

BCE APPLICATION NOTE

BCE'S SMARTFLOW HEATER: REVOLUTIONIZING THERMAL EFFICIENCY IN THE PETROCHEMICAL INDUSTRY

One of the most effective ways to increase heating of plant utilities is by pre-heating combustion gases supplied to burners. This can be challenging especially when a small footprint, high thermal efficiency and low maintenance are required in very harsh environments. In fact, BCE was approached by an international petrochemical giant seeking to replace their line of cartridge heaters used for this very application. This multi-billion dollar oil and gas company was primarily concerned with improving thermal efficiency and heater life as heaters needed to be replaced often due to exposure to corrosive materials and high watt densities. Replacing these heaters was proving to be quite costly and a quick remedy was needed to allow for greater profit generation.

SCOPE

The heater needed to meet the following requirements:

- Thermal efficiency needed to be tripled by reducing watt density.
- 200W, 120V
- Heater sheath material capable of withstanding a corrosive environment.
- Gas needed to be pre-heated to a temperature of 300°C.
- 10 minute ramp time.
- Gas flow needed not be exposed to any resistive material.
- Built-in thermocouple for accurate temperature monitoring
- Easy installation into existing BSP threaded ports
- Heater body dimensions to not exceed 10" x 1" x 1" envelope due to space restriction

OUTCOME:

BCE proposed its SMARTFLOW heater as the most viable option for this dilemma. Its revolutionary fin design tripled thermal efficiency by tripling the heated surface area within the prescribed electrical and dimensional specifications. In effect, this resulted in decreasing the watt density from 36 W/in² to 14 W/in²; greatly diminishing surface temperatures on the heater increasing heater life.

Furthermore, not only was it able to ramp to 300°C in under 10 minutes exceeding customer expectations, its robust 316 stainless steel construction proved to be optimal in preventing heater degradation with exposure to harsh chemicals. Furthermore, an embedded, grounded, type K thermocouple provided accurate temperature monitoring, and the heater body inlet and outlet fit effortlessly into the existing BSP ports on customer site.

For the detailed drawing, [click here](#).



BELILOVE COMPANY-ENGINEERS

BCE

21060 Corsair Blvd Hayward,
CA 94545

Phone: (510) 274-1990

Fax: (510) 274-1999

www.belilove.com

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