

BCE APPLICATION NOTE

ELECTRIC HEATING
ELEMENTS

VACUUM
FEEDTHROUGHS

CUSTOM THERMAL
SYSTEMS

CERAMICS
ENGINEERING

LASER DRILLING AND
ETCHING

BCE'S MINI-CLEAN FLOW (MCF) HEATER AT THE CORE OF 4D ENTERTAINMENT

PICTURE THIS:

A heater that can sustain elevated motion, high temperatures and pressures, and be compact enough to fit into a restricted assembly. BCE was approached by a worldwide provider of 4D cinematic experiences to help design a custom heating apparatus. This novel thermal assembly would be capable of creating a desired heat effect enhancing the viewing of attraction films around the globe.

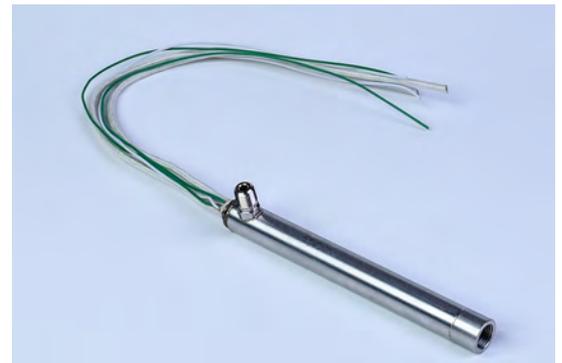
SCOPE:

The heater of the apparatus needed to be able to:

- Generate internal temperatures exceeding 500°C
- Ramp to elevated temperatures within minutes
- Operate at low voltage: 24V
- Sustain pressures up to 80 psi
- Assemble easily to a control valve
- Remain operable at a motion of 10g
- Allow for acute temperature control
- Have a low mass design for efficient heat transfer
- Be compact; allowing the assembly to remain within a 10" envelope

OUTCOME:

BCE's MCF heater provided the optimal solution to this design challenge. During pre-heat with no air flow, the internal temperature of the MCF reached 320°C. After an 80 psi air burst and temperature drop, the low mass of the heater was able to achieve an internal temperature of 505°C in just under 90 s during the heat effect. This greatly surpassed customer expectations. Not only was its compactness an asset in maintaining the dimensional restrictions, its unique design with NPT fitting assembled easily to other components. Moreover, the built-in thermocouple type K offered precise temperature monitoring for this sensitive application. Finally, its robust design allowed for continuous operation under the most strenuous pressures and motion.



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