STYRENE PARK OFFSITE

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							
4	X								44							
5									45							
6									46							
7									47							
8									48							
9									49							
10									50							
11									51							
12									52							
13									53							
14									54							
15									55							
16									56							
17									57							
18									58							
19									59							
20									60							
21									61							
22									62							
23									63							
24									64							
25									65							
26									66							
27									67							
28									68							
29									69							
30									70							
31									71							
32									72							
33									73							
34									74							
35									75							
36									76							
37									77							
38									78							
39									79							
40									80							

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

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)	(m/s)	/ 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	(Deg. C)	67.94 / 56.66				

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			

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

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

Mechanical Equipment

Fan			RPM		1500
Manufacturer		Axial Fans Int Srl (or equivalent)	Service factor		
No./Bay		2	Enclosure		Exec / IP55
RPM	(Revs/min.)		Voltage		400
Diameter	(ft)	7	Phase		3
No. of blades			Cycle		50
Angle	(degrees)		Fan noise level	(dB)	max 85
Pitch adjustment		100% Manual	**Speed Reducer**		
Blade material			Type		V- belt
Hub material			Manufacturer		
@design temp	(kW)		No./Bay		2
@min. ambient temp			Service factor		
Tip speed			Speed ratio		
Driver			Support		
Type			Vib. switch		YES
Manufacturer			Enclosure		
No./Bay					
Driver	(kW)	7.5			

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.