



# Heating Mats and Jackets

## The eltherm GmbH – Solutions with electrical heat tracing systems

eltherm GmbH is an international operating company specializing in the field of electrical heat tracing systems. With more than 50 years of technology know-how, continuous demand for the highest quality and flexibility, this company has grown significantly since its humble beginning. A clear commitment to the production site in Germany strongly emphasizes the philosophy of eltherm, which is to supply its customers with electrical heat tracing system solutions individually customized to their requirements of the highest level.

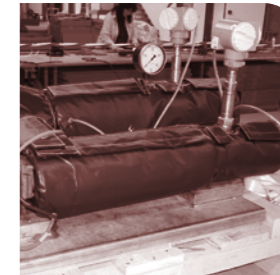
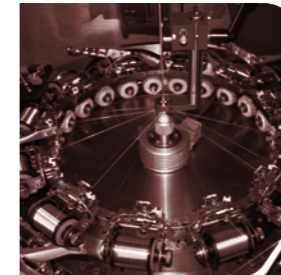
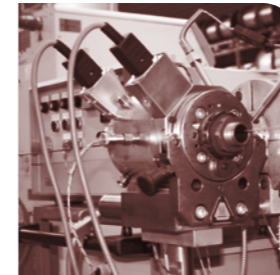
With its own comprehensive production facilities for all types of heating cable and accessories eltherm has built up the engineering expertise to become one of the leading manufacturers of electrical heat tracing systems in the world.

Besides frost protection and temperature maintenance applications up to 1000 °C, eltherm is the competent partner for complete system solutions like heating whole chemical or other industrial plants.

eltherm proved its potential and expertise in different applications for industries such as oil and gas, power plant, construction, automotive and food industries.



**Handicraft:** the eltherm-manufactured heating cables are sewed together with the according insulation custom-fit to the backing fabric of the heating jackets and mats.



## Solutions for your challenge!

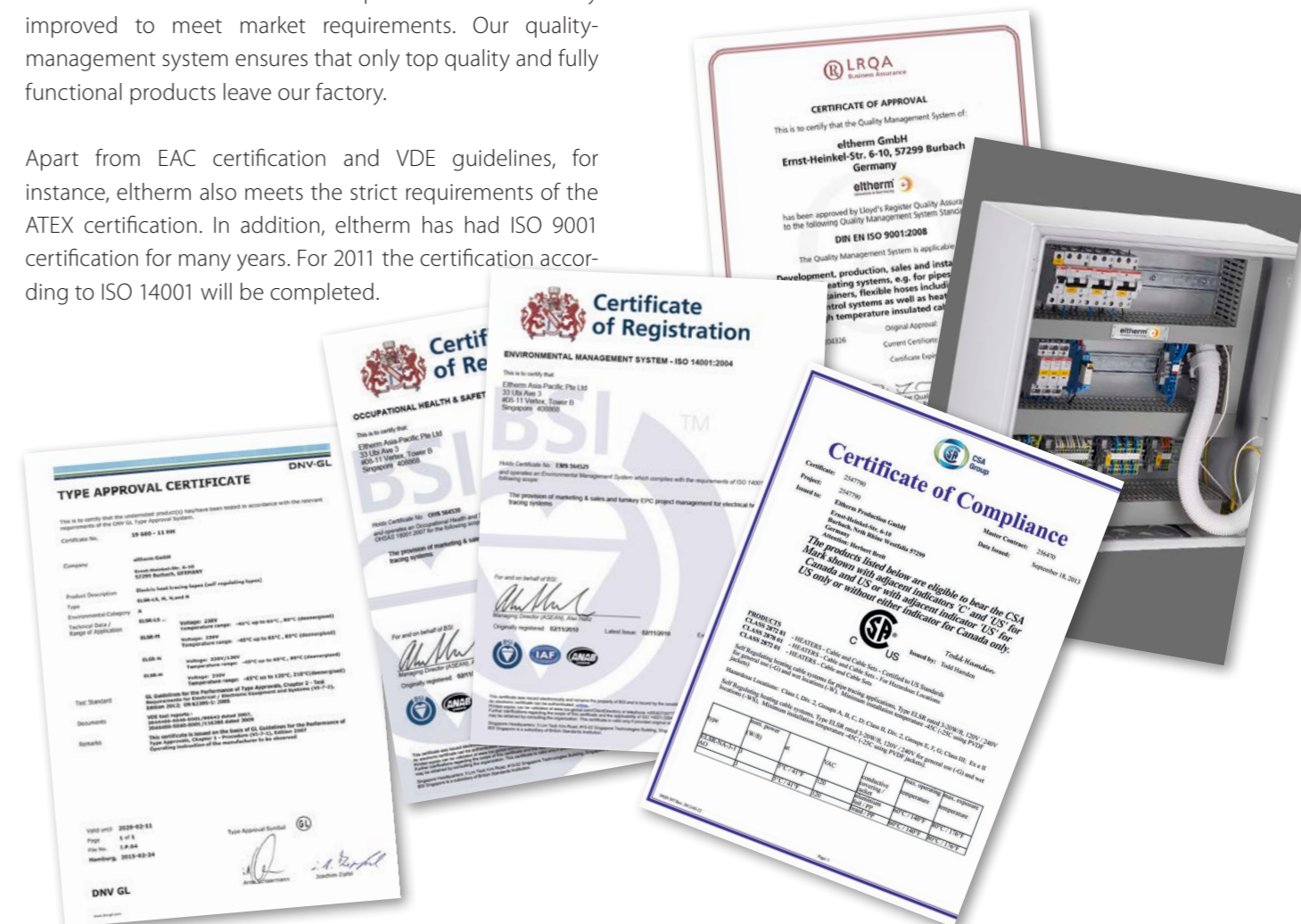
The eltherm engineers would like to face your challenge also.

## Qualified Solutions

eltherm has its own production facilities and its own research and development team. This is where innovative solutions are born and where products are constantly improved to meet market requirements. Our quality-management system ensures that only top quality and fully functional products leave our factory.

Apart from EAC certification and VDE guidelines, for instance, eltherm also meets the strict requirements of the ATEX certification. In addition, eltherm has had ISO 9001 certification for many years. For 2011 the certification according to ISO 14001 will be completed.

## Inspired by eHT



## Flexible Heating mats and jackets

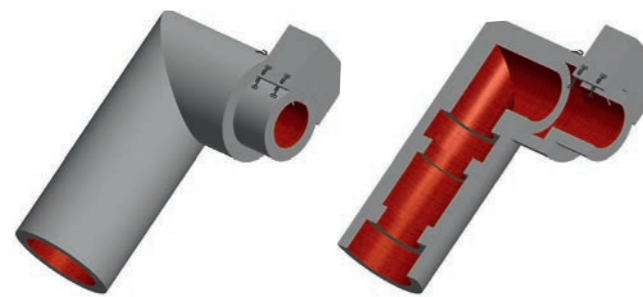
Flexible heating mats and jackets provide optimum heat transfer with good heat distribution. **Heating mats** are the ideal solution for simple level surfaces. They can also be manufactured separately from the insulation upon request.

**Heating jackets** are used when uniform heating of surfaces with more than two levels is required. Very flexible thanks to custom-made segments, they can be produced to match almost any shape. Heating jackets are easy to apply and remove with integrated heat insulation, which considerably reduces the installation and maintenance overhead.

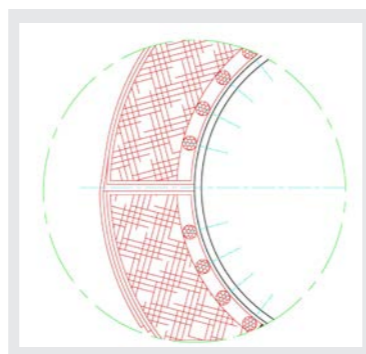
eltherm® heating mats and jackets are used in an extensive range of applications such as for heating bunker tips, IBCs, fans, pumps and many more. Flexible heating mats and jackets are also indispensable in research and development as well as nuclear technology.

### Advantages:

- Removable and replaceable
- Easy to mount, minimum installation time
- Low maintenance overhead
- For applications with high technical requirements
- Long service life
- Adapted according to the container, pipe, valve or pump (custom-made)
- Operating temperatures from 0°C to 900 °C
- Effective heating
- Optimum heat distribution
- Available complete with insulation
- Integrated temperature sensor



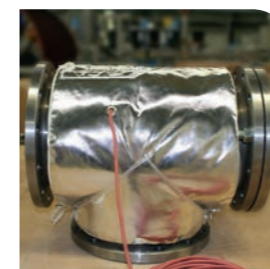
Creation of a virtual heating jacket model in 3D-CAD



Schematic detail design of the heating jacket structure.



### eltherm® heating jackets – industrial application ranges

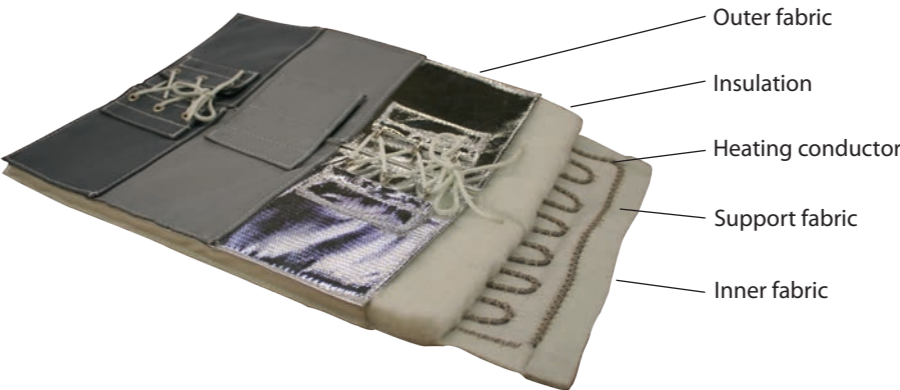


### Heating jackets and heating mats for:

- Pumps
- Valves
- Shut-off valves
- Bunker tips
- Pipeline strings
- Fans
- Baking out block houses
- Rotor blade tips
- Containers
- Drums and barrels
- IBCs
- Hobbocks
- Vacuum chambers
- Hose connectors
- Micro dosing pumps
- Flange caps
- Extruders
- Complete experimental facilities
- Steel pipe frames in particle accelerators
- and much more



# Layout



Sample mat with different layout combinations

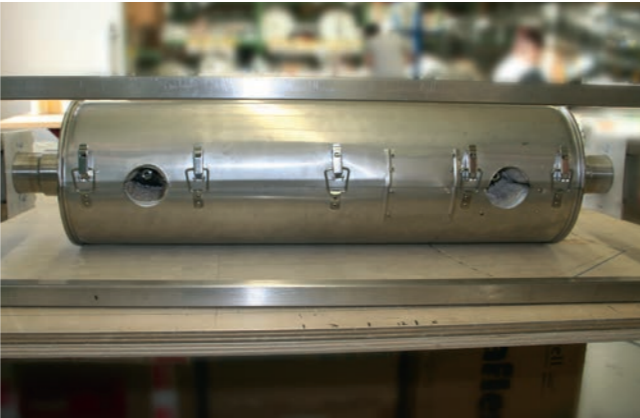
## Layout of heating mats / heating jackets:

Heating mats and jackets consist of textile materials which cling closely to the object being heated. To ensure a long service life, only high-grade materials are used. The selection of the material to be used depends on the conditions of usage. Criteria include the operating temperature and location of the application.

Aluminium-coated glass fabric is used for surface temperatures up to 160 °C, while plastic fabrics are used for temperatures up to 80 °C. Textile glass is used up to 450 °C, while quartz is used for surface temperatures up to 900 °C. Eyelets, hooks and Velcro fasteners are used for fastening.

Depending on the specification, our heating mats and jackets can also be manufactured for use in hazardous locations.

Heating jackets with a metal outer jacket can be used depending on the application, for example if high durability is required due to excessive load conditions. They are especially robust due to their design. Hinges and adjustable clamp fasteners are used to compensate for tolerances in the external diameter.



Heating jacket with sheet metal outer jacket



Heating jacket for hazardous locations, semi-round



Possible combinations				
Heating surface material	Plastic fabric with and without PU-PVC coating	Textile glass with silicone or Fluoropolymer coating	Textile glass without coating	Quartz fabric without coating
Fastening / closure	Velcro fastener	Eyelets, hooks and Velcro fastener	Glass adhesive tape	Quartz lacing
Insulation of heating conductors	Fluoropolymer	Textile E-glass	Quartz fabric	Quartz fabric
Thermal insulation	Plastic foam	Needled glass fleece	Silicone foam	Needled quartz fleece, Ceramic wool
Outer jacket of thermal insulation	The following outer jackets can be used, depending on low surface temperatures on the insulation: <ul style="list-style-type: none"> <li>■ Plastic fabrics up to 80 °C</li> <li>■ Aluminium-coated glass fabric up to 160 °C</li> <li>■ Textile glass with silicone coating up to 180 °C</li> <li>■ Textile glass with Fluoropolymer coating up to 220 °C</li> <li>■ Textile glass up to 450 °C</li> <li>■ Quartz up to 900 °C</li> </ul>			

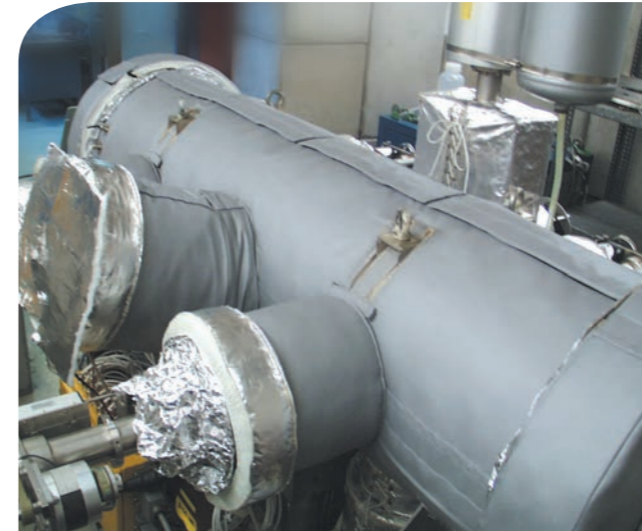
Nominal temperature	80 °C - 900 °C (depending on materials used)
Nominal voltage	Fluoropolymer 500 V E-Glas 300 - 400 V (depending on temperature and strain)
Maximum area output	up to 12.500 W/m <sup>2</sup> (depending on heating element used)

## Application examples



### Ex heating jacket for under/overpressure valve DN150 with removable insulative covers for biogas plant

Mat/jacket type: ELPW-Isol  
Cable used: ELK-AG-N  
Temperature range: Frost protection  
Special feature: Designed for use in areas subject to explosion hazard



### Heating jacket with fibreglass-insulated resistance heating cable for vacuum chamber

Mat/jacket type: ELPH-ISOL  
Cable used: ELK-H  
Temperature range: 230 – 250 °C  
  
Special feature: Vacuum chamber with flange heating jackets (alum.)



### Heating mats for rotor blade manufacturing, design with switch cabinet

Mat/jacket type: ELPW-Isol  
Cable used: ELK-AG-L  
Temperature range: up to 90 °C  
  
Special feature: Multiple heating zones, coupleable, control with defined ramp functions



### Heating jacket set for cyclone dust remover

Mat/jacket type: ELPH  
Cable used: ELK-H  
Temperature range: up to 450 °C



### Heating jacket for chemical / gas storage containers

Mat/jacket type: ELPW-Isol  
Cable used: ELSR-H  
Temperature range: Frost protection



### Quartz heating mat for experimental reactors

Mat/jacket type: ELPQ-Isol  
Cable used: ELK-Q  
Temperature range: up to 500 °C \*  
  
Special feature: Quartz outer jacket for high-temperature range

\* Quartz heating mats can withstand **operating temperatures up to 900 °C**.



# Suitable Measurement and Control

## Electronic Temperature Controller, Type ELTC/H-14

The ELTC/H-14 is an electronic temperature controller with digital display for wall mounting. The temperature is measured by a Pt 100 sensor, processed by the microcontroller and displayed. After having evaluated the actual and preset values, the appropriate output relays are switched, depending on the configuration.

The controller is equipped with a socket. The unit is supplied in a weather proof plastic enclosure, with a transparent cover.

### Advantages:

- LED display operable down to -25 °C
- Programmable 0 °C up to +390 °C
- For switching 20 A resistive load with hybridrelay
- Signaling contact (configurable to operate either as alarm or release contact, potential-free)
- Suitable for Pt 100 with 2 or 3 wires
- Operating voltage: 90 - 260 VAC / 50/60 Hz



### Technical details

■ Operating voltage	90-260 VAC 50/60 Hz
■ Power consumption	max. 4 mA, < 5 W
■ Switching capacity relays 1	max. 20A with hybridrelay*
■ Switching capacity relays 2	8 A, changover contact (alarm)
■ Operating temperature	-25 °C ... +55 °C
■ Storage temperature	-30 °C ... +60 °C
■ Display range	-50 °C ... +400 °C
■ Adjustable range	0 °C ... +390 °C, optional configuration
■ Sensor connection	Pt 100 2-wire, 3-wire, optional configuration
■ Display	LED, red
■ IP rating	IP 65
■ Dimensions (w x h x d)	130 x 130 x 75 mm polycarbonate enclosure

## Temperature Controller Mini ready for connection, Type ELTC-Mini

The ELTC-Mini is an electronic temperature controller featuring an ultra-compact design and suited for direct contact installation on our heated hoses, heating jackets and special trace-heated applications. It is the ideal solution for applications which neither allow the use of an external controller nor need an alteration of value setting. The controller is housed in an extremely stable and ultra-compact enclosure to protect it against vibrations and shocks. The operating status is signaled through multicolor LEDs.

### Advantages:

- Compact design
- Fully encapsulated electronics protected against vibrations and shocks
- Working temperature -25°C up to +55°C
- Switching capacity 1500 W, especially for trace-heated applications optimized through zero-voltage switch



### Technical details

■ Operating voltage	230V / 50/60Hz
■ Power consumption	max. 2VA
■ Operating temperature	-25°C up to 55°C
■ Storage temperature	-30°C up to 60°C
■ Sensor input	PT-100/ 2-wire
■ Hysteresis	2...30K, value setting in factory
■ Temperature range	0°C bis 400°C, value setting in factory
■ Switching capacity	1500W
■ Dimensions	75x46x35mm (l x w x h)
■ IP rating	IP54
■ Supply cable	2.00 m long temperature rubber cable, temperature-resistant up to 120°C, available with Schuko plug on request

## Silicone heating mats

Silicone heating mats are used when highly complex structures have to be heated. They can be used in a variety of ways and can be produced in almost any shape and size. Silicone heating mats are pasted directly onto the shape being heated or are fastened by clamping eyelets.

### Advantages:

- Splash-proof
- Washable
- Easy installation and assembly
- Low overall height
- Also available in accordance with DIN 5510-2 (approval for railway applications)



For further controllers, please note our considerable measurement and control catalogue unit.



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