



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



Document Title: Chiller (Evaporator) Data Sheet

Document No.: EI027-HSE-VD –ME–DSH–007- R0

Rev. R0

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**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

## STYRENE PARK OFFSITE

Please , To be submitted reply sheet and issue new revision  
of Chiller ( Evaporator ) Data sheet and also to be  
implemented our comments.

Vendor Reply: Noted

**Document Title:**

## Chiller (Evaporator) Data Sheet

Evaporator capacity shall be compatible with project  
documents and submitted compressors capacity.

Vendor Reply: It is confirmed that evaporator is  
completely match with project documents. just we  
have considered 10% margin on duty as the safety  
margin of heat exchanger. this 10% margin has been  
considered on each chiller.

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R0	21-02-2024	IFA	F.sh	M.O	A.M



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**REVISION RECORD SHEET**

Page Page	Revisions							Page	Revisions						
	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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HTRI		HEAT EXCHANGER SPECIFICATION SHEET				Page 1
Released to the following company:		Related duty spec. shall be filled out or totally confirm				SI Units
Customer	PAD JAM PETROCHEMICAL	Vendor Reply: Please kindly be informed that we have confirmed and reconfirm				Job No.
Address		duty spec. Additional we have considered 10% margin on flowrate of each				Reference No.
Plant Location	ASSALOUYEH	evaporator.				Proposal No.
Service of Unit	Evaporator					Date
Size	600 - 924.32 x 2500 mm	Type	BKU	Horizontal	Connected In	1 Parallel 1 Series
Surf/Unit (Gross/Eff)	61.76 / 58.884 m2	Shell/Unit	1		Surf/Shell (Gross/Eff)	61.76 / 58.884 m2
PERFORMANCE OF ONE UNIT						
Fluid Allocation		Shell Side		Tube Side		
Fluid Name		Propane		Styrene		
Fluid Quantity, Total kg/hr		3104.1		40623		
Vapor (In/Out)		1346.2		3104.1		
Liquid		1757.8		40623		
Steam				40623		
Water						
Noncondensables						
Temperature (In/Out) C		1.22		1.00		
Specific Gravity		0.5331		0.9100 0.9184		
Viscosity mN-s/m2		0.0076 V/L 0.1295		0.0076 0.8200 0.9600		
Molecular Weight Vapor		1.7857 V/L 2.4337		1.7835 1.6040 1.5780		
Molecular Weight Noncondensables		0.0161 V/L 0.1090		0.0160 1.5000 1.5000		
Specific Heat kJ/kg-C		375.46		375.79		
Thermal Conductivity W/m-C		480.96		300.00		
Latent Heat kJ/kg		0.18		0.67		
Inlet Pressure kPa		5.000		3.429		
Velocity m/s		0.000170				
Pressure Drop, Allow/Calc kPa		183233 W				
Fouling Resistance (min) m2-K/W		Clean		524.15 W/m2		
Heat Exchanged						
Transfer Rate, Service						
CONSTRUCTION OF ONE SHELL						
Design/Test Pressure kPaG		Shell Side 2200.0 /		Tube Side 680.00 /		
Design Temperature C		120.00		85.00		
No Passes per Shell		1		4		
Corrosion Allowance mm		3.000		3.000		
Connections In mm		1 @ 154.05		1 @ 77.927		
Size & Rating Out mm		1 @ 102.26		1 @ 77.927		
Rating Intermediate		@		@		
Tube No. 188U		OD 19.050 mm	Thk(Avg) 1.651 mm	Length 2.500 m	Pitch 23.813 mm	
Tube Type Plain		Material SA-334 6				Tube pattern 30
Shell SA-516 70N		ID 600.00	OD mm	Shell Cover SA-516 70N	(Integ.)	
Channel or Bonnet SA-516 70N		Channel Cover SA-516 70N				
Tubesheet-Stationary SA-350 LF2 CL.1		Tubesheet-Floating				
Floating Head Cover		Impingement Plate Circular plate				
Baffles-Cross Carbon steel		Type Support	%Cut (Diam)	Spacing(c/c) 611.90	Inlet mm	
Baffles-Long		Seal Type None				
Supports-Tube		U-Bend				Type Full support
Bypass Seal Arrangement		pairs seal strips	Tube-Tubesheet Joint	Expanded (2 grooves)		
Expansion Joint		Type None				
Rho-V2-Inlet Nozzle 91.14 kg/m-s2		Bundle Entrance		Bundle Exit	kg/m-s2	
Gaskets-Shell Side Mach. Mtl. (Kammprofile\Flex. Face)		Tube Side	Mach. Mtl. (Kammprofile\Flex. Face)			
- Floating Head Mach. Mtl. (Kammprofile\Flex. Face)						
Code Requirements		TEMA Class R				
Weight/Shell 2116.0 kg		Filled with Water	4073.4 kg	Bundle 872.38	kg	
Remarks: Supports/baffle space = 3.		Vendor Reply: Noted				
Material guarantee is in vendor scope.						
Full Vacuum on Shell Side and Tube Side will be considered.						
Note: Reported duty and flow rates include a user-specified multiplier of 1.10. Reprinted with Permission (v8.0.0.1)						

Evaporator quantity for each unit of specified Vendor Reply evaporator for quantity of each unit has been specified in shell/unit

Shall be reviewed Vendor Reply: this is specific gravity and same as client duty spec

Please recheck Vendor Reply: 1.5000 and 1.5000 required in revised

Refer to client Duty Specification for Refrigeration Unit, page 5, styrene molar specific heat capacity is 167.1 and 167.4 kJ/kmol.°C at 15.2 and 5°C respectively. By considering 104.2 kg/kmol as styrene molecular weight (specified in client duty specification), mass specific heat capacity is calculated (167.1/104.2=1.604 and 167.4/104.2=1.578 kJ/kg.°C)