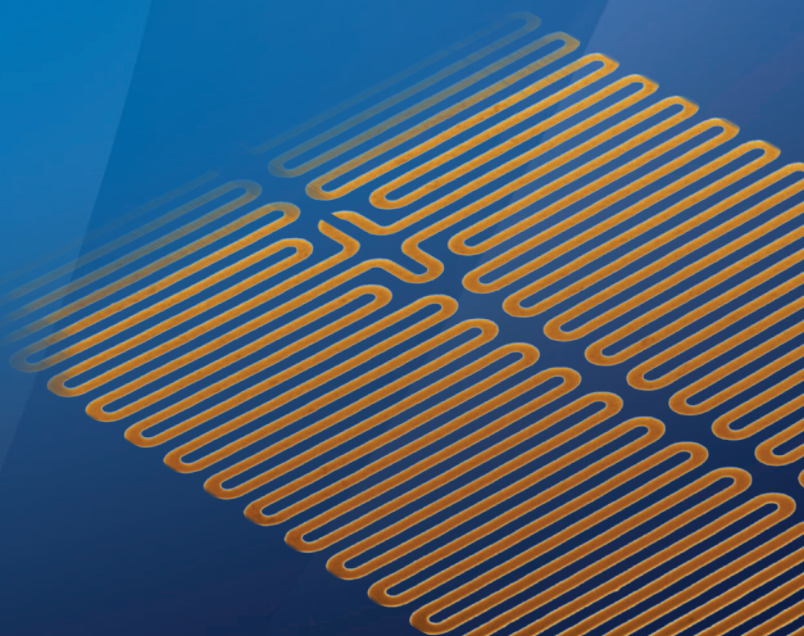
Zoppas Industries

Heating Element Technologies

FLEXIBLE HEATERS



COMPANY INTRODUCTION

Zoppas Industries Heating Elements Technologies specialise in developing and producing a multitude of heating elements and assemblies. We run research, design, manufacture and testing at all our main facilities in Europe, America and China.

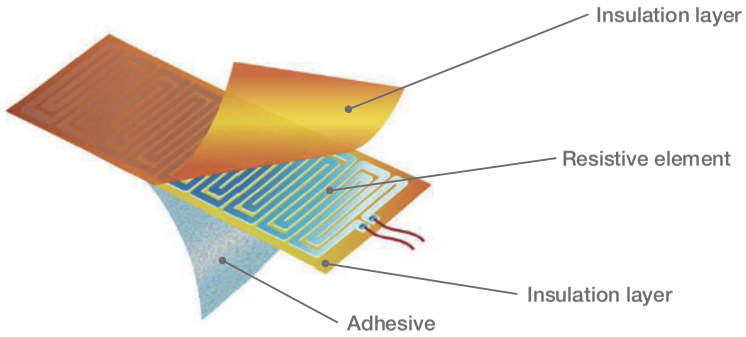
As a global company, Zoppas Industries Heating Elements Technologies supports international design guidelines and agency approvals.

We are constantly aware of the continuous challenges that face us in order to maintain our position and ensure we continue to fulfill our obligations to our customers. By continually monitoring our performance, sharpening our technical expertise and improving response times, we are able to reinforce our added value. Tools such as FMEA are used to continuously detect and help eliminate potential design and production faults.

If you would like to learn more about how Zoppas Industries Heating Elements Technologies can contribute to your business success, we would be pleased to answer your questions and welcome you to meet our people and visit our facility to discuss your requirements.

BASIC INFORMATION ON OUR HEATING ELEMENT

The flexible heating element consists of an etched foil resistive element laminated between two insulation layers. Flexible heating foils produced by Zoppas Industries Heating Elements Technologies start with a minimum thickness of just 0.15 mm, they can generate a heat up of 350°C to allow excellent heat transfer results from the heater's thin design and direct bonding to an application. These heaters are of a thin design and construction and made of flexible materials to be shaped to fit almost any type of equipment.
The heaters can be applied to the most complex shapes, geometries, curves and pipes conceivable without sacrificing efficiency or dependability. Flexible heaters provide fast heat-up and cool-down rates, ensuring uniform heat distribution at various watt densities.



POLYESTER HEATING ELEMENT

The polyester flexible heating element, available also in roll form, is produced by an etching process and is characterized by high quality and low shrinkage polyester substrate. Thanks to edge wattage compensation it is possible to have a uniform temperature profile with a superior heat transfer. This design allows a quicker warm up cycle with the minimal amount of space and evenly on a greater surface area.

Technical specifications

voltage range	≤700 AC/DC (1 or 3-phase)
max watt density (controlled)	0.50 W/cm²
watt tolerance (EN 60335-1)	-10%÷5%
width	10÷590 mm
min thickness	0.30 mm
length PIECE	10÷2700 mm
length ROLL	150 m
max continuous operating temperature	95°C
min ambient temperature	-50°C
RoHS	YES
protection class	up to IP65
adhesive option	YES
approval (depending on the design)	c UL us, VDE

Benefits

- Longevity
- Cost-effective for mid and high volume
- Easy installation
- Able to heat larger and longer surface areas

Applications

- Laboratory equipment
- Medical devices
- Railway application
- Health care beauty
- Telecommunication
- Catering equipment
- Heating and conditioning

SILICONE HEATING ELEMENT

The silicone heater consists of an etched foil resistive element which is laminated between two layers of silicone rubber achieved by a vulcanizing process that delivers a high mechanical stability for the flexible and light weight heating element. As silicone is a robust material with excellent temperature proprieties, it can be used in both high and low temperature applications. Reinforced fiberglass-silicone rubber gives the heater dimensional stability without sacrificing flexibility.

Technical specifications

voltage range	≤700 AC/DC (1 or 3-phase)
max watt density (controlled)	5.00 W/cm²
watt tolerance (EN 60335-1)	-10%÷5%
length piece	10÷2700 mm
width	10÷590 mm
min thickness	0.30 mm
max continuous operating temperature	up to 250°C, 175°C adhesive
min ambient temperature	-50°C
RoHS	YES
protection class	up to IPX5
adhesive option	YES
approval (depending on the design)	c UL us, VDE

Benefits

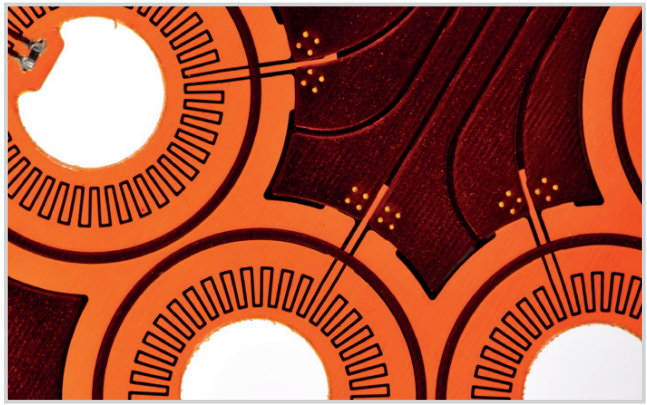
- High temperature range
- High watt density
- Three-dimensional factory formed shapes available
- Easy installation
- Robust material construction

Applications

- Laboratory equipment
- Medical devices
- Health care beauty
- Catering equipment
- Automotive
- Chemical cleaning

POLYIMIDE HEATING ELEMENT

The polyimide heater is produced by an etching process delivering a thin and lightweight flexible heater, which provides excellent tensile strength, tear resistance and dimensional stability. This material has a high resistance to many chemicals, oils, acids and bases. Advanced Zoppas technology allows us to provide sophisticated double-sided heaters and also heating elements with a very high ohmic density.



Technical specifications

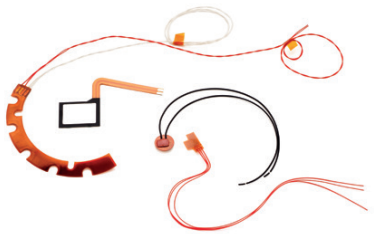
voltage range	≤400 AC/DC (1 or 3-phase)
ohmic density	up to 330 Ω/cm²
max watt density (controlled)	7.50 W/cm²
watt tolerance (EN 60335-1)	±2%
length	10÷590 mm (FEP), 10÷2000 mm (acrylic/epoxy)
width	10÷590 mm
min thickness	0.15 mm (depending on application)
max continuous operating temperature	200°C (FEP), 150°C (acrylic/epoxy)
min ambient temperature	-50°C
RoHS	YES
protection class	up to IP67
adhesive option	YES
approval (depending on the design)	c UL us, VDE, CE

Benefits

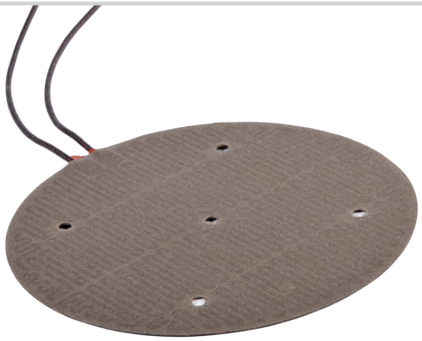
- Extremely precise track layout
- Optimal heat transfer
- Very high operating temperature
- Small bending radius
- Lightweight
- Easy installation
- Low out gassing in a vacuum

Applications

- Laboratory research
- Medical application
- Aerospace and defence
- Optical equipment



MICA HEATING ELEMENT



The mica heating element consists of a resistive element insulated between two layers of micanite. Mica heaters are of varied rigidity and have the capability to work at higher temperatures. These type of heaters need to be mechanically fixed onto the application in order to guarantee optimal heat transfer.

Technical specifications

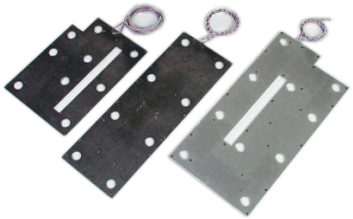
voltage range	≤400 AC/DC (1 or 3-phase)
max watt density (controlled)	5.00 W/cm² (depending on the application)
watt tolerance (EN 60335-1)	-10%÷5%
length	50÷1150 mm
width	50÷590 mm
thickness	0.80÷1.20 mm
max continuous operating temperature	350°C
min ambient temperature	-50°C
RoHS	YES
protection class	up to IPX4
approval (depending on the design)	c UL us

Benefits

- High temperature strength
- Cost-effective
- Fast heat-up times

Applications

- Laboratory research
- Medical application
- Food equipment



CUSTOM FLEXIBLE HEATERS

Flexible heaters give you design options that other heater types cannot match. Here below you can find an overview of the capabilities at Zoppas Industries Heating Elements Technologies for custom flexible heaters.

Element design

Outline shapes, heat profiles and terminations can be fine-tuned to create the exact thermal and physical component to fit your unique requirements. Zoppas Industries Heating Elements Technologies offers:

- options for distributed wattage, unheated areas, single or multi electric circuits;
- various types of leads and terminations;
- three-dimensional factory formed shapes;
- different mounting methods like pressure sensitive adhesive (PSA), vulcanization process or mechanical fasteners;
- thermal insulation options to increase heating efficiency.

Integrated components

Zoppas Industries Heating Elements Technologies can integrate temperature sensors, safety controllers, SMT components and other electronics into your heater to provide a complete operating solution. Integrating electronic components directly into the heater improves your thermal control while at the same time simplifying the assembly operations.

Sub-assembly

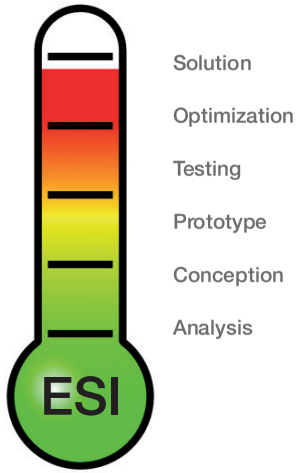
Complete thermal sub-assembly can provide a turnkey solution for your application. The custom value-added assemblies are cost effective for OEMs, by reducing assembly times, purchased parts and freeing up production time for other core competencies. Consider our capabilities at Zoppas Industries Heating Elements Technologies in mounting the heaters in conjunction with other machine parts to make a complete sub-assembly thermal solution.

VALUE-ADDED PROJECT DEVELOPMENT

New projects provide the ability and opportunity for new development and solutions.

Zoppas Industries Heating Elements Technologies is fully equipped to provide project analysis, concept design and laboratory testing to optimize your unique project from prototype to a complete winning solution.

We will support you throughout the complete development phase.



EARLY SUPPLIER INVOLVEMENT

At Zoppas Industries Heating Elements Technologies we trust in the process of early supplier involvement (ESI). ESI presents an engineer with a direct outline of our capabilities.

When Zoppas Industries Heating Elements Technologies is involved early in a project's design phase, it provides cost cutting benefits, makes the project more feasible to manufacture, and ultimately cuts down the lead time between concept and production.

A second set of eyes on your project from Zoppas Industries Heating Elements Technologies can only improve your design.

Let Zoppas Industries Heating Elements Technologies be your heating element design team and thermal system supplier!

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Zoppas Industries
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