Made in USA

Standard Flexible Heater Specifications

SHS Silicone Rubber Heater Specifications

Physical Size and Construction Limitations

Maximum Size:	*Wire:* 36" × 144" (91.4 × 366 cm) *Foil:* 10" × 22" (25.4 × 56.9 cm)
Dimensional Tolerance:	
Less than 6":	±0.030" (0.76 mm)
6" to 12":	±0.060" (1.52 mm)
12" to 18":	±0.125" (3.17 mm)
18" to 36":	±0.250" (6.35 mm)
36" to 72":	±0.500" (12.7 mm)
Every 36" after 72":	Additional ±0.250" (6.35 mm)
Nominal Thickness:	*Wire:* 0.056" (1.42 mm) *Foil:* 0.030" (0.76 mm)
Available Thickness:	0.018" to 0.112" (0.46 mm to 2.85 mm)
Weight:	7 oz./ft² (0.21g/cm²)

Performance Ratings

Maximum Operating Temperature:	500°F / 260°C Intermittent 392°F / 200°C Continuous
Minimum Operating Temperature:	-70°F / -56.6°C
Physically Resistant To:	Moisture, Ozone, Fungus, Radiation
Agency Approvals:	UL File #E65652 (wire-wound only)

Electrical Ratings

Resistance Tolerance:	*Wire:* +10%, -5%, *Foil:* +10%, -10%
Maximum Operating Voltage:	*Wire:* 600 VAC, *Foil:* 480 VAC
Dielectric Strength:	1000 VAC
Standard Leads:	10" Teflon® Insulated Stranded Wire

SHK Kapton® Heater Specifications

Physical Size and Construction Limitations

Maximum Size:	10" × 22" (25.4 × 56.9 cm)
Dimensional Tolerance:	
Less than 6":	±0.030" (0.76 mm)
6" to 12":	±0.060" (1.52 mm)
Over 12":	±0.125" (3.17 mm)
Nominal Thickness:	0.008" (0.20 mm)
Weight:	1.5 oz./ft² (0.05g/cm²)

Performance Ratings

Maximum Operating Temperature:	392°F / 200°C Continuous
Minimum Operating Temperature:	-320°F / -195°C
Physically Resistant To:	Moisture, Ozone, Fungus

Electrical Ratings

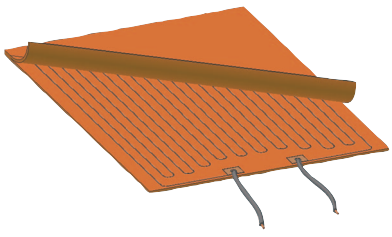
Resistance Tolerance:	+10%, -10%
Maximum Operating Voltage:	480 Vac
Dielectric Strength:	1000 Vac
Standard Leads:	10" Teflon® Insulated Stranded Wire
Maximum Resistance Density for Heaters with Etched Foil Element:	125 Ω/in²

Note: Other materials are available, such as neoprene rubber or vinyl plastic. Consult Tempco for more information.

Wire-Wound Element Construction

Tempco Silicone Rubber heaters with wire-wound elements provide excellent physical strength capable of withstanding repeated flexing without compromising the life and performance of the heater. They are also very effective for manufacturing geometrically challenged shapes, including three dimensional ones.

The wire-wound element process consists of resistance wire wound on a fiberglass cord for added support and flexibility. The wire-wound element is laid out in a special designed pattern to ensure uniform heat profile and to conform to the size and shape of the silicone rubber heater, avoiding holes and cutouts, or to concentrate the heat profile in a specific section(s) of the heater as the application dictates.



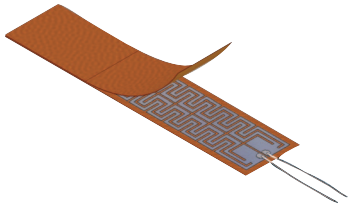
Power lead wires or cord sets are attached to the heater windings with solder and firmly secured in place through a vulcanizing process, ensuring that the assembly becomes homogenous.

The wire-wound process is recommended and preferred for small to medium size quantities, medium to large size heaters, and to produce prototypes to prove out the design parameters prior to entering into large volume production runs when using etched foil.

Etched Foil Element Construction

Etched Foil Silicone Rubber or Kapton flexible heaters are made with a thin metal foil (.001"), usually a nickel base alloy, as the resistance element. The resistance pattern to be etched is designed in CAD and transferred to the foil, which is laminated to the insulating substrate. The element/substrate is then processed through an acid spray to produce the desired resistance pattern.

The top layer is then added and vulcanized for silicone rubber or laminated for Kapton heaters. For silicone rubber heaters, lead wires are then attached to the heater and insulated with additional silicone rubber to complete the heater. For Kapton® heaters, lead wires are attached to the heater and insulated with epoxy cement to complete the heater.



The etched foil heater has exceptional heat transfer compared to wire wound elements, due to its large flat surface area. It can deliver more uniform heat profiles with higher watt densities, providing longer operating heater life. It can also be zoned with distributed wattage or separate heating circuits to compensate for load variations. The etched foil process is recommended for small size heaters in large quantities.

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