FAQ: What is the correct voltage for this flexible heater?

Standard flexible heaters are specified by resistance, not voltage. This lets you operate them at different power levels. In selecting a heater model, you should consider the size, resistance, operating temperature, total wattage and watt density (watts/in^2 or watts/cm^2) for your application. The watt density rather than the total wattage determines the maximum applied voltage. Maximum watt density depends on the insulation type, mounting method and operating temperature. See the guide and graphs of these limits below.

Calculate maximum allowable power

Maximum Watt Density Guide

Overview

The watt density tables on he following page show the maximum allowable power for each heater type, expressed in watts per square inch, or centimeter, of effective area. The rating depends upon the heater's insulation/internal adhesive, heat sink control temperature, and the mounting method.
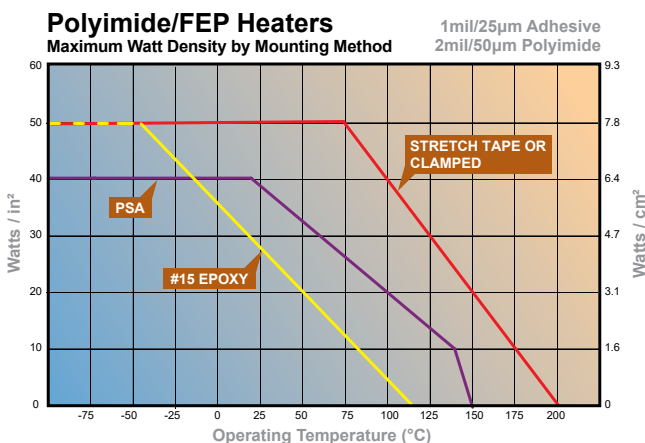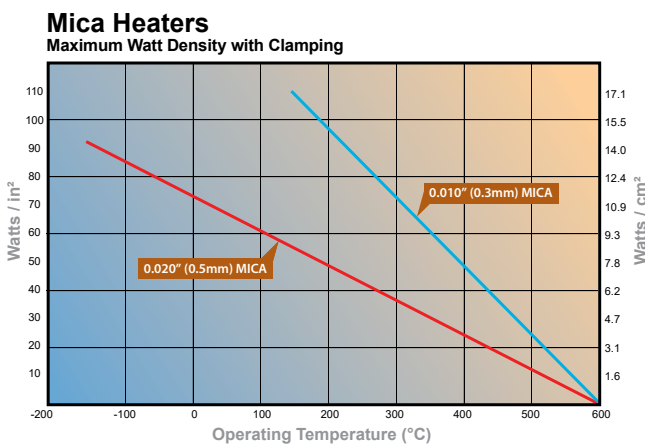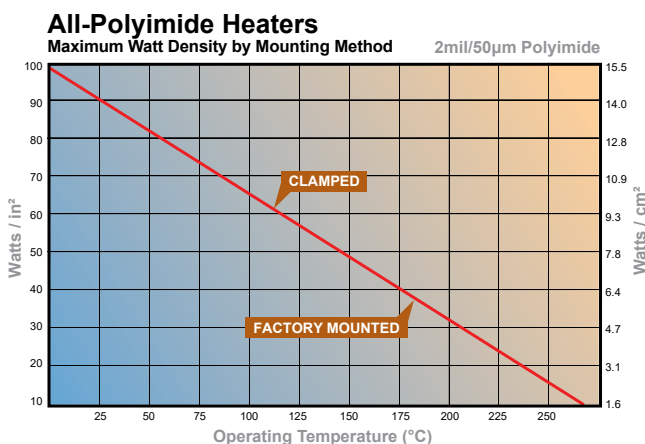
If watt density exceeds the maximum rating, the heater is in danger of overheating and premature failure. To obtain more power:

- Select a larger size heater

- Consider other heater insulation materials, e.g. mica

- Change the mounting method

- Use proportional control to reduce power as the heat sink temperature rises

- Contact Mod-Tronic for product and design assistance

In addition to wattage, you should calculate the current (I) through the heater leadwires to keep it within the maximum rating for the AWG wire size used.

Using watt density charts

1. Look up the effective area for the heater model in question. This is total heater area minus borders and lead attachment space (calculated by Minco).

2. Divide the power requirement in watts by this area to obtain watt density.

3. Draw a line from the heat sink temperature (at the bottom of the chart) to the line labeled with the mounting method and/or insulation you have chosen.

4. The maximum watt density is indicated by the value on the left or right axis that corresponds with that intersection.

All-Polyimide Heaters
Maximum Watt Density by Mounting Method   **2mil/50μm Polyimide**

Mica Heaters
Maximum Watt Density with Clamping

Polyimide/FEP Heaters
Maximum Watt Density by Mounting Method   **1mil/25μm Adhesive**
2mil/50μm Polyimide

Maximum Watt Density

Refer to these graphs when computing watt density

Silicone Rubber Thermofoil Heaters
Maximum Watt Density by Mounting Method   .008"/0.2mm Silicone Rubber
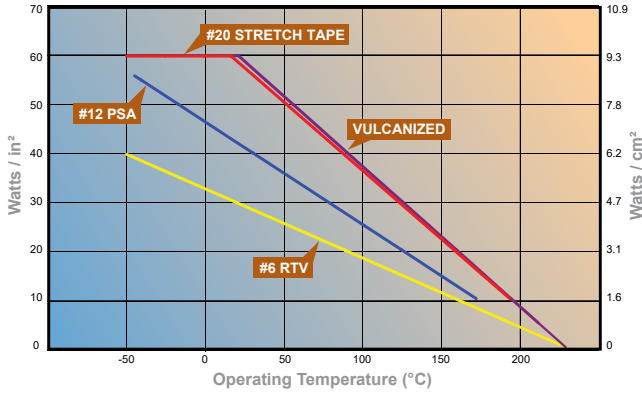
Polyimide WA Heaters
Maximum Watt Density by Mounting Method   1mil/25µm WA 2mil/50µm Polyimide
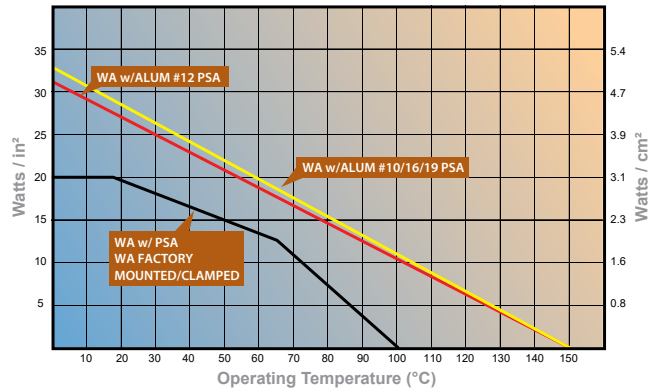
Thermal-Clear™ Heaters
Maximum Watt Density with Acrylic PSA   2mil/50µm Polyester 2mil/50µm Adhesive
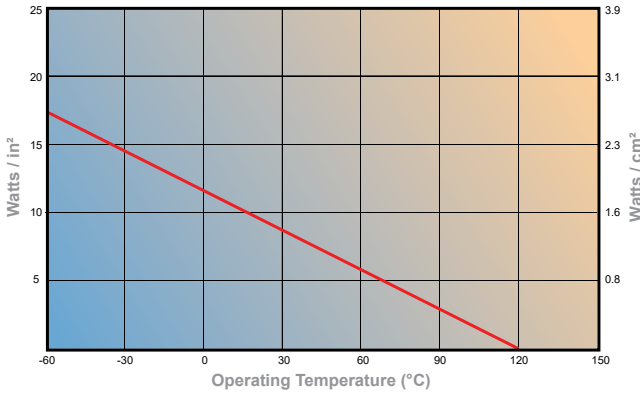
Wire-Wound Rubber Heaters
Maximum Watt Density by Mounting Method   0.025"/.63mm Silicone Rubber

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