



Aluminum Backing for Flexible Heaters

FLEX | RIGID FLEX | HEATERS | ASSEMBLY

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Polyimide Flexible Heater Design Tips

Question: Why should you put an aluminum backing on a polyimide heater?

There are two main reasons:

1. To improve the life and reliability of the heater.
2. To help retain shape when applied to curved surfaces.

(This Tech Note will review the improvement to life. Look for a future article regarding improvement to curved surfaces.)

All Flex typically adds a .003"/0.076mm thick aluminum layer between the heater surface and any mounting Pressure Sensitive Adhesive (PSA). The resulting benefit is better temperature uniformity resulting in a "cooler" running heater

which will improve long term reliability.

While most applications for polyimide flexible heaters are mounted to an aluminum heatsink, the thin layer of .003"/0.076mm thick aluminum foil helps reduce the temperature that the PSA will see prior to the heat being transferred to the heatsink and also reduce the temperature the internal adhesive will see, resulting in a more reliable heater construction.

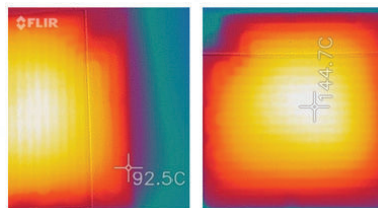
All Flex makes heaters capable of withstanding normal operating temperatures to 1112F/600C and 110 watts per square inch/ 17 watts per square centimeter. Consult All Flex for your particular heater application.

Applications that Benefit from Aluminum Backing:

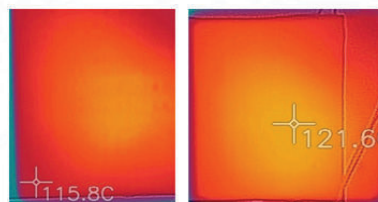
- Watt density uses above 30 watts per square inch/4.7 watts per square centimeter
- Heating optics or glass windows for condensation and ice removal
- Mounting the heater to plastics

Thermal Images to the right are of a 2" by 2" heater. Heater is not attached to anything and is adhered to foam on the back side to insulate from heat losses.

52.2 C temperature gradient with PSA only backing



5.8 C temperature gradient with aluminum backing



NOTE: Aluminum backing does not replace the need for heater profiling in medical applications. Contact All Flex for help with special requirements where uniformity down to $\pm 0.5C$ is required.

Disclaimer: Data presented for informational purposes only. Actual values and/or usage is for reference.