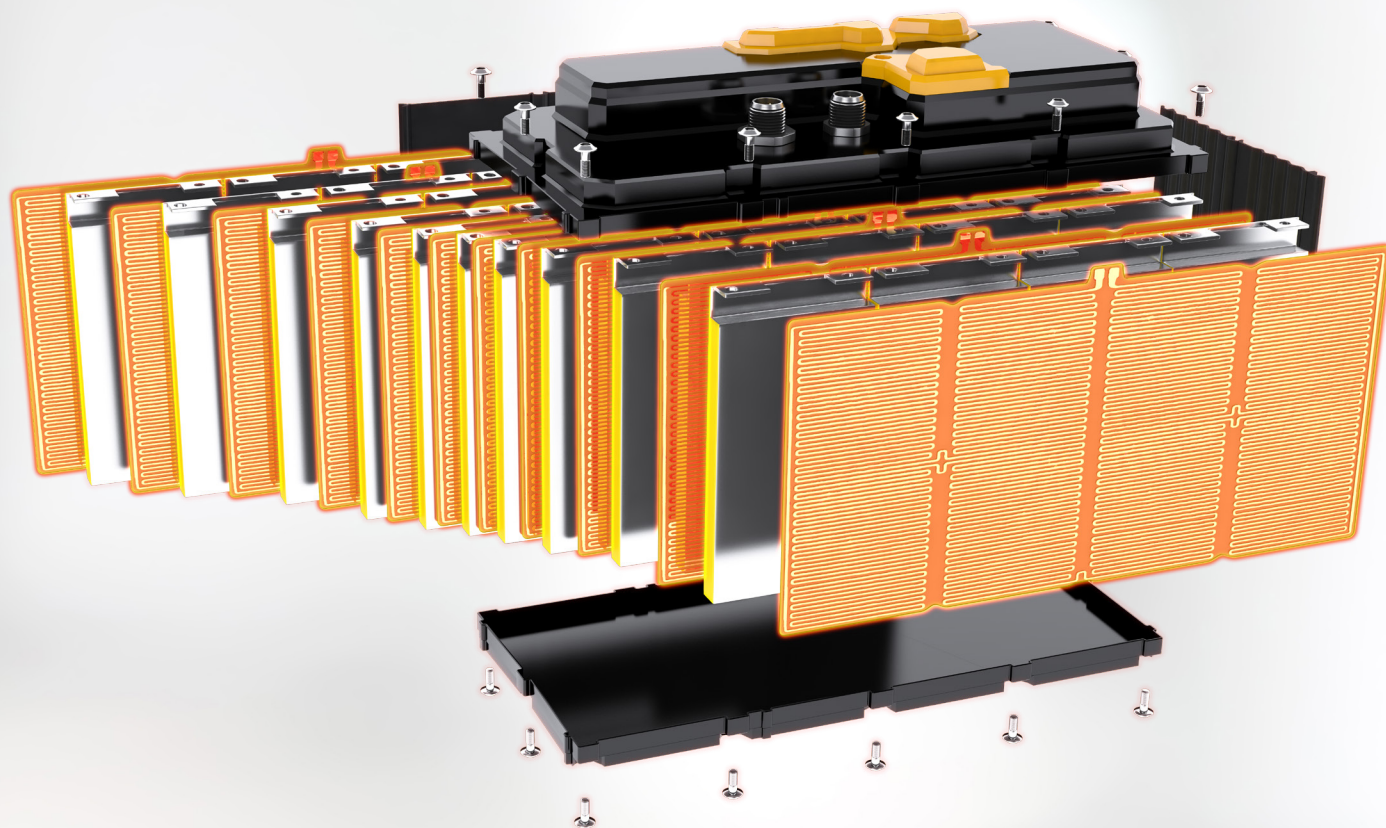




BACKER
CALESCO



BATTERY SOLUTIONS

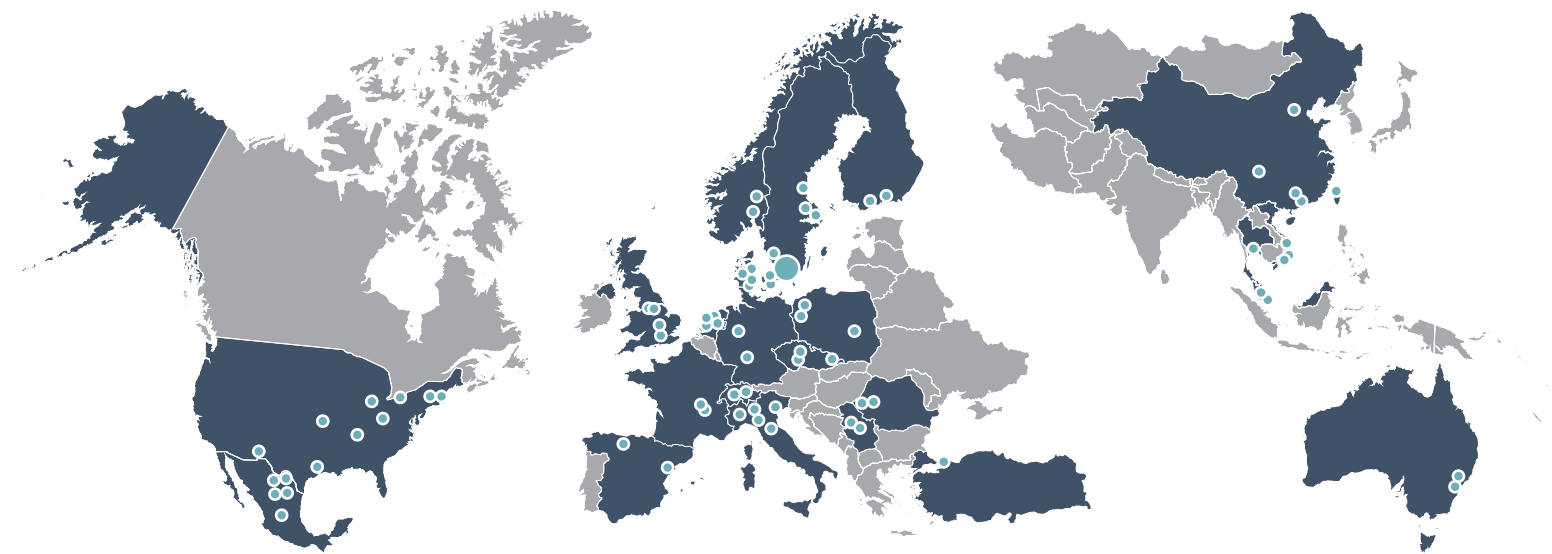
INCREASED LIFETIME · INCREASED CAPACITY · RELIABILITY

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

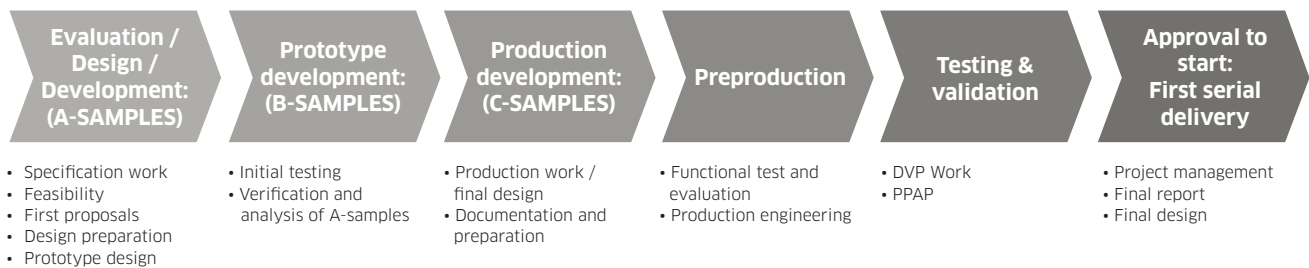
BATTERY HEATING SOLUTIONS

INCREASED LIFETIME · INCREASED CAPACITY · FASTER CHARGING TIME · RELIABILITY

Backer Calesco produces flexible foil heaters for various battery applications. Our foil heaters are customised according to customer needs and we provide total heating solutions and services creating added value.

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.

SOLUTIONS FOR BATTERY HEATING

By adding heating, both lifetime and efficiency will increase

The need for environmentally-friendly vehicles creates a demand for more efficient batteries both for Hybrid and Electric cars. When batteries are exposed to cold weather the temperature of the battery drops and the chemical reactions occur more slowly, so the battery cannot produce the same amount of current that it can at room temperature.

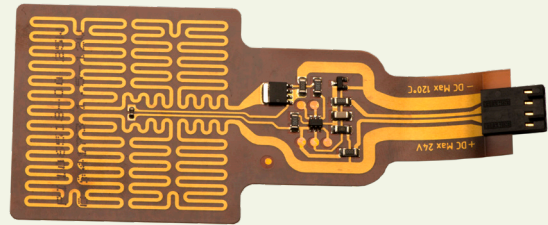
When decreasing below -20°C in some situations, the chemical reactions will happen so slowly and generate so little power that the battery will appear to be dead when, in fact, if it is warmed up, will return to normal output.

The batteries charging rate is affected by temperature and by adding heating to the batteries, both lifetime and efficiency will increase.

SMART HEATER!

Customised heater concept with integrated control

Maintaining correct temperature is critical for many applications and we provide complete solutions to ensure reliable temperature management.



APPLICATION DETAILS

Typical applications

- Electric vehicles
- Electric forklifts
- Battery grids
- Emergency equipment

Heating technologies

- PTC max temp $+70^{\circ}\text{C}$
- PET max temp $+105^{\circ}\text{C}$
- PEN max temp $+160^{\circ}\text{C}$
- Polyimide max temp $+200^{\circ}\text{C}$
- Mica max temp $+600^{\circ}\text{C}$

Typical types

- Internal
- Heat plate
- Wrap around
- Inbuilt housing
- Prismatic Cell, Pouch & Cylindrical batteries

Our services create added value

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.

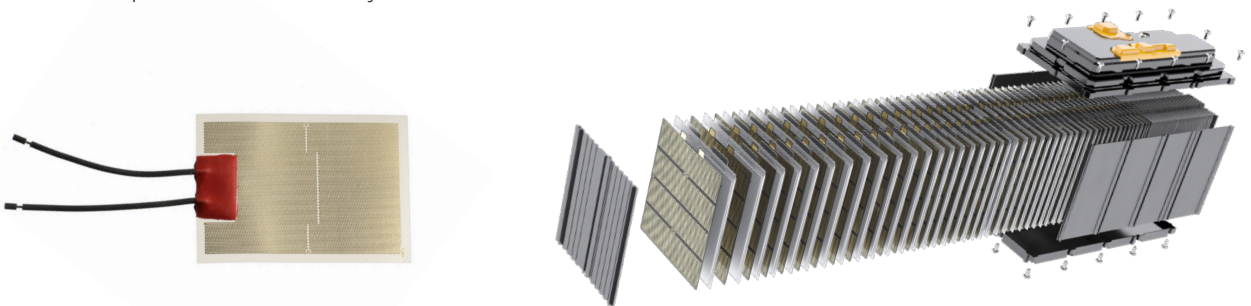
SERVICES

- Simulations
- Tests
- Validations
- Documentations



APPLICATION EXAMPLE

Foil heater placed between battery cells.



TEMPERATURE MANAGEMENT

ELECTRONIC CONTROL SYSTEMS

Control and energy balance

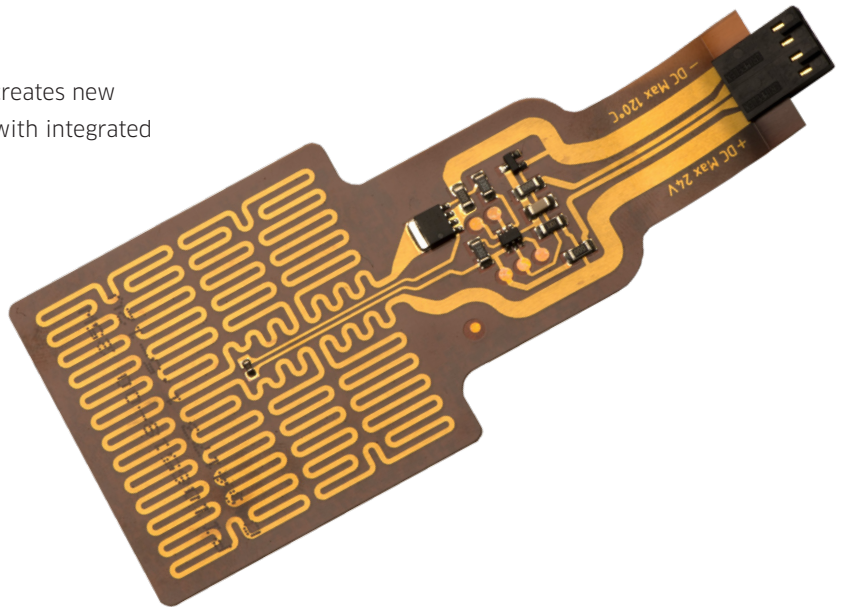
Flexible foil heaters provide excellent thermal transfer where you need it most. Heaters are used in thermal control design to protect components under cold-case environmental conditions or to make up for heat that is not dissipated. It is usually necessary to arrange some form of control to ensure that 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.

Integrated control/smart heater

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

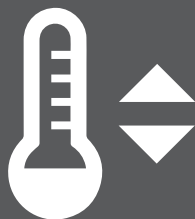
Typical components

- 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.



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/cm²
Max. temperature: 600°C



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backercalesco.com

EVERYDAY · EVERYWHERE