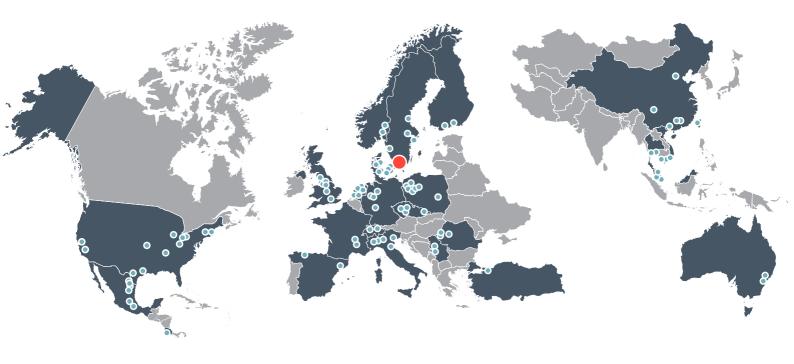


# **BACKER**

# **EVERYDAY** · **EVERYWHERE**



# **BACKER GROUP**

Backer develops, produces and sells customized 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.

## **TECHNOLOGIES**



Tubular Heating Elements



IR & Halogen Elements



Printed Elements



Heating Cables



Supported Wire Elements



Suspended Wire



Measurement & Control



Heat Pump Technology



**Flements** 



- 12 000 employees and 80 production units on 4 continents
- >70 years of accumulated competence and experience in the industry
- International organization with local presence
- Many specialized R&D departments to bring new innovative solutions to the market
- Customized solutions fulfilling special requirements
- · Strong focus on sustainable energy solutions
- Volume and industry production in different parts of the world

# INDUSTRY SECTORS



Energy &





Equipment

Appliance



Transportation



# BACKER TRANSPORTATION & AUTOMOTIVE SOLUTIONS

# SAFETY · ENERGY EFFICIENCY · COMFORT

Backer Transportation & Automotive Solutions wants to make it easy for customers and partners to get high quality solutions for a wide spectrum of heating related Transportation & Automotive applications. The solutions cover both heating components and safety products, complete intelligent systems, new energy solutions, and temperature control devices. Backer Transportation & Automotive Solutions is your single point of contact and inspiration in the heating related Transportation & Automotive Industry.

# PRODUCT DEVELOPMENT

**Pre-study** 

Define product and specification

Sample production

**Validation** 

First serial delivery

Serial delivery

## PERFORMANCE TESTING

- Temperature and measurement
- Interior testing
- Thermal imaging
- Cooling room -25°C
- Noise testing
- · Humidity chamber
- Life cycle testing
- · Wind tunnel tests
- Resistor power testing
- · Long term corrosion tests
- Electrial tests up to 24kV AC
- External resources for other types of tests such as shock and vibration and intermittent pulses.

# MASTERING THE DESIGN

- Creo 3d CAD
- X-ray equipment
- Windchill/ Product data management etc.
- Simulation
- Thermal/ flow simulations PTC MECHANICA
- Thermal and stress analysis

# **OUALITY**

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

## **CFRTIFIFD**

BACKER AB IS IATE & ISO CERTIFIED.

- · IATF 16949
- · ISO 9001, ISO 14001, ISO 45001



#### Innovations for the future

A partnership with Backer 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.

# FOR ELECTRICAL VEHICLES & TRANSPORTATION AIR OR WATER COOLED RESISTORS











Water cooled resistors

Today we offer customized brake resistors with a rated braking power of 90, 110 and 250 kW. They are suited for a wide range of vehicles. Together with our customers we develop sustainable solutions also with regards to packaging and specific requirements.





# **HEATING SYSTEMS**



## **Glycol pre-heaters**

Flange heater mounted in pressure vessel, terminal box with built-in thermostat 20-45°C and temperature limiter. Avaliable for water or oil; for various wattage and voltage and in different sizes, according to customer requirements.



## **Electrical Heater**

A customized heater for both battery conditioning and passsanger compartment heating. Today we offer solutions up to 10 kW. However, we are able to offer joint development projects for higher power requirements.



# **Battery heaters**

- · Ensures ultimate performance of Li-lon batteries even during extreme cold
- $\cdot$  Prolongs the lifetime of the battery

#### **Application Service**

We offer our support by using computer simulation software and thermal models to predict the temperature of the various parts of the resistor. As a result, securing the correct choice of the right component without oversizing, at the same time as speeding up the design. The thermal model depends on the size and weight of the resistor, wire size, length and filling material.

# FOR ELECTRICAL & CONVENTIONAL VEHICLES & TRANSPORTATION **HEATING SYSTEMS**





#### Ad Blue UREA heater

- · AdBlue®
- · Dry surface heater
- · SEMI DRY Surface heater
- · Submerged Surface heater
- · Submerged Free Floating · Insulated dry surface heater



#### Battery heaters.

- · Internal
- · Heat plate
- · Wrap around
- · Inbuilt housing PTC
- · Thru flow
- · Prismatic Cell and Pouch Batteries



#### Thick film elements

For defrosting of urea in exhaust systems



#### Backer HV PTC heating system intended for battery package for electric vehicles.

High DC voltage double insulated PTC element. Con- · High-voltage PTC heating nection box and air duct in plastic. PCB board with implemented Backer software for CAN-bus control with open loop control of power. HV - and LVDC cables integrated. Customized to fit actual vehicle. Compatible with vehicle' A/C system.

- systems for electric cars
- · PTC elements
- · Flow through heaters



#### **Compartment heaters**

- · Aluminium elements
- $\cdot$  Complete heating units with/ without fan



#### Aluminium light weight heating elements

Large surface area wich gives low working temperature.



## Central heat exchanger

Compact heat exchanger with sealed outlets of double insulated cartridge heaters for connection to the terminal line on trolley busses. Nominal power 29-40kW. Nominal voltage 400-900 VDC.



#### Thick film heat exchanger

- · Low weight & compact design
- · Quick temperature rise
- · Robust design
- $\cdot$  Possible high operation temperature (up tp 350°C)



## HVAC

Heating and air-conditioning systems for public transportation



# FOR ELECTRICAL & CONVENTIONAL VEHICLES HEATING COMPONENTS

Several types of heaters are crucial components for modern day cars. The heaters ensure everything from the thermal comfort for the driver and all passengers to optimal performance of all safety functions, e.g. clear sight.

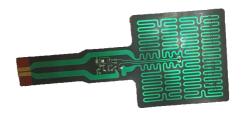


#### **Engine heaters**

- · Engine preheaters
- · Tubular elements
- · Engine crankcase heaters
- · Cast-in elements



· Flexible foil elements



#### Heat Plate

- · Dry surface heater
- · Larger area
- Laminated to Aluminum plate to improve heat transfer



#### Windscreen wiper heaters

A number of flexible foils assembled directly in the wiper and in the standby position for efficiency against icing and freezing of the wiper which makes it a safety application.



#### Rear view mirror heaters

· Flexible foil elements



#### Lens heaters

Flexible foils installed for preventing ice and condensation on night cameras and spotlights.

DID YOU KNOW THAT BACKER IS THE NUMBER ONE SUPPLIER OF REAR VIEW MIRROR HEATERS IN THE WORLD?







# **MEASUREMENT & TEMPERATURE CONTROL**

## ELECTRONIC CONTROL SYSTEMS

Accurate temperature sensing and temperature control are vital when considering any heating application.

We can provide a wide range of various solutions for measurement and control.

Everything from a simple standalone controller, to a large fully customized complex system.



#### PT100 / PT1000

The majority of today's automotive and industrial systems depend on an accurate and reliable supply of information. Our Pt100 and Pt1000 sensors, give an excellent performance in a highly rugged design.



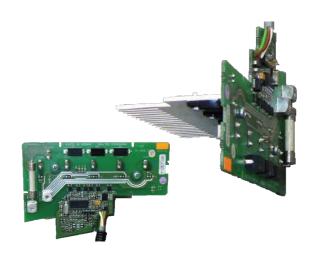
#### NTC SENSORS

Negative temperature coefficient (NTC). Decreases in electrical resistance when their temperature is raised. Negative temperature coefficient (NTC) thermistor is a two terminal solid state electronic component with predictable change in resistance corresponding to changes in absolute body temperature.



#### RELAY / TRIAC / IGBT

The power output control can be executed through mechanical or non mechanical components. Relays, Triacs and IGBT's are examples of devices that we can provide. Specified and approved for automotive AC or DC applications.



#### CONTROL

The integrated power electronics solutions give a compact functional package for easy fitting to any application in the HV area.





