



BACKER

EVERYDAY. EVERYWHERE



The original since 1921

Our founder Christian Backer patented the modern day tubular heating element back in 1921. Almost 30 years later in Sösdala, Backer BHV was founded to commercialize this technology for large scale production. Since that time, Backer has developed and produced components and solutions for electric heating markets around the world. Still today, in that little town in the south of Sweden, Backer BHV AB remains the global headquarters for the Backer Group. With over 40 companies and 6,000 employees around the world, the Backer Group is the premier solutions provider in the heating element industry.

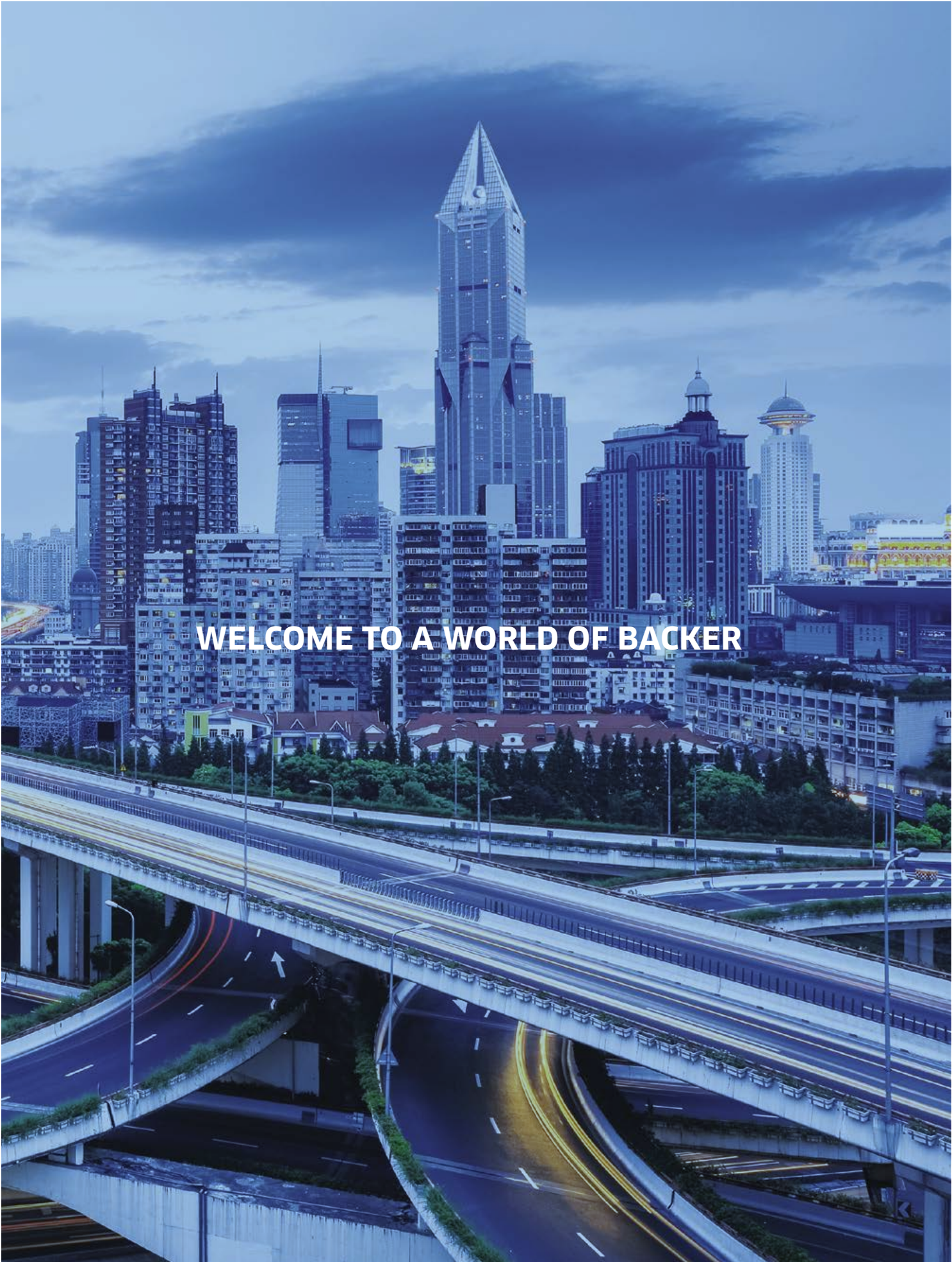
Many of Backer's products maintain their origins from the technical innovations in the original Christian Backer patents. Heating experts around the world still today refer to the so called "Backer element" as the industry standard.

Modern day Backer is a technical industrial partner to the most important companies in several industry sectors. We deliver competitive solutions within the fields of measurement, heating, and control for leading companies in the Automotive, Energy, Railway, Medicine, HVAC and Process industries. Our customers require innovative and customized technical solutions for their specific applications.

At Backer, we strive to help create competitive advantage for our customers by adding value through partnership. Our approach to product design and supply results in real benefits for our customers. Our global presence ensures that no matter where our customers design, test or produce their products, Backer engineering and support services are always available.

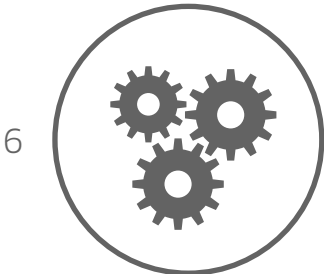
Backer is driven to provide optimal technical solutions with the best possible quality at globally competitive prices. With advanced capabilities in laboratory testing, engineering and agency certification, our passion for exceeding our customers' expectations makes us the first choice in heating solutions.

You'll love our company.



WELCOME TO A WORLD OF BACKER

TABLE OF CONTENTS



6

Innovations



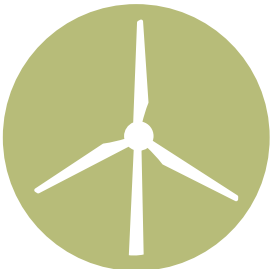
10

Customized solutions



14

Industrial/Projects



16

Energy/Environment



18

Advanced technology



20

Commercial equipment



22

Home appliance



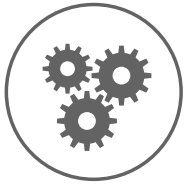
24

Transportation



26

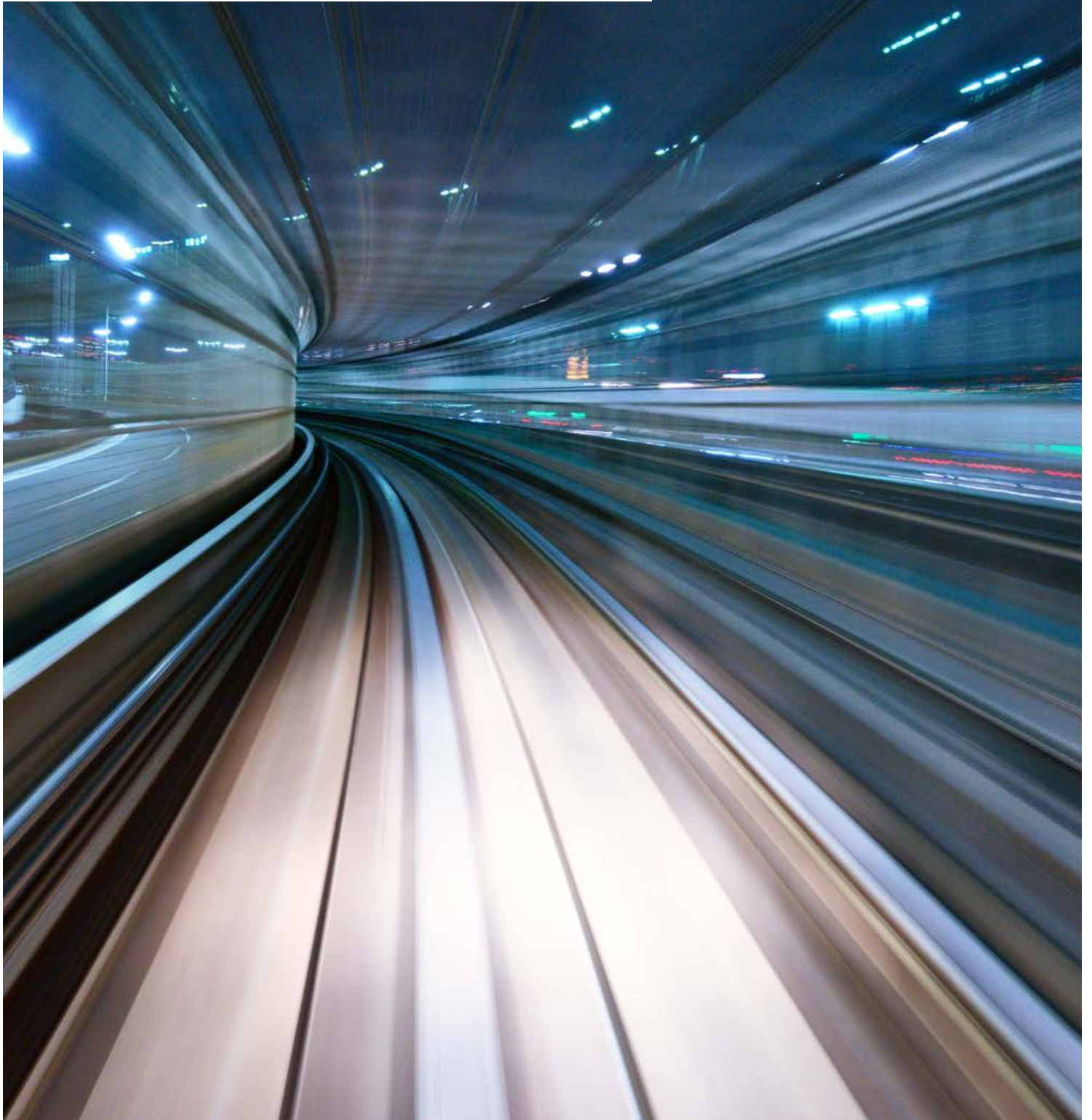
HVAC



Innovations

TECHNOLOGY

Backer has the largest technology portfolio in the industry. Continued investment in new technologies are critical to our success. Process and product development are supported by our meaningful investments in testing resources and labs. Our business grows through partnership with our customers that utilize our resources to develop a unique and competitive solution.





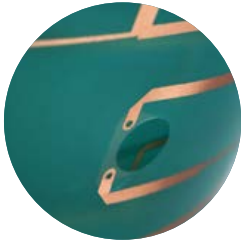
TUBULAR HEATING ELEMENTS

Traditional elements in diameters 6.0 to 21.0 mm. Lengths from 140 to 7200 mm. Material AISI 304, 321, 316L, Incoloy 800, 825. Temperature up to 940°C. Cartridge heaters, diameter 3.3-20.0 mm. Aluminium profiles for convection and radiation. Vulcanised tubular heating elements.



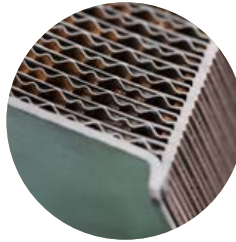
HEATING CABLES

Self-regulated with Thermoplastic or Flourpolymer up to 300°C and 120W/m. Parallell resistive constant power with Silicone or Flourpolymer up to 485°C 150W/m. High temperature with steel sheet up to 1000°C 250W/m. Long line with silicone for <20km



PRINTED ELEMENTS

Thick film elements in AISI 304, temperature max. 500°C. Foil elements in PVC, max. 70°C, polyester, max. 110°C, polyimide, max. 230°C, silicone, max. 230°C, micanite, max. 400°C. Custom connections.



SPECIAL

Components for element production, heat exchangers, heat treatment, furnace brazing, stainless pipes.



SUPPORTED WIRE ELEMENTS

Micanite elements, ceramic elements, enameled elements/resistors. Surface power 3-4 W/cm² at max. 350°C. Max. 7 W/cm² with good thermal conductivity and a good fit. Operating temperature max. 700°C. Aluminium housed brake resistors.



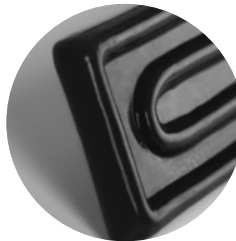
SUSPENDED WIRE ELEMENTS

Rapid heating, thermostat adjustment and overheat protection. Band heaters max 700°C with 4,5W/cm².



MEASUREMENT AND CONTROL

Thermostats, thermal cut-offs, temperature control integrated in tubular heating elements, regulators and sensors, terminal boxes.



IR AND HALOGEN ELEMENTS

Material: Ceramic, quartz glass, quartz glass with halogen. Temperature 150-2400°C depending on the material.



PTC ELEMENTS

Self-regulating function. Adjustment of power via air flow. Connection voltage 110-240 V and 12-36 V. Curie point 50°C-320°C.



HEAT PUMP TECHNOLOGY

Our most energy efficient heating technology. Air-to-air or air-to-water heating. Temperatures up to 70°C. Voltage 230-400V

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
- Electrical tests up to 24kV AC
- External resources for other types of tests such as shock and vibration and intermittent pulses.

MASTERING THE DESIGN

- Pro/ Engineer 3d-CAD
- X-ray equipment
- PDM-link/ Product data management etc.
- FLO EFD - Thermal/ flow simulations PTC MECHANICA
 - Thermal and stress analysis

PRODUCT DEVELOPMENT





PRODUCTION

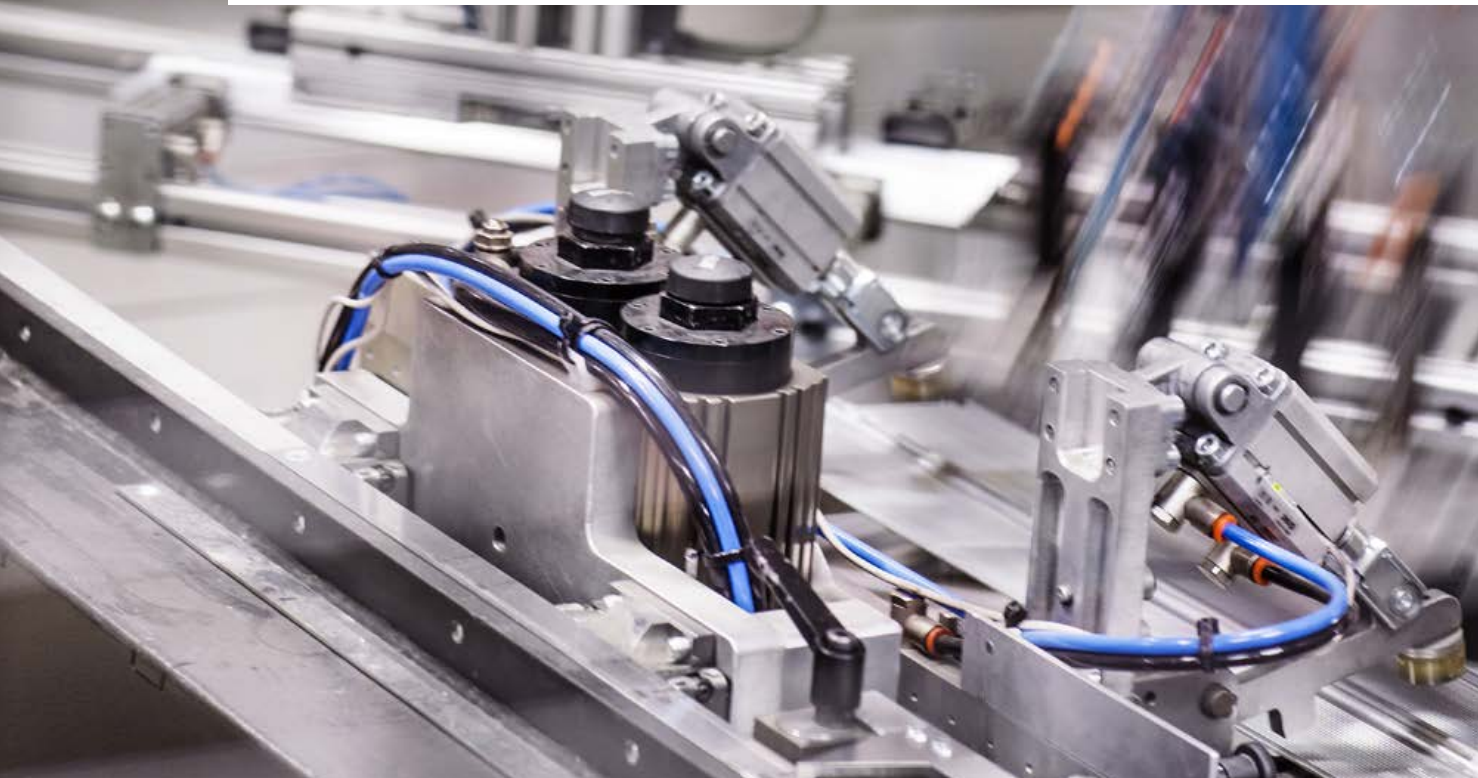
Backer has production sites at some thirty plants on four continents. Local production enables us to offer deliveries with short lead times. A global manufacturing footprint operating in different currencies also gives us considerable flexibility to optimize our production by considering actual cost and currency developments. For larger series and special products, production is based at specialized locations.

Continuous improvement in production efficiency, product and service quality are paramount in our organization. This is achieved through investment programs, such as automation as well as lean manufacturing principles. Our product range

comprises solutions for electric heating, measurement and control. We deliver products to a large number of industry sectors and application areas. Backer has steadily expanded our product portfolio enabling us to evolve from a supplier of solely electrical tubular elements, to having the largest catalog of products in the heating element industry.

Our transformation from just a component supplier to a world class solutions provider has been accomplished by offering both fully assembled system products as well as sensing and control functions for a vast landscape of markets and applications. We are innovate in our ability to apply specialized technologies to alternate applications. Our vacuum-brazing technology, for example, is traditionally used in medical applications but we have successfully be applied the technology to help our customers in other industries launch market leading products.

Our leadership position and expansive manufacturing footprint uniquely enables Backer to distribute our products to both OEM and Industry customers as a world class, cost effective, customer driven and environmentally sound partner.



QUALITY, ENVIRONMENT AND SUSTAINABILITY

We believe that a holistic approach to the environment should apply to all areas of our organisation. The trend towards more energy efficient systems has expanded our market opportunity, as our solutions are often integral features in an end product. Greater use of electric motors in place of hydraulic systems also generates an increased need for resistors. We offer a broad range of resistors and control functions for electric motors, which drastically reduces energy consumption. Our heat pump technology can be utilized across a wide variety of applications can dramatically reduce energy consumption compared to more traditional technologies.

Join our path for a more sustainable future!

DID YOU KNOW?

ALL COMPANIES
IN THE BACKER GROUP
ARE ISO-CERTIFIED.

ISO 9001
ISO 14001





Customized solutions

WE MAKE IT HAPPEN

Our value added heating products together with our measurement and control devices offer our customers complete solutions. Bring us an idea or a problem and we will guide you to an optimal resolution. Our engineers will not only present answers, but they are able to take charge of the entire product development and testing process by utilizing our advanced technical tools and lab facilities. Our extensive experience and competence as well as our reliable quality and service guarantees your success. Our ambition is to not only be a supplier, but your preferred partner.

Together we can make it happen!



WE ARE WITH YOU ALL THE WAY!

Idea

Specification

Shipping

Development

SOLUTION

Manufacturing

Testing

Approval

Presentation

HEATING · MEASUREMENT · CONTROL

MEASUREMENT & CONTROL + HEAT = ENERGY SAVINGS!



Backer measurement & control devices minimize energy losses. They guarantee better precision and therefore better efficiency. Backer offers traditional measurement & control solutions such as energy regulators and thermostats but also the latest technology of different integrated control and sensor solutions as well as soft starters and inverters. Backer measurement & control devices can be added to a large number of heating products for several applications and of course, fully customized for your specific needs. A common denominator for all products is that our measurement & control devices always make sure the heating products operate optimally. What you receive is a more complete solution which does not compromise performance with a care for our planet and the environment we all share.

Join our movement for a more sustainable future!



Energy regulator



Capillary Thermostat



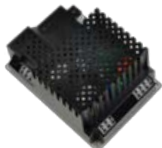
Home appliance



Backer offers a complete range of heating and control solutions for the home appliance industry. Regulators and thermostats include our more traditional solutions and are specially suitable for high temperatures.



Softstarter



Inverter



HVAC



Our soft starters increase the lifetime of a motor by protecting it from electrical stresses. The inverters deliver stable heat and adjust to the real efficiency need at the same time ensuring that less heat is lost.



PT100 / PT1000



Integrated power electronics solutions



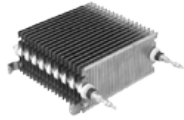
Transportation



The PT100/ PT 1000 monitor the temperature and the integrated power electronic makes sure the power output to the element is optimally regulated.



Dump resistor



Steel grid resistor



Energy/Environment



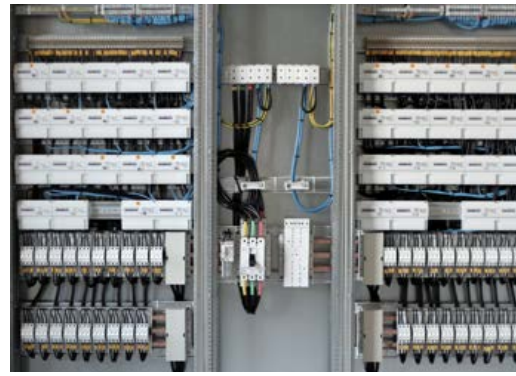
In wind turbines, resistors improve the quality of the electric energy allowing short disturbances in the power grid, without the need for shutting down the turbine, keeping the turbine spinning and producing green energy to the maximum.



Control panel



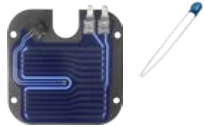
Power controller



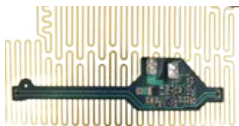
Industrial/Projects



We can help you with design and construction but also installation and commissioning of control cabinets and appurtenant control panels.



Integrated NTC



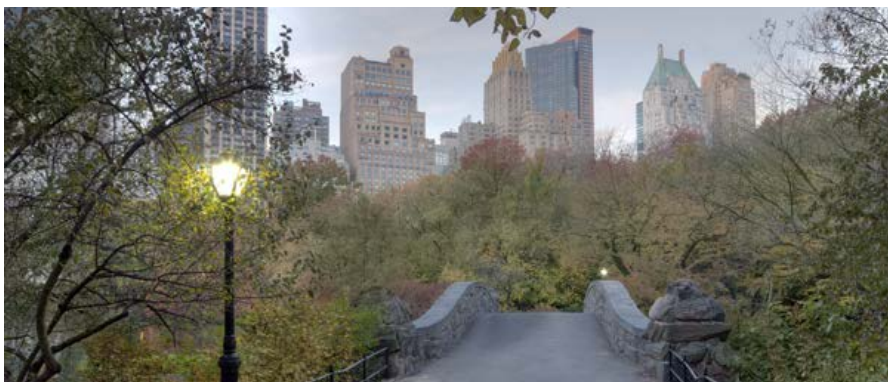
Integrated control



Advanced technology



Some applications are more sensitive than others. We offer heating solutions to the most delicate of objects where control and sensor components are integrated features on the element. E.g. on thick film, foil or tubular elements.



Backer lights up Central Park!



LED

A Backer Group company was chosen to design and manufacture a new high-performance LED light engine for light fixtures in New York City's Central Park. The resulting high-efficiency design maximized visibility on pedestrian walkways, increasing safety and energy efficiency.



Industrial/Projects

Small, medium size and large industrial customers, in various fields turn to us for guidance and technical expertise in electric heating technologies. Backer Group products can be manufactured according to ATEX, CSA, IECEx, UL, VDE, CE and other application specific certificates. We continue to offer sustainable solutions in heating technology in the form of application engineering and project based work methods. We offer deep knowledge and top-of-the-line products for measuring, controlling and generating electrical heat, for your industrial processes.

APPLICATIONS

- LOAD BANKS
- BATTERIES
- PACKAGING
- PLASTIC
- PAPER
- CHEMICAL
- MINE
- SAW MILL
- INDUSTRIAL CLEANING
- PROCESS

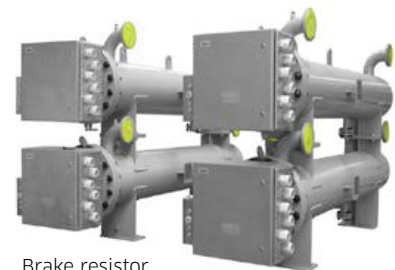
Solutions



Complete project including control cabinet



Hydraulic oil heater



Brake resistor



Flow through heater for process industry



Immersion heater



Ex Immersion heater

Stability - Safety - Reliability

In reality



Load banks



Heating batteries



Process



Packaging machines

“ We take full
responsability
for total
projects ”



Energy/Environment

This is an important industry sector for Backer and for our planet. Continuous work and development is carried out to constantly find new energy saving solutions. Government legislations and other legal institutions, as well as an overall awareness and demand for more sustainable products, play an important role.

As a result, wind energy and reliability is becoming increasingly important. Also higher demands on power quality, i.e. how 'clean' our energy is. Power resistors help to increase the power quality and reliability and Backer has a long and extensive experience in this field of application. We offer a wide range of resistors specially designed for different wind turbine applications but also other applications such as electrical grids.

APPLICATIONS

- WIND TURBINES
- SOLAR HEATING SYSTEMS
- DISTRIBUTION
- ALTERNATIVE FUELS
- OFF SHORE
- ON SHORE
- REFINERY
- NUCLEAR



Solutions



Fan heater for wind turbines



Resistors for wind turbines



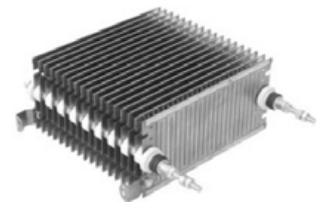
Heating battery



Cabinet heater



Load bank



Steel grid resistor

- Backer contributes to green power

In reality



Wind turbines



Distribution



Solar panels



Off shore

“ Resistors are used to increase efficiency both in energy production and distribution ”



Advanced technology

This highly specialized and demanding area expertise includes different solutions for sectors such as Medical Equipment/Laboratory, Space, Military and Robotics - all with their specific demands and regulations.

Backer works with a vast range of technologies and materials that all contribute to the different solutions we offer these sectors. New tools and equipment are an integral part of advancing these fields of application and in making new scientific discoveries. We recognise the importance of technology advancements and therefore we are constantly developing and designing heating solutions to meet market requirements. Our knowledge and expertise on heating products allows us to produce heaters that can meet your specific heating requirements. Amongst our customers you will find world renowned companies.

APPLICATIONS

- SURGICAL TABLES/BEDS
- STERILIZATION EQUIPMENT
- DISINFECTION EQUIPMENT
- LABORATORY RESEARCH EQUIPMENT
- AUTOCLAVES
- DNA ANALYSIS
- RESPIRATORS
- INCUBATORS
- DIALYSIS
- SATELITE DISHES
- SPACE CRAFTS
- SURVEILLANCE/ SECURITY
- LENSES
- NIGHT VISION SYSTEMS
- MILITARY
- TELECOM
- CABINETS
- GRAPHICS
- ROBOTICS
- ELEVATORS
- PACKAGING MACHINES

Solutions



Heat blanket for hospitals



Laboratory equipment



Medical equipment



Lens heater



Heating solution for anasthesia



Resistor for elevators, cranes and winches

In reality

- Our precision, your results



Satellites



Dialysis equipment



Night vision systems



Elevators

“ Medical equipment
is a growing market
for our products ”



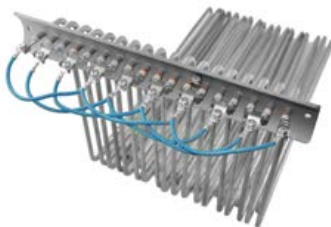
Commercial equipment

Backer is a complete supplier to the vast sector of Commercial Equipment. We offer components but also customized solutions and complete systems. Low, middle and large series, we manufacture it all. Backer offers not only a big range of products but also a wide range of different technologies such as thick film, vacuum brazing, heat pump technology, etc. Naturally, all components, materials and finished solutions comply with international food regulations and standards.

APPLICATIONS

- TUMBLE DRYERS
- DISHWASHERS
- WASHING MACHINES
- DRYING CABINETS
- ICE-MAKERS
- WALK-IN FREEZERS
- STEAM GENERATORS
- DEFROSTING DEVICES
- COOLING UNITS
- REFRIGERATION
- EVAPORATORS
- FOOD CABINET CHILLERS
- OVENS
- COOKING POTS
- FRYERS/ GRILLS
- WARMING EQUIPMENT
- HEATED PRESSURE COOKERS
- BROILERS
- AUTOMATIC DRINK DISPENSERS
- COFFEE MACHINES
- KETTLES

Solutions



Fryer heater



Heat pump for commercial equipment



Flexible heaters and Thick film



Vending machine



Defrosting



Flow through heater

In reality



Dish washers



Food cabinet chillers



Ovens



Coffee machines

- When temperature matters

“ We continually
develop new
innovative solutions
together with our
customers ”



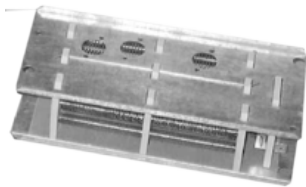
Home appliance

Backer offers a comprehensive range of innovative solutions and technologies in the area of electrical heating, measurement and control for the Home Appliance industry. Healthy profitability and growth as well as strong leadership permeate the Backer world, creating a dedicated staff and a long term partner for our customers. It also ensures high quality of manufacturing and supply. Highly automated production facilities, on four continents, also ensures a global low-cost manufacturing alternative, less vulnerable to market fluctuations. This set-up also makes it possible for us to offer you the most efficient cost structures and logistic solutions. Backer products comply with all international standards.

APPLICATIONS

- DISHWASHERS
- WASHING MACHINES
- TUMBLE DRYERS
- REFRIGERATION
- OVENS
- DRYING CABINETS
- MANGLES
- ICE-MAKERS
- TOWEL DRYERS
- STORAGE WATER HEATERS
- IRONS
- KETTLES
- WAFFLE IRONS
- GRILLS
- DEEP FAT FRYERS
- FRYERS
- WARMING EQUIPMENT
- COOKERS
- TOASTERS

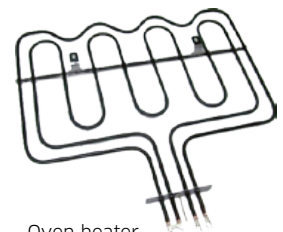
Solutions



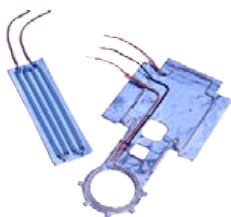
Tumble dryer heater



Ice maker



Oven heater



Defrosting



Flow through heater for dishwasher



Washing machine heater



- Temperature in control

In reality



Ice machines



Tumble dryers



Dish washers



Irons

“ We work intensively together with our customers to develop new and competitive products for the white goods industry ”



Transportation

Automotive, Rail, Ship and Aero. These demanding fields of application require high competence and awareness, long experience, continual development work, flexibility as well as strict compliance with international standards and regulations. This makes Backer a complete and reliable supplier and partner to this industry.

Backer's competence and solutions cover both infrastructure and rolling stock as well as on-line management and control-software technology. Also for the Automotive sector we are a complete supplier and partner not only to traditional vehicles but also to BEVs, PHEVs and HEVs as well as Fuel-cell EVs.

Resistors is another large area of expertise in our Group where we are able to always offer optimal solutions for specific needs, thanks to our THERMAL SIMULATION system.

APPLICATIONS

- SENSORS
- VISION SYSTEMS
- COMPARTMENTS
- A VARIETY OF FLUIDS
- INTELLIGENT WEATHER BASED HEAT CONTROL
- ROLLING STOCK
- BATTERIES
- GEARS
- CABINS
- ENGINES
- TOILET CABINS
- REAR VIEW MIRRORS
- VESTIBULES
- WIPERS
- INFRASTRUCURE
- SWITCH POINTS
- SEATS
- CONTACT WIRE
- BRAKE RESISTORS
- CONDUCTOR RAIL
- LOAD RESISTORS
- DEFROSTING SYSTEMS
- SAFETY TRANSFORMERS
- SNOW DETECTORS

Solutions



Engine heater



Switch point heaters



PTC-heater



Battery heater



Rear view mirror heaters



Seat heater



Saloon heater for trains/trams

- Comfort on rails



In reality



Infrastructure & Rail



Automotive



Ship



Aerospace

“ We are participating in several large infrastructure projects in the railway sector globally ”



HVAC

We control your compressors, defrost your evaporators and heat the water in your homes. We support your heat pump systems in cold winters. Backer is your natural partner in the HVAC sector. We develop and produce components as well as customized solutions, depending on your needs. Our systems secure the functions of measurement and control, offering you optimal and sustainable solutions with precise temperature. Environmental aspects are always key in the Backer World. As a result, we are proud to offer you energy saving products which never consume more than necessary.

APPLICATIONS

- RADIATORS
STONE
ALUMINIUM
CAST IRON WITH NTC
CERAMICS
- CONVECTORS
- WATERBEDS
- HEAT PUMPS
- BOILERS
- AIR-CONDITIONING
- VENTILATION
- WATER STORAGE
- BATTERIES
- DUCT HEATERS
- STEAM GENERATORS
- SAUNA HEATERS
- FREEZE PROTECTION
- HIGH PRESSURE WASHERS
- INVERTERS
- SOFT STARTERS

Solutions



Aluminium heater



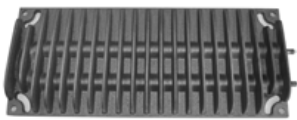
Open coil heater



Flow through heater



Crank case heater



Cast iron heater



Heating battery



Double insulated heater



Inverter

- You'll love our climate

In reality



Radiators



Air Conditioner Units



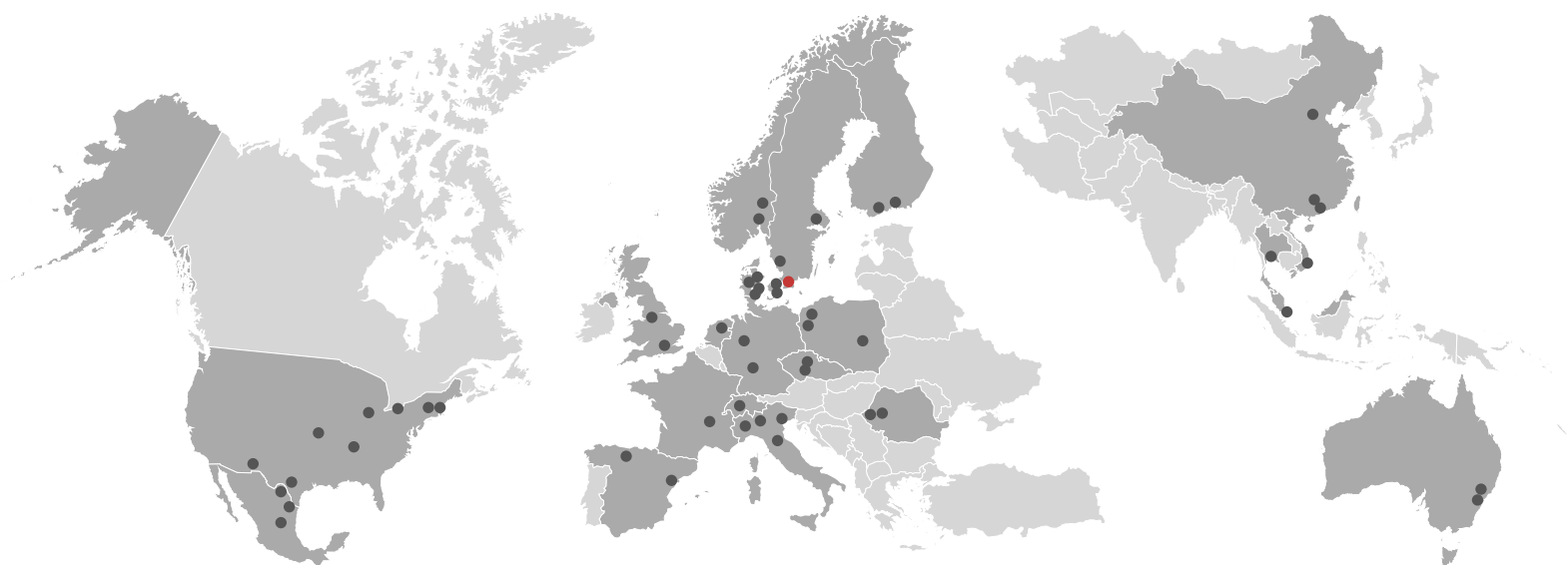
Heat pumps



Floor heating

“ We constantly increase our sales of measurement and controls to the HVAC industry ”

BACKER WORLD WIDE



NORTH AMERICA

EUROPE

ASIA/OCEANIA

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 Group has developed and acquired technologies that have made Backer the worldwide leader. Our product range today is comprised of materials such as; aluminium radiators, cast, ceramic, thick film and other flexible elements along with a wide range of control products. Backer is com-

prised of more than 40 production units that together contribute to the company's vast technical expertise.

Backer delivers heating and control solutions to businesses in industries such as HVAC, Transportation, Energy & Environment, Home Appliance, Industrial & Projects, Advanced Technology and Commercial Equipment; all with their specific requirements and needs for customized solutions.



Industrial/
Projects



Energy/
Environment



Advanced
technology



Commercial
equipment



Home
appliance



Transportation



HVAC