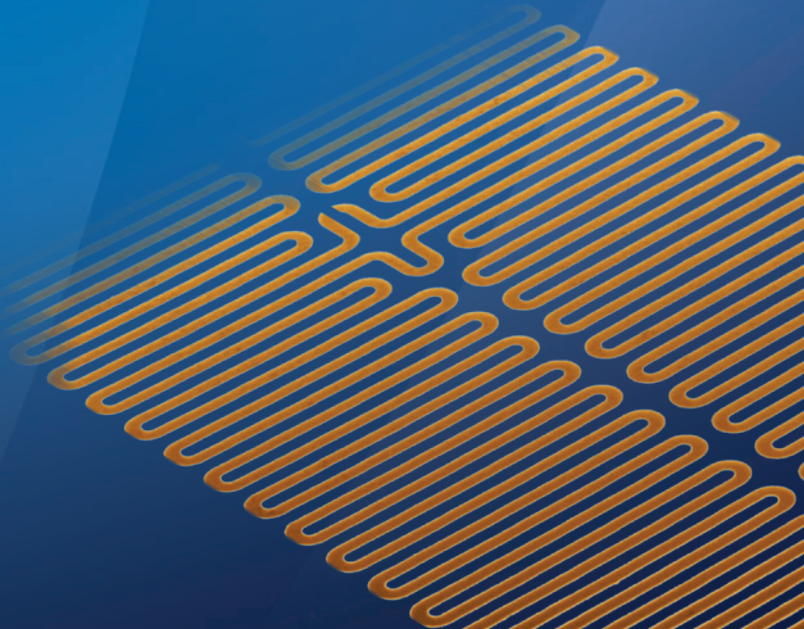
Zoppas Industries
Heating Element Technologies

STOCK FLEXIBLE HEATER FOR SPACE MARKET (SATELLITE - VEHICLE - LAUNCHER AND GROUND SEGMENT)



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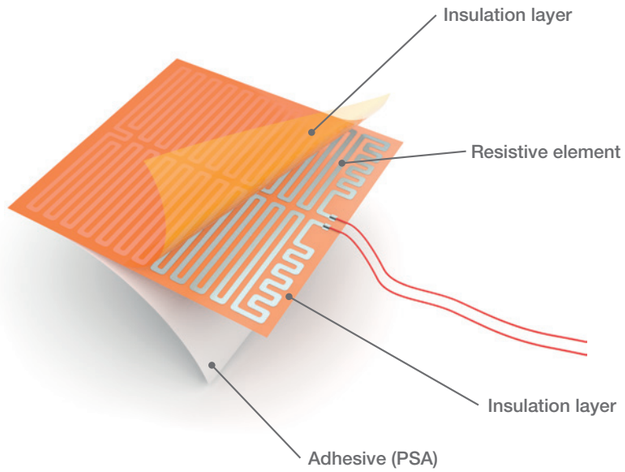
Besides the “made to spec” products, Zoppas Industries also provides a wide range of **standard flexible heaters,** available in our stock in different sizes and ohmic values, as commercial off-the-shelf (COTS) solutions for commercial applications and testing equipment.
Standard parts are available for immediate delivery (according to stock availability).

BASIC INFORMATION ON OUR HEATING ELEMENT

Zoppas Industries Heating Elements Technologies is a global supplier of heaters and systems for space satellites, spacecrafts, pressurized modules and ground-based antennas, ESA/ESCC-qualified since 1992.
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 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.

For more details refer to our company page **zoppasindustries.com/en/aerospace/**

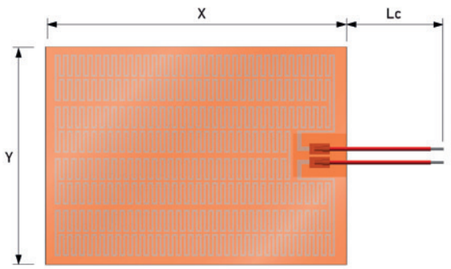


Benefits

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

How to read the product’s code: “SCyyyxxxL”:

SC	Space Catalogue
yyy	3 digits for Y dimension
xxx	3 digits for X dimension
QM/FM	Qualification Level



Select from the standard products’ list here below the solution that will best fit your application, or contact us for a customized solution, at the following link: **zoppasindustries.com/en/quotation-request/**

P/N QM heaters	P/N FM heaters	Size (Y)	Size (X)	Size (Y)	Size (X)	Lead exit size	Net heating area		Resistance (@22°C, wire included)	Wire	Wire length	Typical power
		[mm]	[mm]	[inch]	[inch]	[mm x mm]	[cm²]	[inch²]	Ohm [Ω]	AWG #	[mm]	[W]
SC012037Q	SC012037F	12,5	37,5	0,49	1,47	10x11	2,63	0,40	313,6	26	500	2.5 W at 28 V
SC012075Q	SC012075F	12,5	75	0,49	2,95	10x11	6,56	1,01	247,2	26	500	3.2 W at 28 V
SC012125Q	SC012125F	12,5	125	0,49	4,92	10x11	11,81	1,83	139,4	26	500	5.6 W at 28 V
SC025025Q	SC025025F	25	25	0,98	0,98	10x14	3,61	0,55	392	26	500	2 W at 28 V
SC025037Q	SC025037F	25	37,5	0,98	1,47	10x14	6,49	1,00	239,1	26	500	3.3 W at 28 V
SC025050Q	SC025050F	25	50	0,98	1,96	10x14	9,36	1,45	172	26	500	4.6 W at 28 V
SC025075Q	SC025075F	25	75	0,98	2,95	10x14	15,29	2,36	110,2	26	500	7.1 W at 28 V
SC025100Q	SC025100F	25	100	0,98	3,93	10x14	20,97	3,25	81,1	26	500	9.7 W at 28 V
SC037037Q	SC037037F	37,5	37,5	1,47	1,47	10x14	11,18	1,73	150,1	26	500	5.2 W at 28 V
SC037050Q	SC037050F	37,5	50	1,47	1,96	10x14	15,44	2,39	109,4	26	500	7.2 W at 28 V
SC037100Q	SC037100F	37,5	100	1,47	3,93	10x14	33,27	5,15	52,5	26	500	14.9 W at 28 V
SC050050Q	SC050050F	50	50	1,96	1,96	10x14	21,36	3,31	80,2	26	500	9.8 W at 28 V
SC050075Q	SC050075F	50	75	1,96	2,95	10x14	33,36	5,17	52,3	26	500	15 W at 28 V

If the size or shape of your heatsink precludes using a single standard heater, you can cover the surface with a mosaic configuration, connecting multiple heaters in parallel.

TECHNICAL SPECS	
Insulation material	Polyimide + Acrylic
Resistance tolerance	+/-10%
Reference maximum power density at 100°C	1 W/cm^2 (*)
Type	Single layer, Single circuit
Thickness	max 0,2 mm
Patch	Acrylic, exit side type A
Welded wires	FM: 3901-020-03 AWG 26, red, unshielded, Lc = 500 mm.
	QM: MIL 22759/11 AWG 26, red, unshielded, Lc = 500 mm.
Minimum operating temperature	-65°C
Maximum operating temperature	150°C (to be managed in accordance with applicable de-rating rules (**))
Optional layers	PSA adhesive layer (separately supplied)
RoHS	compliant
Minimum bending radius	1 mm
(*) Please note that the maximum power density is both application and design specific, and the indicated value is intended to be applied to the heater when correctly mounted, respecting all provided instructions in the applicable conditions. Moreover, please also note that voltage and wattage values indicated in the Table are for reference only: you can apply whichever level your mission needs, pending that the maximum operating temperature indicated in the technical drawing (and applicable derating rules, if any) is not exceeded.	
(**): ECSS-Q-ST-30-11C for FM	

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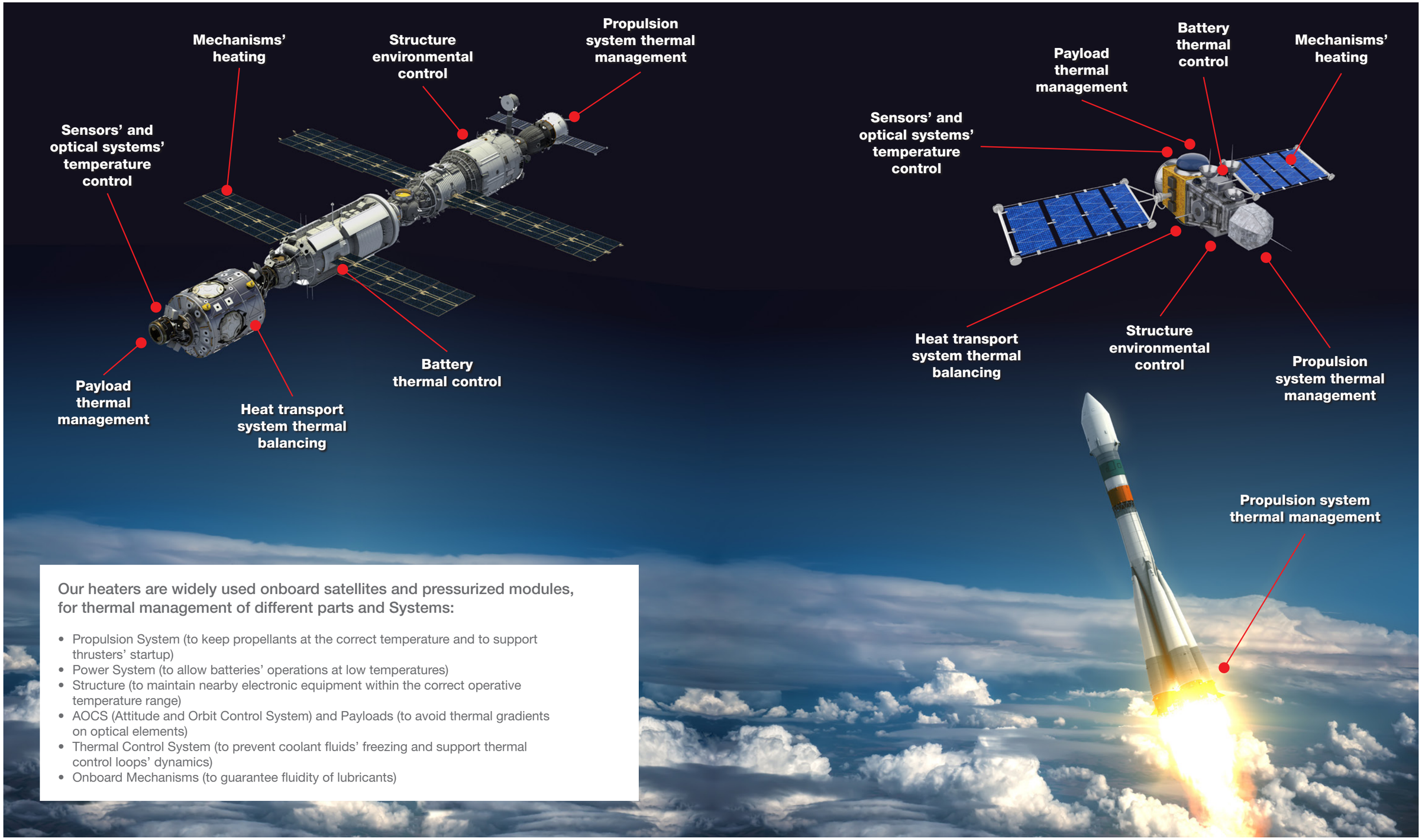

Our heaters are widely used onboard satellites and pressurized modules, for thermal management of different parts and Systems:

- Propulsion System (to keep propellants at the correct temperature and to support thrusters' startup)
- Power System (to allow batteries' operations at low temperatures)
- Structure (to maintain nearby electronic equipment within the correct operative temperature range)
- AOCS (Attitude and Orbit Control System) and Payloads (to avoid thermal gradients on optical elements)
- Thermal Control System (to prevent coolant fluids' freezing and support thermal control loops' dynamics)
- Onboard Mechanisms (to guarantee fluidity of lubricants)

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QUALIFICATION LEVELS

We know that Space is no longer only the domain of large exploration vessels owned by governments or militaries. New Space Economy's satellite and space systems are more and more driven by fast-paced and budget minded practices.

For these reasons, we propose our heaters with 2 incremental qualification levels:
→ Same materials and manufacturing, different inspections and tests.

The available options are described in the Table here below, and allow coverage of all possible usages of the ZIHET heater: from Institutional, Military or Commercial Programs, Cubesats, Nanosats or Constellations, to Ground testing facilities.

In this way, you will be able to tune your procurement according to your mission-specific needs.

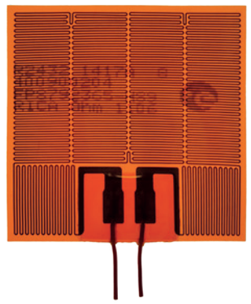
Qualification level	Description
Qualification Model (QM)	These heaters are provided in full compliance with the applicable ESCC specification's prescribed materials and manufacturing; a minimal set of verification steps (i.e. Functional visual inspection, Production Control tests and #ESCC-compliant Final Room Temperature Electrical Measurements) is performed, to ensure its suitability for functional and environmental qualification testing.
ESCC Flight Model (FM)	Fully ESA-qualified Space Heater, covering all the inspections, controls and tests foreseen by the applicable ESCC specification (ESCC 4009/004).

WHAT IS INCLUDED IN MY PURCHASE?

- For each purchased ZIHET Flexible Heater, you will receive:
  - o The flexible heater and cable assembly, packed singularly with humidity protection
  - o 2 x 3M™ Adhesive Transfer Tape 966 foils, including application instructions.
  - o The detailed technical drawing and datasheet including usage, mounting and stocking instructions and warnings.
  - o If ESA-qualified, the complete ESCC certification covering all applicable verification steps.

- The product is intended to be installed, used and eventually substituted, in case of damage, only according to the instructions provided in the technical datasheet. Our company will only be responsible for the product compliance with its technical specifications and not for its operating, working conditions and suitability in the appliance where it is assembled/installed. It is the onus of the Customer, as being responsible for the appliance, of carrying out all the most accurate checks and all the tests necessary to verify and ascertain the product suitability for that appliance.
- The Customer shall ensure that the product installed in the appliance is included in the activities prescribed in the applicable regulations and standards in order to safeguard the environment and human health.

Contact us for more details and a quotation!



Worldwide Local Supplier

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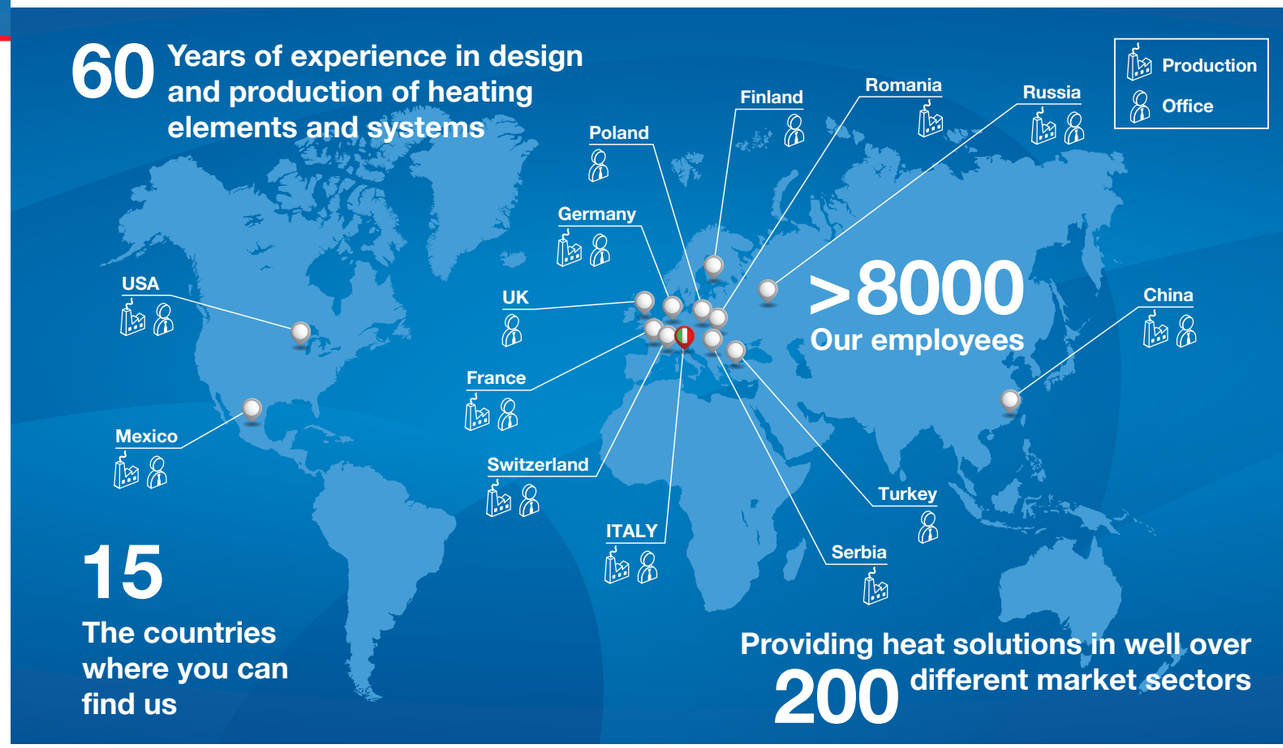

ZOPPAS INDUSTRIES Partner

- Experience Zoppas Industries increasing efficiency using lean enterprise across all facilities and departments.
- Access our state-of-the-art laboratory facilities with over 30 years' design experience.
- Benefit from Zoppas Industries manufacturing and design facilities which maintain Quality Management Systems according to ISO 9001, EN 9100 and IATF 16949, Environmental Management System according to ISO 14001 and Energy Management System according to ISO 50001.
- Access one of the widest Heating Element Technology product portfolios in the world including completely integrated thermal assemblies with sensors, connectors, enclosures, etc.
- Benefit from Zoppas Industries global presence through design and manufacturing facilities across Europe, North America, South America and Asia - lowering your Total Cost of Ownership (TCO) including reduced logistics, design, communication and support costs.
- Access Zoppas Industries' in-house design, development and R&D capabilities, such as CAD 3D design, FEA, DOE, FMEA.
- Benefit from Zoppas Industries products third-party certification, such as UL and VDE: marking applied on customer's request.

We at ZOPPAS INDUSTRIES put you in the front seat of internationalization - sourcing your local needs globally.



PRODUCT TRADEMARKS

Compliance with the mark of each specific product must be properly reviewed with our Sales Department.

COMPANY CERTIFICATIONS

IT-75.12-6975 12/054P_IND EN 15085-2
IT-75.12-6975 12/055P_IND ISO 3834-3
9191.IRCR
9196.IRC8



ZIHET reserves the right to make changes without prior notice: all the specifications may be subject to change

cod. 690976000 - 0623

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