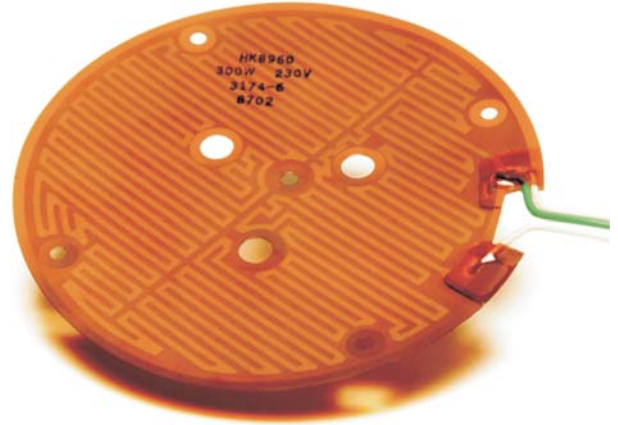


# Polyimide/FEP Thermofoil™ Heaters

Thin, flexible heating solutions from -200 to 200°C



## Overview

Polyimide (Kapton™) is a thin, semitransparent material with excellent dielectric strength. Polyimide heaters are ideal for applications with space and weight limitations, or where the heater will be exposed to vacuum, oil, or chemicals.

- FEP internal adhesive for use to 200°C (392°F)
- UL component recognition available
- Suitable for vacuum environments (NASA-RP-1061)
- NASA approved materials for space applications (S-311-P-079)
- Resistant to most chemicals: acids, solvents, bases (except NaOH)
- Radiation resistant to 10<sup>6</sup> rads if built with polyimide-insulated leads (custom option)
- Can be made in very small sizes
- Fluid immersible models available (not standard)

## Typical applications

- Medical diagnostic instruments such as heated sample trays, cuvettes, reagent bottles, etc.
- Maintain warmth of satellite components
- Protect aircraft electronic and mechanical devices against cold at high altitudes
- Stabilize optoelectronic components
- Test or simulate integrated circuits
- Enable cold weather operation of outdoor electronics such as card readers or LCDs
- Maintain constant temperature in analytic test equipment

## Custom options

- Custom shapes and sizes to 10 × 22" (250 × 560 mm) with FEP adhesive; 12 × 72" (300 × 1830 mm) with WA/ULA
- Custom resistance to 450 Ω/in<sup>2</sup> (70 Ω/cm<sup>2</sup>)
- WA or ULA adhesive preferred for custom designs below 150°C
- Available with surface mount sensors, connectors, even integral controllers
- NASA approval is available in nearly all of the standard size Polyimide heaters
- TÜV or UL approval is optional
- Tighter resistance tolerance

Configure Minco heaters and order online at:  
[www.minco.com/heater\\_config/](http://www.minco.com/heater_config/)

## Polyimide/FEP Heaters

### Specifications for prototype heater models

**Temperature range:** -200 to 200°C (-328 to 392°F). Upper limit with 0.003" (0.08 mm) foil backing is 150°C (302°F).

**Material:** Polyimide/FEP, 0.002"/0.001" (0.05/0.03 mm).

**Resistance tolerance:** ±10% or ±0.5 Ω, whichever is greater.

**Dielectric strength:** 1000 VRMS.

**Minimum bend radius:** 0.030" (0.8 mm).

**Leadwire:** Red PTFE insulated, stranded.

Current capacity (based on 100°C max. ambient temp.):

AWG 30	AWG 26	AWG 24	AWG 20
3.0 A	5.0 A	7.5 A	13.5 A

#### Maximum heater thickness:

Over element 0.012" (0.3 mm)

Over leads

AWG 30 (0.057 mm <sup>2</sup> )	0.050" (1.3 mm)
AWG 26 (0.141 mm <sup>2</sup> )	0.060" (1.5 mm)
AWG 24 (0.227 mm <sup>2</sup> )	0.065" (1.7 mm)
AWG 20 (0.563 mm <sup>2</sup> )	0.085" (2.2 mm)

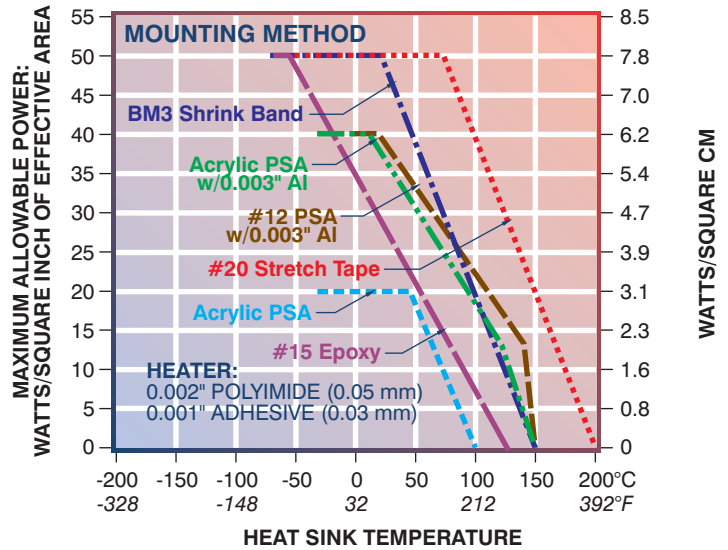
Add 0.005" (0.1 mm) to above dimensions for foil backing.

#### Dimensional tolerance:

6" (150 mm) or less	±0.03" (±0.8 mm)
6.01 to 12" (150 to 300 mm)	±0.06" (±1.5 mm)
Over 12" (300 mm)	±0.12" (±3.0 mm)

Design kit model number	Size (inches)	Size (mm)	Resistance in ohms	Effective area (in <sup>2</sup> )
HK913F	1.5 Dia.	38 Dia.	75.0	1.03
HK913J	2.6 Dia.	66 Dia.	275.0	4.49

### Maximum Watt Density, Polyimide Heaters



Example: At 50°C, the maximum power for a heater mounted with acrylic PSA is 18 W/in<sup>2</sup>.