PR CM: Vendor shall send the native calculation file for checking.

STYRENE PARK OFFSITE

Commented:
Please to be implemented and endorsed acc to below Engineering Document :
- PFD For STYREN (EI027-000-ED-PR-PFD-501-R3)
- P&ID For STYREN (EI027-000-ED-PR-PID-522-R4)

Vendor Reply: Noted

Document Title:

Condenser Data Sheet

R0	16-03-2024	IFA	F.sh	M.O	A.M
Rev.	**Issued Date**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**

REVISION RECORD SHEET

Page	Revisions								Page	Revisions						
Page	R0	R1	R2	R3	R4	R5	R6			R0	R1	R2	R3	R4	R5	R6
1	X								41							
2	X								42							
3	X								43							
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37									77							
38									78							
39									79							
40									80							

Model no.			Heat exchanged	(kW)	252.
Customer			Surface/Item-Finned tube	(m2)	1579.2
Plant location			Bare tube	(m2)	68.101
Service			MTD, Eff.	(Deg. C)	6.8
Type draft		FORCED	Transfer rate-Finned	(W/m2-K)	26.509
Bay size (WxL)	(m)	2.65 X 6.4	Bare tube, service	(W/m2-K)	614.72
No. of bays/ Items		1	Bare tube, clean	(W/m2-K)	708.15

Vendor Reply: Noted
Air cooler draft type is forced type. fan and motor are located at bottom of bundle

Please clarified

Basic design data

Pressure design code		ASME VIII div 1 + API 661	Structural code		UBC 97
Tube bundle code stamped		No.	Flammable service		Yes.
Heating coil code stamped		No.	Lethal/toxic service		No.

Performance Data - Tube Side

					In		Out	
Fluid name		Propane						
Total fluid entering	(kg/hr)	3089.2	Total flow rate (Liq/Vap)	(kg/hr)	0.0000 /	3089.2	3089.2 /	0.0000
Dew/bubble point	(Deg. C)	/	Water/Steam	(kg/hr)	0.0000 /	0.0000	0.0000 /	0.0000
	(Deg. C)		Noncondensables	(kg/hr)		0.0000		0.0000
Latent heat	(kJ/kg)		Molecular Wt. (Vap/Non-cond)		/		/	
Inlet pressure	(bara)	19.867	Density (Liq/Vap)	(kg/m3)	435.50 /	42.251	435.58 /	46.266
Pressure drop (All/Calc)	(bar)	0.200 / 0.015	Specific heat (Liq/Vap)	(kJ/kg-C)	3.6130 /	2.3072	3.6115 /	2.3963
Velocity (Allow/Calc)		/ 0.83	Thermal cond. (Liq/Vap)	(W/m-C)	0.0763 /	0.0248	0.0763 /	0.0239
Inside fouling resistance (m2-K/W)		0.000170	Viscosity (Liq/Vap)	(cP)	0.0728 /	0.0105	0.0729 /	0.0103
		In / Out						
Temperature	(	4 / 56.66						

Vendor Reply: Noted. it was checked based on project site condition and 48 C is confirmed.

Performance Data - Air Side

Air inlet temperature	(Deg. C)	48.00	Face velocity	(m/s)	3.25
Air flow rate/item	(m3/s)	46.975	Minimum design ambient temp	(Deg. C)	5.00
Mass velocity	(kg/s-m2)		Altitude	(m)	20.000
Air outlet temperature	(Deg. C)	52.06	Static pressure	(Pa)	108.40
Air flow rate/fan	(m3/s)	27.733			

Vendor Reply: This temperature is confirmed.

Shall be recheck based on max ambient temperature

Design, Material, and Construction

Design pressure	(barG)	22 + F.V	**Heating Coil**		NO.
Test pressure	(barG)		No. of tubes		
Design temperature	(Deg. C)	120.00	Tube outside diameter	(mm)	
Min. design metal temp.	(Deg. C)		Tube material		
Tube bundle			Fin material and type		
Size (WxL)	(m)	2.5 X 6.4	Fin thickness	(mm)	
No./Bay		1	ASME Code, Sec. VIII, Div. 1		
Number of tube rows		4	Heating fluid		
Bundles in parallel		1	Heating fluid flow rate	(kg/hr)	
Bundles in series			Temperature (In/Out)	(Deg. C)	/
Structure mounting		Grade	Inlet pressure	(bar)	
Pipe rack beams			Pressure drop (All/Calc)	(kPa)	/
Ladders, walkways, platforms			Design temperature	(Deg. C)	
Structure surface prep.			Design pressure	(bar)	
Header surface prep.			Inlet/Outlet nozzle		/
Louver		NO.	**Header**		
Material			Type		Plug
Action control			Material		SA-516 Gr70(N)
Action type			Corrosion Allowance	(mm)	3
			No. of passes		4
			Tube / Tubesheet		Strength weld

Design, Material, and Construction (continued)

Header (continued)

Slope / Split		1% on last pass /	No
Plug material			SA 350 LF2 CL.1
Gasket material			Soft Iron

Nozzle	No.	Size, (in)	Rating/Facing
Inlet	1	6	#300
Outlet	2	4	#300
Vent			
Drain			
Chemical Cleaning			
Min. Wall Thk.			

Vendor Reply: Noted
It will be specified in Tube bundle drawing and GA

Tube

Material		SA-334 6
Tube outside diameter	(mm)	25.400
Min wall thickness	(mm)	1.651

Please specify pipe schedule

No./Bundle		140
Length	(m)	6.096
Pitch	(mm)	69.850
Layout		Triangular

Vendor Reply: Please kindly be informed for aluminum fins of air coolers no need to coating. MAYEKAWA always supplied all around the world including Iran market with such condition. It is under MAYEKAWA Guarantee

Fin

Type		Extruded
Material		Aluminum
Thickness (Base / Tip)	(mm)	1 / 0.24
Selection temp.	(C)	
Outside diameter	(mm)	57.150
Fin density	(fin/meter)	433.1
ASME Code, Sec. VIII, Div. 1		
Customer Spec		

Suitable coating shall be considered such as Heresite

Vendor Reply: Please kindly be informed that 2 fan is enough and always 2 fan per bay is used by MAYEKAWA. It is guaranteed by MAYEKAWA.

For flexibility of system, it is better consider more fans

Mechanical Equipment

Vendor Reply: This is name of company which is Italian manufacturer

Fan

Manufacturer		Axial Fans Int Srl (or equivalent)
No./Bay		2
RPM	(Revs/min.)	
Diameter	(ft)	7
No. of blades		
Pitch adjustment	(degrees)	100% Manual
Blade material		
Hub material		
@design temp	(kW)	
@min. ambient temp		

Vendor Reply: Noted

Shall be specified

Vendor Reply: Noted

Driver

Type		
Manufacturer		
No./Bay		
Driver	(kW)	7.5

Shall be specified

RPM		1500
Service factor		
Enclosure		Exec / IP55
Voltage		400
Phase		3
Cycle		50
Fan noise level	(dB)	max 85

Vendor Reply: Please kindly be informed that blades are adjustable. based on MAYEKAWA design and guarantees, no need to VFD.

VFD shall be considered to control the condenser fans

Speed Reducer

Type	V- belt
Manufacturer	
No./Bay	
Service factor	
Speed ratio	
Support	
Vib. switch	YES
Enclosure	

Direct drive shold be considered

Vendor Reply: Already direct drive has been considered and electric motor is used to drive the fan. this is V belt for transmissions

Controls - Air Side

Air recirculation			Louvers	
Degree control of outlet process temp.			Positioner	
(Max. Cooling),+/-	/		Signal air pressure (bar)	
Action on control signal failure			From	To
Fan pitch			From	To
Louvers			Supply air pressure (bar)	
Actuator air supply			From	To
Fan			From	To

Shipping

Plot area (WxL)	(m)	2.65 X 6.4	Total weight, Dry / Wet	(Kg) (Based On HTRI)	11,800 / 12,300
Bundle weight	(kg)		Shipping	(kg)	
Bay	(kg)				

1) STD. nominated power.