Heatrod Elements

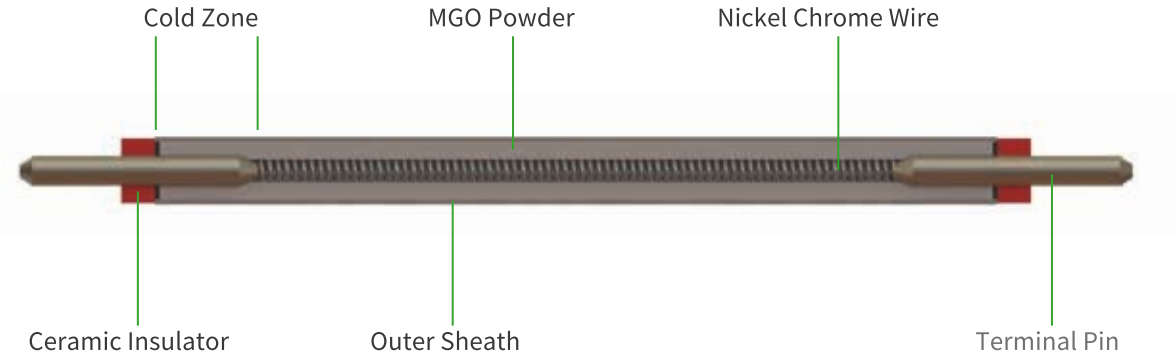
In our Elements brochure you will find reference to many of the different types of electric heating elements we produce both in our Greater Manchester factory and in our group companies around the world.

This ranges from the traditional tubular heating element which remains the most common and versatile form of electric heating available through to more specialist technologies such as flexible film elements.

Tubular Elements

Tubular elements can be used in a range of applications from air, water, oil, chemical solutions and defrost. They are a versatile means of heating an application and can be straight or formed to a required shape and can reach temperatures of 800°C.

A tubular element consists of nickel chrome resistant wire which is spot welded to a terminal pin, the nickel chrome wire is insulated by MGO powder which is then housed in an outer sheath.



MATERIAL	Ø DIAMETER (mm)					TERMINAL PIN					
	6	8	9.5	10.9	12	Plain Pin	4BA	M3	M4	M5	2BA
304 Stainless Steel	•	•	•	•		•	•	•	•	•	•
309 Stainless Steel		•				•	•	•	•	•	•
321 Stainless Steel	•	•	•	•		•	•	•	•	•	•
316 Stainless Steel		•			•	•	•	•	•	•	•
Incoloy 800	•	•	•	•	•	•	•	•	•	•	•
Incoloy 825		•	•			•	•	•	•	•	•
Titanium		•			•	•	•	•	•	•	•
Copper		•				•	•	•	•	•	•

When choosing a tubular element for a certain application there are set parameters that need to be considered. Whilst standard requirements are wattage and voltage, other parameters are sometimes not so obvious. Sheath wattage must also be considered which determines the working surface temperature of the element – this can be critical to the application as many of the media in which our elements are applied will have maximum contact temperatures. Aspects such as electrical and mechanical connections must also be considered at the design stage.

Applications:
Fixings and Electrical Connections

With tubular heaters being so versatile and able to work in a variety of applications, aspects such as electrical connections and a means of fixing the element to an application need to be taken into consideration.

Defrost Application

Electrical Connection

Vulcanised Neoprene 2.5mm Silicone Leads
2.5mm and 5mm Thick Joint available

Air Application

Fixings

1/4" BSP Thread x 1/2" Crimped Collar
1/4" BSP Thread x 1" Crimped Collar
3/8" BSP Thread x 3/4" Crimped Collar
3/8" BSP Thread x 1" Crimped Collar

Fixing plates made to suit specific customer requirements

Electrical Connection

Male Spade Terminal

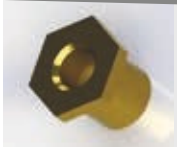
Double Male Spade Terminal

Female Spade Terminal

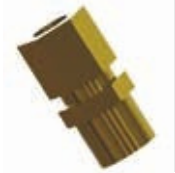
1.5mm Heat Proof Cable
2.5mm Heat Proof Cable

Wet, Oil and Chemical Application

Fixings



1/4" BSP Thread x 1/2" Brazed
1/4" BSP Thread x 1" Brazed
3/8" BSP Thread x 3/4" Brazed
3/8" BSP Thread x 1" Brazed



Compression Fitting:
1/4" BSP Thread x 1/2" Brass
3/8" BSP Thread x 1/2" Brass
1/4" BSP Thread x 1/2" 316SS
3/8" BSP Thread x 1/2" 316SS

Fixing plates made to suit specific customer requirements

Electrical Connection

Male Spade Terminal

Double Male Spade Terminal

Female Spade Terminal

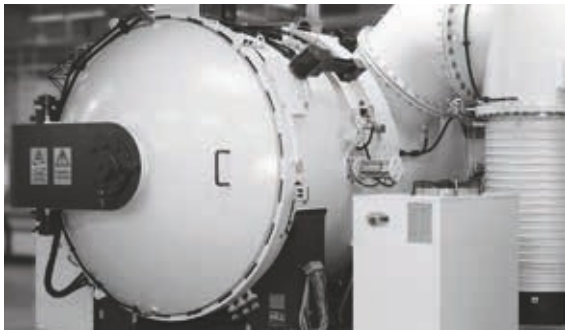
1.5mm Silicone Cable
2.5mm Silicone Cable

Cartridge Heaters

Cartridge Heaters are designed to give high power and temperature outputs for applications in confined spaces.

Thanks to the design the heat is quickly distributed over the whole surface mantle of an element. The elements are designed to withstand high demands of impact resistance and vibration which are often present in the environment where they are required. Fields of application for cartridge heaters are primarily tool heating within industries such as plastic, rubber, pulp and paper, foundries, medical and laboratory to name only a few. The most common material of the housing is stainless steel or where contact with other materials does not allow alternative materials can be employed. The diameters can be as small as 4mm up to in excess of 35mm and lengths are often determined by the application.

Vacuum Brazed Elements



Vacuum brazing technology is one of the most advanced technologies available to combine different parts. We use this technology not only to bond elements into heating solutions but also for technologies such as heat exchange modules.

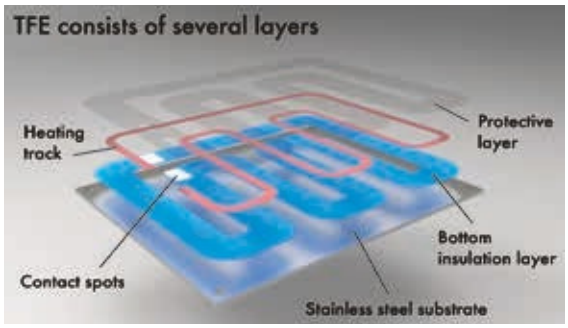
Benefits include:
- High quality brazed joints
- Clean process, no emissions, no need for fluxes
- Suitable for mass production
- Different products can be brazed simultaneously
- Complex joints are easy to braze
- Technique is used especially in aviation and space industries and in clinically demanding applications

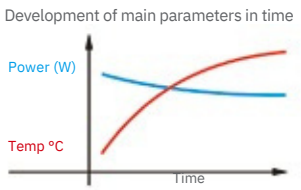
Formed Elements

Applications that require a heat source often have differing application demands such as restricted operating space or very specific local heat zones in shaped objects.

To help solve your specific requirements Heatrod have a fully trained engineering team who can assist with specification, design and manufacture of tubular elements for your application. Our products are produced using traditional manual methods through to CNC controlled bending machinery. A small selection of tubular elements designs are shown here.

Thick Film Elements



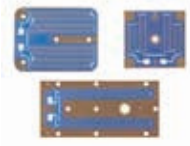


Product Specification

- High performance - power densities up to 50W/cm2
- High operating temperature - up to 350oC and more
- For direct liquid heating or contact heating of flat surfaces
- Electrical strength up to several kV
- Mechanically stable, self supporting steel substrate
- Simple application of holes, screws, nuts, welds, any flat shape
- Does not absorb humidity
- Temperature profile according to requirements

Elements for Ski-Wax Irons

Heating Plates for Industrial Machinery



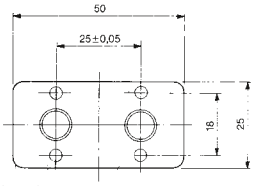
Circular and other Flat Shapes

Heated Tubes

Finned Tubular Elements

Square Finned Elements

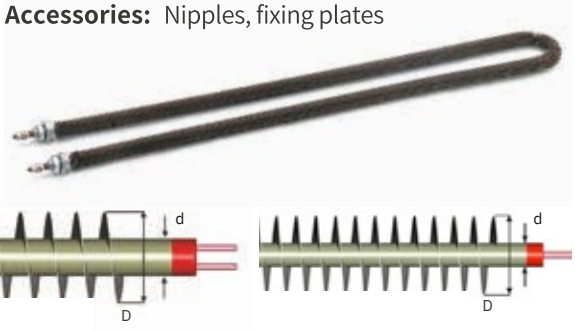
Surface enlarged element Ø (brick dim):
8 (50x25), 8.5 (50x25), 10 (70x40) or 14 (80x40)mm
Fin material: Alu zinc or stainless steel
Accessories: Nipples, fixing plates



Example of brick dimensions

Finned Elements

Surface enlarged element Ø (d/D):
6.4/18, 8/18 8/24, 8.5/22 8.5/28, 10/20
10/26, 12/22 12/28, 14/34 16/32, 18/34 mm
Fin material: SS1160, EN 1.4301
Accessories: Nipples, fixing plates

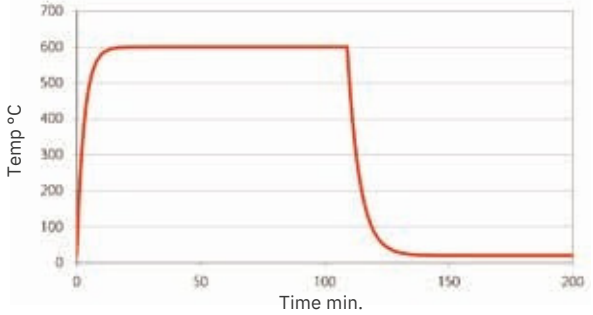


Bifilar, available in 8.5mm and 14mm

Tube materials: Mild Steel - Grade D, Stainless steel: EN 1.4301, EN 1.4404, EN 1.4541, Incoloy 800, EN 1.4828

Connections: One or two end connection: M4, cables flat pin or acc. to customer specification.

Heating and cooling time finned elements



Aluminium Elements

Our range of profiled Aluminium are used in a mixture of air heating applications from domestic use through to more rigorous industrial sectors such as transport.

Finned X-profile

Aluminium profile
61x71, 65x84, 67x89mm
(width x depth)
Length: 215-1570mm
W/length cm: 20-30 W
Max temp: 350°C

Finned I-profile

Aluminium profile
Width: 80 or 100mm
Length: 215-1510mm
W/length cm: 12-15 W
Max temp: 350°C

I-profile

Aluminium profile
Width: 80 or 100mm
Length: 215-1510mm
W/length cm: 15 W
Max temp: 350°C

Ceiling Heating Profile

Aluminium profile
Width: 180mm
Length: 350-1270mm
W/length cm: 15-20 W
Max temp: 285°C

Tube Materials: Aluminium AA6060, AA6063
Connections: Wiring or tab terminals, 1.5, 2.5 pins
Accessories: Flat pins, wiring, fixing devices

Anodised or painted profiles max 285°C

Heating and cooling times alu elements (painted on one side)

Elements for Dry Radiator Applications

Soap Stone

Insert element with customised dimensions. Heating element in wire/mica with insulation class II.

Ceramic

Insert element with customized dimensions. Heating element in wire, insulation class I.

Aluminium/Quarzsand

Insert element with customized dimensions. Heating element from tubular element with insulation class II.

Cast Iron

Mounted element with customized dimensions. Heating element from tubular element, insulation class I (without brackets).

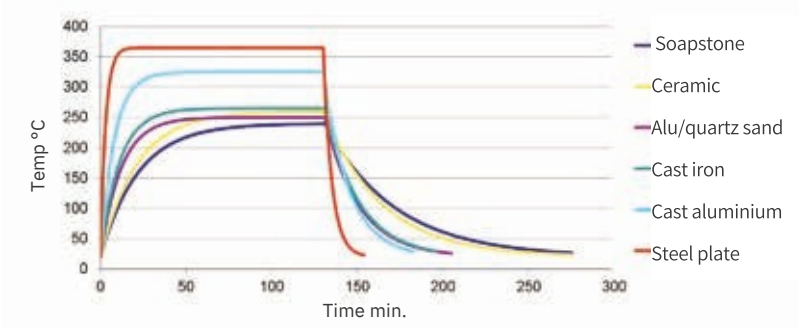
Steel Element

Mounted element with customized dimensions. Heating element from tubular element, insulation class I (without brackets).

Cast Aluminium

Mounted element with customized dimensions. Heating element from tubular element, insulation class I (without brackets).

Heating and cooling times elements for dry radiator appl.



Heating Cables

*For more information about our heating cables which are part of our **Flexible Heating Elements** range, please visit our website or call us on* **0161 727 3713**.

Flexible Heating Elements

FRTP

Fibre reinforced thermoplastic
Max width: 800mm
Power density: 0.1 W/cm² (up to 0.7 immersed)
Voltage: Up to 690V AC/DC 1~ or 3 ~

Features: Stiff, extremely durable, superior impact, resistance, water resistant, possible to laminate to pictures or metal parts

Etched Foil
Polyester, PVC, PEN, Silicone

Max width: 600-800mm
Power density:
Polyester: 3 W/cm²
PVC: 0.1 W/cm²
PEN: 4 W/cm²
Silicone: 1.3 W/cm²
Voltage: Up to 230V AC/DC 1~ or 3~

Features: Uniform heat output, long life product, even heat transmission, waterproof, very flexible

MICA

Max width: 600mm
Power density: 15 W/cm²
Voltage: Up to 690V AC/DC 1~ or 3 ~

Features: Sandwiched between layers of mica, can be used assembled in open air, typically for radiators of heating panels

Aluminium Foil

Dimensions according to customer specification

Power: 50-250 W
Voltage: 110-240V

Features: Low weight, self adhesive, suitable for ceiling heaters

Our customers operate in several industries

Industrial/Projects

General infrastructure and plant refits often require heat sources and in our experience there are opportunities to improve the performance and reliability with electric heating solutions.

Energy/Environment

From enabling technologies such as gearbox and glycol heaters in wind turbines to clean methods to translate renewable energy into heat, we have products and knowledge to fulfil your applications.

Advanced Technology

Applications in industries such as Medical or Defence often have critical requirements such as high batch costs or high accuracy requirements.

Our wide range of heating technologies combined with industry knowledge allow us to solve tough applications often associated with advanced technology sectors.

Commercial Equipment

In a fast moving industry sector, having a flexible range of off the shelf products is key to meeting customer demands.

Our breadth of product solutions combined with our depth of stock-holding is key to our success in this sector.

Home Appliance

Products manufactured for the domestic consumer market always require a demanding combination of high specification, repeatability and highly competitive pricing. This is where we use our local experience and knowledge of the market to design and engineer products and work with our high volume factories to produce competitive end products.

Transportation

In an industry which has intensive performance demands, our engineering and product expertise are often brought into full focus.

Rigour is the key to guaranteeing heating solutions in industry sectors where challenges such as vibration and extreme weather conditions must be accounted for.

HVAC

Applying the correct combination of control and heat source is the key to more reliable and efficient HVAC systems.

Our extensive range of heating technology and sensing/control products allow us to choose the correct combination for our customers every time.

If your industry is not shown or you have a specific project in mind, please get in touch with us as we offer a bespoke service, tailored to your needs.

A complete package which is totally focused on minimum lead time, maximum flexibility and full design service, from individual raw material components through to the finished solution.

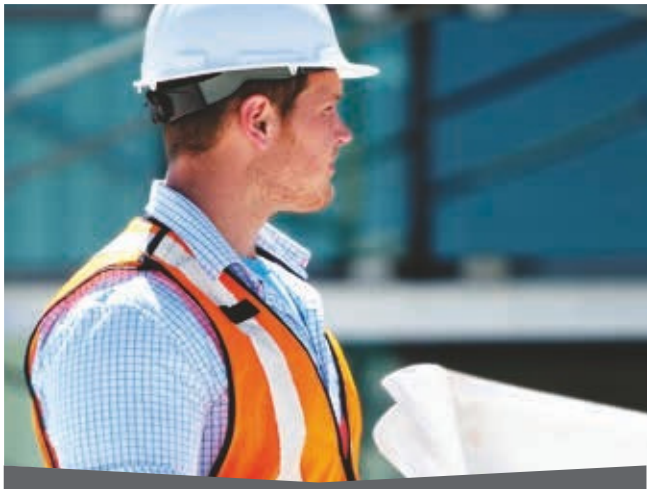
Heatrod Elements are based in Greater Manchester and have been manufacturing electric heating elements and associated equipment for over 50 years.

This level of experience has allowed the business to develop into industrial products and projects whilst still retaining a base manufacturing capability for heating elements. To guide you in our level of expertise we have produced brochures which introduce you to the three main aspects of our industrial business: **Elements, Industrial** and **Projects.**

INDUSTRIAL

Heating is nothing without control and our range of industrial products are engineered not only to provide our customers with the complete heating and control package but also to provide the relevant components in order to build and maintain their own heating applications.

Our application engineering team are available to provide support in selecting the right combination of components through to complete design and manufacturing services.



PROJECTS

Industrial heating processes often demand a level of practical engineering in their design and application in the field.

Our team of application engineers are trained to be able to consult with our customers in solving their process heating challenges and to be able to provide technically and commercially competitive solutions to our customers. Add to this our centre of competence in Sweden and our ability to manufacture and install locally and you have access to a full project delivery team ready to support you.

Heatrod Elements
MEMBER OF BACKER GROUP

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