

Polyimide Thermofoil Heaters

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

Overview

- Polyimide (Kapton™) is a thin, semitransparent material with excellent dielectric strength. Polyimide Thermofoil™ heaters are ideal for applications with space and weight limitations, or where the heater will be exposed to vacuum, oil, or chemicals.
- The lightweight heater has less thermal mass to improve thermal response
- The thin profile with nearly infinite custom X-Y geometry design options allows you to apply heat where it's needed, reducing operating costs
- Etched-foil heating technology provides fast and efficient thermal transfer
- Customized options (i.e. SMT components, flex leads and connectors) offer turnkey solutions to drastically reduce assembly time and increase productivity
- Custom profiling gives uniform thermal performance of the heating output to improve processing yields and productivity
- UL and TUV 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 and solvents
- Radiation resistant to 106 rads if built with polyimide-insulated leadwire (custom option)
- Very small sizes available
- Fluid immersible designs available (not standard)
- Optional built-in temperature sensors

Mounting Methods

- #12 PSA with aluminum backing
- Acrylic PSA with or without aluminum backing
- #15 epoxy
- BM3 shrink band
- Stretch tape
- Mechanical clamping



Typical applications

- Medical diagnostic instruments and analyzers
- 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, LCDs or ruggedized laptops
- Maintain constant temperature in analytic test equipment

Options

- Shapes and sizes up to 22" x 72" (560 x 1825 mm)
- Resistance up to 1500 Ω /in² (233 Ω /cm²)
- WA, ULA, or FEP (UL recognized) internal adhesive
- Available with surface mount sensors, connectors, heat sinks and even integral controllers
- TÜV or UL recognition marking is optional
- RoHS compliance

Polyimide Thermofoil Heaters

Technical specifications

Specifications

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: 0.002" Polyimide/0.001" adhesive (0.05/0.03 mm).

Resistance tolerance: $\pm 10\%$ or $\pm 0.5 \Omega$, 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 - 3.0 A

AWG 26 - 5.0 A

AWG 24 - 7.5 A

AWG 20 - 13.5 A

Maximum heater thickness:

Over element 0.012" (0.3 mm)

Over leads

AWG 30 (0.057 mm²) 0.050" (1.3 mm)

AWG 26 (0.141 mm²) 0.060" (1.5 mm)

AWG 24 (0.227 mm²) 0.065" (1.7 mm)

AWG 20 (0.563 mm²) 0.085" (2.2 mm)

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

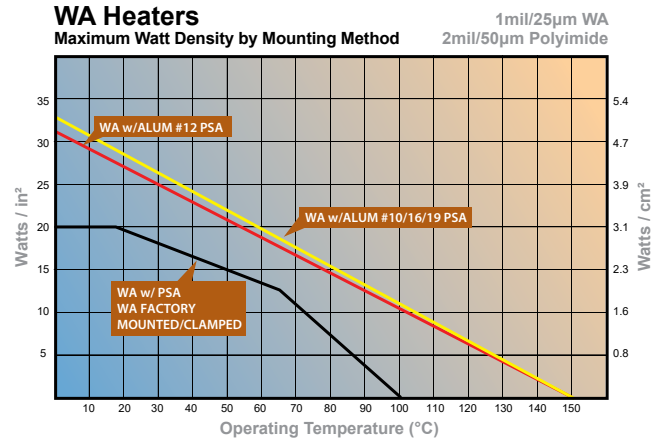
Dimensional tolerance:

6" (150 mm) or less $\pm 0.03"$ (± 0.8 mm)

6.01 to 12" (150 to 300 mm) $\pm 0.06"$ (± 1.5 mm)

Over 12" (300 mm) $\pm 0.12"$ (± 3.0 mm)

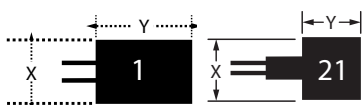
Tighter tolerances are available on custom designs if needed.



Stock Polyimide Thermofoil Heaters

Notes for Stock Heaters

- Heated area is within the X and Y dimensions
- Voltage and wattage values are for reference only
- Resistance tolerance is +/- 10% or +/- 0.5Ω, whichever is greater
- Heaters may be operated at other voltages if they do not exceed the maximum allowable watt density ratings
- Thermoset acrylic internal adhesive (not UL recognized)
- Standard leadwire length is 12" (305 mm) minimum
- Type 21 configurations have lead connections on an external tab, which produces negligible heat, in most cases, does not need to be adhered to the heat sink



Sized (inches)		Size (mm)		Type	Resistance (Ω)	Typical power		Effective area		Lead AWG	Model number
X	Y	X	Y			Watts	Volts	in ²	cm ²		
0.50	1.00	12.7	25.4	21	210.1	4	28	0.37	0.24	26	HK6900
0.50	2.00	12.7	50.8	30	100.1	8	28	0.78	0.51	26	HK6901
0.50	3.00	12.7	76.2	21	65.7	12	28	1.19	0.77	26	HK6902
0.50	4.00	12.7	101.6	21	48.9	16	28	1.60	1.03	26	HK6903
0.50	5.00	12.7	127.0	21	38.9	20	28	2.01	1.30	26	HK6904
0.50	10.00	12.7	254.0	21	19.3	41	28	4.06	2.62	26	HK6905
1.00	1.00	25.4	25.4	21	94.7	8	28	0.83	0.53	26	HK6906
1.00	2.00	25.4	50.8	1	47.8	16	28	1.64	1.06	26	HK6907
1.00	3.00	25.4	76.2	1	32.1	24	28	2.44	1.58	26	HK6908
1.00	4.00	25.4	101.6	1	23.6	33	28	3.32	2.14	26	HK6909
1.00	5.00	25.4	127.0	1	18.7	42	28	4.20	2.71	26	HK6910
2.00	2.00	50.8	50.8	1	22.1	36	28	3.55	2.29	26	HK6911
2.00	3.00	50.8	76.2	1	14.7	53	28	5.32	3.43	26	HK6912
2.00	4.00	50.8	101.6	1	187.6	70	115	7.05	4.55	22	HK6913
2.00	5.00	50.8	127.0	1	157.1	84	115	8.42	5.43	22	HK6914