

# Flexible Kapton® Heaters



## Standard Sizings and Ratings

### Kapton® Standard (Non-Stock) Sizes and Ratings



**Kapton  
Rounds**

Diameter		Area		Watts	Part Number	
in.	mm	in <sup>2</sup>	cm <sup>2</sup>		120V	240V
3.0	76	7.07	45.6	35	SHK00101	—
3.5	89	9.62	62.1	48	SHK00102	—
4.0	102	12.57	81.1	63	SHK00103	—
4.5	114	15.90	102.6	80	SHK00104	SHK00116
5.0	127	19.63	126.6	98	SHK00105	SHK00117
5.5	140	23.76	153.3	119	SHK00106	SHK00118
6.0	152	28.27	182.4	141	SHK00107	SHK00119
6.5	165	33.18	214.1	166	SHK00108	SHK00120
7.0	178	38.48	248.3	192	SHK00109	SHK00121
7.5	190	44.18	285.0	221	SHK00110	SHK00122
8.0	203	50.26	324.3	250	SHK00111	SHK00123
8.5	216	56.74	366.1	284	SHK00112	SHK00124
9.0	229	63.62	410.4	318	SHK00113	SHK00125
9.5	241	70.88	457.3	354	SHK00114	SHK00126
10.0	254	48.54	506.7	393	SHK00115	SHK00127

## KAPTON FLEXIBLE HEATERS



**Kapton  
Squares  
and  
Rectangle**

Width		Length		Watts	Part Number	
in.	mm	in.	mm		120V	240V
1	25	8	203	40	SHK00001	—
1	25	12	305	60	SHK00002	SHK00022
2	51	2	51	20	—	SHK00023
2	51	4	102	40	SHK00004	SHK00024
2	51	8	203	80	SHK00005	SHK00025
2	51	12	305	120	SHK00006	SHK00026
3	76	4	102	60	SHK00007	SHK00027
3	76	8	203	120	SHK00008	SHK00028
3	76	12	305	180	SHK00009	SHK00029
4	102	4	102	80	SHK00010	SHK00030
4	102	8	203	160	SHK00011	SHK00031
4	102	12	305	240	SHK00012	SHK00032
5	127	6	152	150	SHK00013	SHK00033
5	127	10	254	250	SHK00014	SHK00034
5	127	12	305	300	SHK00015	SHK00035
6	152	6	152	180	SHK00016	SHK00036
6	152	10	254	300	SHK00017	SHK00037
6	152	12	305	360	SHK00018	SHK00038
8	203	8	203	320	SHK00019	SHK00039
8	203	12	305	480	SHK00020	SHK00040
10	254	10	254	500	SHK00021	SHK00041

### Ordering Information

#### Catalog Heaters

Chose from the tables of common sizes of Silicone Rubber and Kapton in round or rectangular shapes.

The heaters listed are 5 W/in<sup>2</sup>. Standard configuration includes 10" Teflon® leads, exit style A or L (see page 9-9) and no mounting option.

#### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, **TEMPCO** will design and manufacture a Flexible Surface Heater to meet your requirements. **Standard lead time is 4 to 5 weeks.**

**Please Specify** the following:

- Diameter
- Wattage and Voltage
- Lead Type
- Sensors or Thermostats
- Special Features or Cutouts
- Lead Location

**⚠ WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



## Specifications

### SHK Kapton® Heater Specifications

#### Physical Size and Construction Limitations

<b>Maximum Size:</b>	10" x 22" (25.4 x 56.9 cm)
<b>Dimensional Tolerance:</b>	
Less than 6":	±0.030" (0.76 mm)
6" to 12":	±0.060" (1.52 mm)
Over 12":	±0.125" (3.17 mm)
<b>Nominal Thickness:</b>	0.008" (0.20 mm)
<b>Weight:</b>	1.5 oz./ft <sup>2</sup> (0.05g/cm <sup>2</sup> )

#### Performance Ratings

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

#### Electrical Ratings

<b>Resistance Tolerance:</b>	+10%, -10%
<b>Maximum Operating Voltage:</b>	480 Vac
<b>Dielectric Strength:</b>	1000 Vac
<b>Standard Leads:</b>	10" Teflon® Insulated Stranded Wire

**Maximum Resistance Density for Heaters with Etched Foil Element:** 125 Ω/in<sup>2</sup>

### 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.

