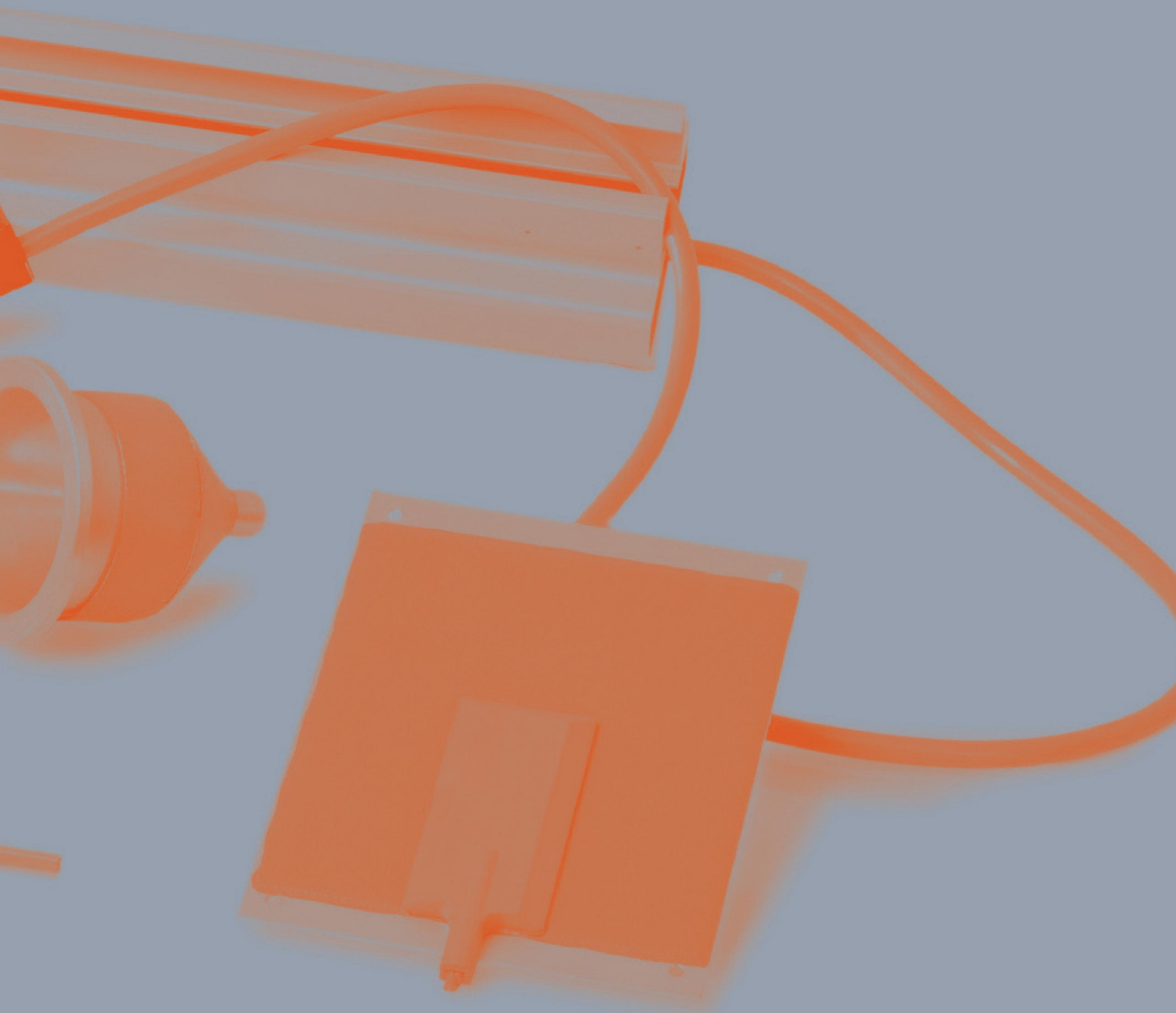


Fullchance Flexible silicone heaters



Innovative solutions tailor-made for your needs



We have been developing and producing flexible silicone heaters for operating temperatures of up to 240°C for more than 50 years. The areas of use range from industrial applications, measurement and control technology and energy systems to medical technology and aerospace. Today more than 3 million Fullchance silicon heaters are in use worldwide. [Experience on which you can build.](#)

With the differentiated requirements of our clients from various sectors, we have orientated our production to customer specific solutions. We produce individual parts as well as large series. Our products are distinguished by the highest quality standards and freedom of maintenance.

Heating Plate

for heating plastic film



- > Very good heat distribution
- > Even surface temperature
- > Dimensions made to fit customer specifications
- > Voltage and output configured to meet customer requirements
- > Small batch sizes can be delivered

In order to be shaped plastic film has to be heated. Many films have a very narrow temperature range in which this is possible. So it is very important that the whole width of the film is evenly warmed up to the same temperature. This is a case for „Fullchance Heating Plates“. The large format and even surface temperature of the vulcanised silicone heater transfers to the aluminium plate. Hot and cold spots are avoided with diverse power density.

At the request of the customer the heating plates can already be equipped with a temperature sensor or a temperature regulator ex factory. If required, the heating surface can also be divided into numerous heating zones.



TECHNICAL DATA

Dimensions	max. 2000 x 1000 mm
Maximum temperature	240°C
Operating voltage	freely selectable
Electrical output	freely selectable
Connection	via strands or cable
Temperature regulation	via sensor in the Al- plate
Protection category / safety class	X4 / 0
Licensure	VDE, UL

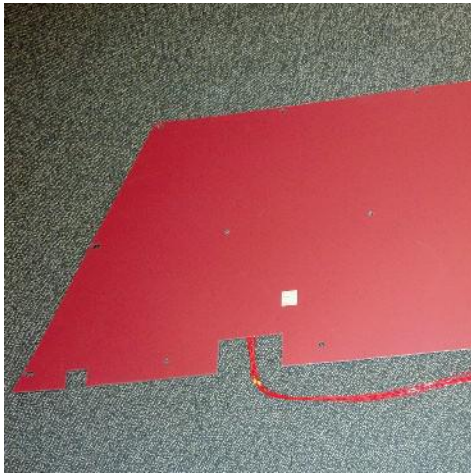
EINBAUHINWEISE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

Fullchance industrial co.,limited

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www.fullchance.com

Press Heaters



- > Very good heat distribution
- > Even surface temperature
- > Dimensions made to fit customer specifications
- > Thickness ≤ 5 mm
- > Voltage and output configured to meet customer requirements
- > Pressure load up to 100 N/cm^2

Components sometimes have to be heated up during the pressing process in order to achieve the desired results (e.g. when rubber is vulcanised). A very even temperature is required for this. This is a case for „Fullchance Press Heaters“.

Unlike tubular heaters or heating cartridges, with the heater's large format and even surface temperature a thick aluminium plate is not required in order to evenly distribute the heat. A significantly thinner aluminium sheet can be worked with. This has the additional advantage of faster heat-up and cool-down periods. This also makes temperature controllability considerably easier.



TECHNICAL DATA

Dimensions	freely selectable
Maximum temperature	240°C
Operating voltage	freely selectable
Electrical output	freely selectable
Connection	via strands or cable
Temperature regulation	via sensor in the Al- plate
Protection category / safety class	X4 / 0
Licensure	VDE, UL

INSTALLATION NOTE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

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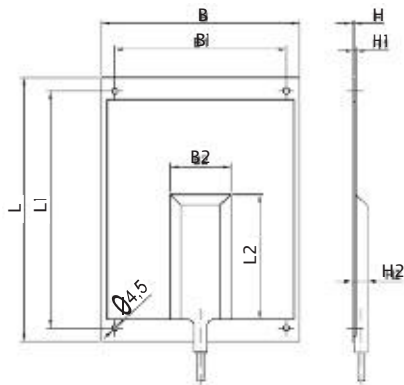
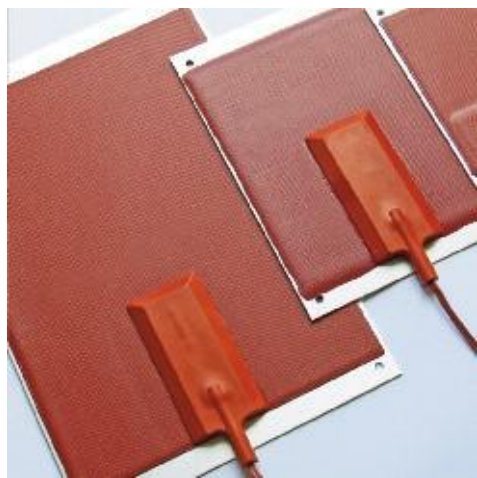
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Flat heating plates

for housings, switch cabinets and devices



INSTALLATION NOTES

Installation must take place according to the valid VDE and CE guidelines for the respective application. The corresponding protection measure and contact protection are to be realised by the user with installation. To achieve good temperature control in the full space in the housing, the heating plate should be mounted in the lowest area. A distance of at least 10 mm to the side walls and 50 mm to the underside is required so convection can form. A distance of 35 mm to thermo-plastic parts is recommended. A separate room temperature controller in front of the heating plate must be switched to control the inside housing temperature.

- > Low surface temperature
- > Limited space requirement, just 3mm thick
- > Even heat distribution over the whole surface
- > Without ventilator – no dust whirls
- > Maintenance-free, long service life

Housings with electrical, electronic or mechanical installations are often subject to temperature fluctuations, which lead to condensation, corrosion and leakage currents. In order to guarantee the functional safety of these installation elements, it makes sense and is cost-efficient to create a balanced inside temperature. Fullchance heating consists of an anodised 1.5 mm thick aluminium plate vulcanised onto a 1.5 mm thick silicone heating film. A small amount of space is required thanks to this flat construction and extensive heat radiation is still provided.



TECHNICAL DATA

Operating voltage	220 – 240 V, 50/60 Hz alternative 115 V, 50 Hz
Electrical power	40 W, 100 W, 200 W
Heating element	Silicone heating
Surface temperature	With bi-metal 65/45°C controller, higher temperatures can be reached without a temperature controller depending on the environmental conditions
Connection	0,5 m line 2 x 0,75 mm ²
Plate	Aluminium
Fixing	Retainer bracket on TS 35 mounting rail or M4 screws
Protection type/class	IP X4 / 1
Approvals	VDE + S G S

ESTABLISHMENT OF NECESSARY HEATING POWER

The necessary heating power depends on the following parameters:

- > Location (inside, outside), switch cabinet size (surface)
- > Environmental temperature, material, insulation, loss power of installed components
- > An estimated calculation is possible as follows:
 - a.) Standstill heating: inside $P = T (K \times A)$
outside $P = T (K \times A) \times 2$
 - b.) Operating heating: inside $P = T (K \times A) - P_v$
(Installation devices switched on) outside $P = T (K \times A) \times 2 - P_v$

P = required heating power
 T = Temperature difference between the required average switch cabinet inside temperature and environmental temperature
 K = heat transmission figure (for steel sheet metal 5 – 6 W/m² K)
 A = overall free-standing housing surface in m²
 P_v = overall installed loss power in W

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ORDER DETAILS													
El. power Watt	Voltage Volt	Temperature controller	Dimensions in mm										Type No.
			L	L1	L2	B	B1	B2	H	H1	H2		
20	230	none	150	134	40	80	64	60	1,5	ca. 3	ca. 7	106978	
40	230	65°C	150	134	95	80	64	46	1,5	ca. 3	ca. 13	107046	
70	230	none	200	180	40	150	130	60	1,5	ca. 3	ca. 7	107190	
100	230	65°C	200	180	95	150	130	46	1,5	ca. 3	ca. 13	107412	
80	230	none	300	280	40	200	180	60	1,5	ca. 3	ca. 7	107424	
200	230	65°C	300	280	95	200	180	46	1,5	ca. 3	ca. 13	107428	
All designs are also available in a 115 Volt version.													

All designs are also available in a 115 Volt version.

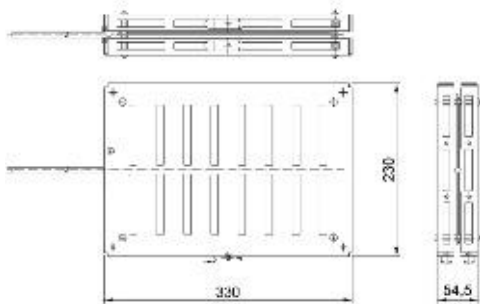
Fixing brackets to clip the heating elements onto a profile rail (TS 35)

- > 150 mm length type 50168
- > 200 mm length type 107547
- > 300 mm length type 50169

Technical changes are reserved. All details are provided without liability. The specified information does not release the customer from the obligation to perform independent application tests. / 18.06.2013

Heating

for housings, switch cabinets and devices



TECHNICAL DATA

Operating voltage	230 V, 50/60 Hz
Electrical power	200 W (Ohm load)
Heating element	Silicone heating
Surface temperature	< 80°C with vertical installation and room temp. \pm 0°C
Connection	0,5 m line 3 x 0,75 mm ²
Housing	Aluminium
Fixing	Clip fixing on mounting rail TS 35
Installation position	vertikal / horizontal
Excess temp. protection	240°C melt protection
Protection type/class	IP X4 / 1

ORDER DETAILS						
Electr. power	Voltage	Temperature controller	Dimensions in mm			Type No.
Watts	Volts		L	B	H	
200	230	none	330	230	55	113870

- > Low surface temperature
- > Large heating surface
- > Quick assembly with clip fixing
- > Without ventilator - no dust whirls
- > Maintenance-free
- > Splash protection

Housings with electrical, electronic or mechanical installations are often subject to temperature fluctuations, which lead to condensation, corrosion and leakage currents. In order to guarantee the functional safety of these installation elements, it makes sense and is cost-efficient to create a balanced inside temperature. The Fullchance heating consists of a large aluminium plate with vulcanised silicone heating. The surface temperature is kept low with the aluminium housing.



ESTABLISHMENT OF NECESSARY HEATING POWER

The necessary heating power depends on the following parameters:

- > Location (inside, outside), switch cabinet size (surface)
- > Environmental temperature, material, insulation, loss power of installed components
- > An estimated calculation is possible as follows:

a.) Standstill heating: inside $P = T (K \times A)$
 outside $P = T (K \times A) \times 2$

b.) Operating heating: inside $P = T (K \times A) - P_v$
(Installation devices switched on) outside $P = T (K \times A) \times 2 - P_v$

P = required heating power

T = Temperature difference between the required average switch cabinet inside temperature and environmental temperature

K = heat transmission figure (for steel sheet metal 5 – 6 W/m² K)

A = overall free-standing housing surface in m²

P_v = overall installed loss power in W

INSTALLATION NOTES

Installation must take place according to the valid VDE and CE guidelines for the respective application. The corresponding protection measure and contact protection are to be realised by the user with installation. An overvoltage category III isolator (e.g. a fuse) should be integrated in the supply line by the user, when connecting the components for complete mains shutdown according to the installation regulations (DIN EN 60355). Repairs or the replacement of parts (e.g. damaged mains power cable) may only be undertaken by the manufacturer or a qualified person authorised by the manufacturer.

To achieve good temperature control in the full space in the housing, the heating plate should be mounted in the lowest area. A distance of at least 10 mm to the side walls and 50 mm to the underside is required so convection can form. A distance of 35 mm to thermo-plastic parts is recommended.

A separate room temperature controller in front of the heating plate must be switched to control the inside housing temperature, which switches the heating off at temperatures > 30° C.

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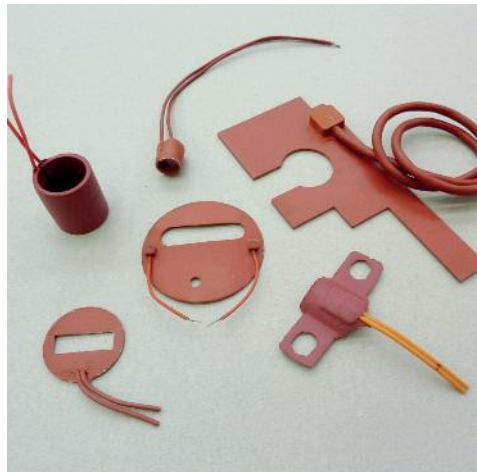
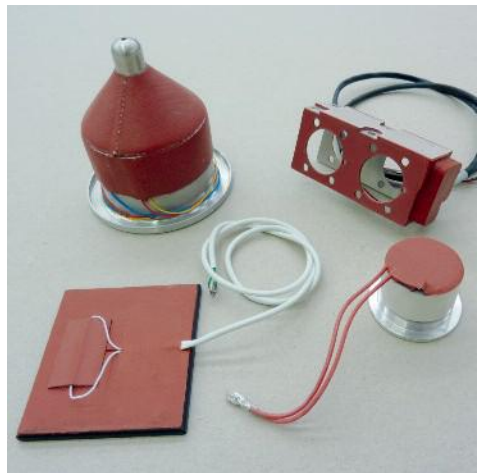
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Heaters for

Valves, nozzles and pumps



- > Design according to customer specifications
- > Easy assembly
- > Low space requirement
- > Maintenance-free
- > Splash-proof
- > Small batch sizes can be delivered

Valves, nozzles and pumps have to be heated when local conditions or the media being used require it. However, particularly in small casing there is often little space left for the heater. Fullchance Silicone Heaters are made to fit the particular shape of the casing. They are not only easy to handle during installation; they are also extremely robust in spite of their high flexibility and absolutely maintenance-free. Our heating mats are custom-made to fit your application requirements and the electrical values and geometry are freely selectable. Among others, we supply flexible, self-adhesive models that can be stuck onto sheet metal or even around a curve, for example. Alternatively a long-lasting and extremely durable mounting can be achieved through vulcanisation. At the request of the customer the heating mats can already be equipped with a temperature sensor or a temperature regulator exfactory. Trust in over 50 years experience in electrical heating technology and increase your productivity and application safety with heaters from Fullchance!



TECHNICAL DATA

Operating voltage	6 – 400V AC/ DC, higher voltages on request
Electrical output	0,05 – 3 W/cm ²
Dimensions	maximum 3000 x 1000 mm
Application range	-60°C to +240°C
Connection	strands or cable, length freely selectable
Attachment	self-adhesive film, Velcro, loops, hooks etc.
Temperature regulation	via Pt100 sensor or thermal element
Protection category / safetyclass	IP x4 / 0

INSTALLATION NOTE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

Casings Heater



- > Easy assembly
- > Low space requirement
- > Dimensions made to fit size of casing
- > Maintenance-free
- > Voltage and output configured to meet customer requirements
- > Splash-proof
- > Small batch sizes can be delivered

Casings have to be heated up if required by the installed components. However, particularly in small casing there is often little space left for the heater. Fullchance Silicone Heaters are made to fit the particular shape of the casing.

There are models than can be fastened to the casing wall with spacing bolts and screws. Alternatively, flexible self-adhesive models are available that can be stuck inside on sheet metal or even around a curve.

At the request of the customer the heaters can already be equipped with a temperature sensor or a temperature regulator ex factory.



TECHNICAL DATA

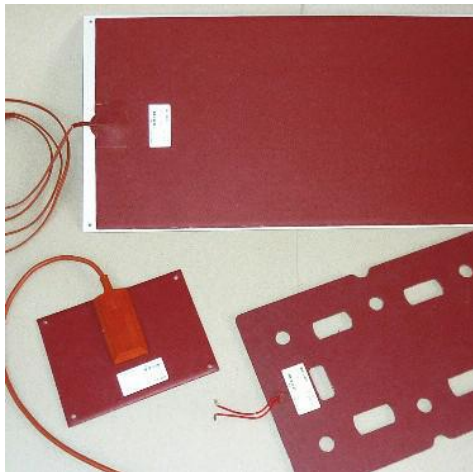
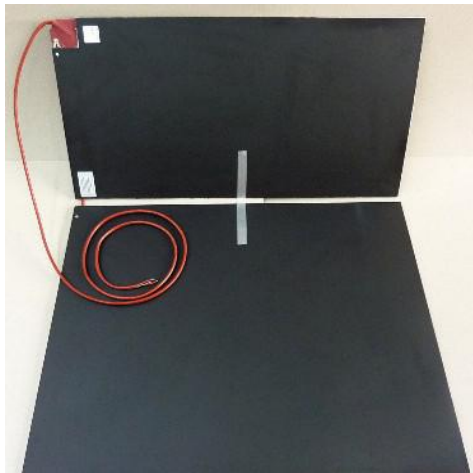
Dimensions	from the size of a postage stamp to maximum 2 x 1 m
Maximum temperature	240°C
Operating voltage	freely selectable
Electrical output	freely selectable
Connection	via strands or cable
Temperature regulation	via sensor in the Al-plate
Protection category / safety class	X4 / 0

EINBAUINWEISE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

Battery Heater

for rail vehicles, industrial trucks and specialty vehicles



- > Longer operating life
- > Less wear-out
- > Best cold-start properties
- > Fast re-chargeability
- > Easy installation
- > Retrofit

In vehicles that are exposed to low surrounding temperatures the performance and capacity of batteries decreases with sinking temperatures. At the same time the strain on the battery cells increases, which can lead to higher wear-out and potential premature breakdown.

With Fullchance Heaters for batteries and casings you reduce the amount of wear-out, increase the capacity thereby preventing early breakdown. Our heaters are custom-made to fit your specific application and the electrical performance as well as the geometry can be freely selected. Among others, we supply flexible, self-adhesive models that, for example, can be stuck onto sheet metal or even around a curve. At the request of the customer the heaters can already be equipped with a temperature sensor or a temperature regulator ex factory.

Trust in over 50 years experience in electrical heating technology and increase your productivity with heaters from Fullchance!



TECHNICAL DATA

Operating voltage	6 – 400V AC/ DC, other voltages on request
Electrical output	0.05 – 3 W/cm ²
Maximum dimensions	3000 x 1000 mm
Operating range	-60°C to +240°C
Connection	strands or cable, length freely selectable
Temperature regulation	via Pt100 sensor or thermo-element
Protection category/ safety class	IP x4 / 0

INSTALLATION NOTE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

Tank Heaters

E.g. ultrasound tanks



- > Tank volume 100% useable
- > Large surface heat transfer
- > Low surface area temperature required
- > Very even liquid temperatures
- > Easy mounting
- > Dimensions according to customer specifications
- > Voltage and output configured based on customer requirements
- > Small batch sizes can be delivered

Liquid in tanks partially needs heating; this is usually solved by using tubular heaters which require space within the tank. This makes larger vessels and more amounts of liquid necessary. If this is not desired then „Fullchance Silicone Heaters“ are ideal. These flexible heaters can be directly vulcanised onto the outside of the tank ex factory. Alternatively a model with self-adhesive film is available. Both versions do not require attachment parts; instead they are simply vulcanised or stuck on. At the request of the customer the heaters can already be equipped with a temperature sensor or a temperature regulator ex factory.



TECHNICAL DATA

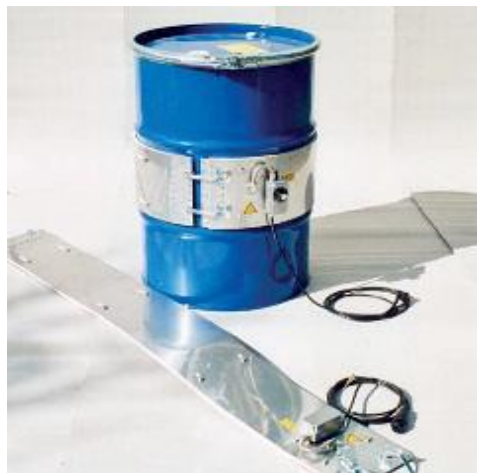
Dimensions	max. 2000 x 1000 mm
Maximum temperature	240°C
Operating voltage	freely selectable
Electrical output	freely selectable
Connection	with strands or cable
Temperature regulation	via sensor in the Al-plate
Protection category / safety class	X4 / 0

INSTALLATION NOTE

Installation must be carried out according to the valid VDE and CE guidelines for the application case. The corresponding protection measures and contact protection are to be realised by the user through the installation.

Drum heater

with isolation for 200l standard drums



- > In accordance with the CE Guideline
- > Splash-water protected IP54
- > Excellent heating transmission
- > Robust construction
- > Mechanically flexible – easy storage
- > Simple assembly
- > Complete with controller

The Fullchance drum heater is a simple and effective tool to heat up and/or keep 200l standard drums warm. Drum heaters are used for melting or for viscosity reduction of

e.g. fats, oils, resin, paints, or soaps. Thanks to its flexible and mechanically robust construction the Fullchance drum heater carries out its task reliably, even under the strain of daily operations.

The drum heater consists of a multi-layer assembly of fiberglass which is thermally and mechanically protected by an insulating layer and a stainless steel jacket. All touchable parts are included in the protective measures – only in this manner can the CE Guideline be observed! The heater is built in accordance with VDE 0700 Part 1 and inspected in accordance with VDE 0700 Part 500. When not in use, the drum heater can be stored and transported as a flat mat.



TECHNICAL DATA

Voltage	220-240V AC, 50/60Hz
Electrical power	1400W
Degree of protection	IP 54
Protection class	1
Heater size	1750 x 240 mm
Heating element	silicone heater
Range of application	0°C up to 200°C
Connector	exchangeable 3 m silicone line 3 x 1,5 mm ² with shock-proof plug
Temperature control	electronically integrated, optional externally
Mounting	stainless-steel quick release clamps

CONTROL

The drum heater disposes over an integrated PT100 temperature detector as well as an electronic controlling device with director for individual temperature setting. Alternatively, a drum heater with external electronic regulation with digital display is available. Optionally, a built-in sensor for the detection of the heating-jacket temperature or a diving sensor for the detection of the temperature right at the medium can be connected.

ORDER DETAILS		
Type	Article number	Temperature regulation
Drum heater with integrated control device	104-225-0750-0A	PT 100 with integrated electronic control device 0°C - 100°C
Drum heater with integrated control device	104-225-0750-A1	PT 100 with integrated electronic control device 0°C - 200°C
Drum heater with external control device	104-225-0750	with sensor pocket
PT100 built-in sensor	135-211-0008	with sensor pocket
PT100 diving sensor	135-211-0007	for medium
External electronic control	135-111-0001	for 104-225-0750

Technical data

Flexible silicone heaters

Useful information for the design of silicone heaters

Temperature:	-60 to +240°C (please note restrictions depending on fastener type)
Operating voltage:	6 - 400 V, AC/DC (1 phase or 3 phase), up to 750V upon request
Heating output:	up to 3 W/cm ² (from 0,45 W/cm ² we recommend a temperature controller)
Maximum length:	3000mm
Maximum width:	1000mm
Thickness:	1,5 - 6mm
Electrical connection:	single cores, cable, plug in contacts
Temperature controller:	depending on design
Installation, fasteners:	depending on design
High voltage resistance:	ca. 24 KV/mm (with standard materials)
Protection against moisture:	on request splash proof IPX4, higher safety categories upon request
Series test:	DIN EN 60335-1 (VDE 0700-1) and DIN EN 50106 (VDE 0700 part 500)
:	1 1

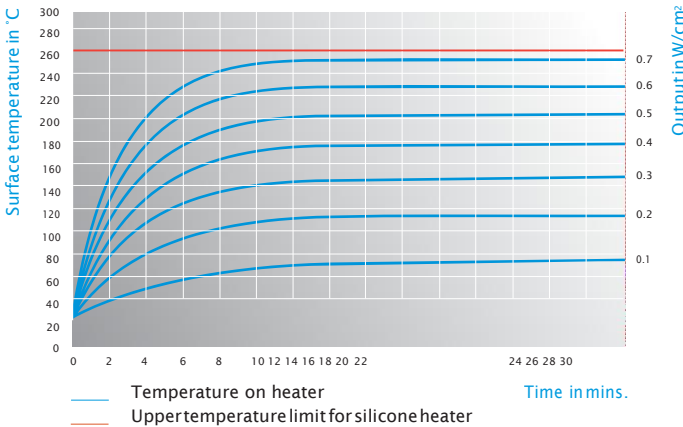
Physical properties

Temperature resistance:	-60 to + 240°C
Thermal conductivity ISO 8301:	ca. 0,27 W/m K (with standard materials)
Weathering and aging resistance:	very good
Ozone resistance:	very good
Steam resistance:	good to ca. 130°C, 2,5 bar

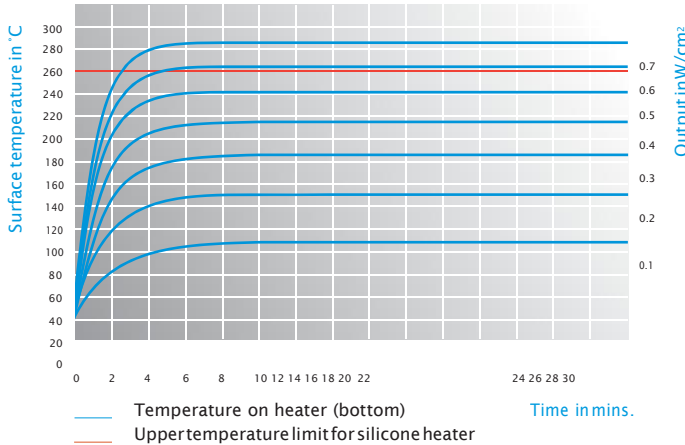
Temperature diagrams

The relationship between the specific heating output and the resulting surface temperature may be seen in the following diagrams (see temperature load).

Silicone heater vulcanised on 1.5 mm aluminium sheeting



Flexible silicone heater



Information for use

- Compressive load on the heater: max. 50 N/cm² two-dimensional pressure
- With container heaters with changing levels the temperature controller or temperature sensor must be attached to the upper side of the heater (= hottest position when the level drops)
- Depending on the heater design, the minimum bending radius is 30 mm
- Silicone heaters must not be bent
- The heaters must not be cut or mechanically damaged
- The heaters may only be operated with the prescribed voltage
- Incoming goods inspections are not carried out for provided materials as we assume that these parts are supplied in perfect condition. Materials must be provided at least three weeks before the confirmed delivery date for the heaters so that this date can be kept.

Temperature load

- The maximum temperature load for silicone heaters is 240°C
- The maximum temperature load for silicone heaters with self adhesive foil is 150°C

To ensure that the heater element does not overheat, a suitable temperature controller is recommended during the planning stage (supplied on request). With power densities > 0,45 W/cm² we recommend additional security by using a thermal cut-out.

The temperature that can be reached with a heater element depends on the following factors:

- Ambient temperature
- Thermal conductivity of the medium / material to be heated
- Insulation of the heater element and the heated medium
- Radiant emittance (heat loss through external influences)
- Thermal conductivity of the heater carrier
- Flow rate of the medium to be heated

Fastener types

	Temperature range	Installation instructions
Vulcanising	-60 to + 240 °C	Attached in factory
Self adhesive foil	0 to + 150 °C	Stick-on
Individual fastening	-60 to + 240 °C	e.g. pressure plate, with cylindrical components with tension spring

Possible labels of our products:



Planning support for heating systems

Company

Contact (surname, first name)

Street & number

Postcode town / country

Tel.

Fax

E-Mail

web

Planned use (please list details concerning special shapes or technical queries)

Temperature controller/sensor

Without

☐

Bimetal regulator

☐

Capillary tube reg.

☐

Electr. controler

☐

controller

PT 100

☐

PT 1000

☐

FeCuNi

☐

NTC

☐

sensor

Voltage

230V

AC

☐

DC

☐

115V

AC

☐

DC

☐

115V/230V

AC

☐

DC

☐

230V/400V

AC

☐

DC

☐

12V

AC

☐

DC

☐

24V

AC

☐

DC

☐

AC

☐

DC

☐

Fastener type

vulcanised

☐

self-adhesive foil

☐

stick-on

☐

press-on

☐

clamp-on

☐

Electrical output

W

Max. thickness

mm

Temperature values

°C

Elect. connection

mm

Length/width

mm

Number

p.a./Lot

You can also phone us on Tel. 8 6 - 7 5 5 - 2 7 7 4 9 4 0 5

SEND

Possible labels of our products:



Further comments

A series of horizontal dotted lines for writing further comments.



Flexibility in every aspect

Dimensions – from postage stamp size up to 3 m².

Forms – rectangles, circles, rhomboids, trapezes – almost all shapes possible.

Fastener types – models with self-adhesive foils or supplied with silicon adhesive as well as clamping and press-on variants. Alternatively, for optimum heat transfer, heaters may also be vulcanised directly onto the component to be heated in our factory.

Customer specific – we supply heaters with drill holes and cut outs, integrate temperature sensors and regulators and establish the connection type, output as well as mechanical flexibility in agreement with you.



