

Flexible Heaters

Flexible Shapes and Geometries

Flexible heaters from Watlow are just what the name implies: thin, bendable and shaped to fit most any equipment. Heat can be applied to the most complex shapes and geometries, without sacrificing efficiency or dependability.

Excellent heat transfer results from the heater's thin design and its direct bonding to the application. Flexible heaters also provide fast heat-up and cool-down rates, uniform heat distribution and high watt densities.

Features and Benefits

Flat geometry

- Permits holes, notches and unusual shapes

Option of two material types and two element styles

- Allows for wider flexibility

Lightweight construction and low thermal mass

- Permits use in applications that have limited space or weight requirements

Close heating elements as close as 0.003 in. (0.08 mm)

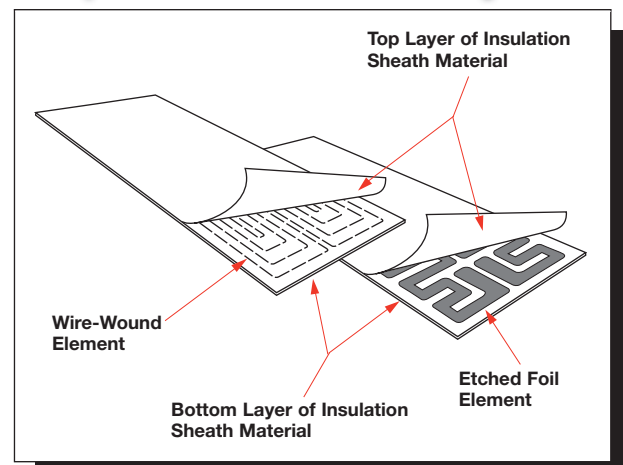
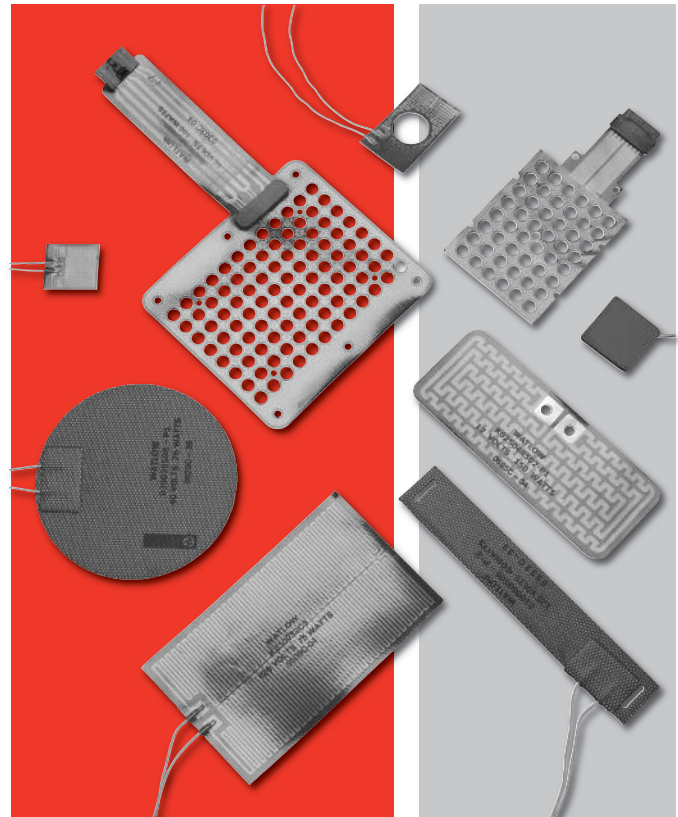
- Creates faster heat-up and cool-down time

Uniformly spaced element paths

- Distributes heat more evenly

Typical Applications

- Medical equipment such as blood analyzers, respiratory therapy units and hydrotherapy baths
- Semiconductor equipment
- Foodservice equipment
- Battery heating
- Satellite and communication equipment
- Freeze protection for military hardware, aircraft instrumentation, hydraulic equipment, etc.
- Any application requiring a flexible shape or design



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Applications and Technical Data

Two Material Types

Silicone Rubber

This rugged, moisture- and chemical-resistant material is easily bonded or adhered to parts. Watlow silicone rubber heaters can handle temperatures up to 500°F (260°C). Many styles of these heaters are available with UR®, cUR®, VDE and CE recognition.

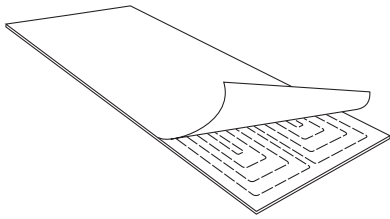
Polyimide

Polyimide is a thin, lightweight transparent material and is designed for precise heating requirements ranging from -319° to 392°F (-195° to 200°C). It is ideal for applications requiring low outgassing in a vacuum, or resistance to radiation, fungus and chemicals. Many custom heaters can be UR® and cUR® recognized.

Two Element Types

Watlow offers both wire-wound and etched foil resistance elements. These element types are available in most insulating materials, and Watlow can recommend the type best suited to your application.

Wire-Wound Elements

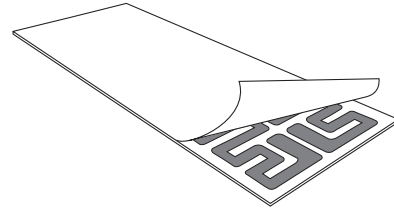


Available on silicone rubber heaters, this element style is created by spiraling fine resistance wires around a fiberglass cord. The element is then laid out in a pattern designed specifically for a specific application. The benefits of wire-wound elements include:

- Its excellent physical strength and flexibility; repeated flexing of the heater has no harmful effects on its performance
- The ability to conform readily to curved surfaces, including small radius bends

Drum heaters and conduit bender heaters are typical examples of applications that use the wire-wound method. These heaters are flexed repeatedly during use, but due to their wiring, no internal damage will occur.

Etched Foil Elements



This element type, created by acid etching a circuit in nickel alloy resistance foil, is available in silicone rubber and polyimide heater types. The etched foil element is noted for its excellent circuit pattern repeatability and superior heat transfer, which results from greater area coverage of the element. Other benefits include:

- The delivery of more heat and up to twice the watt density of a wire-wound element, thus providing longer heater life
- Complex heat distribution patterns

The etched foil element style is usually recommended for applications requiring high temperatures, watt densities, or multiple zoning.