

SAN[®]

Electro Heat



Foil Heaters

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Silicone Rubber Insulated Heater



Silicone Rubber Insulated Heater advantages

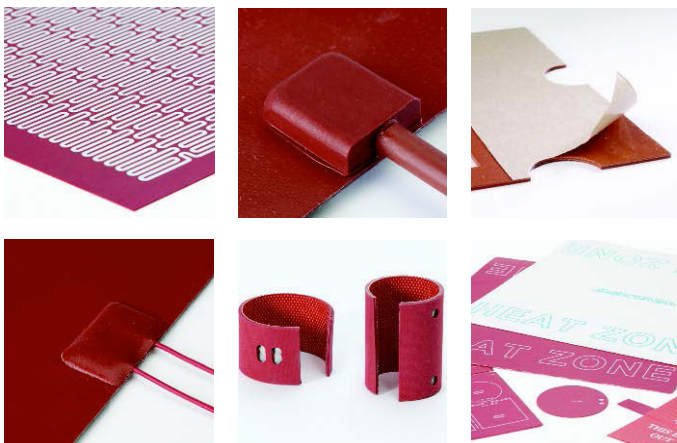
Our silicone heaters are suitable for applications where precise and intimate heating is required. Being thin and lightweight, silicone heater mats have a low thermal mass and hence have rapid heat up characteristics with fast response to temperature control.

Silicone's wide temperature range tolerance of -60 to +230°C and superb electrical properties give it a distinct advantage over other forms of heating.

Applications

We supply silicone heaters for a multitude of applications including industrial catering, battery warming, environmental control or electronics particularly telecommunications, composite repair of aircraft, laboratory equipment, satellite dish snow melting, anti-condensation and GRP pipe curing systems. The uses for silicone heater mats are infinite as they can suit any application requiring surface heating up to 230°C. Their suitability for arduous conditions has been proven in applications from polar expedition to space exploration. We are the final frontier in silicone heaters.

- Custom design
- Etch foil and wire wound technology
- Precise even heating
- Flexible and lightweight
- Moisture and chemical resistant
- Wide temperature range -60 to +230°C
- UL and VDE approval available
- Low smoke and low toxicity options available
- Full design and manufacturing service
- Fast delivery



Installation and Fixing

Our self adhesive option is a quick and simple fixing method which provides superb bonding results to many surfaces including low energy materials.

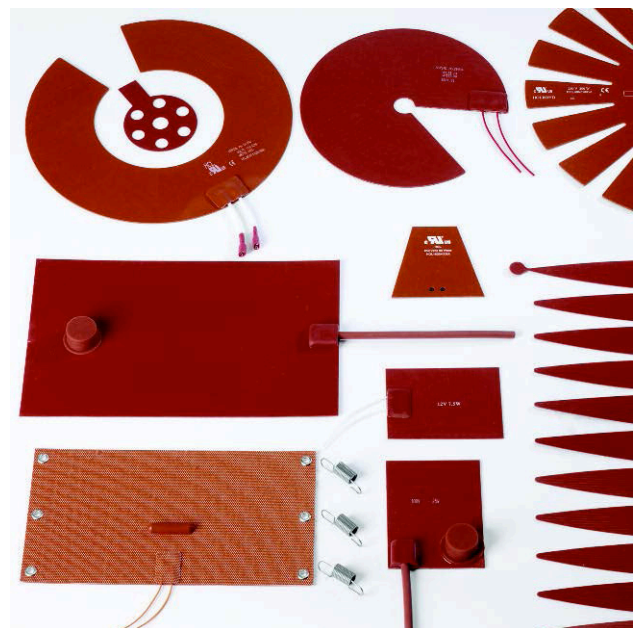
Where removal of the heater is necessary alternative fixings are available such as hooks and straps as well as Velcro and magnetic backed options. Most mechanical fixing methods can be accommodated.

Thermal Control

An extensive range of thermal control devices can be incorporated onto the heaters, these include thermocouples, platinum sensors and limit switches. Pockets and housings can also be applied enabling the client to install their own control devices such as PT100's and capillary thermostats.

Service and Design

Providing the full design service, we can offer virtually any shape and size heater coupled with short delivery times. From prototype to production, spares and problem solving, we cover the full spectrum.



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CVR No.: 42 16 59 13



Silicone Rubber Insulated Heater advantages

Our silicone heaters are suitable for applications where precise and intimate heating is required. Being thin and lightweight, silicone heater mats have a low thermal mass and hence have rapid heat up characteristics and fast response to temperature control. Silicone's wide operating temperature range of -60 to +230°C and superb electrical properties give it a distinct advantage over other forms of heating.

In applications where a heater mat is required to fit small diameter pipe-work a more precise fit can be obtained by using the pre-formed option. We can deliver formed and vulcanized silicone heaters to fit full or partial circumference of any pipe diameter. These heaters can be supplied with separate straps for fixing or can be permanently installed using room temperature vulcanising silicone adhesive or self adhesive systems.

We can provide a factory fitting service for assembly of silicone heaters to customer components using vulcanization or self adhesive methods. We have many years experience of fitting to complicated pipe-work, plates, tanks and many other forms.

Applications

- Custom Design
- Etch Foil and Wire Wound Technology
- Precise Even Heating
- Flexible and Lightweight
- Moisture and Chemical Resistant
- Wide Temperature Range -60 to +230°C
- UL and VDE Approval available
- Full Design and Manufacturing Service
- Fast Delivery



Thermal Control

An extensive range of thermal control devices can be incorporated onto the heaters, these include thermocouples, platinum sensors and limit switches. Pockets and housings can also be applied enabling the client to install their own control devices such as PT100's and capillary thermostats.

Service and Design

Providing the full design service we can offer virtually any shape and size heater coupled with short delivery times of 3-5 days.

From prototype to production, spares and problem solving, we cover the full spectrum.



PVC Heater



PVC Heater advantages

PVC heater is a common used build up for applications in environment with high humidity or wet conditions. The heater is also very flexible and can in advantage be used where flexibility is needed.

Heater benefits

- Water proof
- Flexible
- Acid resistant
- High mechanical strength

Typical applications

- Waterbed heaters
- Surgery beds (tables)
- Slim blankets
- Water heaters
- Military applications
- Battery heaters

Technical Specifications

Max. element temp. °C, (°F)	70 (158)
Min. element temp. °C, (°F)	-40 (-40)
Dielectric strength at 20°C as per ASTM KV/mm	15
Thermal conductivity at 100°C W/m °K	0.17/70°C
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	0.2
Waterproof as per IEC 335-1 sect. 15-16	yes
Constant of dielectricity at 25°C, 50 Hz	5 - 9
Bending radius, min. mm	20
Max. element width mm	800
Power density W/cm ²	0.1
Resistance tolerance	As standard, ± 5% of nominal. tolerance down to ± 2% available.
Rated voltage	Up to 230 V AC/DC single or 3-phase.
Approvals/standards	-
Other.....	-



Polyester Heater advantages

The etched element has superior heat transfer and exceptionally uniform heat output, which results in a faster warm-up cycle and longer life. Use this heater to cover large areas with even heat, for flat or gently curved surfaces. Etched foil polyester heaters can be designed and fabricated in many types of configurations to fit the size and shape required in your application. Our design engineers use a custom computer-aided design program to calculate the design, given the voltage, wattage and resistance.

Heater benefits

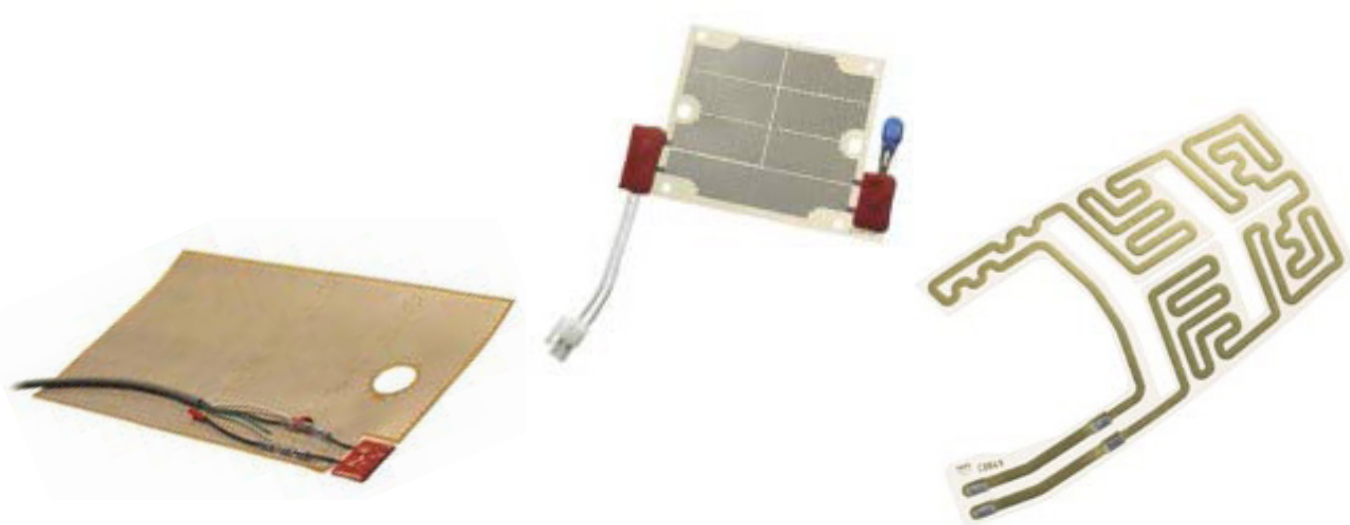
- Low wattage
- Distributed wattage
- Edge loss compensation
- Very small sizes of heaters can be precisely manufactured
- Economical mass production
- Accurate reproduction of complex circuits

Typical applications

- Bathroom mirror heater
- De-icing equipment
- Rear view mirror
- Hand grip heater
- Cabinet heater

Technical Specifications

Max. element temp. °C, (°F)	130 (266)
Min. element temp. °C, (°F)	-60 (-76)
Dielectric strength at 20°C as per ASTM KV/mm	175
Thermal conductivity at 100°C W/m °K	0.16
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	0.8
Waterproof as per IEC 335-1 sect. 15-16	yes
Constant of dielectricity at 25°C, 50 Hz	3.3
Bending radius, min. mm	1
Max. element width mm	800
Power density W/cm2	3
Resistance tolerance	As standard, ± 5% of nominal. tolerance down to ± 2% available.
Rated voltage	Up to 690 V AC/DC single or 3-phase.
Approvals/standards	-
Other	-



Printed Polymer Heater PTC



Printed Polymer Heater PTC advantages

Printed Polymer heaters are based on low resistance printed silver as current distributor. The heat is generated by a number of parallel connected polymer resistors with PTC characteristics (Positive Temperature Coefficient). In most cases the polymer resistor is covering the heater completely and hence gives a very even temperature distribution. The PTC effect makes the heater self limiting and hence hot and cold spots are avoided as the power is generated where you need it. The polymer heater is also very corrosion resistant compared to metal heaters.

Heater benefits

- Self regulation
- Robust design insensitive to small damages
- Corrosion resistant
- Cost effective at low power and high voltage

Typical applications

- Rear view mirrors
- Floor heating
- Waterbed heaters
- Low temperature applications, deicing

Technical Specifications

Max. element temp. °C, (°F)	70 (158)
Min. element temp. °C, (°F)	-50 (-58)
Dielectric strength at 20°C as per ASTM KV/mm	NA
Thermal conductivity at 100°C W/m °K	NA
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	NA
Constant of dielectricity at 25°C, 50 Hz	NA
Power density W/cm ²	0,3@ -40°C
Resistance tolerance	± 20%
Rated voltage	230
Approvals/standards	NA
Other	Possible substrates: PET



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Printed Polymer Heater Constant Wattage



Printed Polymer Heater Constant Wattage advantages

Printed Polymer heaters are based on low resistance printed silver as current distributor. The heat is generated by a number of parallel connected polymer resistors and is therefore very robust and insensitive to small damages. The resistance is virtually constant up 100°C.

Polymer heaters is mostly used in low power applications at moderate to high voltage were one normally need to use rather precious metals to get the as low power as need. The resistance in the polymer can be adjusted in the range from 50 ohm/sq to 50 000 ohm/sq and is therefore suitable for many different applications.

A polymer heater is also more corrosion resistance than metal heaters.

Heater benefits

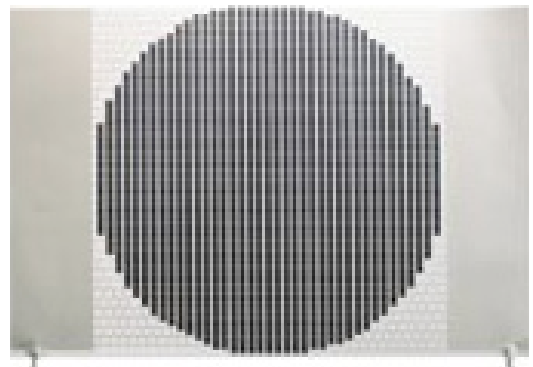
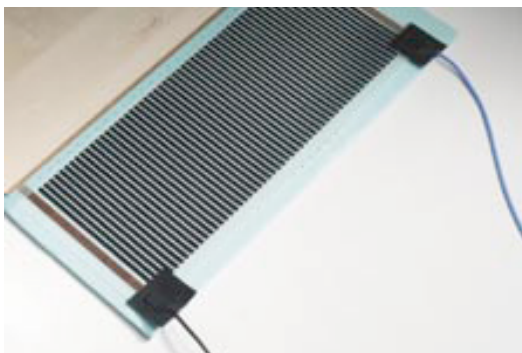
- Possible to use on many different substrates
- Robust design insensitive to small damages
- Corrosion resistant
- Large span of resistivity

Typical applications

- Floor heating
- IR targets
- Waterbed heaters
- High Voltage, small area applications

Technical Specifications

Max. element temp. °C, (°F)	100 (212)
Min. element temp. °C, (°F)	-50 (-58)
Dielectric strength at 20°C as per ASTM KV/mm	NA
Thermal conductivity at 100°C W/m °K	NA
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	NA
Constant of dielectricity at 25°C, 50 Hz	NA
Power density W/cm2	0,1
Resistance tolerance	± 20%
Rated voltage	230
Approvals/standards	NA
Other	Possible substrates: PET, glass, paper, etc



PEN Heater



PEN Heater advantages

PEN is a heater similar to PET but with much better properties. PEN is little more expensive than PET but have higher, chemical, thermal, mechanical and electrical properties. The material is common used in electronic devices.

Heater benefits

- Possible to waveflow solder with leadfree solder
- Higher temp possible compared to PET
- Good chemical resistant
- Higher mechanical strength with 3 approx 30% compared to PET

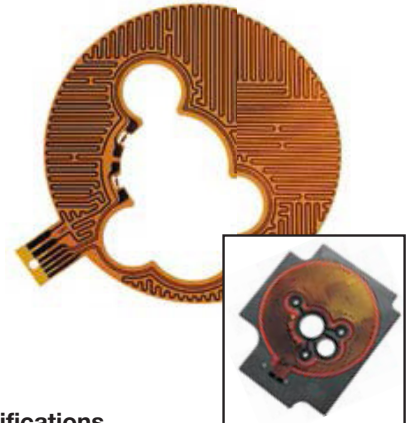
Typical applications

- Bathroom mirror heaters
- Radiator elements
- DNA analyse
- High power standard elements (more cost effective compared to polyimide elements)

Technical Specifications

Max. element temp. °C, (°F)	160 (320)
Min. element temp. °C, (°F)	-60 (-76)
Dielectric strength at 20°C as per ASTM KV/mm	-
Thermal conductivity at 100°C W/m °K	
Moisture absorption as per ASTM D-570-63.	
(24 h immersion at 23°C) %	0.6
Waterproof as per IEC 335-1 sect. 15-16	Yes
Constant of dielectricity at 25°C, 50 Hz	3.16
Bending radius, min. mm	1
Max. element width mm	600
Power density W/cm2	4
Resistance tolerance	As standard, ± 5% of nominal.
..... tolerance down to ± 2% available.	
Rated voltage	Up to 690 V AC/DC single or 3-phase.
Approvals/standards	-
Other	-





Polyimide Heater advantages

Fibre Reinforced Thermoplastic Heater is a unique product. The heating element is integrated in fibre reinforced thermoplastic material. The heating circuit is hence well protected in an extremely durable enclosure with superior impact and abrasion resistance properties.

The material is also moisture resistant and therefore well suited for harsh environments. The stiffness of the products make it suitable for both stand alone applications as well as integration in other equipment. The product can have many different surfaces ranging from soft thermoplastic rubber to stiff shiny surfaces with integrated text or even pictures. The heater can also be laminated together with heat-insulation as well as metal parts.

The unique manufacturing technique enables a large freedom in design.

Heater benefits

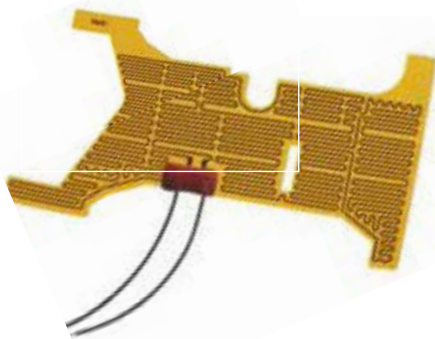
- Stiffness
- Durability
- Impact resistance
- Design freedom
- Integrated functions
- Water resistant

Typical applications

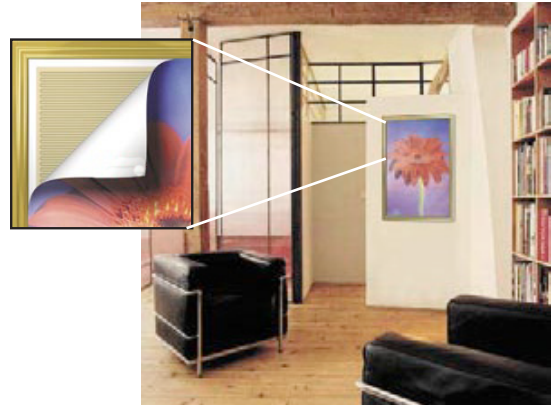
- Radiator panels
- Heater for rough condition
- Floor heating
- Photographic equipment

Technical Specifications

Max. element temp. °C, (°F)	220 (428)
Min. element temp. °C, (°F)	-271 (-455)
Dielectric strength at 20°C as per ASTM KV/mm	205
Thermal conductivity at 100°C W/m °K	-
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	2.9
Waterproof as per IEC 335-1 sect. 15-16	No
Constant of dielectricity at 25°C, 50 Hz	3.5
Bending radius, min. mm	1
Max. element width mm	600
Power density W/cm2	10
Resistance tolerance	As standard, ± 5% of nominal. tolerance down to ± 2% available.
Rated voltage	Up to 690 V AC/DC single or 3-phase.
Approvals/standards	-
Other	-



F RTP Heater



Fibre Reinforced Thermoplastic advantages

PEN is a heater similar to PET but with much better properties. PEN is little more expensive than PET but have higher, chemical, thermal, mechanical and electrical properties. The material is common used in electronic devices.

Heater benefits

- Possible to waveflow solder with leadfree solder
- Higher temp possible compared to PET
- Good chemical resistant
- Higher mechanical strength with 3 approx 30% compared to PET

Typical applications

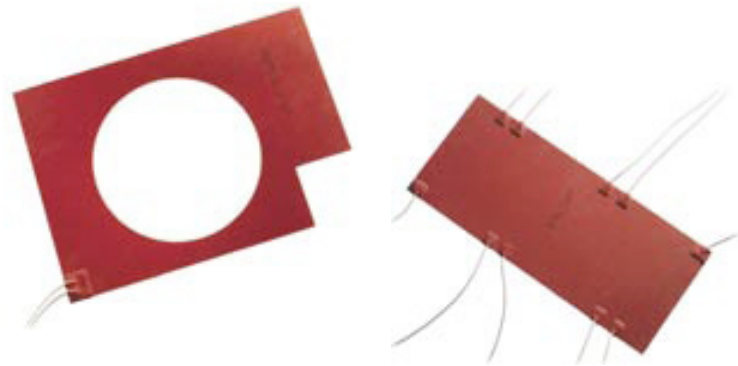
- Bathroom mirror heaters
- Radiator elements
- DNA analyse
- High power standard elements (more cost effective compared to polyimide elements)

Technical Specifications

Max. element temp. °C, (°F)	.....80 (176)
Min. element temp. °C, (°F)	.....-50 (-58)
Dielectric strength at 20°C as per	
ASTM KV/mm.....	20
Thermal conductivity at 100°C W/m °K.....	0.36
Moisture absorption as per ASTM	
D-570-63. (24 h immersion at 23°C) %	.....0.025
Waterproof as per IEC 335-1 sect. 15-16	..... Yes
Constant of dielectricity at	
25°C, 50 Hz.....	3.0
Bending radius, min. mm	.....400
Max. element width mm	.....800
Power density W/cm2	.....0.1 W/cm2 (up to 0,7 immersed)
Resistance tolerance	..... As standard, ± 5% of nominal.
	..... tolerance down to ± 2% available.
Rated voltage	.....Up to 690 V AC/DC single or 3-phase.



Silicone Rubber Heater



Silicone Rubber Heater advantages

Silicon rubber is a rugged, flexible material with excellent temperature properties. Fibreglass-reinforced silicone rubber gives your heater dimension stability without sacrificing flexibility.

Heater benefits

- Can be factory vulcanized to metal parts
- PSA assembly
- Low gas permeability

Typical applications

- Food service equipment
- Freeze protection and condensation prevention for instrumentation and equipment
- Photo copy machines
- Medical respirators
- Ultrasonic cleaner

Technical Specifications

Max. element temp. °C, (°F)	230 (446)
Min. element temp. °C, (°F)	-50 (-58)
Dielectric strength at 20°C as per ASTM KV/mm	17
Thermal conductivity at 100°C W/m °K	0.24
Moisture absorption as per ASTM D-570-63. (24 h immersion at 23°C) %	0
Waterproof as per IEC 335-1 sect. 15-16	yes
Constant of dielectricity at 25°C, 50 Hz	2.9 - 3.6
Bending radius, min. mm	10
Max. element width mm	600
Power density W/cm2	13
Resistance tolerance	As standard, ± 5% of nominal. tolerance down to ± 2% available.
Rated voltage	Up to 690 V AC/DC single or 3-phase.
Approvals/standards	ETL (UL, V0, HB)
Other	-



MICA Heater



MICA Heater advantages

The Mica heaters are etched foil elements, sandwiched between layers of mica. The heater can be rigid or soft in order to fit the application. In all cases the mica heater needs uniform mechanical clamping to give the best longterm performance.

Heater benefits

- High power density
- Possibility to be used assembled in open air
- High working temperatures
- Fast heat-up

Typical applications

- Packing, strapping and sealing equipment
- Food service appliances
- DNA analysis
- Semiconductor industry
- Radiators, heating panels

Technical Specifications

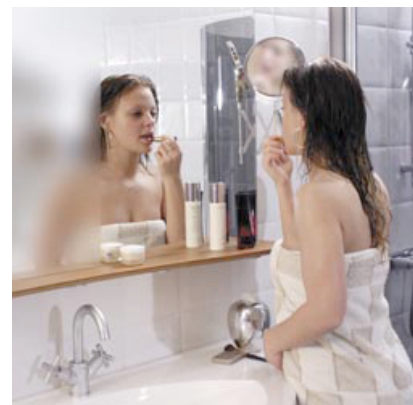
Max. element temp. °C, (°F)	600 (1112)
Min. element temp. °C, (°F)	-150 (-238)
Dielectric strength at 20°C as per ASTM KV/mm	>25
Thermal conductivity at 100°C W/m °K	0.30
Moisture absorpction as per ASTM D-570-63. (24 h immersion at 23°C) %	<1%
Waterproof as per IEC 335-1 sect. 15-16	NA
Constant of dielectricity at 25°C, 50 Hz	4 - 5.5
Bending radius, min. mm	NA
Max. element width mm	900
Power density W/cm2	5W/cm ² (depending on application)
Resistance tolerance	As standard, ± 5% of nominal. tolerance down to ± 2% available.
Rated voltage	Up to 1000V AC/DC single or 3-phase.
Approvals/standards	-
Other	Thickness min. 0,1mm



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Mirror Heater Benefits

Our simple to install mirror heaters enable you to shave or put on make-up without having to worry about the bathroom mirror steaming up.

Easy Installation!

Lay the mirror face down on a protective surface. Make sure the back of the mirror is clean and free from grease. Mark the back of the mirror where the heater is to be positioned. The heater should be at least 50 mm from the edges of the mirror.

Peel back the protective release paper from one corner of the mirror heater. Position this corner in the required corner of the marked area and slowly peel back the release paper whilst applying gentle pressure to remove air bubbles.

The Mirror Heater must be connected to the lighting circuit or to the electrical circuit through a separate switch.

The installation must be in accordance with existing regulations.

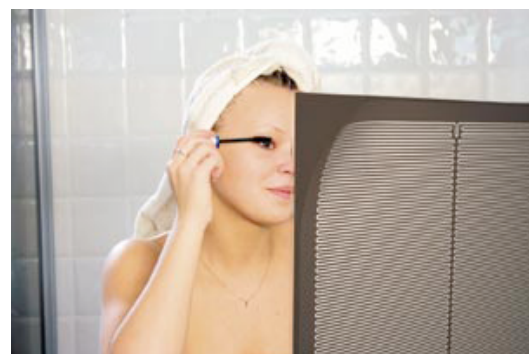
Design Advantages

- Low, even temperature makes the mirror safe to touch but still keeps it clear.
- Very low running costs
- Your mirror will always remain steam-free whilst the heater is on.
- Simple to install.

Technical Specifications

Model	Power	Size
PO967200	230V 70W	40x450mm
PO967300	230V 60W	500x500mm
PO967100	230V 55W	Daim 600mm
PO967500	230V 85W	570x760mm
PO967600	230V 132W	600x1100mm

All heaters have adhesive, 1500 mm cables, silicone insulated terminals and are approved by Semko. According to IEC CO335-1



Food Heater



Food Heater advantages

We offer many types of heaters for food rethermalization. The heaters are easy to design for custom needs. The heating systems are cost efficient, hygienic and can be designed for easy cleaning. The heaters are space saving and can also be produced in different power densities.

Temperature regulation

- Thermostat
- NTC
- PTC
- Solid state
- Resistant temp control

Heater benefits

- Low profile heater (from 0,5 mm to 25 mm)
- Max with 600 mm length 1500 mm
- Insulated / Non insulated
- Adhesive backing
- Design freedom
- Durability
- Water resistant / water proof
- Life time

Typical applications

- Baine Maries
- Rethermalization cabinets
- Noodle cooker
- Keep warm plates
- Transport boxes

Technical Specifications

Max. element temp. °C, (°F)	230 (446)
Min. element temp. °C, (°F)	-50 (-58)
Dielectric strength at 20°C as per ASTM KV/mm.....	20
Thermal conductivity at 100°C W/m °K	0.36
Moisture absorption as per ASTM	
D-570-63. (24 h immersion at 23°C) %	0.025
Waterproof as per IEC 335-1 sect. 15-16	Yes
Constant of dielectricity at 25°C, 50 Hz	3.0
Bending radius, min. mm	400
Max. element width mm	800
Power density W/cm2	13 (max)
Resistance tolerance	As standard, ± 5% of nominal.
..... tolerance down to ± 2% available.	
Rated voltage	Up to 690 V AC/DC single or 3-phase.
Example of materials	
PET	-50 to +130°C
F RTP	-50 to +80°C
Silicone	-50 to +230°C

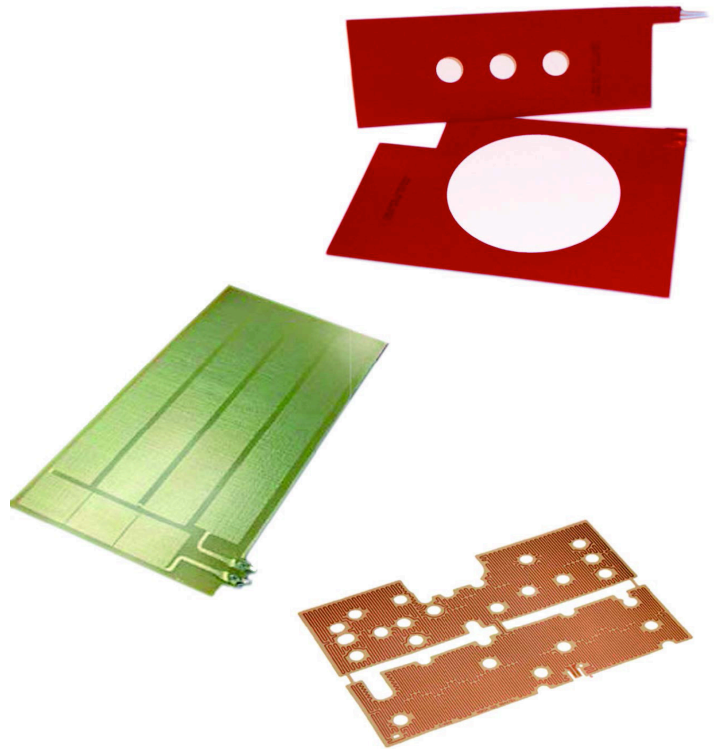


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Foil Heater advantages

Foil heaters are low profile heaters with high power density (0,5 mm to 25 mm). With a maximum width of 600 mm and length of 3000 mm, we cover a big range of applications. Heaters can also be delivered with extra insulation layers. By using PSA or silicone vulcanized directly to metal plates at the assembly, the heaters get excellent heat distribution and high durability.

Technical Specifications

Example materials

	PET	FRTF	Silicone
Max. element temp. °C (°F)	130 (266)	80	230 (446)
Min. element temp. °C (°F)	-50 (-58)	-50	-50 (-58)
Dielectric strength at 20°C KV/mm	220	20	17
Thermal conductivity at 100°C W/m	0.17	0.36	0.24
Moisture absorption (24h immersion at 23°C) in %	0.2	0.025	0
Waterproof as per IED 60335	Yes	Yes	Yes
Resistance tolerance	±5% of standard ±2% available	±5% of standard ±2% available	±5% of standard ±2% available
Rated voltage	Up to 690V AC/DC	Up to 690V AC/DC	Up to 500V AC/DC
Temp. Regulation			
Thermostat/PTC/NTC	Yes	Yes	Yes

*Other base materials are available such as Pen, Polyimide, Mica.

Product significant

- Space saver
- Optimized heat distribution
- High/ Low wattage
- Custom design
- Cost efficient
- High durability



Lens and Sensor Heaters

Lens and Sensor Heater Benefits

With a foil heater your camera, CCTV, sensor or surveillance systems will work at all times. Mist, condensation or ice can ruin the functionality of an expensive system. By heating the lens, sensor or the housing you can eliminate the problem. Shapes, voltages and power possibilities are endless. You find our products in car producers night vision- and lane change assist systems US Police- and Military forces are also among our demanding clients.

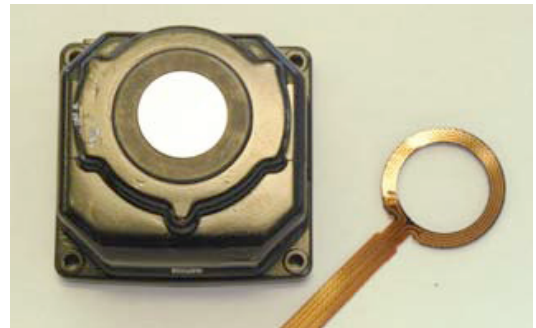
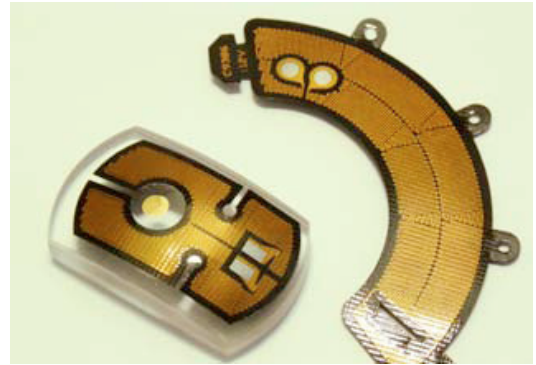
	Polyester	Polyimide
Max. element temp. 0C, (0F)	130 (266)	220 (428)
Min. element temp. 0C, (0F)	-60 (-76)	-271 (-455)
Dielectric strength at 200C as per ASTM KV/mm	175	205
Thermal conductivity at 1000C W/m 0K	0.16	-
Moisture absorption as per ASTM D-570-63. (24 h immersion at 230C)	0.8	2.9
Waterproof as per IEC 335-1 sect. 15-16	yes	no
Constant of dielectricity at 250C, 50Hz	3.3	3.5
Bending radius, min. mm	1	1
Max. element width mm	800	600
Power density W/cm ²	3	10

Advantages

- Space saver
- Optimized heat distribution
- High/Low wattage
- Custom design
- Cost efficient
- High durability

Materials

- Polyester
- Polyimide





Under Floor Heater benefits

The heating film is a low profile heater (0,3 mm) based on a printed carbon track with copperband reinforced distribution tracks along both sides of the web. The parallel circuits give a robust function of the heating element.

This type of heater can in advance be used as comfort heat together with wooden or laminate floors.

Technical Specifications

The basic UFH film is approved up to 120 W m², 230 V, by Semco in according with:

EN 60335-1:2002+A11+A1

EN 60335-2-96:2002+A1

EN 50336:2003

It can however be designed for powers up to 400 W/m² @ 230 V for special applications.

Types and Packages

The heaters are available in two different widths and in three different power ranges.

The heaters can be ordered as a complete installation kit or for bigger volumes as piece goods. The package is only available with the with of 600 mm and power range of 80 W/m².

Piece goods

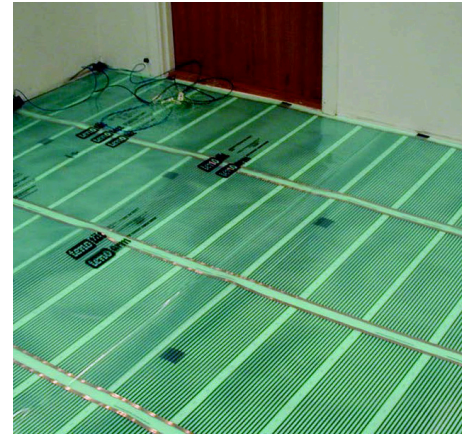
Art. no	Article	Width (mm)	Power (W/m ²)	Unit
PM969900	Floor heater	600	120	Meter
PM969901	Floor heater	600	80	Meter
PM969902	Floor heater	600	60	Meter
PM969903	Floor heater	300	120	Meter
PM969904	Floor heater	300	80	Meter
PM969905	Floor heater	300	60	Meter

Foil UFH kit

Art. no	Article	Width (mm)	Power (W/m ²)	Unit
OT969900	Heat package 10m	0-10	80	pcs
OT969901	Heat package 15m	10-15	80	pcs
OT969902	Heat package 20m	15-20	80	pcs
OT969903	Heat package 25m	20-25	80	pcs



230V Under Floor Heater

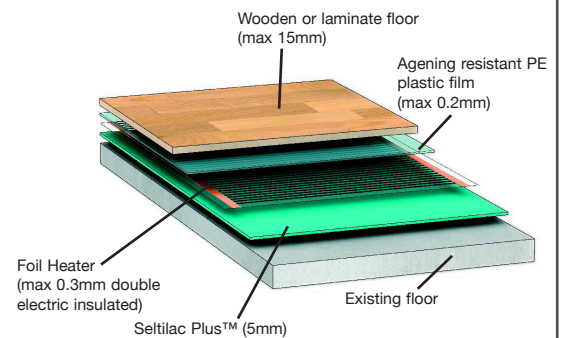


Installation

The heater is easy to install, as the heater do not need to be glued or fastened with filler.

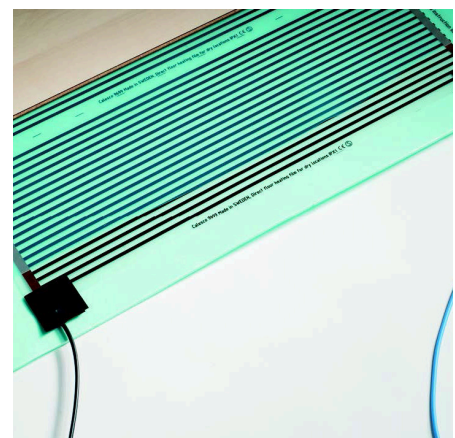
The design gives also big freedom to cut the heaters in right lengths at the assembly. That gives the possibility to cover as much floor surface as possible.

To prevent heat losses down to the ground and direct the heat, a 5 mm polysterene insulation (Sertilac Plus™ or eq.) have to be installed under the heating Foil. On top an age resistant 0,2 mm PE film has to be laid.



Accessories

Art. no	Article	Unit
FG100115	CF Controller, OCD2-1999	pcs
FG969900	Installation kit (for 5 foil lengths)	pcs
FF159000	RKK double insulated wire (blue)	2x11 meters
FB099900	PE film 0,2mm (age restant)	50m ²
FL901001	Spiral hose (sensor protection)	2,5 meters
FK000026	Crimping tool	pcs
FB099921	Insulation (Sertilac Plus™)	5m ²
FD220016	Installation tape	roll (66m)



Design advantages

- Low profile
- Even heat distribution
- Robust function
- Easy installation
- Cost efficient

SAN Electro Heat a/s

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CVR No.: 42 16 59 13



**PTC (Positive Temperature Coefficient)
Under Floor Heater Benefits**

The PTC heating film is a unique product. Designed for maximum reliability, and safety. The PTC heating film is self limiting product and will therefore minimise the risk of local overheating.

The heating film is a low profile heater (0,3 mm) based on a printed carbon track with copper band reinforced distribution tracks along both sides of the web.

The parallel circuits give a robust function of the heating element and this type of heater can in advantage be used as comfort heat together with wooden or laminate floors.

Technical Specifications

The PTC UFH film is approved up to 120 W/m², 230 V, by SEMCO in according with:
EN 60335-1:2002+A11+A1
EN 60335-2-96:2002+A1
EN 50336:2003

Types and Packages

The heaters are available in 300 mm and 600 mm widths, with a power range of 120 W/m².

The heaters can be ordered as a complete installation kit or for bigger volumes as piece goods. The package is only available in the width of 600 mm and power density of 120 W/m² @ 20 °C.

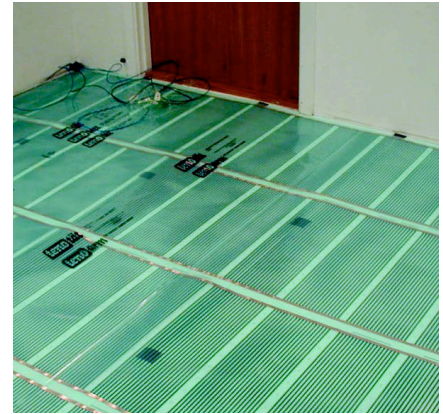
Piece goods

Art. no	Article	Width (mm)	Power (W/m ²)	Unit
PM905501	Floor heater	300	120	Meter
PM905500	Floor heater	600	120	Meter

Foil 230V PTC UFH kit

Art. no	Article	Width (mm)	Power (W/m ²)	Unit
OT905500	Heat package 10m	0-10	120	pcs
OT905501	Heat package 15m	10-15	120	pcs
OT905502	Heat package 20m	15-20	120	pcs
OT905503	Heat package 25m	20-25	120	pcs

230V PTV Under Floor Heater

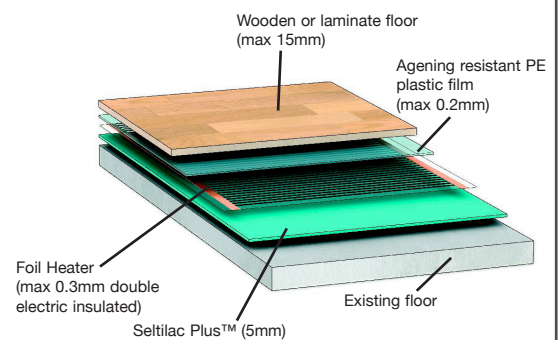


Installation

The heater do not need to be glued or fastened with filler. This makes an easy installation of the heaters.

The design gives also big freedom to cut the heaters in right lengths at the assembly. That gives the possibility to cover as much floor surface as possible.

To prevent heat leakage down to the ground and direct the heat, a 5 mm polysterene insulation (Seltilac Plus™ or eq.) has to be installed under the heating Foil. On top an age resistant 0,2 mm PE film has to be laid.



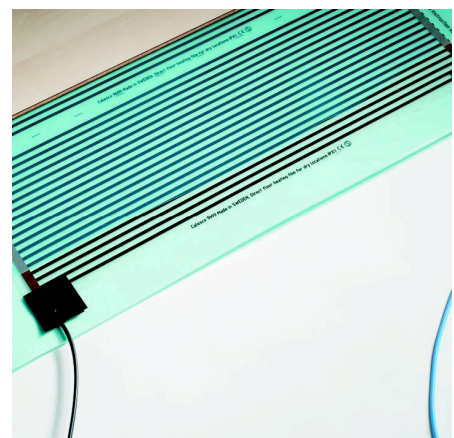
Accessories

Art. no	Article	Unit
FG100115	CF Controller, OCD2-1999	pcs
FG969900	Installation kit (for 5 foil lengths)	pcs
FF159000	RKK double insulated wire (blue)	2x11 meters
FB099900	PE film 0,2mm (age restant)	50m ²
FL901001	Spiral hose (sensor protection(	2,5 meters
FK000026	Crimping tool	pcs
FB099921	Insulation (Seltilac Plus™)	5m ²
FD220016	Installation tape	roll (66m)



Design advantages

- Self regulated power
- Secure design
- Slim profile
- Even heat distribution
- Robust function
- Easy installation



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Under Floor Heater Benefits

The heating film is a low profile heater (0,3 mm) and a low voltage heating system. The low profile do not affect the height of the floor.

The parallel circuits give a robust function of the heating element and this type of heater can in advantage be used as comfort or as main heat in caravans or mobile homes.

Technical Specifications

The basic UFH film is based on a printed carbon and silver tracks, with copper band reinforced distribution tracks along both sides of the web.

The heating system is designed only to be connected to an approved power transformer in according to EN 60335-1:2002 (max 42 voltage).

Types and Packages

The heaters are available in four different widths, with a power density of 75 W/m².

The heaters can be ordered as a complete installation kit or for bigger volumes as piece goods. The package is only available with the width of 300 mm and power density of 75 W/m².

Piece goods

Art. no	Article	Width (mm)	Power (W/m ²)	Unit
PM993601	Floor heater	300	75	Meter
PM993801	Floor heater	400	75	Meter
PM993600	Floor heater	600	75	Meter
PM993500	Floor heater	800	75	Meter

Foil 42V, UFH kit

Art. no	Article	m ²	Power (W/m ²)	Unit
OT993500	Heat package 5m 42, 300mm	5	75	pcs

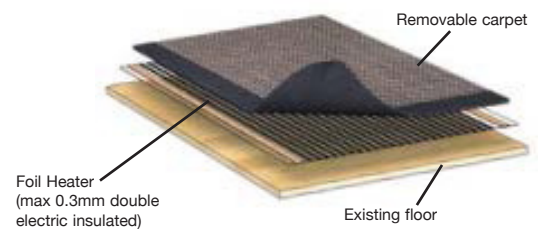


42V Under Floor Heater



Installation

The heater do not need to be glued or fastened with filler. This makes an easy installation of the heaters and the heating film can be installed directly upon the existing floor. The design also gives big freedom to cut the heaters in right lengths and use different widths in the same assembly. This gives the possibility to cover a big area of the floor surface. The heater shall only be used together with approved transformers, with a maximum output voltage of 42 V. On top the heater shall be covered with a thin carpet as a protection.



Accessories

Art. no	Article	Unit
FG969900	Installation kit (for 5 foil lengths)	pcs
FF179000	RK 2,5mm ² wire	10x2 meters
FK000026	Crimping tool	pcs
FG900045	Transformer 250VA 230V/42V	1



Design advantages

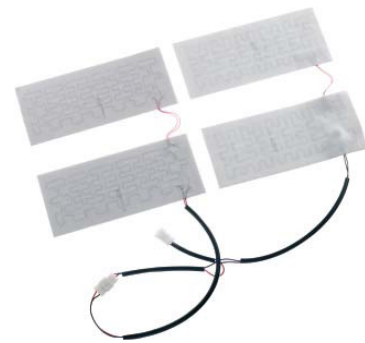
- Slim profile
- Even heat distribution
- Robust function
- Easy installation

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Seat Heater Benefits

The seat heaters are products developed for a variety of applications. With a seat heater you always have a comfortable and cozy ride.

The heaters are constructed by utilizing well known techniques and materials, with more than 30 years of company experience in heating technology.

Our company has a flexible production organization and can therefore provide high volume products as well as low.

Technical Development

The seat heaters have been developed in close collaboration with automotive industry. The seat heaters fulfil most existing specifications for automotive industry.

Extensive testings and research have been performed to obtain optimal function and secure product for long term use.

Some major test areas have been:

- Humidity ageing.
- Fatigue test by pointload, stamp and squirm in different climates.
- Vibration tests.
- Flamability tests.

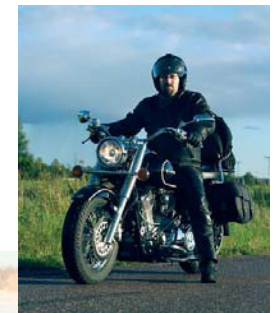
Types, specifications and build up

Most heaters are built with conductive heating wire between different types of material such as polyethylen foam or felt materials. It is also possible to get waterproof solutions with PVC insulations.

For easy assembly, all heaters can be delivered with different types of adhesives (PSA) and connectors.

Power density	0.05-0.08W/cm ²
Voltage	12-24V AC/DC
Thickness	2-5mm (typical)
Working temperature	30-500C (86-1220F)
Current draw	2-5A (typical)

Seat Heater



Type of Controllers

The heaters can be designed with several different types of switches and controllers such as thermostats, sensors or overheat protector type thermostats or melting fuses. Typical thermostats for controlling the temperature is standard 1/2 inch type with optional shut off temperature setting.

We can also provide different types of electronic devices with different functionalities. The controllers can supply more than one unit at same time.

Also available is our control unit for seat heating applications based on the circuit resistance change with temperature.

No mechanical overheat protectors are needed. It gives the user totally variable heating power = more comfort. This device builds in extra safety since it can detect different failure modes such as partial short circuit, short circuit and low temperature. It can protect the unit from both over and under voltage from the vehicle. More comfort and more safety!

Fields of Application

Due to the different buildups the heaters can be customized for a variety of application areas such as:

- Automotive
- Motorcycles
- ATV (All Terrain Vehicle)
- UTV (Utility Terrain Vehicle)
- Marine
- Golf cars
- Ski lifts
- Construction machines and tractors
- Military
- Public arenas

Design Advantages

- High power low cost solution
- Flexible
- Design freedom
- High fatigue limit
- Custom made
- Flame retardant



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Electro Heat

- Process Heating
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- Heating Cables
- Finned Tubular Radiators
- Immersion Heaters
- Church Heating
- Frost Protection
- Ex-Material
- Oilfilled Radiators
- Drum Heaters
- Heating Pads
- Flow Heaters
- Air Duct Heaters
- High-voltage
- Resistors
- Controllers



With more than 50 years of experience SAN Electro Heat's most valuable asset is special knowhow about design, product development and manufacturing of professional electrical heating equipment for industrial use.

The company is geared to deliver 100% customized products, and thus functions both as a catalyst for a development project and as supplier of the final product. At the same time we insure and maintain the required quality level, mechanical and electrical dimensioning, approvals and documentation.



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