

**Quick Ship**

- Same day shipment on stock units with orders received by 11:00 a.m.

## Flexible Heaters

### Silicone Rubber

Rugged, yet thin, lightweight and flexible ... the use of Watlow silicone rubber heaters is limited only by your imagination. With these heaters, you can put the heat where it's needed and, in the process, improve heat transfer, speed warm-ups and decrease wattage requirements.

Fiberglass-reinforced silicone rubber gives your heater dimensional stability without sacrificing flexibility. Because very little material separates the element from the part, heat transfer is rapid and efficient.

#### Performance Capabilities

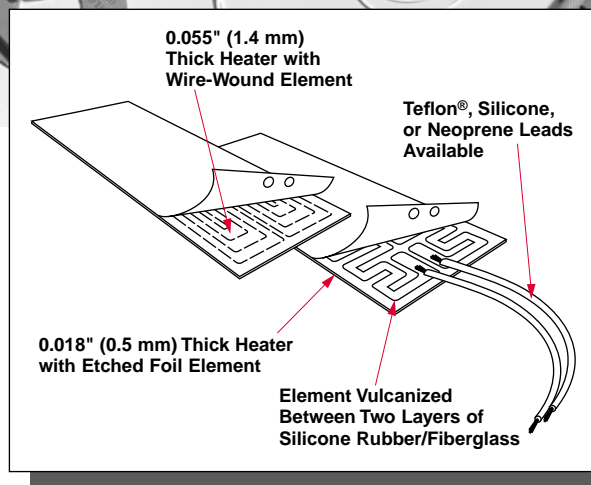
- Operating temperatures to 500°F (260°C)
- Watt densities to 80 W/in<sup>2</sup> (12.5 W/cm<sup>2</sup>) dependent upon application temperature
- 0.055 inch (1.4 mm) thick with a wire-wound element; only 0.018 inch (0.5 mm) with an etched foil element

#### Features and Benefits

- **Designed in the exact shape and size**, including 3-D geometries, to conform to your equipment.
- **More than 80 designs** available immediately from stock.
- **UR®, cUR® and VDE** recognitions are available on many designs.
- **Moisture and chemical-resistant** silicone rubber material provides longer heater life.
- **Easy to bond or attach** to your part through the use of vulcanizing, adhesives, or fasteners.

#### Applications

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



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UR® and cUR® are registered trademarks of Underwriter's Laboratories, Inc.

# Flexible Heaters

## Silicone Rubber

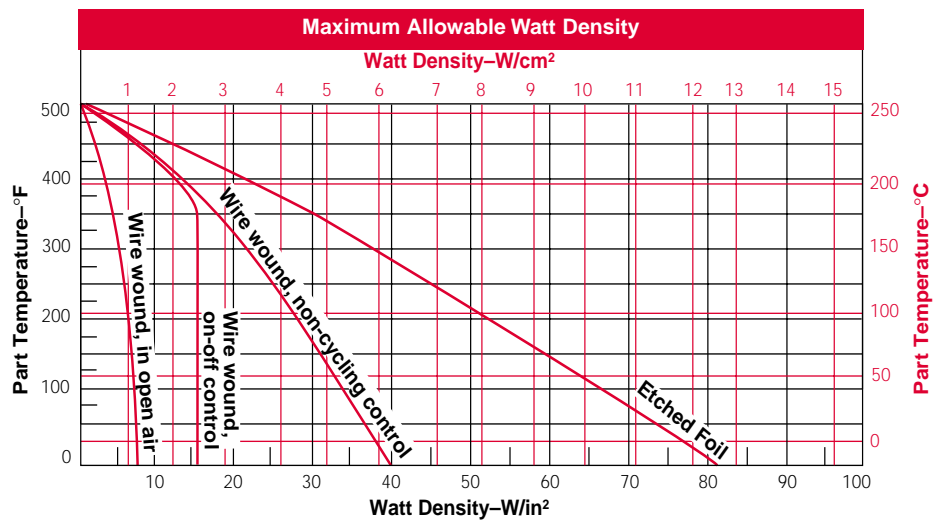
### Applications and Technical Data

#### Determining Watt Density

The *Maximum Allowable Watt Density* graph illustrates the maximum recommended heater watt density at various metal part or ambient air temperatures. However, it does not indicate the watt density necessary to achieve a given part temperature. See the *Surface Temperature vs. Time* graph on the next page for assistance with those calculations. When using this graph, remember:

- Part temperature is measured at the point where the heater contacts the metal part.
- Thermostats and on-off controls are typically bimetal or capillary bulb.
- Non-cycling controls are typically solid state, time-proportioning or SCR temperature controllers.
- Watt density values should be derated by one third if insulation is used.
- UL® recognition temperature limits are not detailed.
- Consult Watlow before doing any of the following: selecting high watt density etched-foil elements, or operating heaters with back side insulation or non-metallic parts, which are poor thermal conductors.

**Example:** A wire-wound heater with non-cycling control at a part temperature of 250°F (120°C) can be rated at 24 W/in<sup>2</sup> (3.7 W/cm<sup>2</sup>) maximum. An etched foil heater under the same conditions can be rated at 45 W/in<sup>2</sup> (7 W/cm<sup>2</sup>) maximum.



#### Standard Silicone Rubber Specifications

##### Maximum width x maximum length:

- Wire wound: 36 x 120 inches (915 mm x 3050 mm)
- Etched foil: 20 x 30 inches (510 mm x 760 mm)

##### Thickness (standard):

- Wire wound: 0.055 inch (1.4 mm)
- Etched foil: 0.018 inch (0.5 mm)

##### Weight (standard):

- Wire wound: 8 oz./ft<sup>2</sup> (0.24 g/cm<sup>2</sup>)
- Etched foil: 3 oz./ft<sup>2</sup> (0.09 g/cm<sup>2</sup>)

**Maximum operating temperature:** 500°F (260°C)

**Maximum temperature for UL® recognition:** 428°F (220°C)

**Minimum ambient temperature:** -80°F (-62°C)

**Maximum voltage:** 600V~(ac)

**Maximum wattage:** See watt density graph

**Lead size:** Sized to load

**Lead length:** 12 + 1 ½ - ½ inches (305 mm + 40 mm - 15 mm)

##### Wattage tolerance:

- Wire: ±5 percent
- Foil: +5 percent -10 percent

##### Dimensional tolerances:

- 0 to 6 inches (0 to 150 mm): ±1/16 inch (1.6 mm)
- 6 to 18 inches (150 to 455 mm): ±1/8 inch (3.2 mm)
- 18 to 36 inches (455 mm to 915 mm): ±3/16 inch (4.8 mm)
- Over 36 inches (915 mm): ±1 percent

Government Supply Code Number

Cage code = 78056

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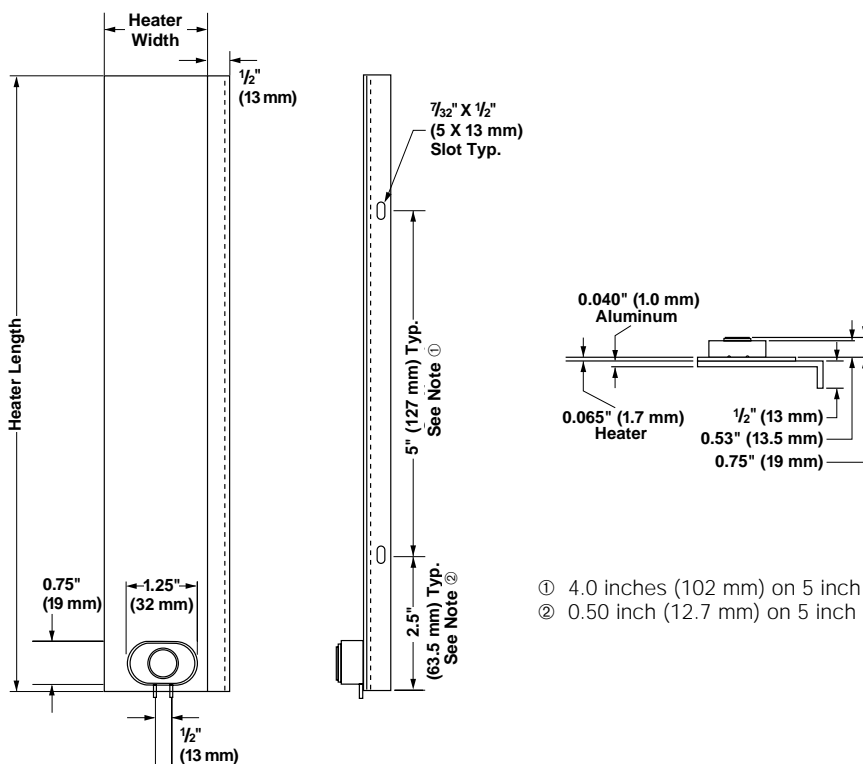
## Flexible Heaters

### Silicone Rubber Stock Product Offering Enclosure Heaters Options

#### Aluminum Mounting Plate

Both vertical and horizontal mounting can be accomplished with enclosure heaters. The mounting plates are 0.040 inch (1 mm) thick, specified as #3003 H14 aluminum. The preferred orientation is vertical, with a thermostat attached at the lower end (as shown in the drawing).

For horizontal mounting, a remote thermostat is recommended. An enclosure heater can be ordered by itself, with PSAS or vulcanized to an aluminum mounting plate. See *Thermostats* below for more information.



- ① 4.0 inches (102 mm) on 5 inch unit.  
② 0.50 inch (12.7 mm) on 5 inch unit.

### Thermostats

#### Mounted on Heater

Built-in snap action thermostats from Watlow are designed to sense air temperature. See the ordering chart on the following page for available settings.

#### Remote From Heater

For an air sensing thermostat separate from the heater, the ST-207E is ideal. This is a modified ST-207 mounted on a 1/32 inch (0.8 mm) thick G-10 circuit board with the thermostat's metal cap exposed to sense air temperature. The thermostat is placed at the

midpoint of the lead length. The sensor can be preset at the temperatures listed for integral sensors. For more information, turn to **pages 167-168**.

#### Notes:

- On both integral and remote sensors, the thermostat's exposed metal cap is vulnerable to impact. This could defeat the thermostat's switching action and cause heater malfunction.
- T-10 thermostats are not recommended for enclosure heating applications.