



## **Indirect fired heaters**

## INDIRECT BATH HEATERS

Indirect bath heaters have a wide variety of successful applications in the oil and gas production, processing and transmission industry. Some of the most common application include the following:

1. Gas Dew Point Heating: high-pressure natural gas heating upstream pressure regulation stations preventing condensation phenomena due to the Joule-Thomson effect.
2. Heating of high-pressure natural gas upstream pressure regulation in order to prevent external icing formation.
3. Fuel gas super-heating upstream gas turbines (Performance heaters)
4. Gas heating downstream low temperature storages
5. Hydrate prevention
6. Viscosity reduction: Crude Oil Heating upstream treatments to facilitate degassing and dewatering.

Range:

The duty of Pietro Fiorentini heaters can vary from 90Kw up to 10Mw.

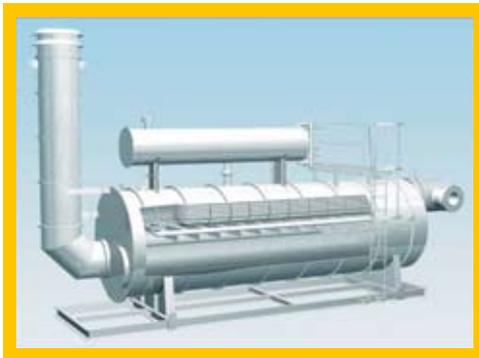


## Main features

## Indirect bath heaters

Indirect Bath Heaters are composed of the following main parts:

- Main body
- The coil or tube bundle
- The water expansion tank
- The fuel feed line
- Burner (gas type, oil type or bi-fuel)
- The fire-tube
- Chimney
- Burner management system panel
- Skid frame and service platform
- Insulation



The heater shell contains the fire-tube that allows a rapid heat transfer (both radiant and convective) from the flame to the hot medium. The heat is transferred from the bath to the coil / tube bundle and then safely to the gas or the oil.



The expansion tank allow the hot medium to be contained for the thermal expansion due to the temperature increase. Level gauges and transmitters advise when additional water or hot medium is required and give alarms in case of overfilling.

## External insulation

## Indirect bath heaters

Heaters are thermally insulated, except end sides left bare to facilitate access to the coils, burner or stack. Insulation materials are properly selected based on operating temperature and climate conditions.

## Forced draft vs natural draft

## Indirect bath heaters

Forced or natural draft heater designs are available depending on working conditions and power availability on site.

**Natural draft** burner relies on a stack to create negative pressure at the burner inlet, which induces as much air as is required for combustion. These heaters are popular for remote locations and/or locations with limited or even no power supply available.

**Forced draft** heaters are ideal whenever there is a low emission requirement, utilizing small bore fire-tubes in conjunction with a combustion air fan. High velocities in the small bore fire tube reduce the “dead gas film” region along the tube walls. This results in a reduced tube areas compared to their large bore counterparts, therefore, overall heater size is minimized creating a significantly smaller footprint while offering superior burner control compared to natural draft style heaters.

## API 12K – OFFICIAL MONOGRAM

## Indirect bath heaters



PIETRO FIORENTINI is one of the few companies worldwide bearing the API 12K monogram confirming the full compliance of Indirect Heaters to API (American Petroleum Institute) specifications.

**Indirect fired gas heater (water bath heaters)**
**Indirect bath heaters**


Tailor designed according to customer specification and design conditions they can have different configurations:

<b>GAS PIPE INSIDE THE HEATER:</b>	Tube bundle or coil.
<b>AIR DRAFTS:</b>	Natural circulation or forced flow.
<b>BURNERS</b>	Low NOx or conventional, mono-fuel or bi-fuel
<b>HEAT SOURCE:</b>	Gas, oil or electricity.
<b>HOT MEDIUM:</b>	De-mineralized Water, Glycol, hot oil, Thermal B

The operation of the gas heaters is completely automatic. Gas heaters are fired with natural gas which will be supplied to the burner at a specific pressure thanks to a dedicated fuel gas pressure regulators complete of all the required safety devices and electrical heating on a dedicated line.



## HOT OIL HEATER

## Indirect bath heaters

Used in order to reduce the viscosity to ease the oil stream transportation.  
The hot medium can be water, hot oil, Glycol or Thermal B.

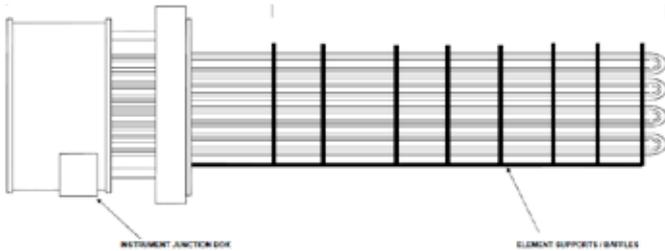


Almost every coil bundle require a tailored design in order to meet the requirements of heat duty, working pressure, corrosion allowance, sour gas service, NACE MR-01-75 and governing specification or normative, usually ASTM or ANSI B 31.3.

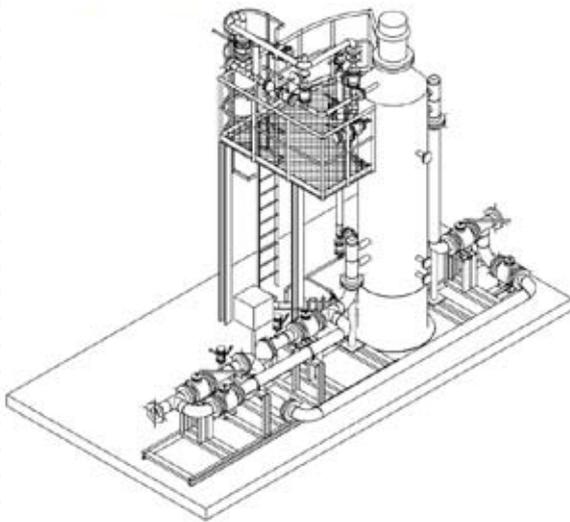


**Electric heaters****Indirect bath heaters**

All the previous type of heater can be constructed with Electrical heating source.



Example of electrical Gas Heating to prevent condensate creation after the gas temperature reducing at the pressure reducing valves for the joule-Thompson effect.



On Electrical Heaters the temperature control is operated by a Thyristor systems.

FIorentini can offer a full range of flameproof heaters, immersion heaters, process flow heaters and electric heating skids for a variety of applications.

Typical electric process heating applications include fuel gas heaters, fuel oil heaters, glycol reboilers, TEG heaters, MEG heaters and water heaters.





Gas treatment plants



Reducing station



Ball valve



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