



BACKER  
CALESCO



## RAILWAY SOLUTIONS

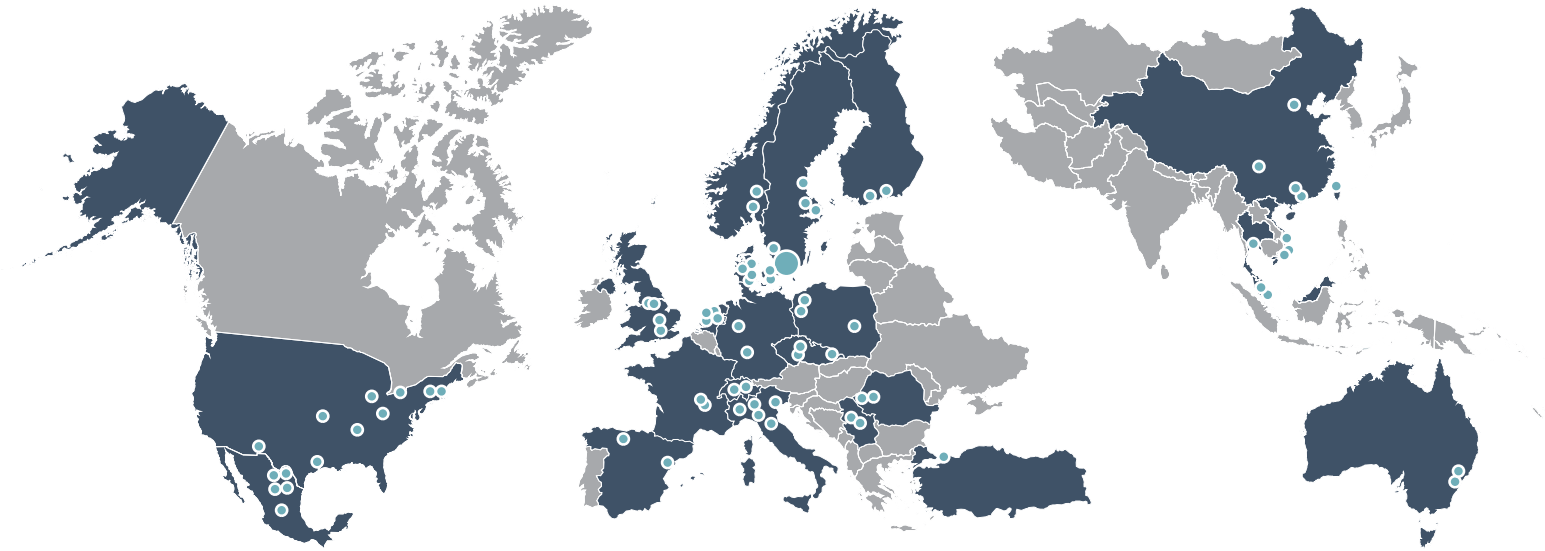
RELIABILITY · SUSTAINABILITY · COMFORT

# BACKER CALESCO

EVERYDAY · EVERYWHERE

Our heating products together with our measurement and control devices offer our customers complete solutions. Our engineers will not only suggest solutions, they can also take part in and contribute to your product development by using our advanced technical tools and lab facilities. Our extensive experience and competence as well as our reliable quality and service guarantee your success. Our ambition is to not only be a supplier, but your preferred partner.

*Together we can make it happen!*



NORTH AMERICA

EUROPE

ASIA/OCEANIA

## MEMBER OF BACKER-GROUP

Backer develops, produces and sells customised solutions and components for electric heating, measurement and control. The original technology was stainless steel tubular elements. However, the constant growth of the Group, both organically and through acquisitions, has enabled the integration of several new technologies. Today the Group offers a far wider product range, with a vast number of technologies for several industry sectors and a large variety of applications.

## PRODUCTION LOCATIONS

- Backer Calesco main office and production in Sweden
- Production facilities in China, Poland & Vietnam
- Sales office/warehouse in the US



Customised solutions

## INDUSTRY SECTORS



AUTOMOTIVE



LIFE SCIENCE



RAILWAY



BATTERY



COMFORT



COMMERCIAL EQUIPMENT

# RAILWAY HEATING SOLUTIONS

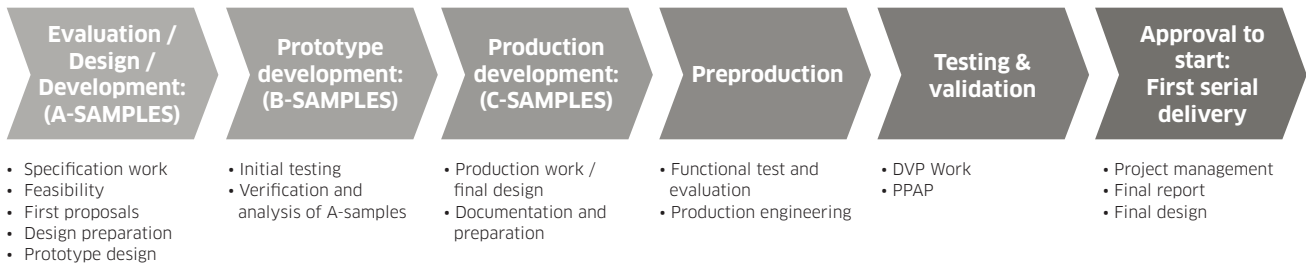
RELIABILITY · SUSTAINABILITY · COMFORT

**Backer Calesco** has been supplying flexible foil to the Railway industry for decades. Our foil is approved for high-tech, weight-management applications. A space-saving efficient alternative to be used in, for example, as floor heating, frost protection, rear-view mirror heating and seat heating. The flexible foil is supplied in various materials such as PVC, Polyester, Silicon and Mica. As one of the largest suppliers of rear-view mirror heating concepts, we have a vast knowledge of the demands of the transportation industry. The possibilities are endless.

<b>Typical applications</b>	Windshield wipers	Heating of water pipes
Floor heating systems	Headlights	Switch points
Couplers	Lens heaters	Rear-view mirrors
Steps	Heating in driver's cabins	

## PRODUCT DEVELOPMENT

We work together in a gate model to make sure we reach target in cost and production SOP



## DVP PERFORMANCE TESTING

- To validate the design, we perform the test needed to fulfil the specification
- Temperature profile (sensor and image)
- Resistance to climate and environment
- Electrical durability and resistance
- Specific customer requirements

## QUALITY

We strive to deliver the highest quality products combined with a flexible way of working. This permeates the whole process including sales, product development, manufacturing, customer service and logistics. Backer Calesco delivers products that meet all relevant standards and tests, certifying products according to customer specifications. We are also able to carry out tests in modern labs, constantly improving our product performance and energy efficiency.

## CERTIFICATIONS

Backer Calesco is certified:  
ISO 9001 · ISO 14001 · IATF 16949

Our facilities in China, Poland & Vietnam are certified:  
ISO 9001 · ISO 14001 · IATF 16949



**Innovations for the future**

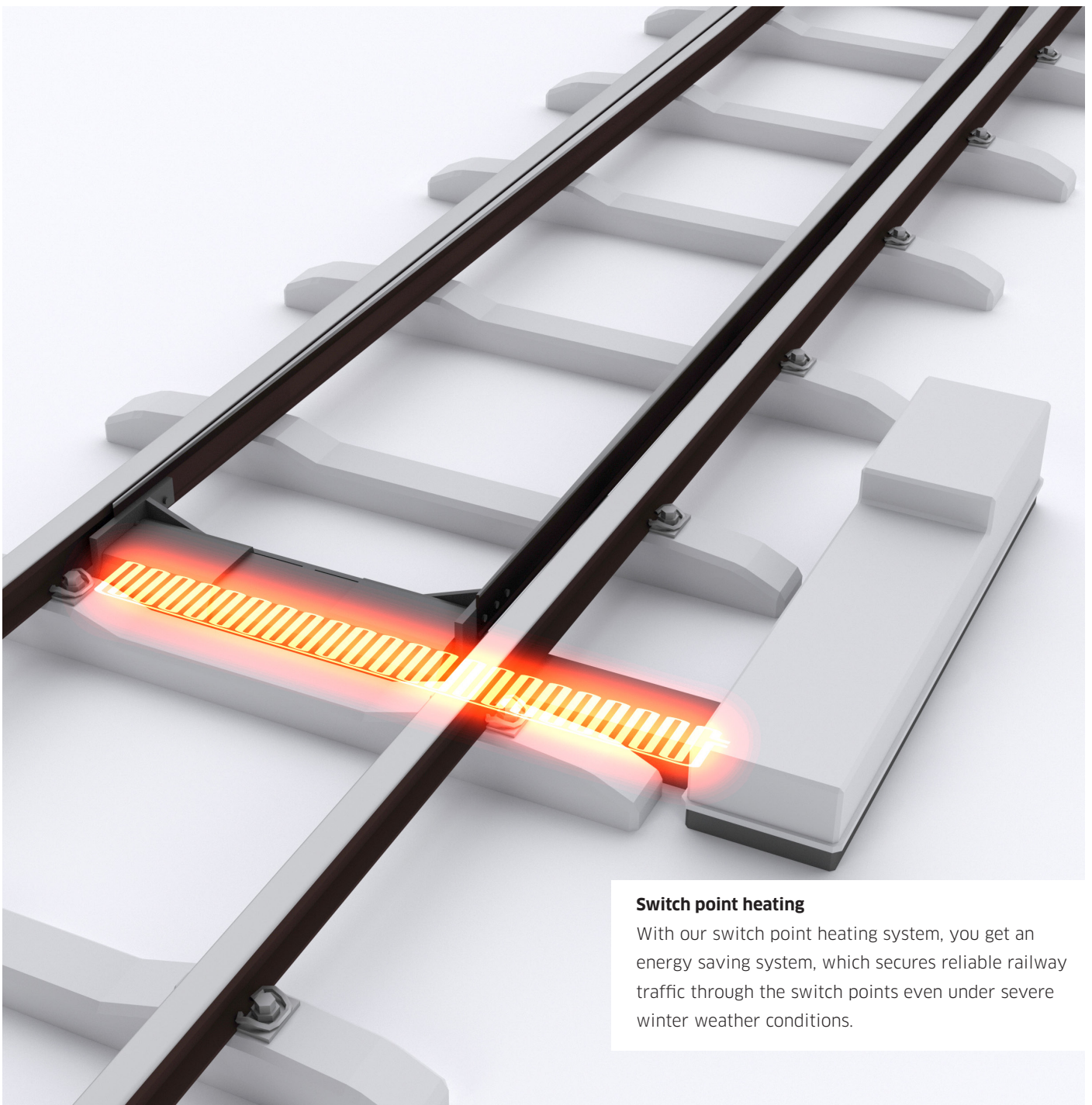
A partnership with Backer Calesco gives you a dedicated team of designers, project engineers and technical experts in the fields of electric heating, measurement and control, ready to provide you with the optimal solutions for your needs.

# HEATING COMPONENTS

## FLEXIBLE FOIL ELEMENTS

### **Flexible, lightweight and space-saving**

Flexible elements, or foil elements, offer many advantages, beside the fact that the material is flexible. Examples include the ability to have multiple circuits or multiple voltages in the same element, or the ease of locating a sensor. Foil elements provide excellent thermal transfer where you need it most. They are used in thermal control design to protect components under cold-case environmental conditions or to make up for heat that is not dissipated. Foil elements are a space-saving, efficient alternative to applications where precise heat and maintaining exact temperature are important. They are supplied in various materials such as Polyimide, Polyester, Silicon, PTC and Mica.

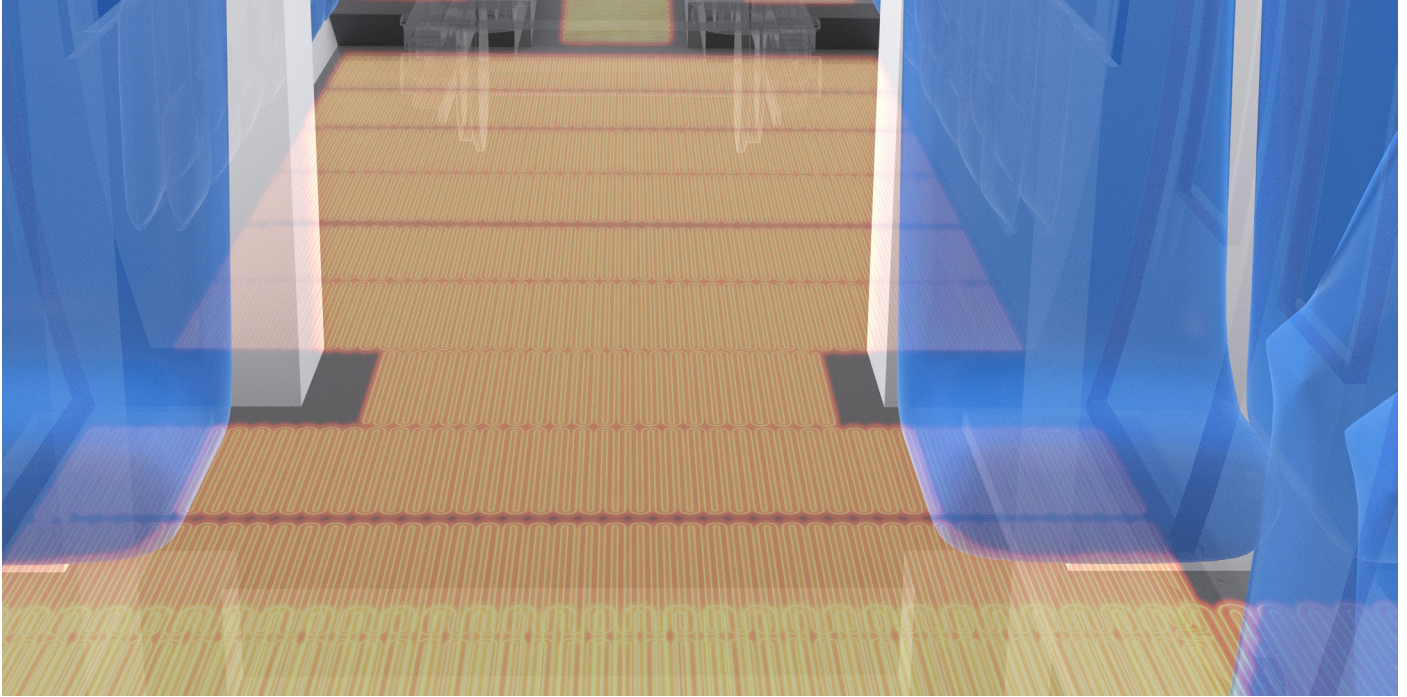


### **Switch point heating**

With our switch point heating system, you get an energy saving system, which secures reliable railway traffic through the switch points even under severe winter weather conditions.

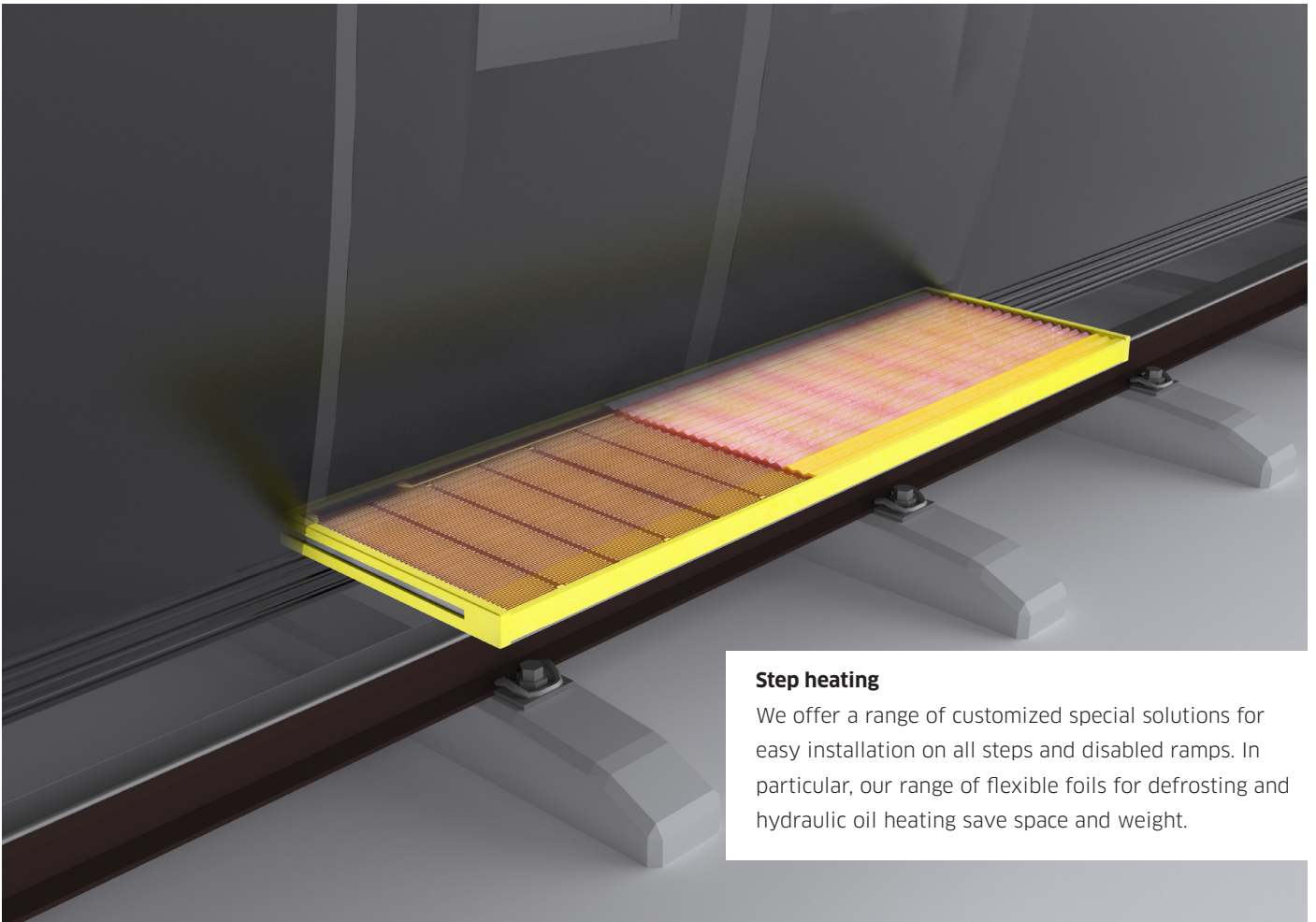
### Floor heating

With our electric radiant heated floor solutions, you can save space and weight by installing foil as floor heating. Power output: 50W - 700W/m<sup>2</sup>  
Supply voltage: 48-800VAC/DC



### Step heating

We offer a range of customized special solutions for easy installation on all steps and disabled ramps. In particular, our range of flexible foils for defrosting and hydraulic oil heating save space and weight.



# TEMPERATURE MANAGEMENT

## ELECTRONIC CONTROL SYSTEMS

### Control and energy balance

Flexible foil heaters provide excellent thermal transfer where you need it most. Heaters are used in thermal control design to protect components under cold-case environmental conditions or to make up for heat that is not dissipated. It is usually necessary to arrange some form of control to ensure that the desired temperature is maintained; accurate temperature control is therefore needed. This can be achieved with electromechanical thermostats of bimetallic type when temperatures and surface ratings are low, while electronic thermostats are preferred when temperatures and surface loads are high. We can fit thermostats, temperature fuses and sensors of thermo element type, thermistors and resistance sensors directly to elements in accordance with customer specifications. This helps to ensure reliable control.

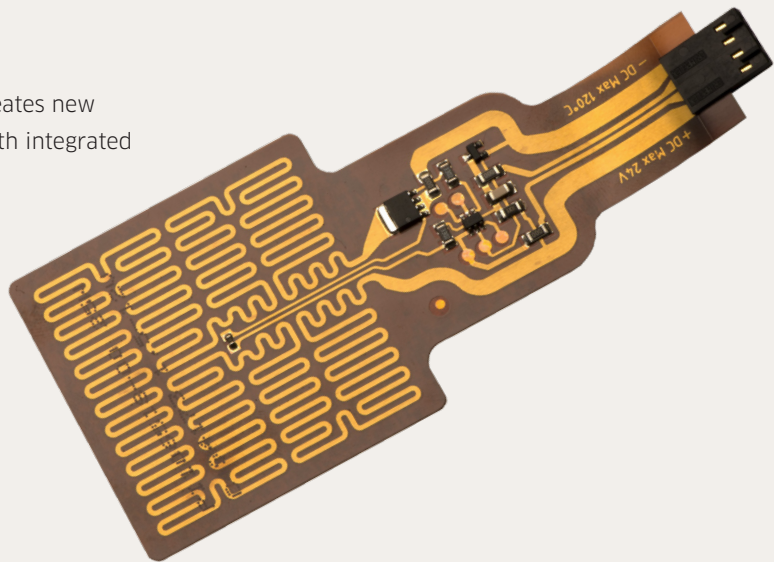
## SMART HEATER!

### Heater concept with integrated control

The demand for smart simple solutions creates new applications and we can offer solutions with integrated thermal controllers and sensors.

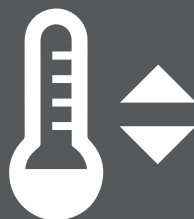
### Typical components

- Thermostat
- Resistance controlled
- NTC
- PTC
- PT100/PT1000
- Thermocouple
- Overheat protection



HEATER

+



MEASUREMENT  
& CONTROL

=



COMPLETE  
SOLUTION



Customised solutions

Customers often come to us with an idea about a new project/solution, a need for our expertise or because they want to enter a partnership with us. We are more than happy to share our facilities, vast experience and expertise at this initial stage. The earlier we are involved in a project, the more we can control the optimisation of core issues, such as the choice of materials, components and technology, temperature control, energy consumption and sustainability, cost efficiency and compliance with all applicable norms, regulations and standards.



## FOIL HEATING SOLUTIONS

### Advantages

- Thin, flexible & lightweight
- Customised shapes
- Multiple temperature zones
- Simple assembly
- Quick heating
- Efficient heat transmission
- Low energy consumption
- High quality
- Wide material selection

### Technical specifications

We offer standard products as well as customised solutions  
Voltage: Up to 1000V  
Power density: From 0 to 5W/cm<sup>2</sup>  
Max. temperature: 600°C



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