

# Fullchance Silicone Heater

## Product Data Sheet for Silicone Rubber Heaters

### FEATURES

- Rectangular, tape and round standard heaters in the most frequently requested dimensions for immediate delivery
- 115V standard
- Power densities of 2.5W/in.<sup>2</sup>, 5W/in.<sup>2</sup> and 10W/in.<sup>2</sup> cover a wide range of applications
- Operating temperature range of -70°F to 450°F
- Resistant to many chemical substances
- Components UL Recognized and CSA Certified
- Custom configurations available

### APPLICATIONS

- De-icing and anti-icing equipment
- Freeze protection for drains in refrigeration equipment
- Electric motor dehumidifying
- Consumer appliances
- Vending equipment
- Food service equipment
- Security cameras

Please contact the engineering department at Fullchance Silicone Heater for assistance with specific applications.



### GENERAL INFORMATION

Silicone Rubber heaters have wire-wound or etched foil heating circuits laminated between thin layers of fiberglass-reinforced, high temperature insulation, silicone rubber.

The thin profile transfers heat quickly because the actual resistance element is so close to the heated part. A common application of Silicone Rubber Heaters is wrap-around drum heating to provide freeze protection/viscosity control for a variety of materials. (See our separate Drum Heaters and Insulating Blankets product sheet, EFN-1001.)

Silicone Rubber heaters are resistant to temperature extremes, moisture, weathering, radiation, fungus and chemical attack. They also have a high dielectric strength, flexibility, provide a cost effective heating solution and are easily bonded or cemented to heat sinks or other parts to be heated.

Silicone Rubber Heaters can be virtually any size, shape and configuration and are the ideal solution for many low and medium temperature applications which do not conform to standard heater shapes, sizes and dimensions. Although Fullchance heater offers three off-the-shelf configurations (rectangular, tape and round) available for immediate delivery, we can also customize heaters in a wide variety of shapes, contours, three-dimensional patterns and heat concentrations to fit the requirements of your specific application.

Three power densities at 115V are available for most stock heaters: 2.5W/in.<sup>2</sup>, 5W/in.<sup>2</sup> and 10W/in.<sup>2</sup>. Gentle warming is best done with 2.5W/in.<sup>2</sup>, while the 5W/in.<sup>2</sup> are used for all-purpose heaters. Rapid warm up and high temperature are achieved with the 10W/in.<sup>2</sup> heaters; however, temperature should be controlled to ensure as a safe limit of 450°F is not exceeded.

### How to order:

1. Determine specifications desired (see Figure 1 and Tables 1, 2, 3).
2. Determine power density desired (see Figure 2 and Tables 2, 3).
3. Specify model number (see Figure 3).
4. Contact factory or representative (see back page for contact information).

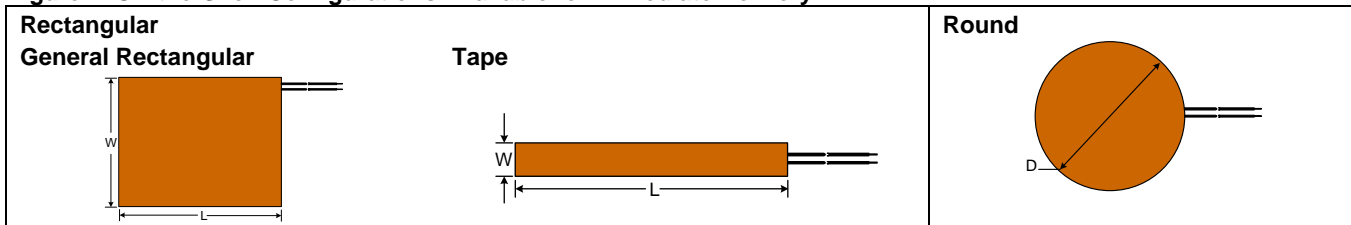
# Silicone Rubber Heaters



**Table 1. General Specifications**

Characteristic	Value
Material and construction	fully vulcanized fiberglass-reinforced silicone rubber encapsulating a nickel alloy or thin foil heating element
Voltage	115V
Power densities available (at 115 V)	2.5W/in. <sup>2</sup> , 5W/in. <sup>2</sup> , 10W/in. <sup>2</sup>
Operating temperature range	-70°F to 450°F
Exposure temperature range	-70°F to 450°F
Resistance tolerance	±10%
Thickness	0.030in. to 0.070in. (except at lead exit)
Leads: gage insulation length	varies according heater wattage and voltage Teflon <sup>®</sup> unless specified 12.0in. min.
Component approvals	UL, CSA
High-potential dielectric testing (at 115 V)	1250V
Serviceable parts	none

**Figure 1. Off-the-Shelf Configurations Available for Immediate Delivery**



**Table 2. Rectangular Configuration at 115V (Power Density in W/in.<sup>2</sup>)**

Width (in.)	Length (in.)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	- 10*	- 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
2	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
3	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
4	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
5	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
6	-	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
7	-	-	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
8	-	-	-	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
9	-	-	-	-	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10	2.5 5 10
10	-	-	-	-	-	-	-	-	-	2.5 5 10	2.5 5 10	2.5 5 10
11	-	-	-	-	-	-	-	-	-	-	2.5 5 10	2.5 5 10
12	-	-	-	-	-	-	-	-	-	-	-	2.5 5 10

**Note:** \* 1in. x 1in. available as 350 Ohm only.

# Silicone Rubber Heaters

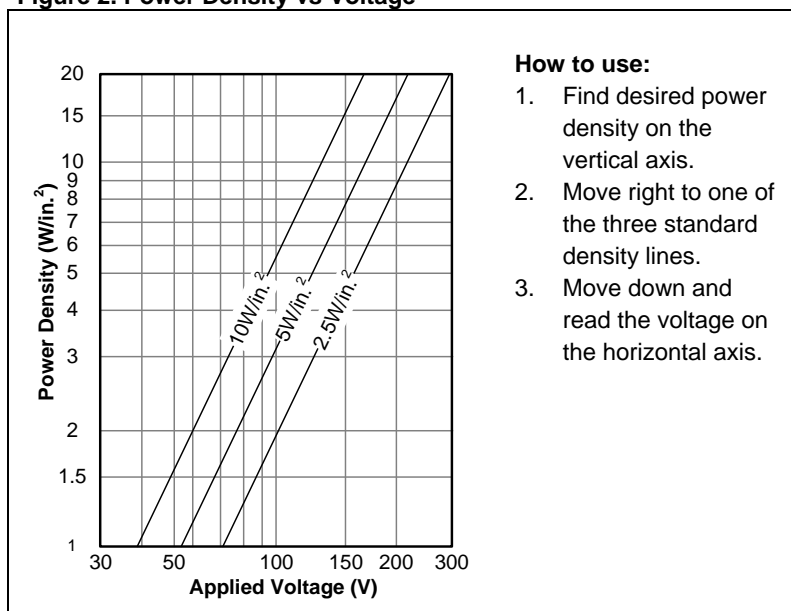
**Table 2. Rectangular Configuration at 115V (Power Density in W/in.<sup>2</sup>) (continued)**

Length (in.)	Width (in.)											
	1	2	3	4	5	6	7	8	9	10	11	12
18	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10
24	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10
30	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10
36	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10
42	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10
48	2.5	2.5	2.5	2.5	-	2.5	-	2.5	-	2.5	-	2.5
	5	5	5	5	-	5	-	5	-	5	-	5
	10	10	10	10	-	10	-	10	-	10	-	10

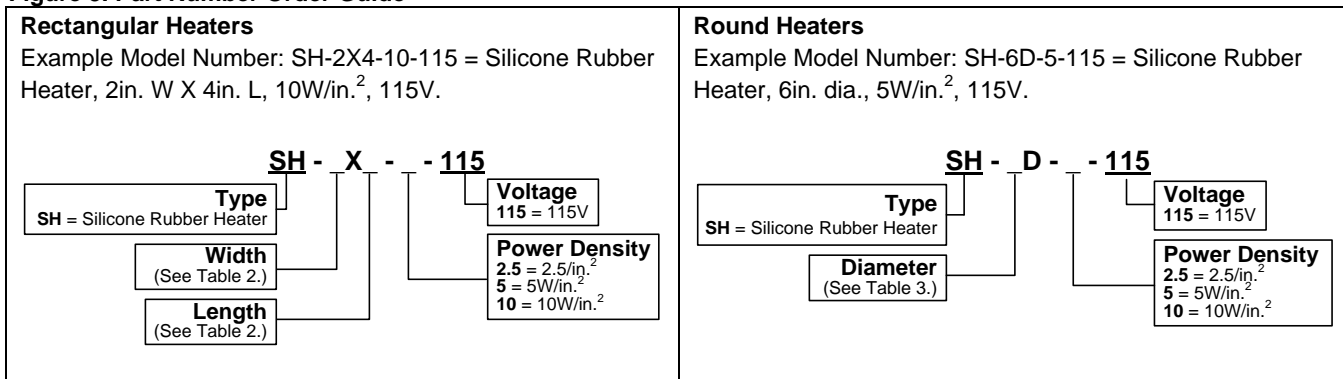
**Table 3. Round Configuration at 115V**

Diameter (in.)	Power Density (W/in. <sup>2</sup> )	Diameter (in.)	Power Density (W/in. <sup>2</sup> )
3	2.5	8	2.5
	5		5
	10		10
4	2.5	9	2.5
	5		5
	10		10
5	2.5	10	2.5
	5		5
	10		10
6	2.5	11	2.5
	5		5
	10		10
7	2.5	12	2.5
	5		5
	10		10

**Figure 2. Power Density vs Voltage**



**Figure 3. Part Number Order Guide**



# Silicone Rubber Heaters

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Silicone rubber heaters provide dependable performance under rigorous conditions. These heaters can be designed and fabricated to fit your industrial application. We use custom software to calculate the configuration of the heating element of the silicone rubber heater, given the voltage, wattage and resistance.

## Etched Foil Silicone Rubber Heaters

The etched element provides superior heat transfer and exceptionally uniform heat output, which results in a faster warm-up cycle and longer life. The heaters operate in ambient temperatures from -80°F to 500°F

Advantages over wire wound silicone rubber heaters:

Higher watt densities

Distributed wattages

Elimination of edge loss compensation

Greater element area over heater sheath

Complex heat distribution with a rating of about 200°C (392°F)

Economical mass production

Reproduction of complex circuits

## Wire Wound Silicone Rubber Heaters

The excellent dielectric properties of silicone rubber and the strength of fiberglass combine to produce a unique heater.

First, fine nickel-chromium alloy wire is spiraled onto a center core of fiberglass twine producing a strong flexible heating element. Electronically-controlled precision winding equipment ensures consistency.

Circuits are then hand-wound on permanent tooling providing repeatability of resistance and pattern. Parallel circuits are utilized where possible, permitting continued operation should a single circuit be damaged.

When the heating element is positioned, a second layer of silicone rubber is laid over the wire. The layers are then vulcanized to permanently position the circuits.

Using these versatile and flexible heaters, the ability to apply heat exactly where required is limited only by imagination and a maximum continuous operating temperature of about 200°C (392°F).

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