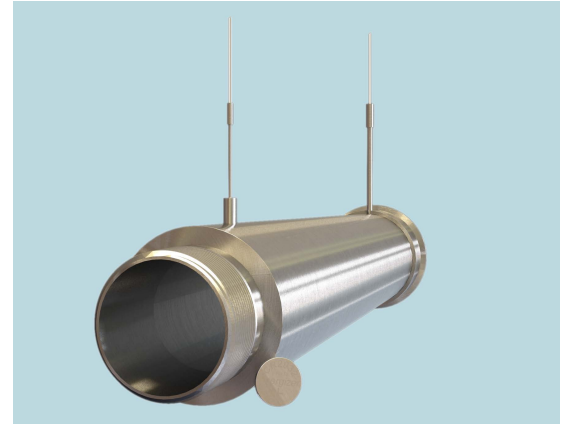


# BCE APPLICATION NOTE

## Mini Clean Flow - Hi-Wattage

### BACKGROUND

The application involved using environmentally friendly electric heat replacing a gas burner type system. The engineering request was to conform to a direct replacement 3" stainless tubing while utilizing BCE's Mini Clean Flow In-line design. The challenge was building the right inlet and outlet fittings in-line for a seamless change in the air heating process (gas to electric). Electrically isolated elements in the air stream were required with a high temperature thermocouple assembly near the outlet.



### SCOPE:

Mini Clean Flow – Hi Wattage needed to satisfy the following:

- Temperature 482°C to 648°C
- Internal element must be able to withstand temperature <750°C and be electrically isolated
- 3" outside diameter, no insulation
- A sanitary fitting on the inlet with an NPT on the outlet
- A cold section on the heat source was required with fiberglass leads
- 304 stainless steel material on the heat source and vessel
- Type "J" Thermocouple able to withstand high temp at the outlet
- 480Volt, 7,000Watt (+/-10%)

### OUTCOME

BCE produced a highly effective Mini Clean Flow heater meeting the delta "T" requirements during the final testing. We were able to pressure test the part to 90PSI @ 20°C-25° without any visible leaks in the weld or braze joints. A thorough quality inspection was completed on the heater source with final cleaning using isopropyl alcohol and dry air.



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