

# BCE APPLICATION NOTE

ELECTRIC HEATING  
ELEMENTS

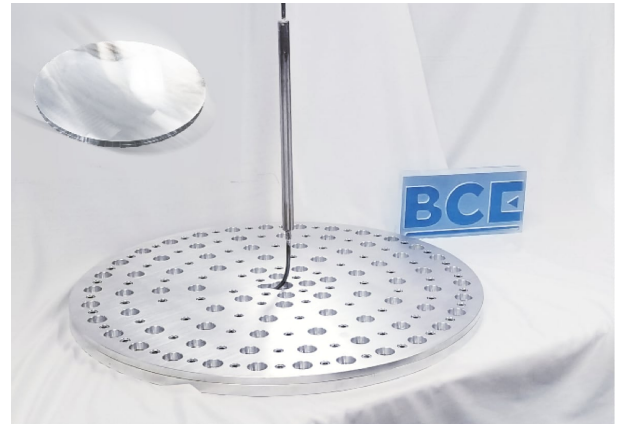
VACUUM  
FEEDTHROUGHS

CUSTOM THERMAL  
SYSTEMS

## 450mm - Vacuum Heater Chuck

### BACKGROUND

With the existing chip shortage, an atomic layer deposition (ALD) application up to 360°C was the focus of the latest BCE Vacuum Heater Chuck. A compressed assembly was used with many vacuum holes and grooves in the bottom plate to allow the gases to escape during pump down of the vacuum chamber. No surface anodizing was required.



### SCOPE:

450mm - Vacuum Heater Chuck needed to satisfy the following:

- Temperature <361°C
- Internal element must be able to withstand temperature <601°C
- Top surface 16ra
- A cold section was needed with added thickness for a vacuum fitting
- 304 Stainless Steel Heat Source
- 240Volt, 3850Watt (+/-10%)
- Type "K" Thermocouple was placed near edge (or built-in to heat source)
- Maximum allowable grooves and holes on the bottom plate to allow any trapped gases to escape

### OUTCOME

BCE produced a highly effective vacuum heater which reached an atmospheric temperature of 360°C in under 30 minutes. The reduced mass on the bottom plate provided proper gas elimination with a quicker initial ramp time. Due to this decreased ramp time in atmosphere, a reduced wattage may be an option for the next iteration of the 450mm Vacuum Heater Chuck.



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