

BCE APPLICATION NOTE

Mini Clean Flow - Harsh Environments

BACKGROUND

The BCE application was a custom heating solution for harsh environments where the medium material needed to be heated using low carbon metals. Stainless steels such as 316L and 304L are the best option for low carbon, these materials were not readily available on the a standard Mini Clean Flow (MCF) heater. BCE adapted making all wetted parts 316L or 304L while being heated with a 321 stainless steel heat source.



ELECTRIC HEATING
ELEMENTS

VACUUM
FEEDTHROUGHS

CUSTOM THERMAL
SYSTEMS

SCOPE:

The Mini Clean Flow Heater - Harsh Environment needed to satisfy the following:

- Temperature outlet needed to be 100°C
- Perpendicular configuration, with locking fittings
- Body must pass Helium Leak rate of 1×10^{-7} cc/sec He
- Pressure test of 50PSI
- Ability to place heater in a series flow configuration if necessary
- Thermocouple for additional temperature measurement
- 400 Watt, 120 Volt
- All wetted surfaces must be 304 or 316 Stainless Steel L (low carbon)

OUTCOME

This BCE MCF heater was tested to 100°C with the mass of the heater being slightly above 5 lbs. The 100°C temperature was reached within about 2 minutes. This efficiency was achieved by maintaining good contact with the internal heat source and the low carbon steel MCF heater body.



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