



Toase-eh Park Sanati Gohar Ofogh
Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN
ENGINEERING OF STYRENE PARK OFFSITE**



Document Title: Condenser Data Sheet

Document No.: EI027-HSE-VD –ME–DSH–004- R0

Rev. R0

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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

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



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REVISION RECORD SHEET

Page Page	Revisions							Page	Revisions						
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1	X							41							
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Model no.		Heat exchanged (kW)	252.
Customer		Surface/Item-Finned tube (m2)	1579.2
Plant location	Vendor Reply: Noted Air cooler draft type is forced type. fan and motor are located at bottom of bundle	Bare tube (m2)	68.101
Service		MTD, Eff. (Deg. C)	6.8
Type draft	Please clarified	Transfer rate-Finned (W/m2-K)	26.509
Bay size (WxL) (m)	FORCED	Bare tube, service (W/m2-K)	614.72
No. of bays/Items	Meeting Conclusion: Already correct. Closed.	Bare tube, clean (W/m2-K)	708.15

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

Fluid name		Propane		In		Out	
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	
Latent heat (kJ/kg)		Noncondensables (kg/hr)		0.0000		0.0000	
Inlet pressure (bara)	19.867	Molecular Wt. (Vap/Non-cond)	/	/	/	/	
Pressure drop (All/Calc) (bar)	0.200 / 0.015	Density (Liq/Vap) (kg/m3)	435.50 /	42.251	435.58 /	46.266	
Velocity (Allow/Calc)	0.92	Specific heat (Liq/Vap) (kJ/kg-C)	3.6130 /	2.3072	3.6115 /	2.3963	
Inside fouling resistance (m2-K/W)		Thermal cond. (Liq/Vap) (W/m-C)	0.0763 /	0.0248	0.0763 /	0.0239	
Temperature (C)	4	Viscosity (Liq/Vap) (cP)	0.0728 /	0.0105	0.0729 /	0.0103	

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)	Shall be recheck based on max ambient temperature	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 Installation

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)			No./Bundle	140
Slope / Split	1% on last pass /	No	Length	(m) 6.096
Plug material	SA 350 LF2 CL.1		Pitch	(mm) 69.850
Gasket material	Soft Iron		Layout	Triangular
Nozzle	No.	Size, (in)	Rating/Facing	
Inlet	1	6	#300	
Outlet	2	4	#300	
Vent				
Drain				
Chemical Cleaning				
Min. Wall Thk.				
Tube				
Material	Please specify pipe schedule			
Tube outside diameter	(mm)			
Min wall thickness	(mm)			
			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	

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

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