

## Heaters for vacuum use - overview

Allectra offers a variation of heaters for in-vacuum use:

- small ceramic heaters
- Foil heaters
- high temperature ceramic heaters
- components for self-made heaters
- custom applications

Depending on the type, the heaters can be used from 4K up to 1000°C or even 1500°C with Bora-Electric heaters.

### 1) Miniature Heaters

**343-HEATER-2x10**, Ceramic, 1,9 x 9,5 x 0,2mm,  
-40°C ... 500°C  
Max. 13.4V, 2A, 27W, ~7 Ohm at RT

**343-HEATER-2x9**, Glass, circular, 2,2mm ø, 9mm long  
-200°C ... 450°C  
Max. 0,75A, 10W, ~11 Ohm at RT

A good contact to the heat sink is required. See also the accessories

### 2) Foil Heaters

#### 317-KAPH-1/1 and other sizes

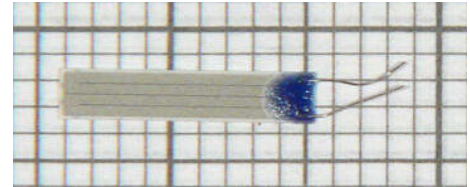
Flexible foils with attached PTFE insulated wires  
various sizes available, circular 12,7mm to 66mm ø  
rightangular from 12,7mm x 51mm to 102mm x 102mm

4K ... 200°C, ~1,5W/cm<sup>2</sup>, nom. voltage 28V

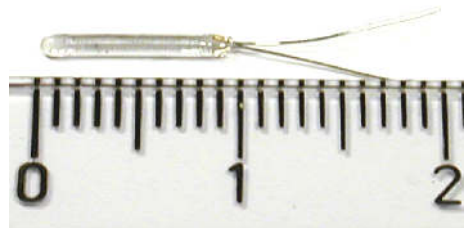
### 3) Silicon Nitride Heaters

**343-HEATER-SIN-8X10**, a very robust ceramic heater, 60 x 8 x 2,4mm, heated area 8x10mm. -50°C ... 1000°C, shock resistant, Nom. voltage 24V, 180W, max. 48V. Can be used in air and vacuum. Low thermal mass allow fast heating and allow accurate regulation of temperature.

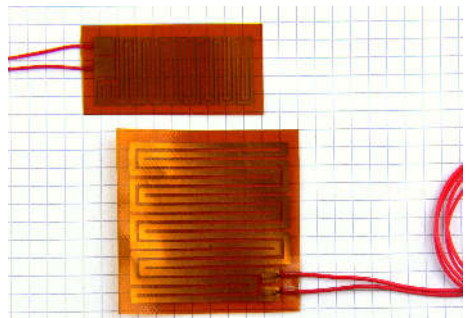
Significantly more robust and lower price than Bora-Electric heaters. Other sizes are available. Special sizes can be offered from ~10 off



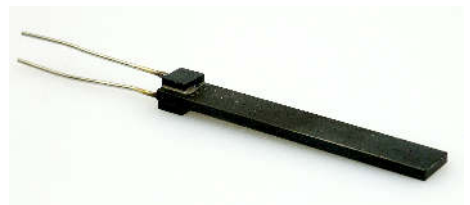
Ceramic heater 343-HEATER-2x10



Glass heater, circular 343-HEATER-2x9



Kapton Foil heaters



Ceramic heater up to 1000°C,  
343-HEATER-SIN-8x10

#### 4) PBN (Bora-Electric) Heaters

Pyrolytic Boron Nitride heaters can reach about 1500°C in vacuum, they are available on request in sizes from 25mm x 35mm to 75mm x 93mm and circular. Prices start from approx. 1200.-- and can exceed 5000.--



PBN heater including housing

#### 5) Heater Components

Mainly for research applications, self-made heaters are in use. Allectra offers ceramic tubes with 1 / 2 / 4 holes and Tantalum or Tungsten wire. With these two components, a simple but effective sample heater can be created. Crimp- and screw connectors are offered for the wire connections.

Special temperature measurement components, like thermocouples or wide range PT-100 resistors (-200 ... 750°C) are available from Allectra as well.



Ceramic tubes, which can be used for heater assemblies

#### 5) Thermal Contact Components

To achieve good thermal contact, Allectra offers two UHV compatible products: Liquid Metal and a low melting metal foil. These products contain nothing else than metal!

317-TCL-1: Liquid metal (MP: 8°C), for vacuum use up to 500°C, not for Aluminium

317-TCP-20x20 and 317-TCP-38x38 are thin foils with a melting temp. of 58°C, for vacuum use up to 500°C



Thermal contact foils 317-TCP-20X20 and 317-TCP-38X38 and the liquid metal 317-TCL-1



Custom made heater, on the right during vacuum test at ~800°C