maximum strip length is stated in the table above at the page 5. The maximum total output of the heating strips connected to a thermostat must not exceed 3200 W.

If the total consumption is higher than W 3200, it is recommendable to install an additional electrical connection

with its own fuse. Then the heating elements will be connected to the network and to the thermostat via magnetic switch.

3. Lay the thermal insulation foam sheet (at least 3mm thick layer) **without** metal coating and attach it with adhesive tape. (Picture 18).

4. Then install the heating elements Calorique ® on the insulation layer. With proper positioning of the heating elements all the lettering should be readable. Attach the heating film using tape, furniture nails or a staple gun, so they would be fixed during further work. (Picture 19).

WARNING! Attach with clamps only at the edges of the heating film through the transparent strip. The attachment should not be closer than 6.4 mm to the silver rails. Cut-outs in the thermal isolation layer for electrical connections are made for equalization of the space (picture 20).



Picture 18



Picture 19



Picture 20

5. Make a visual inspection and an electrical test.

Visual inspection

During a visual inspection you should check, whether the foil strips have any traces of damage that might have occurred during installation. If any part of the panel is damaged it is recommended to replace the entire panel.

RESISTANCE VALUE

Between upper and lower resistance limit:

Everything is OK, no further action is required

Higher than the upper resistance value:

Open electricity circle. Check all the connections and undertake necessary reparations.

Zero (0):

Short Circuit: Check all the connecting cables if they are damaged. Foil panels with damaged bus bars must be completely exchanged:

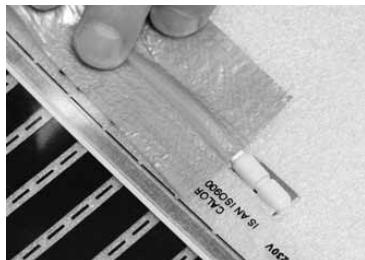
Electrical Test

The electrical test must be performed on the cable to check the accuracy of the electrical connections. The allowed resistance value for 240V can be determined by using the following formula:

$$\text{Upper resistance limit} = \frac{63360}{\text{built-in watts}}$$

$$\text{Lower resistance limit} = \frac{54720}{\text{built-in watts}}$$

Check the measured value on the left side. After repairs of any kind this electrical test should be done again. This process should be performed very carefully to avoid possible damage to the heating elements.



Picture 21

several minutes, the foil should be pleasantly warm.

6. Cut a suitable hole in the insulation layer and attach the temperature sensor with the 1-1.5 cm distance from the heating part of the heating foil. (Picture 21). Attach the heating elements to the thermostat and turn it on. After

Cover up the heating surface with a polyethylene film, with at least 300 g / m² density, with a help of adhesive tape. The edges of the foil must overlap for 20 cm. Bond the special self-adhesive alum foil, Alum-E, from Calorique ® set on the PE vapor barrier film (not directly on the heating foil!). The aluminum foil must be glued so that the aluminum foil strips overlap with each other and build an even screening surface over the heating foil. (Pictures 22, 23).



Picture 22



Picture 23



Picture 24

Use scissors to cut an approximately 3-4cm long line of aluminum foil and bend it under the PE film. Fix the connector clamp as illustrated. Attach the alum foil shielding to the earth. (Picture 24).

7. Laminate, Parquet and Wooden Board

Lay the laminate, parquet or wooden board directly on the heating foil according to manufacturer's instructions. Enjoy a comfortable warm floor.

Carpet, Linoleum and Tiles

Lay an interlayer of plywood, chipboard, dry dash plates etc. on the heating strips; the interlayer should be fixed with screws on the bottom and is supposed to even out the final layer.

The screws must be attached to the heating film only in the places of transparent margins. The minimum distance between the screws, current conducting elements and bus bars should be at least 6.4 mm. Then the flooring material is to be laid on the interlayer according to manufacturer's instructions. (Pictures 25, 26, 27).

Now the warm floor is finished. If no placement of any furniture is planned on the heated surface, it is possible to lay the carpet or linoleum directly on the heating foil without using an interlayer.

Installation of the Calorique® System under Wooden Balk Floor

The system Calorique® is a unique heating technology allowing building main or comforting heating system. Completely invisible and silent, the heating foils warm up the floor up to comfortable 30 °C. Planning, installation and maintenance of the operating system are incredibly simple: determine floor areas, cut the foils into panels of the required length, fix the panels with a staple gun between the joists, and connect to the power - that's it!

Calorique® system consists of four major components: heating foil, wires, thermostats, and supports. Your correct choice and installation of the components provides excellent functionality of the heating.

Proper planning of all components ensures all the warranty obligations of the manufacturer, if all the installation was done in compliance with instructions. When planning the heating system, it is important to take into consideration the location of walls, partitions and other permanent components of the room.

Built-in or permanent decorative elements. Heating foils must be installed so that they are not wholly or even partially covered up by the decorative elements. Covering of the heated surface can easily cause overheating. The minimum distance between these objects and heating film should not be less than 50 mm.

Power cables. The distance between the power cables and the heating should not exceed 50 mm (with heat insulating material-filled gap).

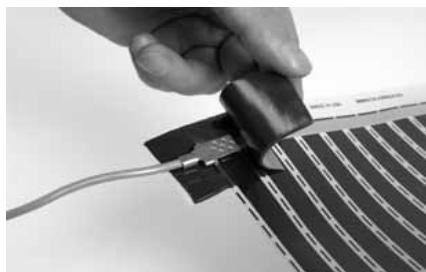
Heat sources. The distance between heat panels Calorique® and heat sources should not be less than 200 mm. The same applies for hot water pipes. If it is not possible to maintain the required distance, the pipes should be insulated.

WARNING!

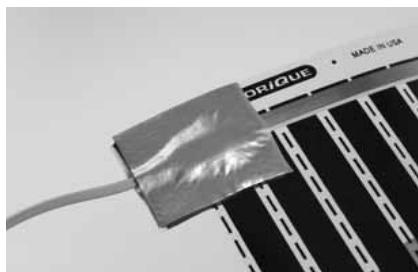
- Never pierce the floor after heating installation. The mechanical damage to the heating foil may cause an electrical accident, short-circuit or even a fire.
- If the floor needs to be exchanged partially or completely, the heating panels should be precisely controlled on any possible damage.
- If partition walls will be rebuilt or a new object will be installed on a heated surface, then you should disable the heating system in order to avoid overheating.

The Montage of the Calorique® System under Wooden Floors

- Preparation of the heating elements in accordance with point 2 on page 8 of this manual.



Picture 28



Picture 29



Picture 30

WARNING! Isolate the power line connections with the self-welding insulating tape from the Calorique® set (pictures 28, 29).

- Set the space between the joists, the insulation material in the required amount. If thermal insulation layer is already present, then this step can be skipped.
- Lay the insulating foam sheet which should be at least 3 mm thick and have a metal coating. Attach the foam film with the coating on top of the joists with around 5-7 cm distance remaining to the floor. Attach the heating foil Calorique® above the coated insulation material in parallel to the joists. The heating foil must be attached so that there is still a distance between the heating foil and the foam film. Fix the foil using clamps or furniture nails so that there is about 150 mm distance left free for electrical connections to the wall. (Pictures 30, 31, 32, 33). The distance between the staples or nails should not exceed 300 mm on each side of the strips. If the distance between the floor joists exceeds the width of the heating foil, then attach the wooden slats to the floor joists and then fix the heating foil to the battens.



Picture 31



Picture 32



Picture 33

- Connect the heater panels parallel to each other and to the thermostat.
- Fix the temperature sensor with a strip of Aluminum tape within 3-5 cm of the heating panel.
- Test the system; check the electrical connections and insulation (as described on page 9, 10).
- Lay the top floor layer.
- Enjoy a comfortable warm floor.

Ceiling Heating System Calorique®

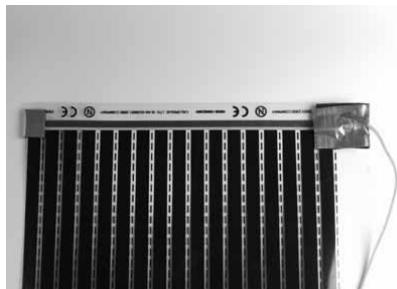
The ceiling heating system Calorique® is a unique heating system that can be used as the main home heating. The heating strips are evenly distributed across the ceiling and the heat is transferred to the room and furniture, the air is never too hot and, in comparison to other types of heating, the energy is saved significantly.

The installation of the ceiling heating is quite similar to the installation of Calorique® System under Wooden Floor. Here are some important points to consider:

- Never dig through the ceiling. Mechanical damage of the heating foil may cause an electrical accident, short-circuit or even a fire.
- If the ceiling needs a renovation due to water or other damage, the damaged heating strips also have to be exchanged.
- It is prohibited to install any decorative or other elements within heated area of the ceiling, as it can lead to heat accumulation and overheating.
- If the addition of extra elements on the heated area is unavoidable, then the affected heating foils have to be deactivated.

Mirror Defogging Heating

- Install a mirror heating using Calorique® and your mirror remains clear even during a hot shower! Here are a few easy steps to help you finish the anti-fog mirror heating system in your bathroom:
- Turn off the power connector.
- The mirror should not have a rear wall, as it reduces the heating effect drastically.
- Check that the rear surface of the mirror is clean and dry.
- Prepare the heating element so that it is less than 5 cm in any dimension of the mirror itself



Picture 34



Picture 35



Picture 36

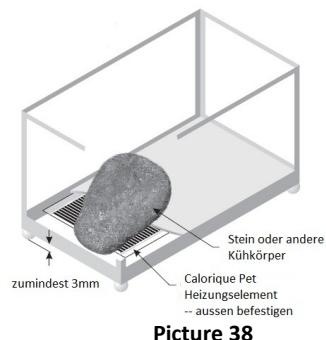
- Attach the electrical connector terminals to the rails of the heating foil and clamp the cable with its stripped wire end with a diameter of at least 0.5 mm. Insulate the connections and the power rails of heating foil with an electric self-welding tape set from the Calorique®. (Picture 34).
- WARNING! A clear view will be provided at the same height as the heating foil plus 5 cm on the each side. Please keep in mind the correct position for the heating foil.
- Attach the heating foil on the wall using an adhesive tape. (Pictures 35, 36).
- Connect the wires to the light port in the bathtub or to the mirror lighting. Please keep in mind the rules for the power connection in wet locations.
- Fix the mirror on the wall with a best possible contact with the heating foil. The mirror must completely cover the heating foil, as it also provides protection for the heating foil at the same time. (Figure 37).
- Enjoy the mirror with a clear view



Picture 37

Heating for a Terrarium

With the help of the heating foil Calorique® you can provide your favorite cold-blooded animals with pleasant warmth. Lay the Alum-E protective film, place the heating foil simply on the floor and set on a stone or other conductor of heat. (Picture 38)



Picture 38

Soil Heating in the Greenhouse, Heating of Seedlings

For an accelerated growth of plants in greenhouses or outdoors you can heat the soil in the spring time. It can extend the harvest season to 2-3 months and makes it easier to grow thermophilic plants. The soil heating is used in greenhouses, winter gardens, flower beds, vegetable beds and seedling boxes.

For optimal effect, the heating foil is applied with 90 W/m²; otherwise there will be danger for the plant root to dry out quickly.

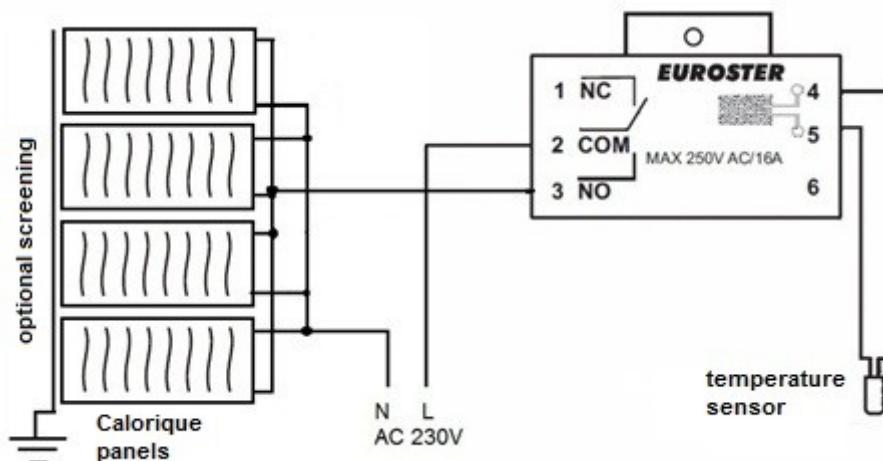
To reduce the heat loss you should put the insulation material with low moisture absorption value such as Polystyrene foam under the foil.

Cover the heat insulation layer with about 5 cm of sand and lay the Calorique® heating foil on it. If necessary, adhere the protective film Alum-E and connect to earth. Then place the textile foil and the wire mesh for protection from gardening equipment.

Use thermostat to optimize the temperature. Temperature sensor should be placed in the soil.

The distance from the heating foil to the plant roots should be around 15-25 cm depending on the type of the plant and its individual preferences. The soil temperature around the root zone should be 15-25 °C; in flower beds it may reach 30 °C.

Electric Connection to a Thermostat with a Floor Sensor





Calorique® 15 Years Warranty

Calorique guarantees an error-free operation of the heating elements for 15 years.

The 15-year warranty is a voluntary warranty assurance and does not affect legally prescribed guarantee period.

The 15-year warranty ensures error-free operation of the heating system Calorique® in its entirety.

During the warranty period Calorique® offers the free repair or replacement of the heating elements. This warranty does not reimburse the cost of the new installation, the repair of the floor, walls or ceilings where the heating elements are placed.

This warranty does not cover damage due to misuse or improper use or for additional damages. The warranty does not cover the damage caused to heating elements during installation. Therefore it is important that the correct function of the heating elements is precisely controlled by the installation instructions of the manufacturer. The heating elements must be connected to the RCD (residual current operated device).

Warranty

The warranty applies solely to individuals who have attained the age of eighteen years, were the buyers of the Calorique® heating system and who own the premises where the heating system Calorique® was installed.

The Calorique® product must be registered within 30 days after the purchase at this link:

- <http://www.calorique.info/>, go from there to the „guarantee form“;
- Or over sending the warranty sheet to the address below:

Calorique, Agathastr.80, 52355 Düren, Germany;

- Or over e-mail: info@calorique.info

After you have a confirmation from us, the registration is effective.

Please preserve well the purchasing receipt and confirmation to make a valid warranty claim.

The warranty does not cover the damage or faulty functions due to the use of incorrect components and supply, or incorrect installation, operation, or maintenance.

The guarantee applies only to products which were installed in EU countries and which were purchased through an authorized sales agent.

The warranty is void in case of water damage, flooding, lightning, and earthquake and force majeure events.

WARRANTY REGISTRATION FORM

<input type="checkbox"/> Mr.	<input type="checkbox"/> Mrs.	<input type="checkbox"/> Ms	<input type="checkbox"/> Enterprise	
Name				
Enterprise				
Telephone				
Fax				
E-mail				
Street and house number				
ZIP/Area				
Country				
Product				
Date of purchase				
Where have you bought the product				
Date of installation				
RCD (residual current operated device).	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
Usage of the space	<input type="checkbox"/>	Private	<input type="checkbox"/>	Commercial

Vendor /Location/Date _____

Buyer/Location/Date _____

Waste Management

WEEE-Reg.-Nr.DE42348200



Although our product is very long-lasting (with average functioning period of 30 years and above), we cannot prevent the natural deterioration. Please dispose of the equipment once it no longer meets your needs at a duly qualified organization. Electronic waste is collected by local electronic and electrical waste disposal company for free. The incorrect disposal of electronic devices leads to unnecessary pollution. The cardboard packaging should be disposed of in waste paper.