

BCE APPLICATION NOTE

ELECTRIC HEATING
ELEMENTS

VACUUM
FEEDTHROUGHS

CUSTOM THERMAL
SYSTEMS

High Temperature Type J Thermocouple Feedthrough

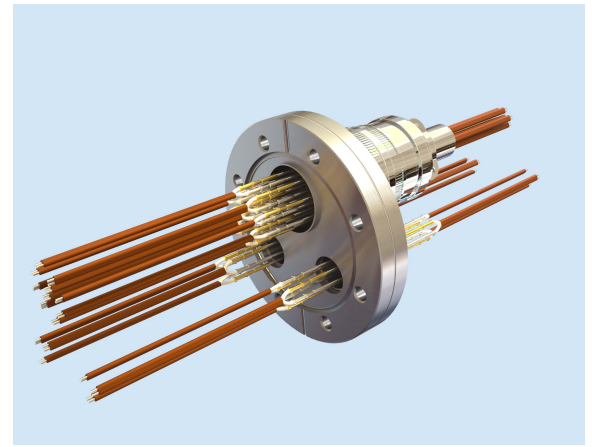
BACKGROUND

A 3D Printer company specializing in Aerospace parts provided BCE a challenge in creating a High Temperature Feedthrough for their new composite 3D printer. The 3-D composite company needed a high enough temperature in the sealed area with a vacuum chamber being essential in printing aircraft components. They had difficulties integrating their existing thermocouple design into their expanded chamber with an off the shelf feedthrough.

SCOPE

The 16 (32-wire) Pair Thermocouple feedthrough needed to satisfy the following:

- Operating temperatures between -25 C to 300 C
- Low vacuum leak rate of 10^{-9} ATM-CC/S or better
- Able to withstand a 450 C Bake-out temperature
- Type J thermocouples (customer preference) with ring terminations
- Fiberglass lead wires to withstand the high temperature



OUTCOME

BCE successfully designed a Thermocouple Feedthrough with a type J T/C extension wire so that the customer could integrate the component with ease into their 3D Printer. The High Temperature Feedthrough went through extensive pressure and temperature cycling before being shipped. One final helium leak check was made and a polarity verification for all connectors was done too.



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