BCE APPLICATION NOTE

ELECTRIC HEATING ELEMENTS

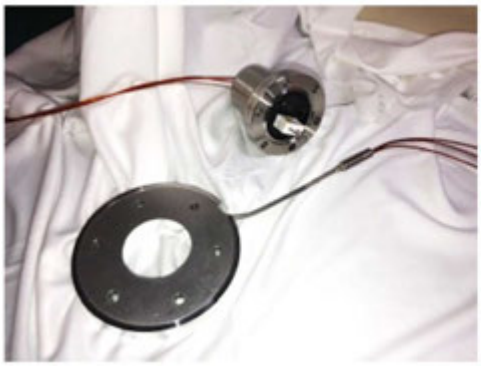
VACUUM FEEDTHROUGHS

CUSTOM THERMAL SYSTEMS

Vacuum Ring Heater - Feedthrough Combo

BACKGROUND

Aerospace lubricants need to be heated and tested in vacuum for quality assurances that they will work at high altitudes and beyond. The application involved reducing the cost of a replacement heater component while keeping the heat transfer the same in vacuum. Vacuum integrity was crucial to the success of the project since it needed to comply with the existing component used.



SCOPE

Vacuum Ring Heater - Feedthrough with the following specs:

- Vacuum Ring Heater to achieve temperature up to 200°C in 15 to 30 minutes.
- 304 SS 2.75 CF Flange Feedthrough -10°C to +65°C
- Vacuum rating to 1 x 10^{-9} Torr
- Internal element must be able to withstand temperatures up to 300°C
- Surface connection needed to mate properly with the center extrusion device
- 120 Volt, 60 Ohm, 240 Watt (+/-10%), 2 Amp
- Thermocouple built-in to heater source with ceramic connector
- Proper through holes for mounting Aluminum base with 304 Stainless Steel Heater
- Surface Finish: 32 Ra

OUTCOME

The heater and vacuum feedthrough combination achieved their desired effectiveness by reducing the customers component cost and increasing efficiency. A BCE Temp Control Console was added which had an RS-485 communication system enabling it to be operated from a control room. The ramp time performed above expectations during the atmosphere bench test at BCE. A temperature uniformity check was not a requirement on this application, but can be engineered if necessary.

BELILOVE COMPANY-ENGINEERS

BCE | 21060 Corsair Blvd.
Hayward, CA 94545
Phone: (510) 274-1990
www.bcemfg.com