Desuperheater

Conceived specifically for desuperheating units, it is a special heater normally installed at the end of the line of heater trains with only a desuperheating surface. The thermal and mechanical design is similar to the others heaters.

PROGRAM WINDOWS

Desuperheater Thermal Calculation

Instructions | Run File | Results | Print Results | Drawing | Print Drawing | Save File | Load File | Clear All | Press For Mechanical Calculation | Exit

INPUTS

Units Code (1 = S.I. 2 = USA)	1	Press Button	Button	Job Name	HP5-DES
Steam Flow	39.132	tn/h			
Steam Temperature At Inlet	493.9	oC	Type Of Water Box :		
Steam Pressure At Inlet	25.37	bara	1=Hemispherical 2=(Cylind.+Hemisp.End)	2	
Expected Shell Side Pressure Drop	0.25	bar	Tubes Material :		
Steam Temperature At Outlet	288	oC	[1] .... Carbon Steel		
Feed Water Flow	820.872	tn/h	[2] .... Austenitic S.S.		
Feed Water Pressure	208	bar	[3] .... Ferritic S.S.		
Feed Water Inlet Temperature	257.9	oC	Enter Code Material	1	
Feed Water Outlet Temperature	262.6	oC	Tubes Pitch	22	mm
Tubes Outlet Diameter	16	mm	Feed Water Velocity	2	m/s
Tubes Thickness (0=If According To HEI)	0	mm	Exchange Coefficient Correction	1	
Tube Material Allowable Stress At Design Temp.	1200	bar	Maximum Length Of Equipement	3.5	m
Mini Radius Of Tube Curvature (0=not considered)	0	mm	Feed Water Design Pressure	306	bar
Allowable Tube Material Corrosion	0.1	mm	Code For Type Of By-Pass (1 = In Water Box 2 = Out Of Heater)	1	

DATA ENTRY WINDOW

DESUPERHEATER - Data Results

Job Name : HP5-DES

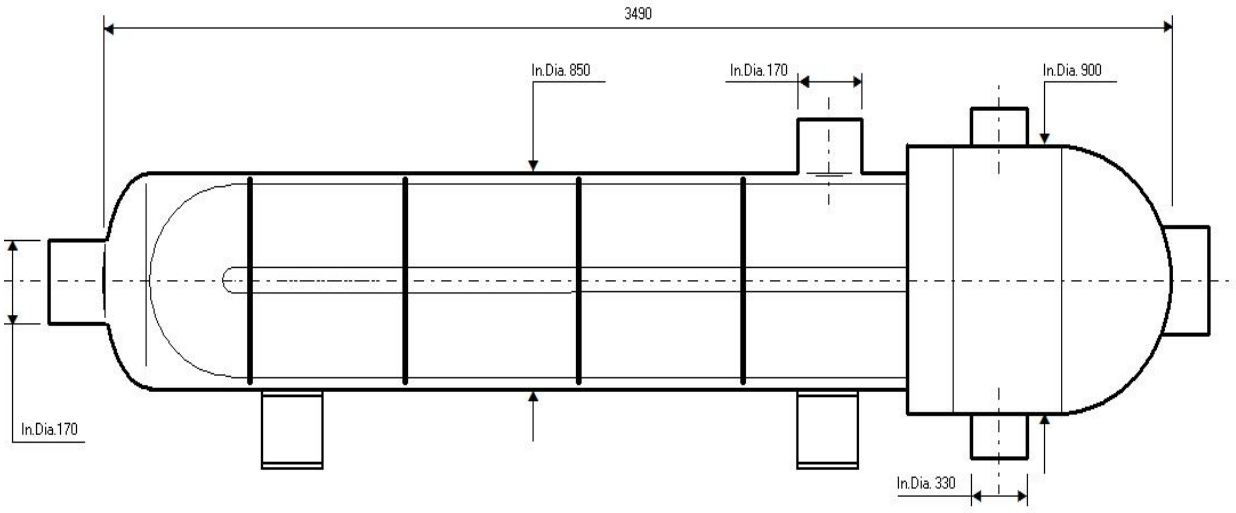
Data

Steam Flow (Including 0.3% Lost)	39,402	Tn/h
Steam Enthalpy At Inlet	3447,82	Kj/Kg
Steam Temperature At Inlet	493,9	oC
Steam Pressure At Inlet	25,37	Bara
Steam Enthalpy At Outlet	2980,24	Kj/Kg
Steam Temperature At Outlet	288	oC
Feed Water Flow	820,872	Tn/h
Feed Water Inlet Enthalpy	1124,01	Kj/Kg
Feed Water Inlet Temperature	257,9	oC
Feed Water Outlet Enthapy	1146,38	Kj/Kg
Feed Water Outlet Temperature	262,6	oC
Tubes Outlet Diameter	16	mm
Tubes Thickness	1,95	mm
Tubes Material	Carbon Steel	
Tubes Pitch	22	mm
Inlet Tubes Velocity	2	m/s
Exchange Coefficient Correction	1	
Length Of Equipement	3,5	m

Results

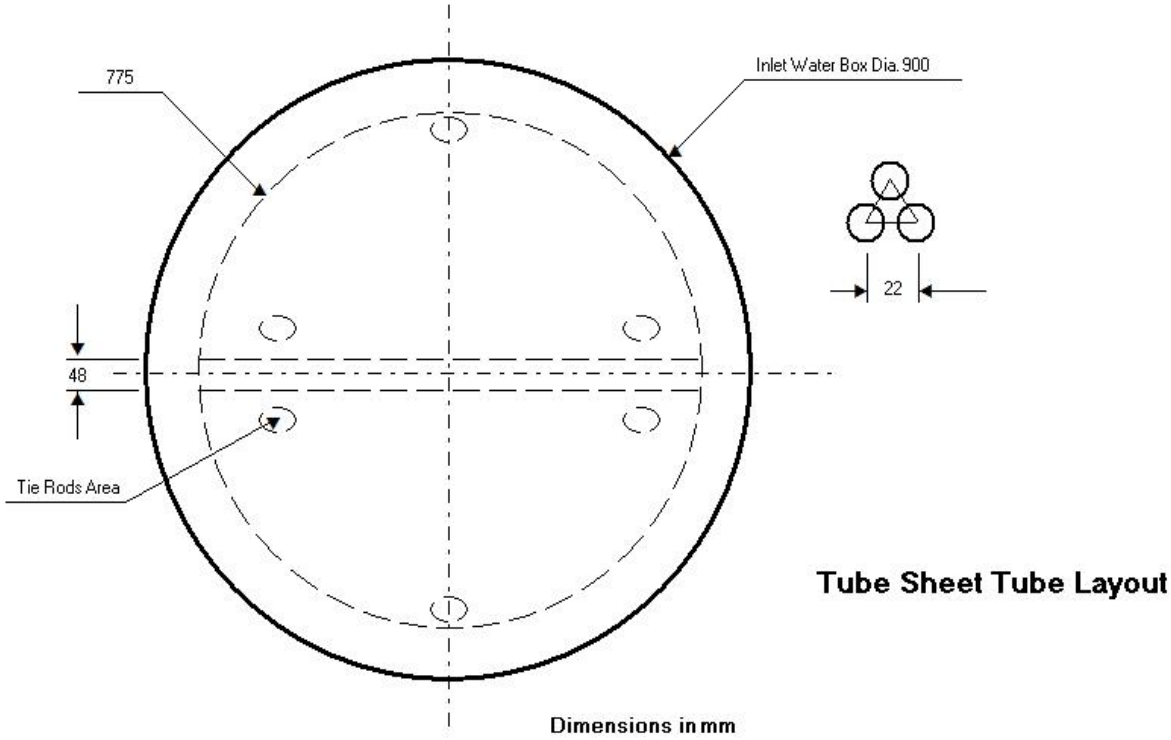
Desuperheater Duty	18423,42	Mj/h
L.M.T.D. Correction	0,93	
L.M.T.D. Corrected	90,45	oC
Exchanged Coefficient	1945	Kj/hoCm2
Exchange Surface	105	m2
Number Of Tubes	478	
Approx.Internal Diameter Of Channel	880	mm
Length Of Equipement	3,49	m
Feed Water Pressure Drop	0,14	Bar
Approx. Shell Side Presure Drop	0,25	Bar
Feed Water Flow At Tubes Inlet	317,67	Tn/h
Feed Water Outlet Tubes Temperature	270,71	oC
By-Pass Flow Percentage In Channel	61,29	%
Channel Nozzles Inlet Diameters	330	mm
Approx. Internal Shell Diameter	830	mm
Steam Nozzles Inlet/Outlet Diameter	170	mm
Number Of Tubes Support Plates	5	
Feed Water By-pass Hole Diameter	247	mm

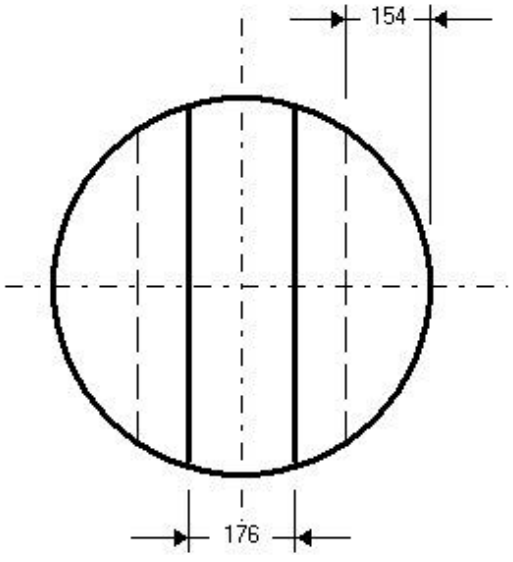
RESULTS SHEETS



Dimensions in mm

DIMENSIONAL DRAWING





TUBE SUPPORT PLATES DRAWING

Desuperheater Mechanical Calculation

Run File

Results

Print Results

Save File

Load File

To First Page

Clear All

Exit

INPUTS

Units Code (1 = S.I. 2 = USA) 1 Press Button Button

Shell Side Design Pressure	31	bar
General Allowable Corrosion	3	mm

Allowable Stress Value At Design Temperature In Bar For Material Of :
(Taking account reduction due to joint efficiency)

Shell And Elliptical Shell End	500
Tube Sheet	1200
Water Box Hemispheric Type (If Cylindrical Put Zero)	0
Water Box Cylindrical Type (If Hemispherical Put Zero)	1200
Hemispherical End For Cylindrical Water Box Type	1200
Steam Inlet / Outlet Connections	500
Inlet / Outlet Water Box Connections	1000

MECHANICAL CALCULATION DATA WINDOW

HEATER RESULTS - Thickness (mm) and Weights (Kg)

Job Name : HP5-DES

■ THICKNESSES

Shell	30
Elliptical Shell Cover End	30
Tube Sheet	260
Hemispherical Water Box	0
Cylindrical Water Box	136
Hemispherical End For Cylindrical W.B.	61
Tubes Support Plate	10
Water Box Pass Partition Sheet	16
Steam Inlet Pipe	9
Steam Outlet Pipe	9
Feedwater Inlet/Outlet Pipe	65

■ WEIGHTS

Exchange Tubes	1580
Tube Sheet Gross Weight	2140
Tube Sheet Net Weight	1740
Shell With Elliptical End, Pipes And Internals	1690
Hemispherical Water Box, Pipes And Manhole	0
Cylindrical W B, Pipes And Hemispherical End	3680
Tubes Support Plates	120
Heater Supports	130
Heater Empty	8940
Heater In Operation	10060
Heater Full Of Water	10820

RESULTS SHEET