PPI / NARGAN	DEHDASHT PETROCHEMICAL INDUSTRY COMPANY DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT	PGPIC
	DOCUMENT TITLE: Condenser Data Sheet	POI: IFA
Contract No.: DPIC/98-12	DOCUMENT NUMBER: DPIC9812-000-VD-1002-ME-DS-0075	Rev. No.: D2

Regarding last meeting with vendor, please revise calculation as per thermal calculation comment for considering 1.1x748000 for flowrate and duty of 1750 kw and please size all equipment inside package for mentioned design duty of chiller

Previous comment as per agreement shall be implemented

DOCUMENT TITLE:

Condenser Data Sheet
(E-PK6101-2)

Tube and shell detail data which will be affected based on revised thermal calculation will be checked in next revision and discrepancies with data sheet and DWG will be checked in next revision

PURCHASER'S COMMENT/APPROVAL STATUS		Purchaser: NARGAN
1	AP: Approved (Released for Manufacturing)	Requisition No.: DPIC98-12-001-000-ME-MR-4150-0001-D2
X	AN: Approved With Minor Comments (Fabrication may Proceed)	
3	NF: Approved With Comments (Fabrication not Proceed)	Item No. (Tag No.): PK-6101
4	RJ: Rejected	
5	NR: Not be Returned	Vendor Doc. No.: DPIC9812-000-VD-1002-ME-DS-0075-D1
Date: 06.03.2022	Signature: A.AB	

REV	DATE ISSUE	PREPARED	CHECKED	APPROVED
D2	21.Jan.22	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI
D1	25.Dec.21	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI
D0	30.Oct.21	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI

KASRAVAND Engineering & Construction

PPI / NARGAN	**DEHDASHT PETROCHEMICAL INDUSTRY COMPANY** **DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT**	شرکت صنایع پتروشیمی خلیج فارس PGPIC شرکت صنایع پتروشیمی دهدشت (سهامی خاص)
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Page	Rev-D0	Rev-D1	Rev-D2	Rev-D3	Rev-D4
1	x	x	x		
2	x	x	x		
3	x	x	x		
4	x	x	x		
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DEHDASHT PETROCHEMICAL INDUSTRY COMPANY

DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT

DOCUMENT TITLE: Condenser Data Sheet

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Surface is under design.

1	SERVICE	CONDENSER				ITEM	E-PK6101-2	
2	DIAM. X LENGTH	1180 X 5000 mm		MOUNTIN	HORIZONTAL	TYPE	BEM	
3	NO. OF UNIT	1		SURFACE PER UNIT	521.12 m²	IN PARALLEL	1	
4	SHELLS PER UNIT	1		SURFACE PER SHELL	521.12 m²	IN SERIES	1	
5	TEMA CLASS	R		REQUIRED OVERDESIGN		CODE	TEMA. 9TH ED.	

			SHELL SIDE		TUBE SIDE	
6	**PERFORMANCE**					
7			SHELL SIDE		TUBE SIDE	
8	FLUID CIRCULATED		PROPYLENE		JACKETED WATER	
9	FLUID QUANTITY, TOTAL	kg/h	26500		289043	
10			IN	OUT	IN	OUT
11	VAPOUR	kg/h	26500	-	-	-
12	LIQUID	kg/h	-	26500	289043	289043
13	NON CONDENSABLES	kg/h	-	-	-	-
14	TEMPERATURE	°C	80.3	48.4	37	45
15	DENSITY at T and P (Vap./Liq.)	kg/m³	35.722	466.87	993.59	990.48
16	VISCOSITY at T and P (Vap./Liq.)	cP	0.0111	0.0668	0.6914	0.596
17	MOLECULAR WEIGHT					
18	SPECIFIC HEAT (Vap./Liq.)	k		3.2608	4.1773	4.1774
19	THERMAL CONDUCTIVITY (Vap./Liq.)	W		0.0902	0.6252	0.6352
20						
21	INLET PRESSURE (abs)		0.900		6.914	
22	VELOCITY (Mean/Max)			/ 0.59		/ 1.01
23	PRESSURE DROP (Allowable/Calculated)			0.018	0.1	0.267
24	FOULING RESISTANCE (Min)	m²·K/W	0.00017		0.0002	
25	TYPE OF CLEANING MAINTENANCE		☑ NO CHEM.		☐ NONE ☐ MECH. ☐ CHEM.	
26	HEAT EXCHANGED	2627 kW	MTD (		9.7	°C
27	TRANSFER RATE: SERVICE:	529.86 CALCULATED:		CLEAN:	954.6	W/m²·K
28	**CONSTRUCT**					
29	DESIGN PRESSURE	barg			23	
30	VACUUM PRESSURE	barg	-1.03		-	
31	TEST PRESSURE	barg	29.9		29.9	
32	DESIGN TEMPERATURE	°C	135		190	
33	MIN. DESIGN METAL TEMPERATURE	°C	-45.0		-4	
34	NUMBER PASSES PER SHELL		1		4	
35	CORROSION ALLOWANCE		3		3	
36	PARTICULAR SERVICE		-		-	
37	PROVIDE X-RAY		FULL		FULL	
38	PROVIDE STRESS RELIEVING		☐ CHANNEL	☐ BUNDLE	☐ SHELL	

Allowable Pressure drop to be considered 1 bar based on project utility and site condition. PFD anf H&MB to be updated based on calculated pressure drop.

Full vacuum to be considered. (design pressure shall be the same as shell based on PK-6101 data sheet)

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CONSTRUCTION OF ONE SHELL

TUBE TYPE :	☑ PLAIN ☐ FINNED		SHELL OD	1210	mm	BAFFLE TYPE	SINGLE SEG.	
TUBE OD:	19.05	mm	SHELL ID	1180	mm	ORIENTATION	VERTICAL	
TUBE THK (avg):	2.11	mm	IMPINGEMENT PROTECTION	YES		BAFFLE NO.	8	#
TUBE LENGTH:	5000	mm	OUTER TUBE LIMIT	1161.3	mm	BAFFLE THK.	8	mm
TUBE NO:	1802	#	TUBESHEET THK	75	mm	BAFFLE CUT	35	%
PITCH:	24	mm	TUBE TO TUBESHEET JOINT			C/C SPACING	500	mm
☐ 30°	☑ 60°		☑ WELD ☑ EXPAND ☑ GROOVES			INLET SPACING	854	mm
☐ 90°	☐ 45°		TUBE TO TUBESHEET WELD TYPE			CLEARANCE TO SHELL	6.35	mm
			☐ SEAL ☑ FULL STRENGTH			CLEARANCE TO TUBE	0.39	mm
			☐ PARTIAL STRENGTH					

Discrepancy with drawing

To be rechecked with DWG.

MATERIALS

TUBES	SA-334 GR 6 SEAMLESS	SELL SIDE :		BODY FLANGE :	
SHELL	SA-516 GR70N	NOZZLES:	SA-333 GR6	SHELL:	SA-350 LF2
CHANNEL	SA-516 GR70	FLANGES:	SA-350 LF2	CHANNEL:	SA-350 LF2
SHELL COVER	SA-516 GR70	TUBE SIDE :		BOLTS	SA-320 L7
TUBE SHEET	SA-350 LF2	NOZZLES:	SA-333 GR6	NUTS	SA 194 Gr. 4
CROSS BAFFLES	SA-516 GR70N	FLANGES:	SA-350 LF2	GASKET	JACKETED METAL
SADDEL/LEG	SA-283GR.C				

Based on vendor DWG, personnel protection insulation is considered

INSULATION AND PAINTING

	SHELL SIDE	CHANNEL SIDE
INSULATION (TYPE / THK)	-	-
PAINTING		
PRIMER	ZINCETHYL SILICATE (1X70µm)	
MID COATING		
TOP COATING		

MECHANICAL DESIGN DATA

EXPANSION JOINT: ☐ YES ☑ NO ☐ BY MFR. MATERIAL:

	SHELL 1	SHELL 2	TUBE SHEET	LIFE CYCLES NO
MEAN SHELL METAL TEMPERATURE °C	53.84	-	-	-
MEAN TUBE METAL TEMPERATURE °C	44.71	-	-	-
MINIMUM TUBE METAL TEMPERATURE °C	42.69	-	-	-
MAXIMUM TUBE METAL TEMPERATURE °C	46.73	-	-	-

WEIGHT — EMPTY: 14695 kg — HYDROTEST: 20783 kg

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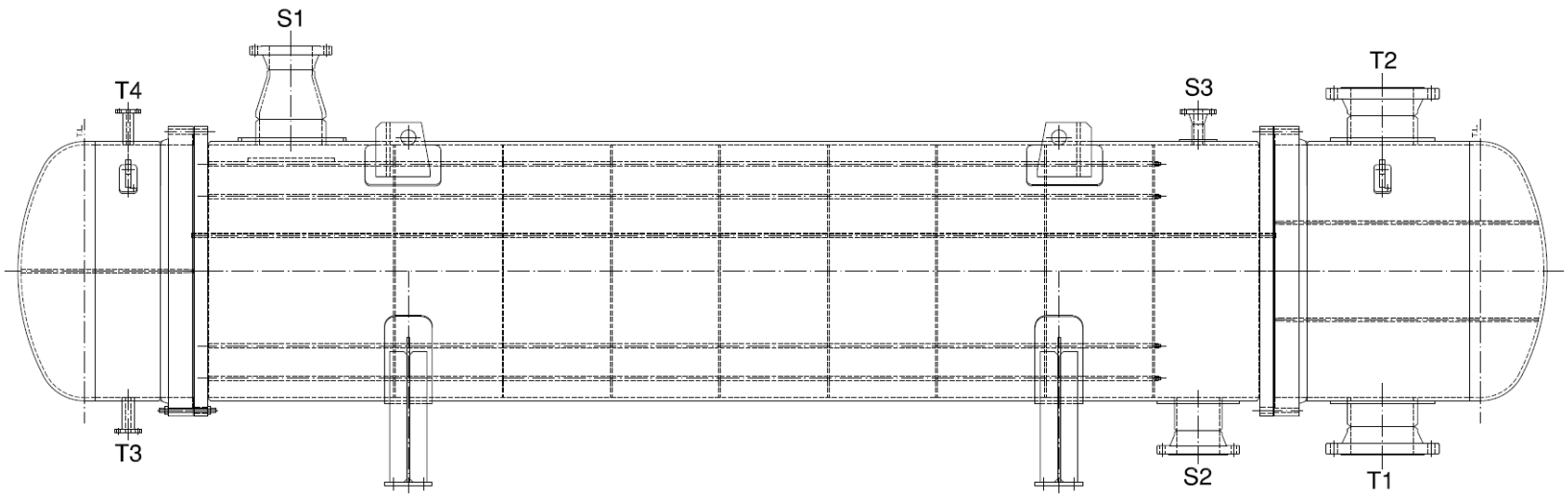
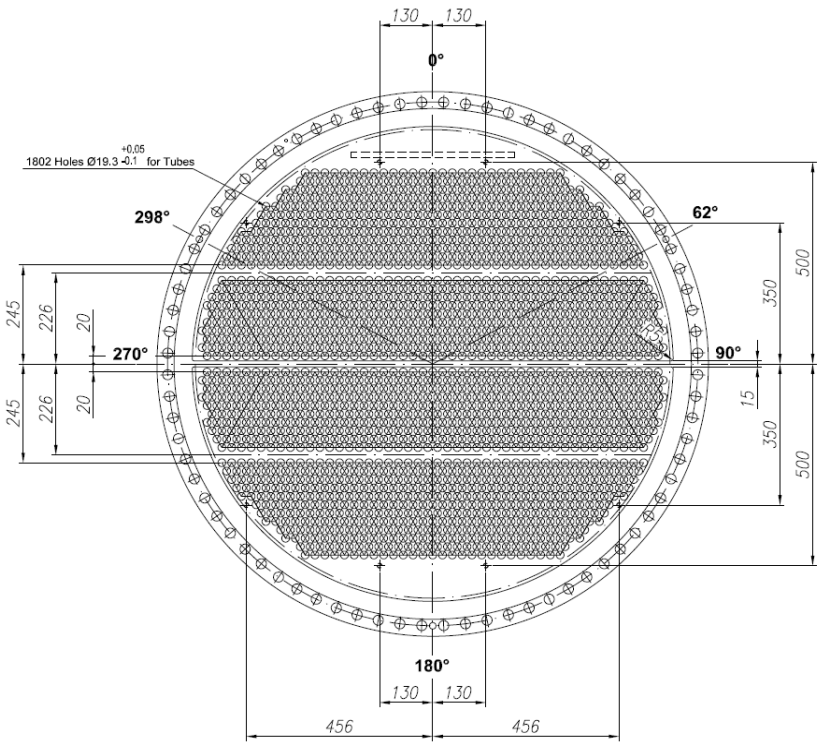
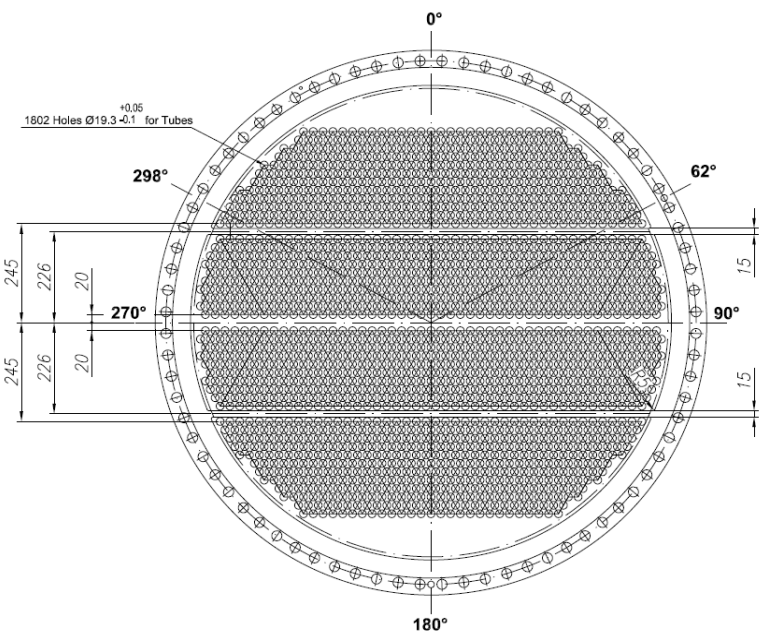




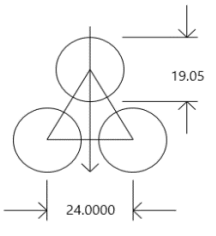
Front Tube Sheet

It seems to be rear tube sheet. To be rechecked.



Rear Tube Sheet

It seems to be front tube sheet. To be rechecked.



To be revised based on vendor DWG.

Tag.	No.	Description	Size	Rating	Facing	PROJECTION (mm)
S3	1	EQUILIZE LINE	2"	300#	RF	200
S2	1	PROPYLENE OUTLET	8"	300#	RF	200
S1	1	PROPYLENE INLET	12"	300#	RF	200
T4	1	VENT	3/4"	300#	RF	200
T3	1	DRAIN	1"	300#	RF	200
T2	1	COOLING WATER OUT	12"	300#	RF	200
T1	1	COOLING WATER IN	12"	300#	RF	200