

All-Polyimide (AP) Thermofoil Heaters

Flexible heaters provide uniform heat transfer to 260°C (500°F)

Overview

AP heaters are a high performance alternative to Minco's standard polyimide heaters, allowing higher temperatures and watt densities. Minco's unique ability to manufacture these heaters has prompted success in many high-temperature applications worldwide.

AP heaters must be factory mounted or clamped to heat sinks, and are only available as custom designs.

- Thin, lightweight heaters allow you to apply heat where it's needed ultimately reducing overall operating costs
- Etched-foil heating technology provides efficient thermal cycling of samples for increased throughput
- Low mass construction and factory lamination saves space and reduces cycle time
- Custom profiling offers uniform thermal performance of heating output for improved processing yields and productivity
- Maximum operating temperature of 260°C offers a higher temperature range than any other flexible film heater for maximum design flexibility
- Turnkey assembly solutions can drastically reduce assembly time and provide lowest total cost of operation
- Available in round, rectangular, and irregular shapes
- Power ratings to 120 W/in² (18.60 W/cm²)
- Resistant to most chemicals
- Optional built-in temperature sensors
- Contact Customer Sales for design assistance.

Typical applications

- Semiconductor wafer processing
- Heating of electronic components
- Packaging, fusing, and splicing equipment
- Medical diagnostic analyzers

Specifications

Temperature range:

-200 to 260°C (-328 to 500°F).

With UL component recognition:

-200 to 240°C (-328 to 464°F).

Leadwires: Stranded, PTFE insulated, AWG 30 to AWG 20.

Heater thickness:

Over element: 0.012" (0.3 mm) max.

Over leadwire terminations: 0.150" (3.8 mm) ref.



Dielectric strength: 1000 VRMS at 60 Hz for 1 minute.

Insulation resistance: 1000 megohms min. at 500 VDC.

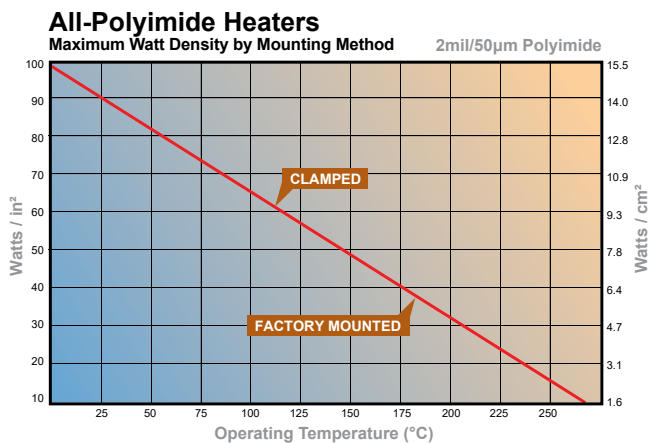
Outgassing: 0.36% total mass loss, 0.01% collected volatile condensable material, per NASA-JSC.

Agency Approvals: UL recognition optional.

Maximum size: 22" x 45" (560 x 1145 mm).

Consult Mod-tronic for larger size options.

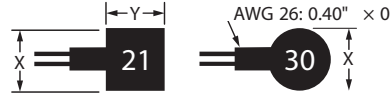
Maximum resistance density: 1500 Ω/in² (233 Ω/cm²).



Stock AP 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
- Standard leadwire length is 12" (305 mm) minimum
- Type 21 and 30 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
- Mounting: must be clamped to heat sinks
- Type (configuration)



TAB DIMENSIONS:

AWG 30: 0.25" wide x 0.50" long (6.4 mm x 12.7 mm)

AWG 26: 0.50" wide x 0.50" long (12.7 mm x 12.7 mm)

AWG 22: 0.60" wide x 0.60" long (15.2 mm x 15.2 mm)

Size (inches)		Size (mm)		Type	Resistance (Ω)	Typical power		Effective area		Lead AWG	Model number
X	Y	X	Y			Watts	Volts	in ²	cm ²		
0.25	10.00	6.4	254.0	21	24.4	28	32	1.28	0.83	30	HAP6943
0.50	0.50	12.7	12.7	30	37.9	12	4	0.15	0.10	26	HAP6944
0.50	2.00	12.7	50.8	21	40.0	28	20	0.78	0.51	26	HAP6945
0.50	5.00	12.7	127.0	21	15.6	28	50	2.01	1.30	26	HAP6946
1.00	1.00	25.4	25.4	21	37.9	28	21	0.83	0.53	26	HAP6947
1.50	3.00	38.1	76.2	21	7.9	28	99	3.97	2.56	26	HAP6948
3.00	5.00	76.2	127.0	21	39.4	115	336	13.44	8.67	22	HAP6949