



HeatWorks

HeatWorks 20 | www.ceramicx.com



Putting it all together: Infrared Heat and Ceramicx

ENGINEERING COMPETENCIES
PRODUCT GUIDE TYPES OF HEATERS
NEW BUILDING

Welcome

A fresh look at a new science

A new factory certainly gives inspiration to take a fresh look at all manner of things.

Such is the case here at Ceramicx and especially with regard to this the 20th issue of our in-house magazine – HeatWorks. We have chosen to celebrate our newly constructed facilities with a companion issue of the magazine – one that reminds, re-iterates and underscores the fundamentals of the science of Infrared heating.

It is my hope that the reader retains this magazine issue as a regular primer and refresher on these IR heating matters.

Four sections cover the ground;

- Principal types of IR heaters
- Primary Industrial Applications for IR heating
- Energy and radiation fundamentals
- Control and measurement of IR energy and heating.

Make no mistake, Ceramicx is at the forefront of the scientific advancement of Infrared heating: Our commercial successes on five continents simply attest to the superior technical and scientific nature of our manufacturing and our resulting products and heaters. Empirical scientific research backs everything we do. And - as this magazine issue clearly shows - such IR science is not approximate. No 'black art' skills are required here.

Instead, the clean, green and cost-effective energy solution for the C21 is becoming better understood and applied with every passing year.

The new Ceramicx factory and enterprise remains at the cutting edge of that advancement.




Frank Wilson
Managing Director, Ceramicx Ltd.

HeatWorks

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Contents

02 | CERAMICX EXPANSION

World class production demands world class manufacturing facilities

06 | THE MAIN TYPES OF IR EMITTERS

PRODUCT GUIDE

09 | PRODUCT GUIDE INDEX

10 | CERAMIC ELEMENTS

18 | QUARTZ ELEMENTS

21 | PANEL HEATERS

22 | QUARTZ TUNGSTEN / QUARTZ HALOGEN TUBES

24 | REFLECTORS AND PROJECTORS

26 | MODULAR IR HEATER

27 | FAST IR SYSTEMS

28 | ACCESSORIES

PRINCIPAL TYPES OF IR HEATERS

30 | 2.1 PUTTING IT ALL TOGETHER – CERAMIC ELEMENTS

32 | 2.2 PUTTING IT ALL TOGETHER – QUARTZ ELEMENTS

34 | 2.3 PUTTING IT ALL TOGETHER – QUARTZ TUNGSTEN / QUARTZ HALOGEN

36 | CERAMICX HERSCHEL LIGHTS THE WAY The Herschel test instrument

37 | The benefits of in house testing

PRIMARY INDUSTRIAL APPLICATIONS FOR IR HEATING

38 | 3.0 THE APPLICATION OF IR HEATING clean, green and cost effective,

39 | Where is infrared used in industry

40 | 3.1 INFRARED ENERGY CONVERSION FOR THE WORLD'S PROCESS INDUSTRIES

41 | Thermoforming 40% energy saving

42 | 3.2 INFRARED – ENERGY CONVERSION FOR DRYING, CURING AND COATING

43 | Drying system for concrete pipes

44 | 3.3 INFRARED – ENERGY IN FABRICATION, MATERIAL BONDING, WELDING AND JOINING

IR HEAT :

PRINCIPLES, DEFINITIONS AND LAWS

45 | 4.1 TERMS AND DEFINITIONS

46 | 4.2 THE KEY PRINCIPLES OF HEATING AND HEAT TRANSFER – non-IR based

47 | 4.3 THE KEY PRINCIPLES OF IR HEATING AND HEAT TRANSFER

48 | THE APPLICATIONS OF IR

49 | Benefits of a reflector and analysis of reflector material discolouration

50 | 4.4 THE FUNDAMENTAL LAWS OF IR HEATING The science that underpins the workings of IR heat transfer

51 | Explanatory notes on Planck's Law

CONTROL AND MEASUREMENT OF IR ENERGY AND HEATING.

53 | 5.1 CONTROL OVERVIEW

55 | 5.2 TEMPERATURE MEASUREMENT OVERVIEW

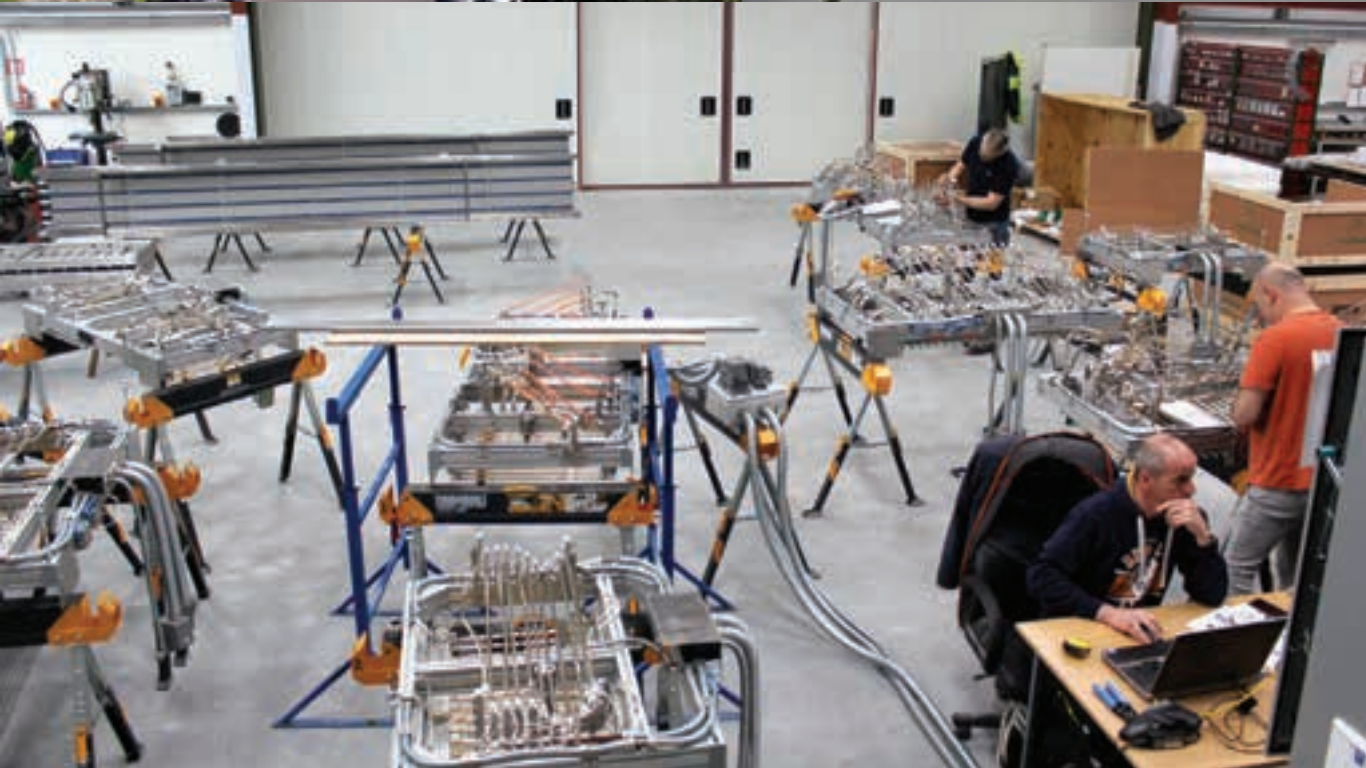
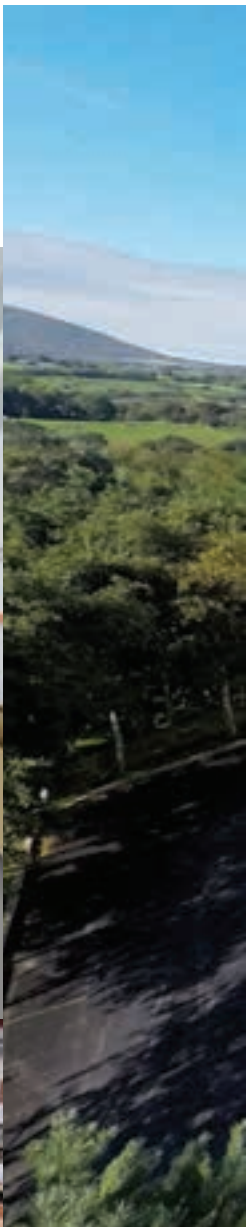
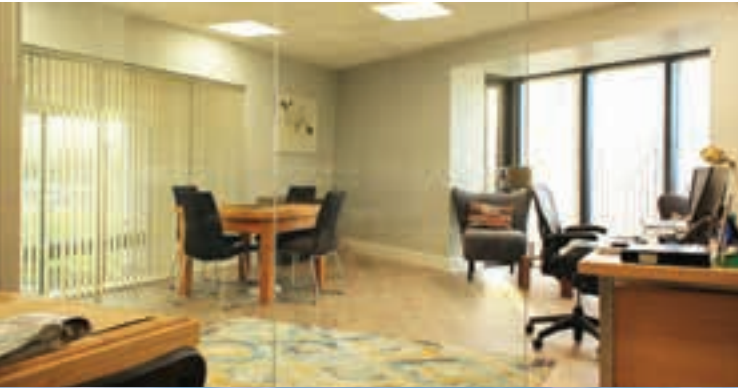
56 | Cericx Thermocouple

58 | PUTTING IT ALL TOGETHER – A comparison of the use of convectional and infrared heating in out of autoclave curing of carbon fibre

60 | CONTACT US



“World class production demands world class manufacturing facilities” such was the thinking behind our new build and expansion.





Such are the results we witness around us today I am very pleased to note any visitor to our new Ceramicx factory will find great difficulty in discerning the past footprint of the previous space: This has been superseded, reconfigured and elevated into two storeys in many parts. The whole of our enterprise has been effectively doubled in size.

We are very well forward in making this new habitat fit for purpose and in fitting out our new spaces, production halls and systems, physical and virtual; creating a place for everything and having everything in its place.

We have set hard targets for these new facilities. The previous infrastructure succeeded in achieving an average of 15% annual growth figure through the past five years. The new facilities therefore have a high benchmark to out perform.

I am more than confident that we can do it. Wherever we find ourselves Ceramicx maintains a 'can do' spirit that has enabled us to export over 95% of our production to 65 countries worldwide; to exhibit through the year on four continents and to continue to develop world-leading IR heat innovation.



The unsurpassed surroundings of West Cork and our new facilities are, of course, great assets for our business.

The key, however, for our 65 strong enterprise lies in the ever growing technical strength of our IR production together with a widening access to world markets for IR heating solutions.

Our new facilities are there to support these fundamentals and to ever improve our aims for business growth.



Engineering Capabilities

At Ceramicx, we pride ourselves in our ability to make all our components in house. Due to our location, we have become as self-sufficient as possible.

Over the last few years we have steadily grown our business, along with this we have invested heavily in engineering and have become increasingly skilled in our CNC and sheet metal fabrication. Due to our growth we now have enough capacity to allow us to offer the following services.

Custom Punching and Folding

The Trumpf Hydraulic punch machine along with the Safan folding machine and guillotine give us the capability to make almost any component, with any type of material up to 3mm in thickness. Throughout our website you will see a variety of custom ovens and projects, in which every piece of sheet metal is now made in house. Below are a few examples of custom sheet metal parts we have created.



One of the biggest benefits of the Trumpf Punch Machine is our ability to make custom forms. We can;

- thread material
- create a variety of forms, to strengthen the material or just for aesthetics
- engrave a text or design into a sheet
- emboss or stamp a design on top or bottom of a sheet including likes the earth mark or CE logo

All of this can be done on the one machine in the one operation. With our Safan machines we can then cut and fold the part to the required shape and size.

Conclusion

If you have any questions about our proficiencies or need a custom part made please don't hesitate contact us, send through your design and see what we can do for you.

“Electrical Insulation - A full manufacturing service is available of Steatite Products from Ceramicx”

It includes consultancy, design, tooling and the manufacture of specialized Steatite ceramic dust press components on the Ceramicx 6 Ton, 15 Ton and 30 Ton Dorst presses. These capabilities are also deployed in making mainstream Ceramicx products.



Steatite – commonly known as ceramic dust - has proven itself to be the material-of-choice for the manufacture of electrical insulators. It has good mechanical strength with good dielectric properties and a high temperature resistance of up to 1000°C.



Current Ceramicx Steatite production includes beads, connector blocks and additional components for high-temperature infrared heating applications.

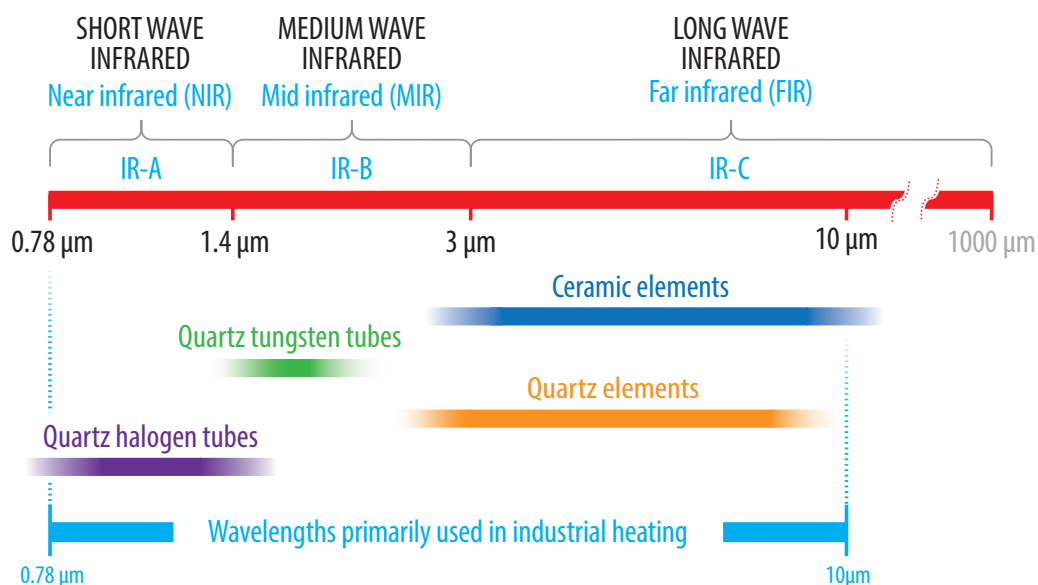
Ceramicx global commercial expertise and services can be included in the Steatite and machining services.

Ceramicx has purchased a new high temperature kiln for Alumina production to further develop this sector for higher temperature components.

The main types of IR heat emitters

Infrared emitters used in industrial heating generally have a usable peak emission wavelength in the range of 0.75 to 10 μm . Within this range there are three sub-divisions which are long, medium and short wave.

Long wave emitters - also known as far infrared (FIR), have a peak emission range in the 3-10 μm range. This range generally refers to ceramic elements which consist of a FeCrAl resistance coil embedded into either a solid or hollow constructed highly emissive ceramic body. Ceramic emitters are manufactured in a number of industry standard sizes with either flat or curved (trough style) emitting surfaces.



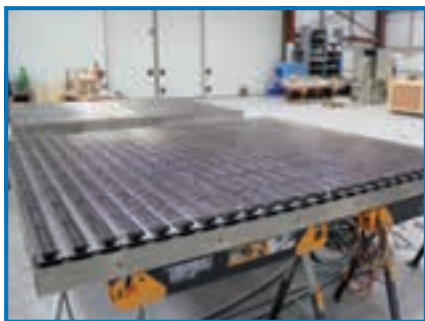
Shorter peak emission wavelengths are achieved by higher using emission sources with higher surface temperatures. Quartz cassette style emitters are available in similar industry standard sizes to that of ceramic and consist of a series of translucent quartz tubes built into a polished aluminised steel housing. These emitters can operate with a higher front surface temperature and emit in the long to medium wave range.

At the shorter end of the medium wave range is the quartz tungsten emitter which consists of a sealed linear clear quartz tube containing a star design tungsten coil. The tungsten coil provides a fast response time with low thermal inertia. At the shorter end of the spectrum lies the short wave halogen range. Basic construction is similar to that of the fast medium wave tungsten emitter with the exception that a round tungsten coil is employed. The higher coil temperature results in the generation of white light and a peak emission wavelength in the short wave range.

This portable test stand allows you to quickly determine the most suitable type of emitter and heating distance for a specific material, with a simple, repeatable test set up. see page 06 for further details



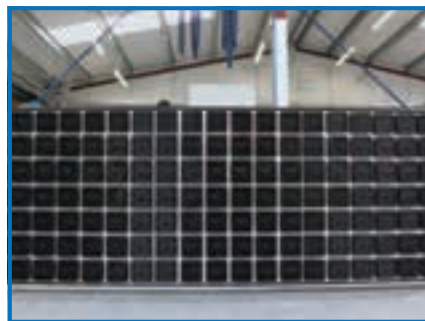
Ceramic elements 2 to 10 μm



281 kW long wave ceramic heating platen fitted with black ceramic hollow emitter model FFEH. Used to thermoform acrylic sheet for hot tub production.



42 kW long wave ceramic conveyor oven fitted with white ceramic emitter model HTE. Used to cure foam on speaker housings.



75.6 kW long wave ceramic heating platen fitted with black ceramic hollow emitter model SFEH. Used to pre-heat carbon fibre fabric.

Quartz elements 1.5 to 8 μm



3.75 kW medium wave quartz heating platen fitted with quartz emitter model PHQE. Used to heat polyester fabric in footwear manufacture.



108 kW medium wave quartz heating platen fitted with quartz emitter model FQE. Used to heat PVC coating in calendaring machine.

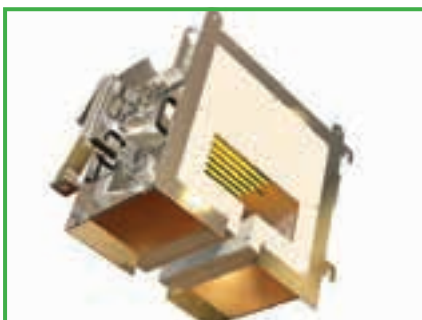


16.9 kW medium wave quartz heating platen fitted with quartz emitter model PFQE. Used to infrared weld plastic components.

Quartz tungsten tubes 1.6 to 2.0 μm



134 kW fast medium tungsten heating platen fitted with custom built curved quartz tungsten emitters. Used to heat plastic substrate in an automotive application.



11 kW fast medium tungsten modular oven fitted with custom built quartz tungsten emitters. Used in glass forming application.



24 kW fast medium wave tungsten test oven fitted with quartz tungsten emitters model QTM. Used as a test platform for multiple materials in the automotive industry.

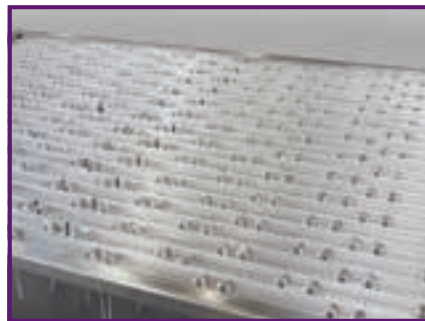
Quartz halogen tubes 1.0 to 1.4 μm



43 kW short wave halogen test oven fitted with custom built curved short wave emitters. Used as a high intensity material test oven in an aerospace application.



2 kW short wave halogen clamshell oven fitted with custom built short wave emitters. Used to heat wire/round tube up to 100mm in diameter.



1133 kW short wave halogen heating platen fitted with custom built short wave emitters. Used in retrofit of existing Thermoforming machine.

PORTABLE TEST STAND

Ceramicx' new Portable Test Stand allows for quick and consistent testing of materials. The interchangeable long, medium and short wave Infrared emitters are easily attached to the test stand.

The emitters face down and heat a material that is placed on a stainless steel mesh. The distance between emitter and material can easily be adjusted between 50mm and 200mm, in 50mm intervals.

This test stand allows the user to quickly determine the most suitable type of emitter and heating distance for a specific material, with consistent results due to the simple, repeatable test set up.

2 x 800 W, Black Ceramic SFEH

2 x 750 W, Quartz FQE

2 x 750 W, Tungsten QTS





Ceramicx Product Guide

CERAMIC ELEMENTS

- 10 | Ceramic trough elements
- 12 | Ceramic hollow elements
- 14 | Ceramic flat elements
- 16 | Ceramic Edison screw elements

QUARTZ ELEMENTS

- 18 | Quartz elements
- 20 | Pillared quartz elements
- 20 | Single tube quartz heaters

PANEL HEATERS

- 21 | Panel heaters

QUARTZ TUNGSTEN/HALOGEN TUBES

- 22 | Quartz tungsten tubes
- 23 | Quartz halogen tubes

REFLECTORS AND PROJECTORS

- 24 | Reflectors RAS
- 25 | Quartz tungsten/halogen reflectors
- 25 | Projectors PAS

MODULAR IR HEATERS

- 26 | Modular IR 260 modular long wave infrared heater

FAST IR SYSTEMS

- 27 | Fast IR 305 / Fast IR 500

ACCESSORIES

- 28 | Ceramic terminal blocks
- 28 | Ceramic beads
- 29 | High temperature cable and cable sleeving

NEW
PRODUCT





CERAMIC TROUGH ELEMENTS

Useful wavelength range 2 to 10 μm

(FTE/HTE/QTE) are industry standard curved ceramic infrared heaters used in a wide range of industrial, commercial and domestic applications. These solid cast elements consist of a high temperature FeCrAl resistance alloy embedded in a specially formulated ceramic body allowing operating temperatures up to 750°C and a maximum power of 1000W (FTE Model Only).

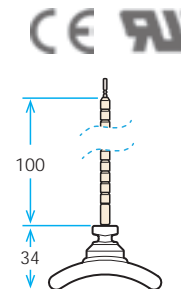
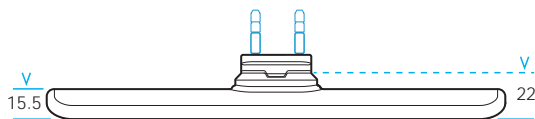
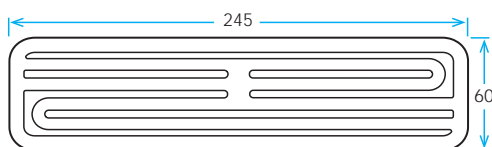
All dimensions mm Tolerances apply

FTE

Full Trough Element,

Standard Wattages 150W 250W 300W 400W 500W 650W 750W 1000W.

Standard Voltage 230V. Average weight 192g.



Wattage	150W	250W	300W	400W	500W	650W	750W	1000W
Mean surface temperature	272 °C	351 °C	405 °C	480 °C	515 °C	596 °C	624 °C	726 °C
Max power density	9 kW/m ²	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	45 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm	0.10 W/cm ²		0.26 W/cm ²		0.48 W/cm ²	0.69 W/cm ²		1.14 W/cm ²

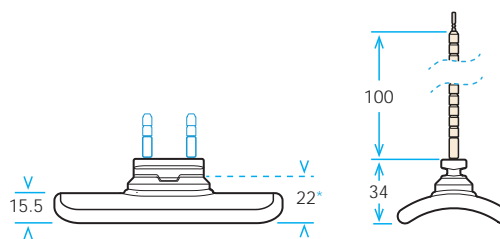
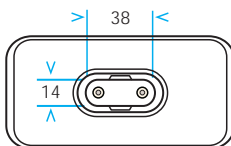
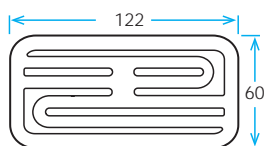
Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)

HTE

Half Trough Element,

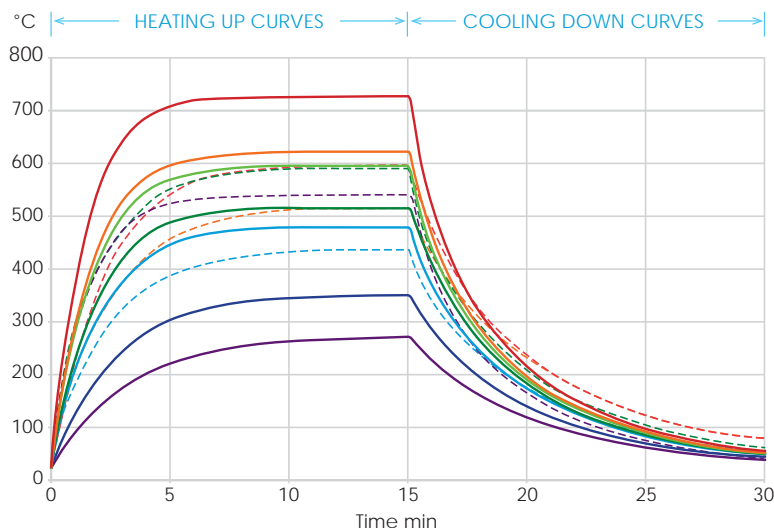
Standard Wattages 125W 150W 200W 250W 325W 400W 500W.

Standard Voltage 230V. Average weight 105g.



Wattage	125W	150W	200W	250W	325W	500W
Mean surface temperature	351 °C	405 °C	480 °C	515 °C	596 °C	726 °C
Max power density	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm		0.26 W/cm ²			0.69 W/cm ²	1.14 W/cm ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



Heating up cooling down curves based on FTE tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9

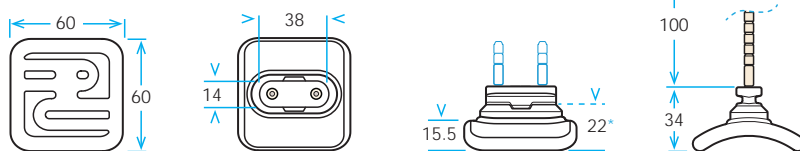
(element mounted in an aluminised steel reflector, RAS)

	FTE	HTE	QTE	
	1000W	500W	250W	--- LFTE 1500W
	750W			--- LFTE 1000W
	650W	325W		
	500W	250W	125W	--- QCE 250W
	400W	200W		--- QCE 150W
	250W	125W		
	150W			--- FTEL-LN 1000W

QTE

Quarter Trough Element,

Standard Wattages 125W 250W. Standard Voltage 230V. Average weight 65g.



Wattage	125W	250W
Mean surface temperature	515 °C	726 °C
Max power density	30 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm		1.14 W/cm ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



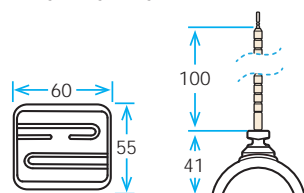
QCE

Quarter Curved Element

Standard Wattages 150W 250W.

Standard Voltage 230V.

Average weight 70g

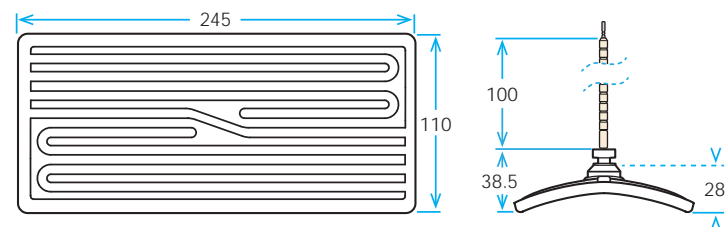


LFTE

Large Full Trough Element

Standard Wattages 1000W 1500W.

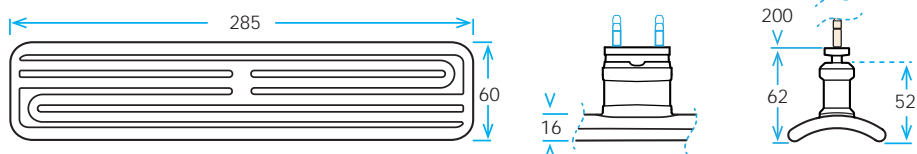
Standard Voltage 230V. Average weight 356g



FTEL-LN

Full Trough Element Long - Long Neck,

Standard Wattage 1000W. Standard Voltage 230V.





CERAMIC HOLLOW ELEMENTS

Useful wavelength range 2 to 10 μm

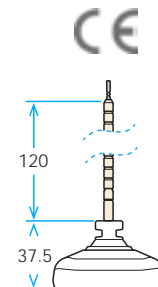
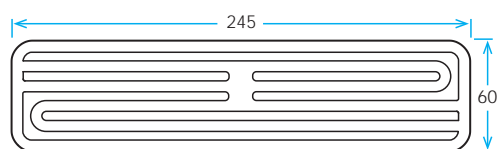
Ceramic Hollow Elements (SFEH, FFEH, HFEH, QFEH) are industry standard ceramic emitters used in a wide range of industrial, commercial and domestic applications. The hollow constructed ceramic element has the advantage of having a shorter heat up time combined with increased energy efficiency. These hollow constructed products consist of a high temperature FeCrAl resistance alloy embedded in a specially formulated light weight hollow cast ceramic body which is subsequently filled with a high density insulating material. This results in a significant reduction in rear heat loss and increased radiant output from the front of the element, the operating temperature is up to a maximum of 750°C and a maximum power of 800W (FFEH and SFEH)

All dimensions mm Tolerances apply

FFEH

Full Flat Element Hollow,

Standard Wattages 250W 400W 500W 600W 800W. Standard Voltage 230V. Average weight 250g.



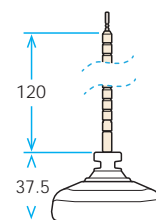
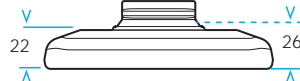
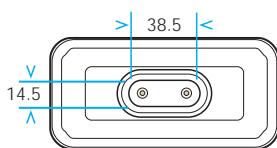
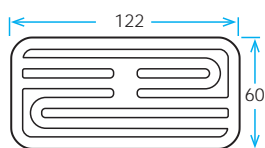
Wattage	250W	400W	500W	600W	800W
Mean surface temperature	390 °C	497 °C	548 °C	602 °C	710 °C
Max power density	15 kW/m ²	24 kW/m ²	30 kW/m ²	36 kW/m ²	48 kW/m ²
Radiant Watt density at 100mm	0.25 W/cm ²	0.44 W/cm ²		0.73 W/cm ²	

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)

HFEH

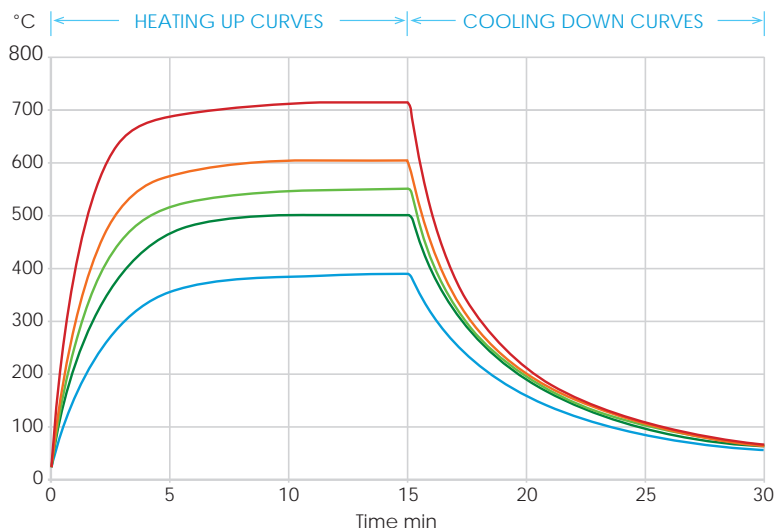
Half Flat Element Hollow,

Standard Wattages 125W 200W 250W 300W 400W. Standard Voltage 230V. Average weight 117g.



Wattage	125W	200W	250W	300W	400W
Mean surface temperature	390 °C	497 °C	548 °C	602 °C	710 °C
Max power density	15 kW/m ²	24 kW/m ²	30 kW/m ²	36 kW/m ²	48 kW/m ²
Radiant Watt density at 100mm		0.31 W/cm ²		0.49 W/cm ²	

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



Heating up cooling down curves based on FTE tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9

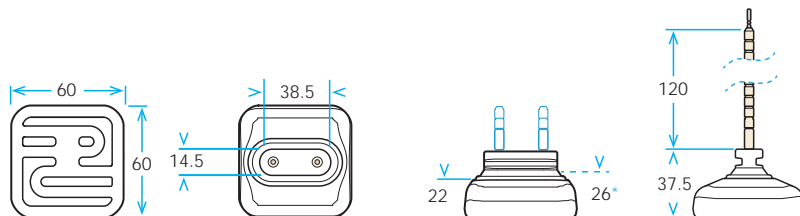
(element mounted in an aluminised steel reflector, RAS)

	FFEH	HFEH	QFEH	SFEH
—	800W	400W	200W	800W
—	600W	300W		600W
—	500W	250W	125W	500W
—	400W	200W		400W
—	250W	125W		250W

QFEH

Quarter Flat Element Hollow,

Standard Wattages 125W 200W. Standard Voltage 230V. Average weight 75g.



Wattage

Mean surface temperature

Max power density

125W

548 °C

30 kW/m²

200W

710 °C

48kW/m²

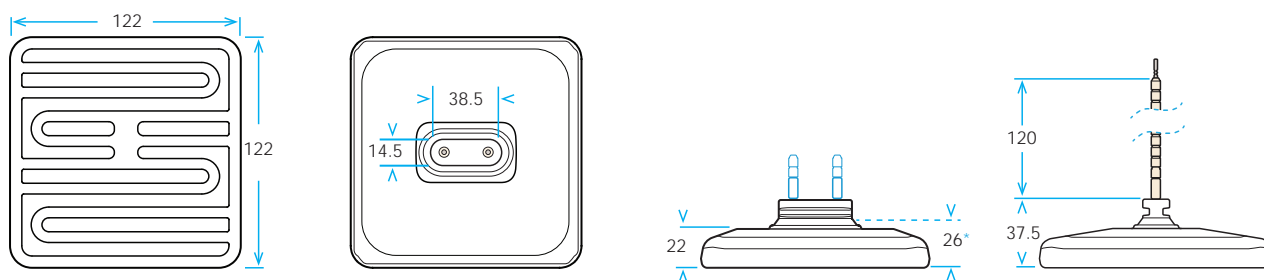
Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



SFEH

Square Flat Element Hollow,

Standard Wattages 250W 400W 500W 600W 800W. Standard Voltage 230V. Average weight 239g.



Wattage

Mean surface temperature

Max power density

Radiant Watt density at 100mm

250W

390 °C

15 kW/m²

0.28 W/cm²

400W

497 °C

24 kW/m²

0.51W/cm²

500W

548 °C

30 kW/m²

600W

602 °C

36 kW/m²

0.81 W/cm²

800W

710 °C

48kW/m²

1.18W/cm²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)





CERAMIC FLAT ELEMENTS

Useful wavelength range 2 to 10 μm

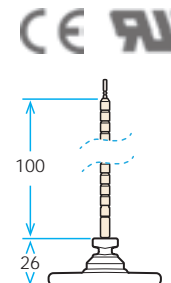
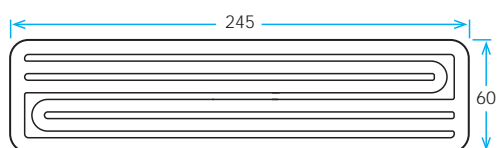
Ceramic IR Flat Elements (FFE/HFE/QFE) are industry standard ceramic emitters used in a wide range of industrial, commercial and domestic applications. These solid cast ceramic elements consist of a high temperature FeCrAl resistance alloy embedded in a specially formulated ceramic body allowing operating temperatures up to 750°C and a maximum power output of 1000W (FFE Model Only). The solid cast heater body is flat, producing a diffuse radiant output to target distance in some applications.

All dimensions mm Tolerances apply

FFE

Full Flat Element,

Standard Wattages 150W 250W 300W 400W 500W 650W 750W 1000W. Standard Voltage 230V. Average weight 182g.



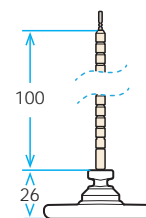
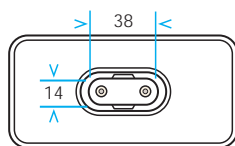
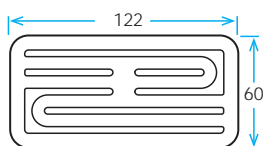
Wattage	150W	250W	300W	400W	500W	650W	750W	1000W
Mean surface temperature	272 °C	351 °C	405 °C	480 °C	515 °C	596 °C	624 °C	726 °C
Max power density	9 kW/m ²	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	45 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm	0.10 W/cm ²		0.25 W/cm ²		0.47 W/cm ²			

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)

HFE

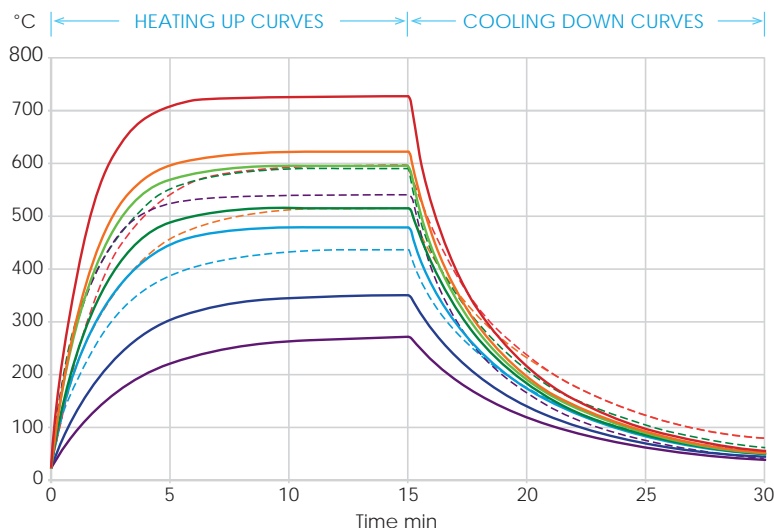
Half Flat Element,

Standard Wattages 125W 150W 200W 250W 325W 500W. Standard Voltage 230V. Average weight 105g.



Wattage	125W	150W	200W	250W	325W	500W
Mean surface temperature	351 °C	405 °C	480 °C	515 °C	596 °C	726 °C
Max power density	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	60 kW/m ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



Heating up cooling down curves based on FTE tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9

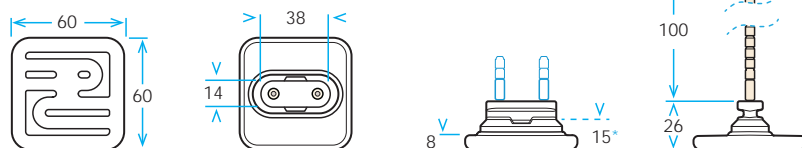
(element mounted in an aluminised steel reflector, RAS)

	FTE	HTE	QTE	
	1000W	500W	250W	--- LFTE 1500W
	750W			--- LFTE 1000W
	650W	325W		
	500W	250W	125W	--- QCE 250W
	400W	200W		--- QCE 150W
	250W	125W		
	150W			--- FTEL-LN 1000W

QFE

Quarter Flat Element,

Standard Wattages 125W 250W. Standard Voltage 230V. Average weight 65g.



Wattage

Mean surface temperature

Max power density

125W	250W
515 °C	726 °C
30 kW/m ²	60 kW/m ²

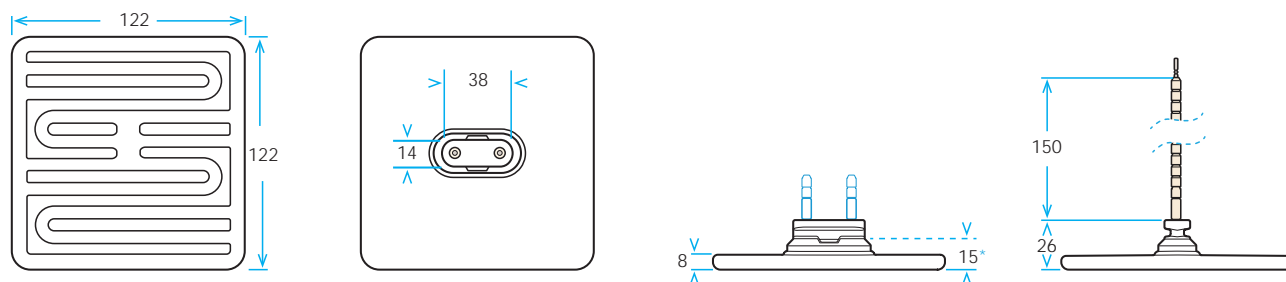
Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



SFSE

Full Flat Solid Element,

Standard Wattages 250W 400W 500W 600W 800W. Standard Voltage 230V. Average weight 192g.



Wattage

Mean surface temperature

Max power density

Radiant Watt density at 100mm

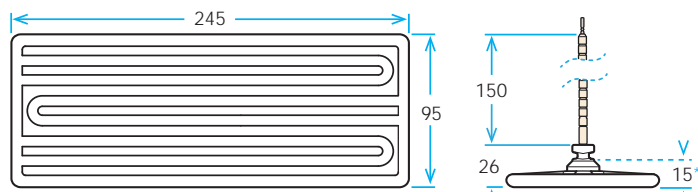
150W	250W	300W	400W	500W	650W	750W
272 °C	351 °C	405 °C	480 °C	515 °C	596 °C	624 °C
9 kW/m ²	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	45 kW/m ²
	0.23 W/cm ²		0.39 W/cm ²		0.71 W/cm ²	0.81 W/cm ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)




LFEE
Large Full Fat Element,

Standard Wattages 150W 350W 750W 1400W. Standard Voltage 230V. Average weight 342g.



Wattage	150W	350W	750W	1400W
Mean surface temperature	204 °C	338 °C	501 °C	667 °C
Max power density	5.4 kW/m ²	12 kW/m ²	27 kW/m ²	50 kW/m ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)

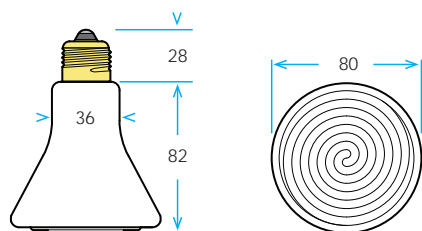

CERAMIC EDISON SCREW ELEMENTS

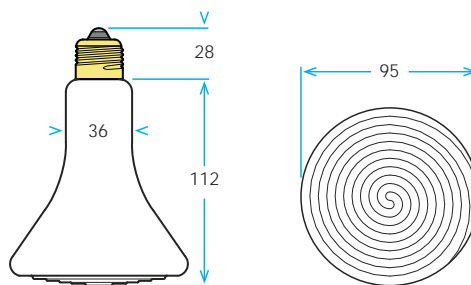
Useful wavelength range 2 to 10 µm

Ceramic Edison Screw Elements (ESEB, ESES, ESER, ESEXL) are industry standard infrared bulbs used primarily in the area of reptile/animal/pet health care. These ceramic bulbs provide the infrared heat required without any of the negative effects of a light output that can disturb the day/night sleeping cycle of the reptile/animal. Ceramicx hollow cast bulbs consist of a high temperature FeCrAl resistance alloy embedded in a specially formulated ceramic body allowing operating temperature up to 530°C and a maximum power of 400W (ESEXL Model Only). The face of the ESEB is circular and convex in design, producing a circular outward trending radiant output.

All dimensions mm Tolerances apply

ESES
Edison Screw Element Small,

 Standard Wattages 60W 100W.
Standard Voltage 230V. Average weight 113g

ESES
Edison Screw Element Regular,

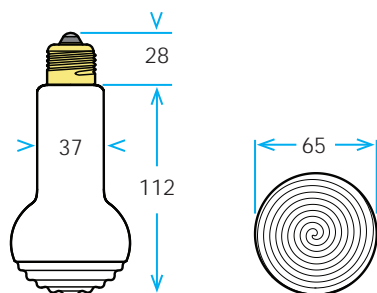
 Standard Wattages 150W 250W.
Standard Voltage 230V. Average weight 165g


ESEB

Edison Screw Element Bulb,

Standard Wattages 60W 100W.

Standard Voltage 230V. Average weight 112g

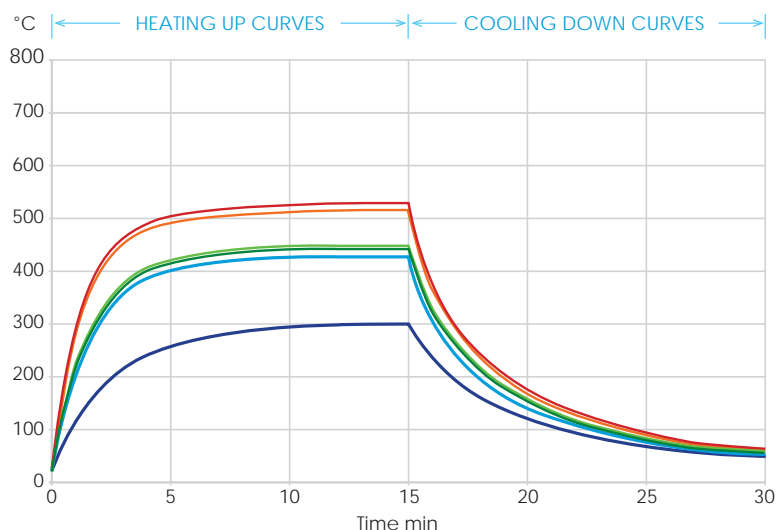
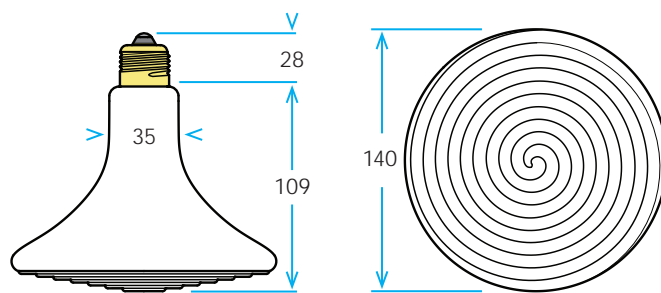


ESEL

Edison Screw Element Large,

Standard Wattages 300W 400W.

Standard Voltage 230V. Average weight 253g



Heating up cooling down curves based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9 (element mounted in an aluminised steel reflector, RAS)

	ESES	ESER	ESEB	ESEXL
—				400W
—		250W		
—				300W
—		150W		
—	100W		100W	
—	60W		60W	

Wattage

ESES

60W

100W

ESER

150W

250W

ESEB

60W

100W

ESEXL

300W

400W

Mean surface temperature

300°C

426°C

441°C

516°C

300°C

426°C

450°C

530°C

Max power density

7.3kW/m²

12 kW/m²

15kW/m²

25 kW/m²

13.5kW/m²

22.5 kW/m²

22.5kW/m²

30 kW/m²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9



QUARTZ ELEMENTS

Useful wavelength range 1.5 to 8µm

Quartz infrared heating elements provide medium wave infrared radiation. They are favoured in industrial applications where a more rapid heater response is necessary, including systems with long heater off cycles.

Quartz infrared heating elements are particularly effective in systems where rapid heater response and/or zone controlled heating is required.

They have a broad emission spectrum from around 1.4 to 8 microns, slightly shorter in wavelength than ceramic elements.

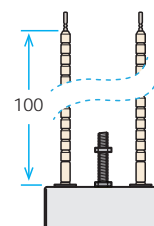
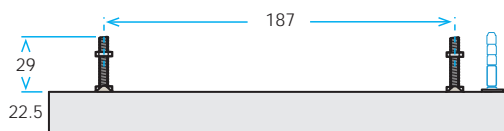
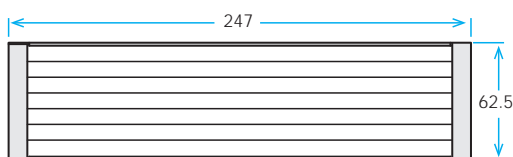
Pillared quartz elements have the same mounting fixture as ceramic elements allowing easy replacement.

All dimensions mm Tolerances apply

FQE

Full Quartz Element,

Standard Wattages 150W 250W 300W 400W 500W 650W 750W 1000W. Standard Voltage 230V. Average weight 403g.



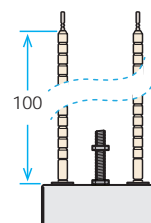
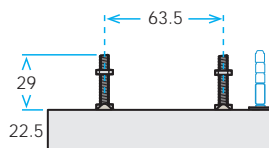
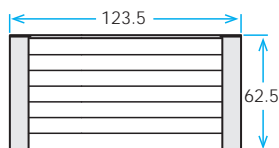
Wattage	150W	250W	300W	400W	500W	650W	750W	1000W
Mean surface temperature	343 °C	438 °C	477 °C	542 °C	593 °C	664 °C	690 °C	772 °C
Max power density	9 kW/m ²	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	45 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm	0.10 W/cm ²		0.26 W/cm ²		0.48 W/cm ²	0.69 W/cm ²		1.14 W/cm ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)

HQE

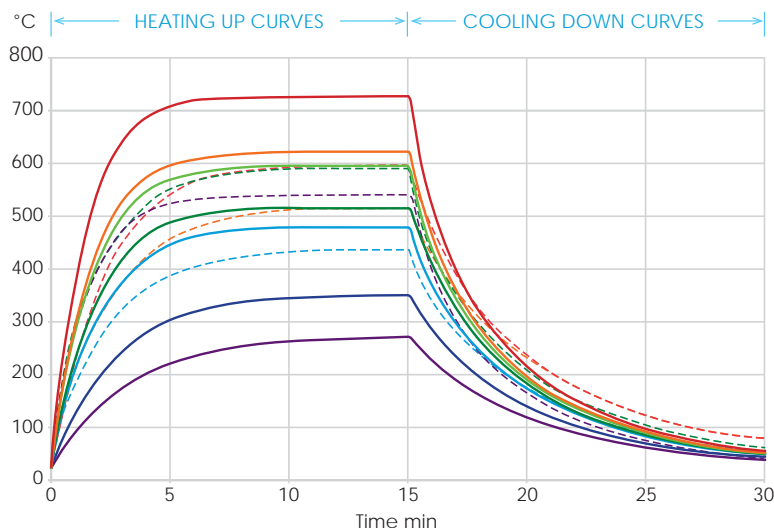
Half Quartz Element,

Standard Wattages 150W 250W 400W 500W. Standard Voltage 230V. Average weight 210g.



Wattage	150W	250W	325W	400W	500W
Mean surface temperature	477 °C	493 °C	644 °C	709 °C	772 °C
Max power density	18 kW/m ²	30 kW/m ²	39 kW/m ²	48 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm	0.26 W/cm ²		0.69 W/cm ²		1.14 W/cm ²

Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



Heating up cooling down curves based on FTE tests of average surface temperature with an infrared thermometer set at an emissivity of 0.9

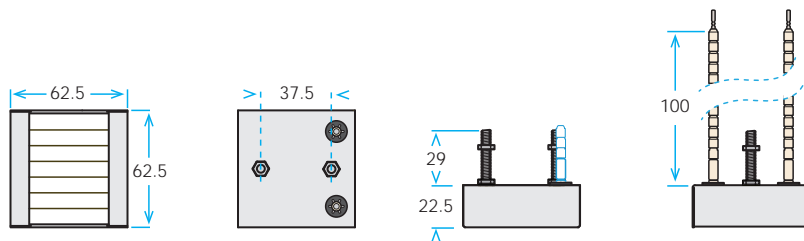
(element mounted in an aluminised steel reflector, RAS)

	FTE	HTE	QTE	
—	1000W	500W	250W	--- LFTE 1500W
—	750W			--- LFTE 1000W
—	650W	325W		
—	500W	250W	125W	--- QCE 250W
—	400W	200W		--- QCE 150W
—	250W	125W		
—	150W			--- FTEL-LN 1000W

QQE

Quarter Quartz Element,

Standard Wattages 150W 250W. Standard Voltage 230V. Average weight 144g.



Wattage	150W	250W
Mean surface temperature	642 °C	772 °C
Max power density	36 kW/m ²	60 kW/m ²
Radiant Watt density at 100mm		1.14 W/cm ²

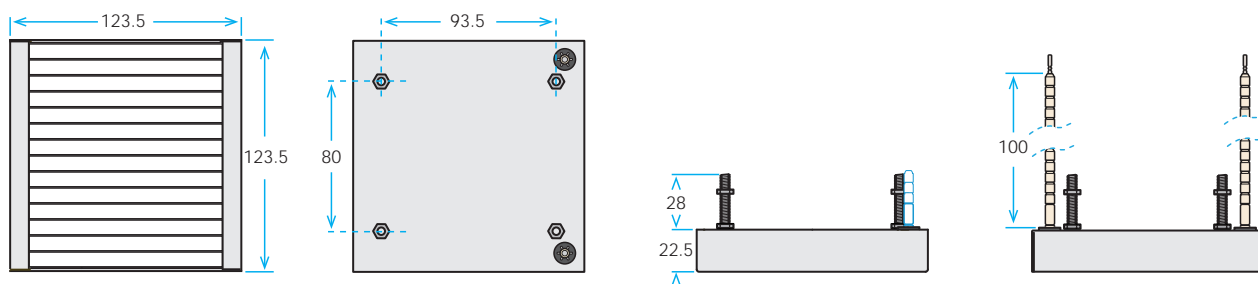
Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



SQE

Square Quartz Element,

Standard Wattages 150W 650W, 1000W. Standard Voltage 230V. Average weight 401g.



Wattage	150W	250W	300W	400W	500W	650W	750W	1000W
Mean surface temperature	343 °C	438 °C	477 °C	542 °C	593 °C	644 °C	690 °C	772 °C
Max power density	9 kW/m ²	15 kW/m ²	18 kW/m ²	24 kW/m ²	30 kW/m ²	39 kW/m ²	45 kW/m ²	60 kW/m ²

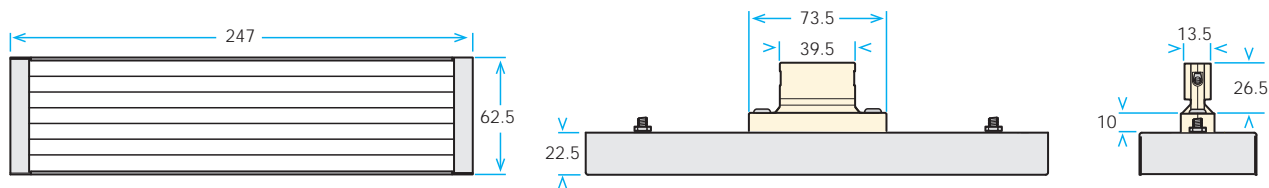
Based on tests of average surface temperature with an infrared thermometer set at an emissivity of 0.95 (element mounted in an aluminised steel reflector, RAS)



PFQE

Pillared Full Quartz Element,

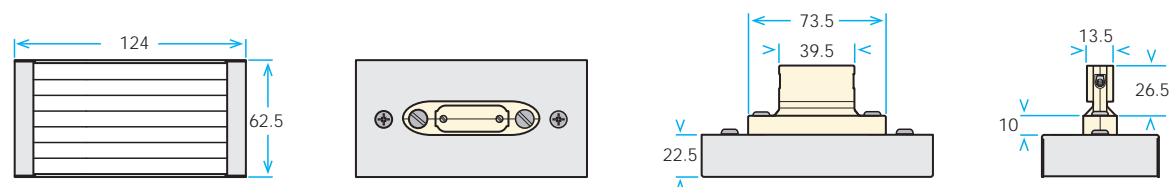
Standard Wattages 150W 250W 400W 500W 650W 750W 1000W. Standard Voltage 230V. Average Weight 403g



PHQE

Pillared Half Quartz Element,

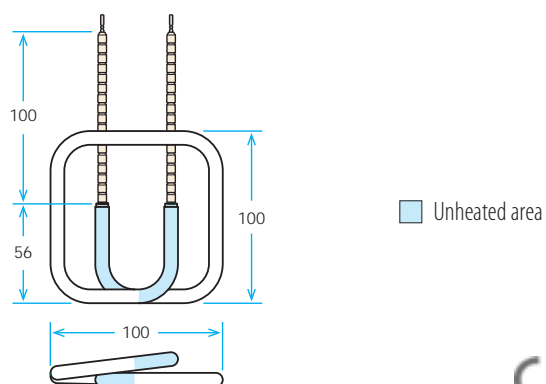
Standard Wattages 150W 250W 400W 500W. Standard Voltage 230V. Average Weight 268g



STQH 100

Single Tube Quartz Heater 100,

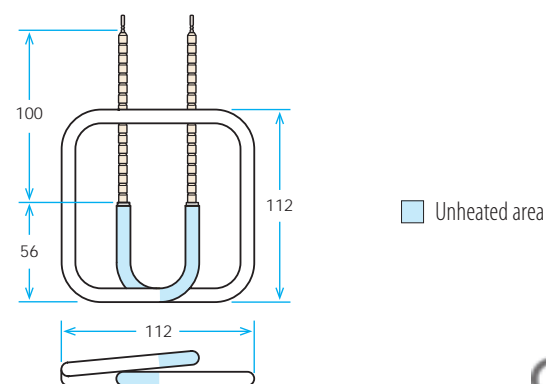
Standard Wattage Range 150W - 400W Standard Voltage 230V.



STQH 112

Single Tube Quartz Heater 112,

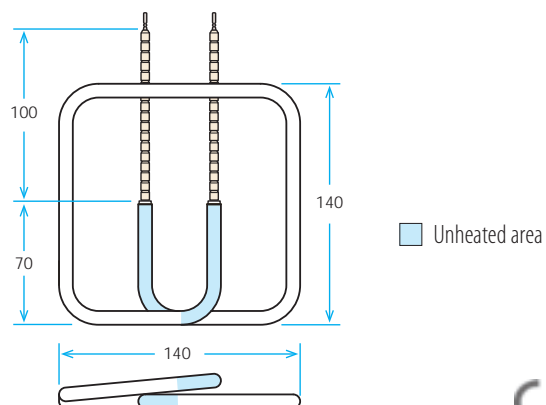
Standard Wattage Range 150W - 400W Standard Voltage 230V.



STQH 140

Single Tube Quartz Heater 140,

Standard Wattage Range 150W - 650W Standard Voltage 230V.



STQH 150

Single Tube Quartz Heater 150,

Standard Wattage Range 150W - 650W Standard Voltage 230V.

