

Flexible Heaters

Silicone Rubber Heaters

Rugged, yet thin, lightweight and flexible — use of Watlow® silicone rubber heaters is limited only by the imagination. Heat can be put exactly where it is needed to improve heat transfer, speed warm ups and decrease wattage requirements in an application process.

Fiberglass-reinforced silicone rubber provides dimensional stability without sacrificing flexibility. Because very little material separates the element from the part, heat transfer is rapid and efficient. Heaters are constructed with a wire-wound element or with an etched foil element. Its thin construction allows it to fit into applications where space is limited.

Performance Capabilities

- Operating temperatures up to 500°F (260°C)
- Watt densities up to 80 W/in² (12.5 W/cm²), dependent upon application temperature
- Wire-wound element thickness — 0.055 in. (1.4 mm)
- Etched foil element — 0.022 in. (0.56 mm)
- UR®, cUR®, VDE and CE recognitions are available on many designs up to 428°F (220°C)

Features and Benefits

Designed to the exact shape and size needed

- Conforms to component and/or equipment

More than 80 designs available immediately from stock

- Reduces downtime

Constructed with wire-wound or etched foil elements

- Enables a thin, lightweight heater
- Provides the desired flexibility for many dynamic applications
- Delivers low mass and easily repeatable distributed watt densities

Moisture and chemical-resistant silicone rubber material

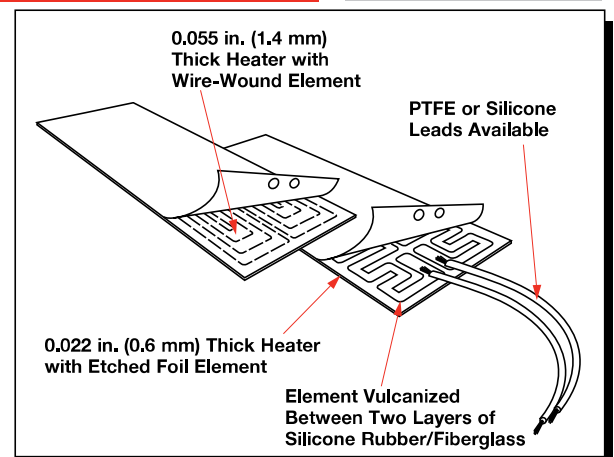
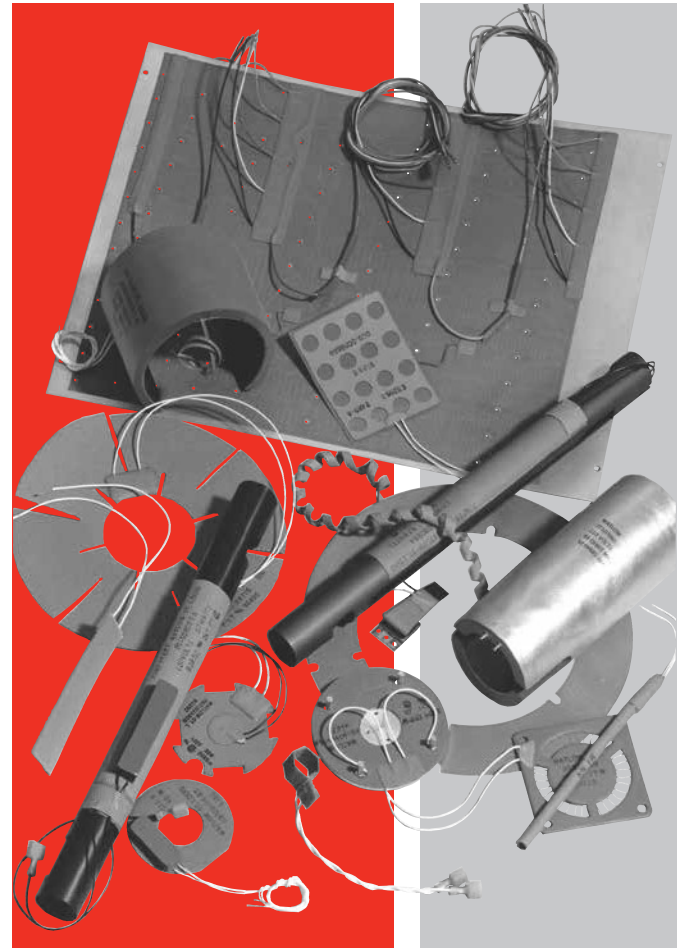
- Provides longer heater life

Vulcanizing adhesives or fasteners

- Allows heaters to be easily bonded to parts

Typical Applications

- Semiconductor processing equipment
- Freeze protection and condensation prevention for many types of instrumentation and equipment
- Medical equipment such as blood analyzers and test tube heaters
- Computer peripherals such as laser printers
- Curing of plastic laminates
- Photo processing equipment



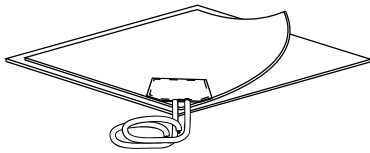
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Mounting Methods

Watlow offers various attachment techniques designed for fast installation.

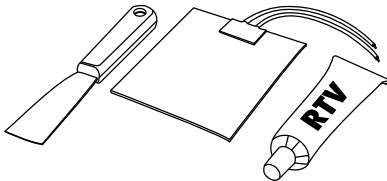
Pressure Sensitive Adhesive Surface (PSAS)



For speed, convenience and economy of installation, specify PSAS. Simply peel off the protective backing and roll the heater in place for an even bond to a clean, smooth surface. PSAS is not recommended for curved surfaces or for heaters rated above 10 W/in² (1.5 W/cm²). It should not be used for applications exceeding 400°F (205°C) on silicone rubber and 300°F (150°C) on polyimide.

Note: PSAS has a maximum six-month storage life at or below 86°F (30°C) before heater installation.

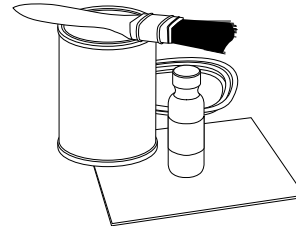
Field Applied Adhesive



For a stronger bond or when long storage is probable, room temperature vulcanizing (RTV) silicone adhesive works well. Watlow offers red RTV for temperatures up to 500°F (260°C). White RTV is available from adhesive suppliers for temperatures up to 400°F (205°C). Watlow's one-part RTV is self-priming and can be ordered in either 3 oz (90 ml) or 12 oz (355 ml) tubes. For larger heaters requiring longer adhesive working time, two-part RTV kits can be purchased from adhesive suppliers. These kits require primer on the surface prior to adhesive application.

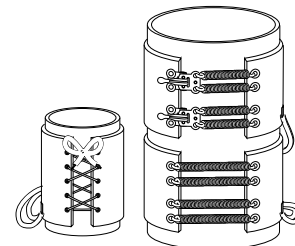
Note: Not recommended for polyimide heaters.

Silicone Contact Cement Kit



This two-part adhesive consists of a resin and catalyst that are easily mixed together and applied with a paintbrush. Recommended usage is for field cementing of silicone rubber heaters to customer parts. Available for immediate delivery, the cement kit handles temperatures up to 350°F (175°C). The resin is available in pint or quart containers. To order, specify **silicone contact cement** and the container size.

Mechanical Fasteners



When a wire-wound flexible heater must be detachable, any type of fastener normally used with fabrics can usually be built into the flexible heater's sheath material. The most common types are latch fasteners, boot hooks and grommets. Other styles include snap fasteners, springs and lacing cord. (Hook and loop style fastener strips are only available as part of the extended capabilities offering.) Grommets and boot hooks are commonly used with tension springs to compensate for slight variations in part size.

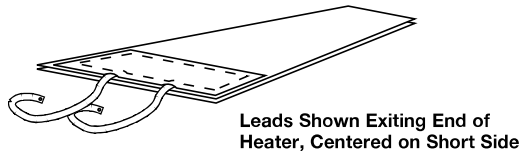
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Termination Styles

Watlow offers many types of leads and terminations. Leads can project from any position along the perimeter of the unit. **They are centered on the short side width of rectangular heaters unless specified.**

PTFE UL® 1180 CSA



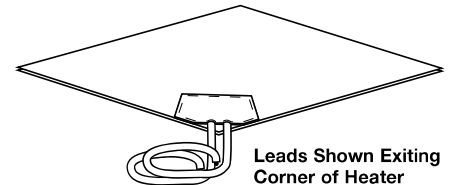
Watlow's leads are 12 in. (305 mm) long, white, PTFE insulated, flexible, plated copper UL® 1180 CSA wire. Leads are rated for 392°F (200°C)/300V. Lead connections on or at the heater are insulated with a cap of sheath material vulcanized to the heater body.

PTFE Leads



PTFE Type E (MIL-W-16878) and PTFE UL® 1199 leads rated for 392°F (200°C)/600V are also available.

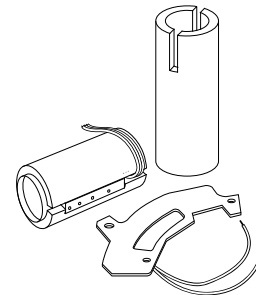
Silicone Insulated Leads



For a better moisture seal, specify UL® silicone insulated lead wires. This lead type is rated for 302°F (150°C)/600V. Any lead length is available. **Note:** Silicone rubber heaters are not designed to be waterproof. Excess exposure to moisture may facilitate premature heater failure.

Option

Thermal Insulation



To increase heating efficiency of your application, silicone rubber heaters can be thermally insulated with silicone sponge rubber bonded to one side in the following thicknesses: 1/16, 1/8, 1/4, 3/8 or 1/2 in. (1.6, 3.2, 6, 9.5 or 13 mm).

An aluminized surface can be added to the back side of the heater to reduce radiated heat losses. This aluminized surface, called "low loss treatment," adds very little to the unit thickness or mass and maintains a very clean appearance.