

BCE APPLICATION NOTE

ELECTRIC HEATING
ELEMENTS

VACUUM
FEEDTHROUGHS

CUSTOM THERMAL
SYSTEMS

Custom Coiled Immersion Heater with Thermocouple and Thermal Cutout

BACKGROUND

A major US Aerospace company approached BCE in need of a custom heating solution.

Their existing heating element failed to evenly distribute heat inside a water reservoir, leading to thermal stratification and hotspots.

Additionally, while the customer's existing thermal system included temperature limiting devices, the new heater design required it's own thermal cutout to ensure over-temperature protection and remove any possibility of a runaway condition.



SCOPE

The coiled immersion heater needed to satisfy the following:

- Temperature uniformity throughout the heated section (± 3 deg. C)
- Hermetic seal
- Over-temperature heater failure
- Thermocouple for additional temperature measurement
- 275 Watt, 115 Volt

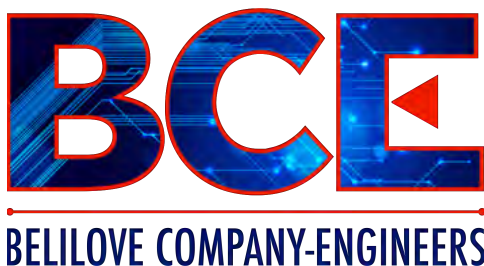
OUTCOME

ABCE designed a highly effective coiled heater with exceptional heat uniformity.

An additional thermocouple was welded to the sheath of the heater to ensure accurate temperature measurement.

A thermal cutout was placed into the NPT bushing and potted with thermally conductive epoxy to allow for heater failure if all other safety systems fail.

BCE was able to design, create 3D models/ drawings, and provide the custom heating elements within a 3 week timeframe.



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