Delham
Engineering Company



# INDIRECT WATER BATH HEATER

# Indirect Water Bath Heater

## INTRODUCTION

***Delham Engineering Co.*** is a leading company in the design and manufacture of pressure parts and pipeline equipments to the oil & Gas, petrochemical and other process industries.

## Description

Water Bath Heaters are Indirect Fired Type usually designed to API 12K, these devices are traditionally used to heat natural gas and oil.

*Delham* heaters operate on an indirect heating basis which consists of a water bath with two natural draft burners firing into immersion tubes.

A separate serpentine tube bundle immersed into the water bath is used to transfer and absorb heat into the process fluid.

The principle of indirect or bath type heating has been around for decades meaning modern units are very reliable. Designed and constructed in accordance with API 12K as standard, the bath heaters comprise a horizontal, cylindrical heating tank containing the heat transfer medium in which the fire tube and process heating coil are immersed. Custom designs to other codes such as ASME are available.

## Water Bath Heaters can be used for heating:

- Natural Gas
- Crude Oil
- Vaporizing and superheating LPG & LNG
- Regeneration Gas Heating
- Heat Transfer Fluids
- Heat sensitive gas and fluids
- Molten Salt Heaters

## Types of Indirect Bath Heater

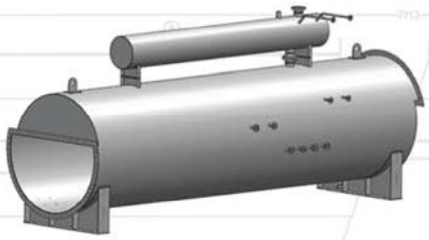
- Water or water/glycol bath heating to 80-90 °C
- Steam bath heating to 110 °C
- Oil bath heating to 250 °C
- Salt bath heating to >350 °C

## HEATER COMPONENTS

The indirect fired water bath heater consists of the following components each designed to meet specific design critria:

### Heater Shell

The water bath shells are horizontally orientated with two supporting saddles and are externally insulated and aluminum clad to minimize heat losses. The process gas tube bundle and fire tube assembly are flange mounted to the heater shell at opposite ends. This arrangement allows the equipment to be retractable for lon term maintenance.



### The Fire Tube

The fire tube is commonly of the U-tube configuration. The tube is removable & designed to efficiently transfer heat into the surrounding heat media and to minimize flue gas friction losses.



### The process coil

The process coil is a pressure containing part commonly designed in accordance with API-12K or ASME/ANSI code requirements.



## Control Principle

The principle of control system is to regulate the water bath temperature for the required outlet temperature which is set from a remote analogue input signal. Burner start/stop, alarm conditions and operation status are communicated between the local control system and remote plant PLC system.



## Optional Control Enhanced Designs

- Pneumatic controlled equipment operation
- Electrical controlled equipment operation
- Combination pneumatic & electrical controlled equiment operation
- Flame-Safeguard assemblies
- Manual or Automatic pilot ignition designs

## Combustion System

The water bath is heated by two high pressure natural draft burers mounted in a burner box and fire into the immersion tubes.

The burner controls operate from an approved flame management system and are designed to meet NFPA codes.

## The flue gas stack

The flue gas stack is designed to provide positive flue gas flow (draft) by overcoming the friction losses in the complete combustion system.



## The heat media

The heat media is commonly a mixture of inhibited ethylene or propylene glycol and water which is blended to a certain consistency in order to provide the proper freeze protection for a given application.

## The expansion tank

The expansion tank is designed to reduce internal corrsion within the heater shell by keeping the heater shell liquid packed & moving the wet dry interface of the expanding bath media from the heater shell into the expansion tank. The expansion tank is designed to contain 100% of the expanded bath media from a temperature of 40°c to the maximum operating temperature.

## Accessories Items:

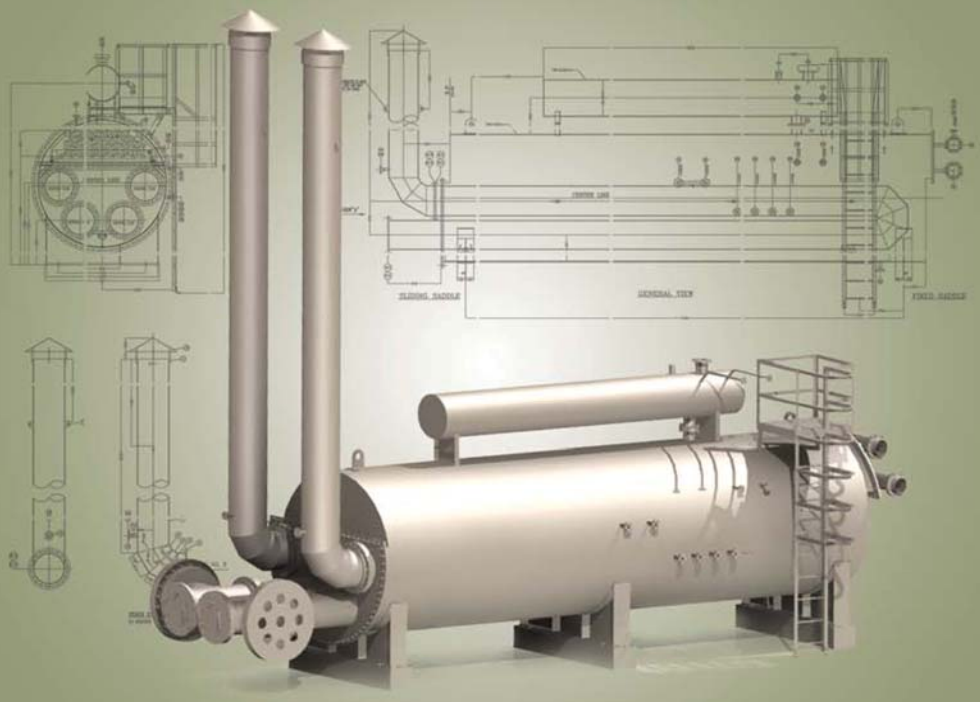
Delham designs & manufactures heaters with a wide variety of accessories to meet customer specified mechanical & operation requirements. our accessories could include simple pneumatic controls to sophisticated remotely controlled & monitored equipment.

## Codes and Standards

- Electronic Industry Association (E.I.A.)
- API 12 K
- I.E.E.E.
- NFPA
- ANSI / ASME SEC II
- ANSI / ASME SEC V
- ANSI / ASME SEC VIII DIV. 1 or 2
- ANSI / ASME SEC IX
- ANSI / B16.5 , ANSI / B16.9 , ANSI / B36.10
- IGS-PM-104
- IPS



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