

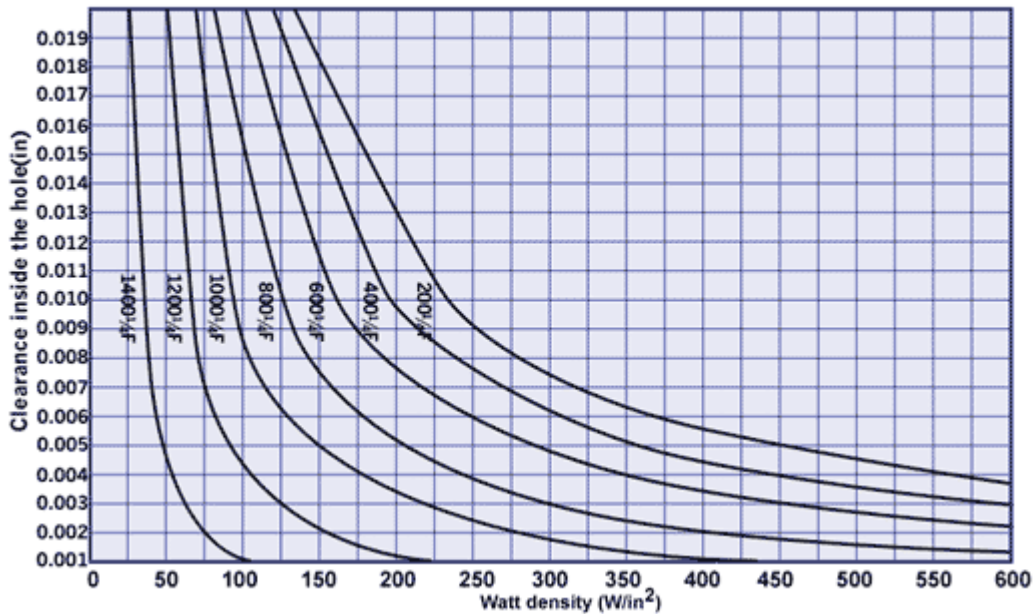


## Cartridge Heaters - Maximum Allowable Watt Density

While most maintenance men understand basic thermal principles even the seasoned thermal engineer needs help determining maximum allowable watt densities for cartridge heaters.

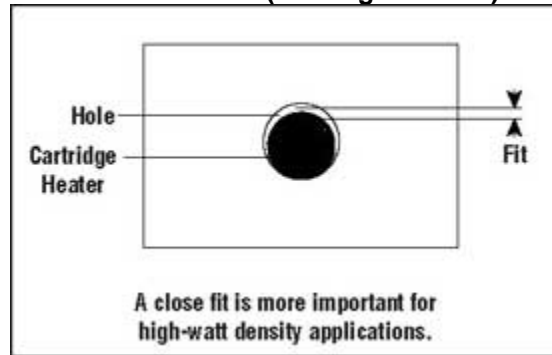
The Maximum Watt Density--Heating Metals chart will tell you either the maximum hole fit or the recommended watt density of the heater. Enter the chart with either known variable, part fit in hole dimension or W/in<sup>2</sup>. Then find the application temperature by reading up or over on the chart. If the fit of the heater in the hole dimension is not known, it is easily determined. Subtract the minimum diameter of the cartridge heater (nominal diameter minus tolerance) from the maximum hole diameter.

**Maximum Watt Density-Heating Metals**  
**Watt Densities**



For example, take a hole diameter of 0.500 minus a heater diameter of 0.496 ±0.002 inch. The hole fit would be 0.006 inch.

**Fit =Fit in Hole (cartridge heaters)**



For Cartridge heaters in square holes or grooves, contact your NPH sales engineer or account manager for the fit in hole dimension.

Correction Factors: Also note, this graph depicts cartridge heaters used in steel parts. Therefore, for either stainless steel or aluminum and brass, refer to applicable correction factors:

1-For stainless steel, enter the graph with a fit 0.04 mm (0.0015 in.) larger than actual.

2-For aluminum and brass, enter the graph with a temperature 38 deg. C (100 deg. F) above actual temperature.



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