

# **TECHNICAL DATA OF HIGH PRESSURE HEATERS**

## **1. Technical specification**

**1.1.1** The design, fabrication and acceptance shall follow Chinese standard *Steel Pressure Vessel* and American standard *Surface Type Feed Water Heater Code*

**1.1.2** Regarding the materials which is delivered from other manufactures to the supplier(see item 3) the required test form shall sent to buyer .

**1.1.3** The supplier should give the detail drawing for HP heaters to show the:

a). General arrangement, overall dimension and nozzle schedule

b). Section and material list

c). Table showing the number and dimension of U tubes in each tube bunk heater

d). General arrangement and equipment weight

**1.1.4** Unit of measure should be metric system

**1.1.5** Design of manhole should be the same as related drawing which be delivered by buyer before .

**1.1.6** The dimension of the branched tubes, shell thickness, etc shall not be less than the previous heaters in local plant.

**1.1.7** The design drawings of the baffle plates that manufacturer wants to perform on the new heaters should be attached and should guarantee that no malfunction will occur due to vibration inside heaters.

**1.1.8** For the manufacturing of heaters a clean area for the fabrication in supplier site must be provided .

**1.1.9** The feed water inlet and outlet pipes on the heaters should be beveled according to old drawings or ASME standard at the supplier's workshop and temporary cups should be provided for preservation.

**1.1.10** The supplier should send reports for heat treatment performed during the manufacturing to the client

**1.1.11** The supplier should send the required document such as hydro-test, U-tube plugging procedure when ready.

**1.1.12** The outside surface of the heaters must be painted with suitable paint prior to shipment

**1.1.13** Guarantee: When the heater is in service with 6 months or after its' arrival at site for 18 months, no more than three U-tubes should be plugged per each heaters.

## **1.2 Design data**

## **H.P Heater 1#**

Pressure shell side	: 22 kg/cm <sup>2</sup>
Temperature shell side	: 470 / 220 °C
Pressure water box side	: 279 kg/cm <sup>2</sup>
Temperature water box side	: 220 °C
Manhole bolt tightening force	: 800 kgm.
Hydrostatic test shell side	: 27.5 kg/cm <sup>2</sup>
Hydrostatic test water box side	: 350 kg/cm <sup>2</sup>
Surface	: 513 m <sup>2</sup>

2. The overall dimension and dimension for major connection and support shall be as 5(five) drawing signed by both sides as attachment of this agreement. And the drawing should be sent to buyer before the beginning of manufacturing process for approval.

3. Main material:

Heating tubes: SA-556GRC2, Dia.16x2.5. The tube shall be bent by material supplier (ASME)

Water box head: SA516Gr70

Shell side: SA516Gr70

Tube side, feed water pipe, manhole: 20MnMo(China)

Shell header : SA516Gr70 (low temperature zone) SA387Gr11CL2 (high temperature zone)

All above mentioned “main materials” will be stated clearly in the drawing which should be sent for buyer’s approval before production.

The supplier will provide the buyer with chemical and mechanical content for material 20MnMo

4. Agreement of HP heater: vertical head down with U-Tube structure

5. The connection between the U-tube and tube sheet shall use automatic welding and explosion expansion technology

6. Insert pipe shall be used for protection of water flushing at heating tube inlet, and the material of insert shall be stainless steel

7. Impingement plate of stainless steel shall be installed at steam inlet and condensate inlet

- 8. When the fabrication of HP heater is completed, a hydro-test shall be carried out at shop with the pressure indicated in item 1.2 above design pressure and nitrogen shall be filled after hydro-test is passed in shell and tube side with suitable pressure for transportation and notices for user.**
- 9. Two pieces of gasket for manhole as spare parts shall be provided for each HP heater.**