




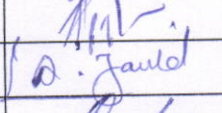
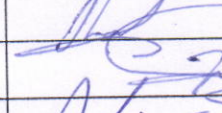
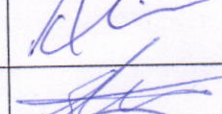
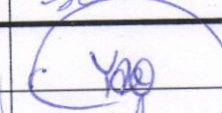
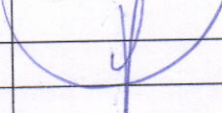
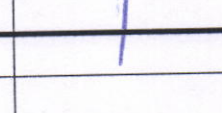
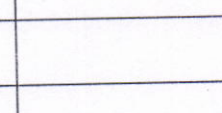






Owner/MC:  	<b>MINUTES OF METTING</b>	Contractor: 
	<b>Project Title:</b> Procure, Construct, Pre-Commissioning & Commissioning of Styrene Park (Off-site Facilities & Utilities)	<b>Dated:</b> 09-Apr-2024
	<b>P.O. Description:</b> Refrigeration Package	<b>Project No.:</b> PJPC-98-36 <b>P.O. No.:</b> Offsite - 60

Attendees: (*: Part Time Attendance)			
Company	Name	Title	Signature
Client /Consultant PJPC/ Gohar Ofogh	Mr. Bakhtiari	Project Manager-PJPC	
	Mr. Ahangaran	Offsite engineering Head-PJPC	
	Mr. Javid	Engineering Head- GOPC	
	Mr. Chizari	Process Engineer- GOPC	
	Mr. Parnianchi	Mechanical Engineer- GOPC	
Contractor	Mr. Afshinnejad	Chairman (Hse Group)	
	Mr. Shoarian	Project Manager (Hse Group)	
Purchaser: Petroelectric Energy Development CO (PEEDCo.)	Mr. Yari	Purchasing Manager	

Owner/MC:  	<b>MINUTES OF METTING</b>	Contractor: 
	<b>Project Title:</b> Procure, Construct, Pre-Commissioning & Commissioning of Styrene Park (Off-site Facilities & Utilities)	<b>Dated:</b> 09-Apr-2024
	<b>P.O. Description:</b> Refrigeration Package	<b>Project No.:</b> PJPC-98-36 <b>P.O. No.:</b> Offsite - 60

شرح	ردیف
<p>مدارک ذیل مورد بررسی قرار گرفت و کلیه مدارک از طرف کارفرما (Approved as Note) شد.</p> <p style="text-align: right;">           ۱. Evaporator Data sheet            ۲. Condenser Data sheet            ۳. Compressor/Package Data Sheet         </p>	۱
<p>۱. با توجه به بررسی مدارک ذکر شده کامنت جدیدی از نظر بخش Mechanical از طرف کارفرمای محترم وجود ندارد. مقرر گردید مدرک Compressor/Package Data sheet از نظر فرایندی تا حداکثر روز یکشنبه ۲۶ فروردین مورد بررسی نهایی توسط کارفرما قرار گیرد.</p>	۲







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

Page 1 of 3

## STYRENE PARK OFFSITE

**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

*Handwritten signature*



Toase-che 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

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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
1	X						41							
2	X						42							
3	X						43							
4							44							
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Toase-che 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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Page 1  
SI Units

**HEAT EXCHANGER SPECIFICATION SHEET**

Related duty spec. shall be filled out or totally confirm  
Released to the following company:  
SC  
SSD

Vendor Reply: Please kindly be informed that we have confirmed and reconfirm  
Job No.  
Reference No.  
Additional we have considered 10% margin on flowrate of each  
evaporator.

Proposed No.  
Date: 2/21/2024 Rev: 0

Item No.

Customer: PAD JAM PETROCHEMICAL  
Address:  
Plant Location: ASSALOUYEH  
Service of Unit: Evaporator  
Size: 600 - 924.32 x 2500 mm Type: BKU Horizontal Connected In: 1 Parallel: 1 Series: 1  
Surf/Unit (Gross/Eff): 61.76 / 58.884 m2 Shell/Unit: 1 76 / 58.884 m2

PERFORMANCE OF ONE UNIT			
Shell Side		Tube Side	
Fluid Allocation	Propane		
Fluid Name			
Fluid Quantity, Total	kg/hr	3104.1	3104.1
Vapor (In/Out)		1346.2	3104.1
Liquid		1757.9	40623
Steam			
Water			
Noncondensables			
Temperature (In/Out)	C		1.00
Specific Gravity		0.5331	0.9100
Viscosity	mN-sm <sup>2</sup>	0.0076	0.8200
Molecular Weight		V/L 0.1295	0.9600
Molecular Weight			
Specific Heat		1.7857	1.7835
Thermal Conductivity	W/m-C	0.0161	0.0160
Latent Heat	kJ/kg	375.46	375.79
Inlet Pressure	kPa		480.96
Velocity	m/s		0.18
Pressure Drop, Allow/Calc	kPa	5.000	3.429
Fouling Resistance (min)	m <sup>2</sup> -K/W		0.000170
Heat Exchanged		183233 W	
Transfer Rate, Service	391.85 W/m <sup>2</sup> -K	Clean	524.15 W/m <sup>2</sup>

Vendor Reply: Please kindly be informed that we have confirmed and reconfirm  
Vendor Reply: this is specific gravity and same as client duty spec.  
Vendor Reply: This specific gravity and has not unit.  
Please recheck  
Vendor Reply: Deleted and updated as 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)

**CONSTRUCTION OF ONE SHELL**

	Shell Side	Tube Side
Pressure	kPaG	2200.0 / 680.00
Temperature	C	120.00 / 85.00
Number of Tubes		1 / 4
Tube Diameter	mm	3.000 / 3.000
Tube Length	mm	1 @ 154.05 / 1 @ 77.927
Tube Spacing	mm	1 @ 102.26 / 1 @ 77.927
Tube End	mm	@ / @
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.  
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.

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



Document Title: Package / Compressor Data Sheet

Document No.: EI027-HSE-VD -GE-DSH-001- R1

Rev. R1

Page 1 of 7

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

**General Comments:**

1- Vendor shall issue the "Duty Specification" for this package and mention it in this data sheet. Moreover more clarification about equipments shall represented in that document.

Vendor Reply 17-Feb-24: Duty specification is issued by esteemed Client and we have issued package Data Sheet based on agreements made during the meeting and scope of supply agreements, accordingly duty specification can not be issued by vendor and client can refer to this document as per this Data Sheet.

2- Vendor shall issue the P&ID for this package. There are some items that need to be specify in the P&ID, i.e. Instrument items, size of the lines and ...

Vendor Reply 17-Feb-24: Noted. This is part of VPIS agreed with Client.

3- Vendor shall issue the "Equipment List" document for this package and specify all required equipment in that document with their specification.

Vendor Reply 17-Feb-24: VPIS has been agreed with Client during the meeting and this Document (Package data sheet) is our Equipment List.

4- Safety Equipment Specifications shall be submitted.

Vendor Reply 17-Feb-24: This is not applicable in this Package.

5-Field Instrument Specifications shall be submitted.

Vendor Reply 17-Feb-24: This will be submitted as Instrument Data sheet in approved VPIS.

**Document Title:**

**Package / Compressor Data Sheet**

**Mechanical comments:**

1.Filled client duty spec. shall be submitted by vendor.

2.Closed.

3.Equipment list shall be considered otherwise related table shall be shown in layout document.

4.As min. safety equipment spec. shall be reviewed and deviation list shall be submitted.

5.Closed.

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R1	05-02-2024	IFA	F.SH	M.O	A.M
R0	09-09-2023	IFA	N.B	F.SH	A.M



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



Document Title: Package / Compressor Data Sheet

Document No.: EI027-HSE-VD-GE-DSH-001- R1

Rev. R1

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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	X						41							
2	X	X						42							
3	X	X						43							
4	X	X						44							
5	X	X						45							
6	X	X						46							
7	X	X						47							
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Document Title: Package / Compressor Data Sheet      Rev.R1      Date:05.02.2024      Page 03 Of 07

Document No.: EI027-HSE-VD-ME-DSH-001- R1

Customer: **PETRO ELECTRIC**  
 Plant Name/Project Name: 0001 A/B  
 Item No./Name: OPERATING COND  
 No. of Required: 2 Unit(s)  
 R DS / PER EACH COMP. UNIT

Fluid (degC): Styrene      152      5  
 Capacity (kW): 165      *Shall be acc. to project*  
 Evaporating Temp. (degC): 0  
 Condensing Temp. (degC): 56      *Shall be recheck based on max ambient temperature*  
 Side Temp. (degC):

Vendor reply 07.04.24: this is in accordance with project document Conclusion meeting 8 Apr. Closed

COMPRESSOR DESIGN COND  
 Design: Design specified capacity is as per duty spec of the project Conclusion meeting 8 Apr. Closed.  
 Compressor Model:      *Vendor reply 07.04.24: please clarify*  
 Motor Speed (rpm): 2950      *※Motor Speed = Compressor Speed*  
 Comp Load (%): 100      *Related duty spec. shall be fillet out or totally confirm*

Quantity: 1 Per unit  
 Capacity/unit (kW): 165      *Shall be acc. to project docs*  
 Power/unit (kW): 120      *\* Compressor BkW*  
 Driver: Motor  
 Stating Method: Direct  
 Capacity Control: Control      *Vendor reply 07.04.24: This has been agreed as per MOM 09.01.24 Conclusion meeting 8 Apr. Closed.*

According to the "Duty Specification" document, "outdoor without any shelter" shall be considered. Vendor Reply 17-Feb-24: Please refer to our KOM and withdraw the Comment.

SITE CONDITION  
 Location:  Indoor (heated)     Outdoor under Shelter (Provided by Client)     Hazardous Area : Zone 2 IIB T3  
 Normal weather condition (Temp. +5°C TO +48°C)      *Shall be acc. to project docs*





Noise:  Noise Level 85dB(A) at 1m from Unit  
 Oil Separation: 1st Separation

**MATERIAL DESIGN**

Code & Standard	Item	Material	Design	Remarks
	Unit System	<input type="checkbox"/> JIS	<input checked="" type="checkbox"/> MYK Standard	JIS = Japanese Industrial Standards
	Compressor	<input checked="" type="checkbox"/> JIS	<input checked="" type="checkbox"/> MYK Standard	
	Press Vessel	<input checked="" type="checkbox"/> AD/MYCOM STD <input type="checkbox"/> ISO <input type="checkbox"/> PED	<input checked="" type="checkbox"/> MYK Standard	<i>All manufacturer &amp; MYCOM standard items shall be guaranteed by vendor</i>
	Heat Exchanger	<input checked="" type="checkbox"/> AD/MYCOM STD <input type="checkbox"/> ISO <input type="checkbox"/> PED	<input checked="" type="checkbox"/> MYK Standard	
	Valve	<input checked="" type="checkbox"/> DIN <input checked="" type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> PED	<input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ISO	DIN = Germany Industrial Standards
	Safety Valve	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO	<input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ASRAE	Single Type
	Piping	<input checked="" type="checkbox"/> DIN <input checked="" type="checkbox"/> ASME <input type="checkbox"/> ISO	<input checked="" type="checkbox"/> Manufacture's Std.	Piping inside the Compressor Skid is as per MYCOM STD. Tie in as per Project specification
	Flange	<input checked="" type="checkbox"/> DIN <input checked="" type="checkbox"/> ASME <input type="checkbox"/> ISO	<input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> JIS	Piping inside the Compressor Skid is as per MYCOM STD. Tie in as per Project specification
	Thread Connection	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> PT <input type="checkbox"/> NPT		
	MOTOR	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> JIS	<input checked="" type="checkbox"/> IEC <input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ISO	
	Instrumentation	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> JIS	<input checked="" type="checkbox"/> IEC <input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ISO	
	Control Panel	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> JIS	<input type="checkbox"/> IEC <input type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ISO	1 set of S7 1200 Common for the Unit
	Cable & wiring	<input type="checkbox"/> DIN <input type="checkbox"/> ASME <input type="checkbox"/> ISO <input type="checkbox"/> JIS	<input checked="" type="checkbox"/> IEC <input checked="" type="checkbox"/> Manufacture's Std. <input type="checkbox"/> ISO	

**UTILITY**

Electricity		Rated Power (kW)		Volte (V)	Frequency (Hz)	Phase	Note
		Value	Q'ty				
	Compressor Power	120	1	LV	50	3	Compressor shaft power Rpm. 2950
	Oil Pump Motor for CP	2.5	1	LV	50	3	CP = Compressor Pump
	SB Oil Pump Motor for CP	n/a				3	SB = Stand-by
	Control Panel			DC24V		1	
	Oil Heater	1.5kW				3	
Cooling Water	Temp. (degC)	in NA				return NA	
	Press. (barG)	in					
	Flow Rate (m3/hr)			x 1	Fouling Factor TBA		m2h°C/kcal
Instrument	Press. (barG)	***	Temp. (degC)	***	Flow Rate (Nm3/hr)		Approx. ***

 		Package data sheet		 	
Document Title: Package / Compressor Data Sheet		Rev.R1		Date:05.02.2024	Page 04 Of 07
Document No.: EI027-HSE-VD-ME-DSH-001- R1		Scope of Supply and Work (1/3)- Two Refrigeration Packages Each One including following items:			
No	Item	Scope	Q'ty	Remarks	
1	MYCOM Compressor		1	Compressor Skid	
	Compressor			model P160VSD-M	
	Electric motor for compressor	■	1	Casing / Rotor : Cast iron / Ductile Iron, O-rings Viton Rated power 120k , LV, 50 Hz IP55 Exec Suitable for Zone 2	
	Oil Pump	■	1	For Each Compressor	
	Electric motor for Oil Pump	■	1	2.5 kW IP55 / Class F/B	
	1st Oil separator	■	1	Horizontal drum type primary fine oil separator Shell : Carbon Steel / Design Cord : PED	
	Oil cooler	■	1	MYCOM STD Refrigerant Cooled	
	Oil filter	■	1	Shell : Carbon Steel For Each Compressor	
	Oil heater	■	1	1.5 kW For Eac	
	Compressor	■	1	Related duty spec. shall be filled out or totally confirm	
	Compressor	■	1	Some items of this page need to be specified in the "Duty Specification" document, i.e. oil heater, oil filter and ...	
	Compressor	■	1	Moreover, Instrument items will be check in the P&ID Vendor Reply 17-Feb-24: These Items are part of MYCOM Compressor Package and Compressor package Data Sheet and Drawing is already provided as per approved VPIS.	
	Compressor	■	1	Vendor reply 07.04.24: This will be used only for refrigerant charging Conclusion meeting 8 Apr: Closed.	
	Compressor	■	1	Shall be clarified	
	Dryer Filter	■	1	Temporary use for both packages	
	Suction Filter	■	1	Suction strainer Shall be clarified	
	Control panel	■	1	Siemens S7-1200 PLC for safe area common for complete system	
	Instruments IP65, Ex execution	■	1 set	1) Suction/Discharge check valves (SC) 2) Single Safety valve for compressor on oil separators (CS) 3) ATEX coupling (main coupling and oil pump) , non sparking 4) Instrumentation Exd and will be As per MYCOM STD 5) Instruments to be mounted locally Per Mfr Std. qty: 1 pce, Exe	
	Junction Box			Vendor reply 07.04.24: PLC is located in Safe area(control room) Conclusion meeting 8 Apr: Closed. Direct feeder for Package Electrical users to be provided by client	



Package data sheet



Document Title: Package / Compressor Data Sheet

Document No.: EI027-HSE-VD-ME-DSH-001- R1

Rev.R1

Date:05.02.2024

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Scope of Supply and Work (2/3):

No	Item	Scope	Q'ty	Remarks
	<b>Piping , Tubing Work &amp; Valves</b>			
	Within skid / Shop Work	<input checked="" type="checkbox"/>	1 set	CS material  According to General Comment number 2, size of the pipes will be checked in the P&ID document Vendor Reply 17-Feb-24: To be discussed in P&ID please withdraw this comment.
	Between skids / Site Work	<input type="checkbox"/>		
	To others / site Work	<input type="checkbox"/>		
	<b>Electric Wiring Work</b>			
	Wiring within skid / Shop Work	<input checked="" type="checkbox"/>	1 set	More specification shall be represented in the "Duty Specification" document Vendor Reply 17-Feb-24: Please refer to above replies. Duty specification is not a part of Vendor Documents.
	Wiring between skids / Site Work	<input type="checkbox"/>		
	Wiring to others / site Work	<input type="checkbox"/>		
	<b>Thermal insulation, personal protection and fire protection</b>			
	Engineering	<input checked="" type="checkbox"/>		Related duty spec. shall be filled out or totally confirm
	Shop work	<input type="checkbox"/>		
	Field work	<input type="checkbox"/>		
	<b>Ladder, Platform and Structure / Maintenance accessory</b>			
	Material	<input type="checkbox"/>		Not For this Size Machine Not Required
	Shop work	<input type="checkbox"/>		
	Field work	<input type="checkbox"/>		
	<b>Heat/Steam tracing</b>			
	Material	<input type="checkbox"/>	By Client	Required insulation & heat tracing for parts of equipment shall be considered by vendor.
	Shop work	<input type="checkbox"/>		
	Field work	<input type="checkbox"/>		
	<b>Acoustic Enclosure</b>	<input type="checkbox"/>		

Vendor reply 07.04.24: As per previous revision which comments are agreed between parties, supply of Insulation and heat tracing is by site contractor not by vendor. This is also specified in project in duty spec to be done by others. Vendor will provide information. Conclusion meeting 8 Apr. Closed. refer to Item No.8 this can be done against optional daily rate.



**MYCOM SCREW COMPRESSOR PERFORMANCE SINGLE STAGE (BOOSTER)**

Title : \_\_\_\_\_

MODEL :	P160VS*-M	Please recheck and refer to comments on the body of document, just required capacity specifications shall be submitted. M Vendor reply: we have considered higher capacity compressor however, 165 KW as guaranteed capacity as per duty specification is our guarantee figure Conclusion meet 156.1 Appl. 151.3		
REFRIGERANT :	PROPANE			
RECOMMENDED PORT :				
Vi :	[-]	3.64	3.64	3.64
COMPRESSION RATIO :	[-]	1.33	1.33	1.33
CAPACITY :	[kW]	156.1	151.3	151.3
CAPACITY :	[TR]	55.8	48.7	43.0
ABSORBED POWER :	[kW]	98.2	91.2	85.6
DRIVE SHAFT SPEED :	[min-1]	2950	2950	2950
COMPRESSOR SPEED :	[min-1]	2950	2950	2950
INDICATOR POSITION :	[%]	80.0	80.0	70.0
CONDENSING TEMP. :	[degC]	56.0	56.0	56.0
EVAPORATIVE TEMP. :	[degC]	0.00	0.00	0.00
SUCTION SUPERHEAT :	[degC]	0.00	0.00	0.00
LIQUID SUBCOOLING :	[degC]	0.00	0.00	0.00
SUCTION TEMP. :	[degC]	0.00	0.00	0.00
OIL SUPPLY TEMP. :	[degC]	50.0	50.0	50.0
SUCTION PRESS. :	[MPaA]	0.466	0.466	0.466
DISCHARGE PRESS. :	[MPaA]	2.03	2.03	2.03
OIL SUPPLY PRESS. :	[MPaA]	2.23	2.23	2.23
SUCTION PRES. DROP :	[MPa]	0.005	0.005	0.005
DISCHARGE PRES. DROP :	[MPa]	0.050	0.050	0.050
SWEPT VOLUME :	[m3/h]	415	415	415
LOAD(SUCTION VOL. FLOW RATE) :	[%]	86.5	75.6	66.7
DISCHARGE TEMP. :	[degC]	68.6	69.2	69.7
REFRIG. FLOW RATE SUC. :	[m3/h]	317	277	245
REFRIG. FLOW RATE DIS. :	[m3/h]	75.1	65.9	58.4
REFRIG. FLOW RATE SUC. :	[kg/h]	3213	2808	2479
REFRIG. FLOW RATE DIS. :	[kg/h]	3213	2808	2479
INJECT. OIL FLOW RATE :	[L/min]	-	-	-
LUB. OIL FLOW RATE :	[L/min]	44.9	44.9	44.9
F. SIDE OIL FLOW RATE :	[L/min]	8.33	8.33	8.33
*TOTAL* OIL FLOW RATE :	[L/min]	53.2	53.2	53.2
OIL HEAT REJECTION :	[kW]	28.0	28.9	29.7
OIL SPEC HT :	[J/kgK]	1930	1930	1930
OIL DENSITY :	[kg/m3]	880	880	880
COP :	[-]	2.00	1.88	1.77
Elevation :	[m]	NA	NA	NA
Atmospheric :	[MPa]	NA	NA	NA

--- SUPER HEAT is NOT counted in refrigeration capacity ---

--- WITH THERMO-SIPHON OIL COOLER ---

--- NO OIL INJECTION ---

--- When choosing the motor set a safety factor of more than 10% for the brake power. ---

--- Please check carefully the operating range. ---

--- Reference temperature : Dew Point ---

\*\*\* MYCOMW27 compressor performance table is valid until the end of Mar. 2024. \*\*\*

Performance curve shall be submitted  
 Vendor reply: Oil flooded screw compressor curve is not applicable



Toase-ehe 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

Page 1 of 4

## 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**

*[Handwritten signatures and initials in blue ink]*

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

*[Handwritten signatures in blue ink]*



Toase-che Park Sanati Gohar Ofogh  
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Rev. R0

Page 2 of 4

**REVISION RECORD SHEET**

Page Page	Revisions						Page	Revisions						
	R0	R1	R2	R3	R4	R5		R6	R0	R1	R2	R3	R4	R5
1	X						41							
2	X						42							
3	X						43							
4	X						44							
5							45							
6							46							
7							47							
8							48							
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39							79							
40							80							

<p>Model no. _____</p> <p>Customer _____</p> <p>Plant location <span style="font-size: x-small;">Vendor Reply: Noted Air cooler draft type is forced type, fan and motor are located at bottom of bundle</span> _____</p> <p>Service _____</p> <p>Type draft <span style="font-size: x-small;">Please clarified</span> <b>FORCED</b></p> <p>Bay size (WxL) _____ (m) <b>2.65 X 6.4</b></p> <p>No. of bays/Items _____ <b>1</b></p>	<table style="width:100%; border-collapse: collapse;"> <tr><td>Heat exchanged (kW)</td><td style="text-align: right;">252.</td></tr> <tr><td>Surface/Item-Finned tube (m2)</td><td style="text-align: right;">1578.2</td></tr> <tr><td>Bare tube (m2)</td><td style="text-align: right;">68.101</td></tr> <tr><td>MTD, Eff. (Deg. C)</td><td style="text-align: right;">6.8</td></tr> <tr><td>Transfer rate-Finned (W/m2-K)</td><td style="text-align: right;">26.509</td></tr> <tr><td>Bare tube, service (W/m2-K)</td><td style="text-align: right;">614.72</td></tr> <tr><td>Bare tube, clean (W/m2-K)</td><td style="text-align: right;">708.15</td></tr> </table>	Heat exchanged (kW)	252.	Surface/Item-Finned tube (m2)	1578.2	Bare tube (m2)	68.101	MTD, Eff. (Deg. C)	6.8	Transfer rate-Finned (W/m2-K)	26.509	Bare tube, service (W/m2-K)	614.72	Bare tube, clean (W/m2-K)	708.15
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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	0.0000
Dew/bubble point (Deg. C)	/	Water/Steam (kg/hr)	0.0000 / 0.0000	0.0000 / 0.0000	0.0000
Latent heat (kJ/kg)		Noncondensables (kg/hr)	0.0000	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	435.58 / 46.266
Velocity (Allow/Calc)	0.82	Specific heat (Liq/Vap) (kJ/kg-C)	3.6130 / 2.3072	3.6115 / 2.3983	3.6115 / 2.3983
Inside fouling resistance (m2-K/W)		Thermal cond. (Liq/Vap) (W/m-C)	0.0763 / 0.0248	0.0763 / 0.0239	0.0763 / 0.0239
Temperature	4	Viscosity (Liq/Vap) (cP)	0.0728 / 0.0105	0.0729 / 0.0103	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)	52.06	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)**

<p><b>Header (continued)</b></p> <p>Slope / Split _____ 1% on last pass / No</p> <p>Plug material _____ SA 350 LF2 CL.1</p> <p>Gasket material _____ Soft Iron</p> <p><b>Nozzle</b></p> <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;">No.</th> <th style="width:15%;">Size, (in)</th> <th style="width:15%;">Rating/Facing</th> <th style="width:10%;">No./Bundle</th> </tr> <tr> <td>1</td> <td>6</td> <td>#300</td> <td>140</td> </tr> <tr> <td>2</td> <td>4</td> <td>#300</td> <td>6,096</td> </tr> </table> <p>Inlet _____</p> <p>Outlet _____</p> <p>Vent _____</p> <p>Drain _____</p> <p>Chemical Cleaning _____</p> <p>Min. Wall Thk. _____</p> <p><b>Tube</b></p> <p>Material _____ <small>Vendor Reply: Noted It will be specified in Tube bundle drawing and GA Please specify pipe schedule</small></p> <p>Tube outside diameter _____ (mm)</p> <p>Min wall thickness _____ (mm)</p>	No.	Size, (in)	Rating/Facing	No./Bundle	1	6	#300	140	2	4	#300	6,096	<p>Layout _____ Triangular</p> <p>Fin _____ Extruded</p> <p>Material _____ Aluminum</p> <p>Thickness (Base / Tip) _____ (mm) 1 / 0.24</p> <p>Selection temp. _____ (C)</p> <p>Outside diameter _____ (mm) 57.150</p> <p>Fin density _____ (fin/meter) 433.1</p> <p>ASME Code, See VIII Div. 1 _____</p> <p>Customer Spec _____ <small>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.</small></p> <p><small>For flexibility of system, it is better consider more fans</small></p>
No.	Size, (in)	Rating/Facing	No./Bundle										
1	6	#300	140										
2	4	#300	6,096										

<p><b>Fan</b></p> <p>Manufacturer _____ <small>Vendor Reply: This is name of company which is Italian manufacturer</small></p> <p>No./Bay _____ Axial Fans Int Srl (or equivalent)</p> <p>RPM _____ <small>Vendor Reply: Noted</small></p> <p>Diameter _____ (ft) <small>Should be specified</small></p> <p>No. of blades _____</p> <p>Pitch adjustment _____ (degrees) <small>Vendor Reply: Noted</small></p> <p>Blade material _____</p> <p>Hub material _____</p> <p>@design temp _____ (kW)</p> <p>@min. ambient temp _____</p> <p><b>Driver</b></p> <p>Type _____ <small>Should be specified</small></p> <p>Manufacturer _____</p> <p>No./Bay _____</p> <p>Driver _____ (kW) 7.5</p>	<p><b>Equipment</b></p> <p>RPM _____ 1500</p> <p>Service factor _____</p> <p>Enclosure _____ Exec / IP55</p> <p>Voltage _____ 400</p> <p>Phase _____ 3</p> <p>Cycle _____ 50</p> <p>Fan noise level _____ max 85</p> <p><b>Speed Reducer</b></p> <p>Type _____ VFD shall be considered to control the condenser fans</p> <p>Manufacturer _____</p> <p>No./Bay _____</p> <p>Service factor _____</p> <p>Speed ratio _____</p> <p>Support _____</p> <p>Vib. switch _____ YES</p> <p>Enclosure _____</p>
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<p><b>Controls - Air Side</b></p> <p>Air recirculation _____</p> <p>Degree control of outlet process temp. _____ (Max. Cooling), +/-</p> <p>Action on control signal failure _____</p> <p>Fan pitch _____</p> <p>Louvers _____</p> <p>Actuator air supply _____</p> <p>Fan _____</p>	<p>Louvers _____</p> <p>Positioner _____</p> <p>Signal air pressure (bar) _____</p> <p>From _____ To _____</p> <p>From _____ To _____</p> <p>Supply air pressure (bar) _____</p> <p>From _____ To _____</p> <p>From _____ To _____</p>
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<p><b>Shipping</b></p> <p>Plot area (WxL) _____ (m) 2.65 X 6.4</p> <p>Bundle weight _____ (kg)</p> <p>Bay _____ (kg)</p>	<p>Total weight, Dry / Wet (Kg) _____ (Based On HTRI) 11,800 / 12,300</p> <p>Shipping _____ (kg)</p>
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1) STD. nominated power.