

Innovative flange immersion heaters for liquid fuel

FLANGE IMMERSION HEATERS FOR LIQUID FUEL

The project to develop a high-efficiency immersion heater started a long time ago at Thermocoax with a particular R&D project for high purity aluminium foundries.

HEAVY FUEL STORAGE

Then we decided to adapt our technology to heating applications for the storage of heavy fuel. We designed an innovative **flange immersion heater** offering longer lifetime than existing solutions.

The technology is based on THERMOCOAX Mineral Insulated Cables that offers high reliability, high resistance, long lifetime and a fully insulated heating solution.



A COMPLETE RANGE OF IMMERSION HEATERS

A full range of Flange Immersion Heaters low density is now available with a total length above the flange of maximum 2 meters.

To respond to the needs of fuel storage applications in tanks where the accessibility is reduced and where small footprint heating systems are requested, we limited the length of the immersion heaters and made our design with DN100 & DN200 flanges only.

The challenge was to develop a design with high total power, a Low power density and a small footprint while offering a natural movement of the fluid through the heater.

Another challenge was to make a comfortable maintenance design, with a strong mechanical resistance and that can resist the immersion in petroleum-based liquids with 100% energy efficiency.

THE THERMOCOAX IMMERSION HEATERS DESIGN

We based the design on a strong mechanical stainless steel structure with mineral insulated heating cable spiralled and firmly fixed on the structure.



In the middle of the heater, a stable Stainless steel square tube is welded to the flange. Another construction is fixed on this tube so that a solid essential strength is created.

The heating cables are held by particular carrier profiles which are connected to stainless steel discs and fixed to the middle tube.

We managed to make a design where each heating cable is independent, and due to an innovative assembly, each heating cable can be replaced independently for easy maintenance of the Immersion Heater on site.



Mineral insulated cables with 316L stainless steel sheath are used to offer to the heater a high resistance for immersion in main petroleum-based liquids and also asphalt, tar or other dense or highly viscous components.

We also wanted to offer a solution with better fluid circulation through the heater and with more contact between the fluid and the heating surface than with existing solutions on the market.

To meet this need, THERMOCOAX ISOPAD Immersion Heaters can have up to 3 layers of heating elements while keeping enough space for fluid circulation. The multilayer design increases the contact surface between the fluid and the heaters for a better heat transfer efficiency.

The clearance between two spires for the movement of the fluid through the heater is between 9mm and more than 15mm depending on the total power of the Immersion Heater.

All our immersion Heaters can be manufactured with an integrated thermocouple or PT100 for temperature control, with flange with screw plug and junction box.

THERMOCOAX IMMERSION HEATERS APPLICATIONS :

- Fuel, light diesel fuel, standard diesel fuel, maximum load 1 - 2 w / cm², materials: 321, 316l
- Heavy fuel, maximum load 0,5 - 3,5 w / cm² according to grade, materials: 316l
- Diesel, kerosene, maximum charge 3 - 3.5 w / cm², materials: 316l
- Machine oil, maximum load 2 - 3.5 w / cm², materials: 316l
- Mineral oil, maximum load 0,5 - 3,5 w / cm² according to temperature, materials: 321, 316l
- Lubricating oil, maximum load 2,3 w / cm², materials: 321, 316l
- Asphalt, tar and other heavy or highly viscous components