PPI / NARGAN	DEHDASHT PETROCHEMICAL INDUSTRY COMPANY DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT	PGPIC
	DOCUMENT TITLE: Oil Cooler Data Sheet	POI: IFA
Contract No.: DPIC/98-12	DOCUMENT NUMBER: DPIC9812-000-VD-1002-ME-DS-0078	Rev. No.: D2

DOCUMENT TITLE:

Oil Cooler Data Sheet (E-PK6101-1A/B)

PURCHASER'S COMMENT/APPROVAL STATUS		Purchaser: NARGAN
1	AP: Approved (Released for Manufacturing)	Requisition No.: DPIC98-12-001-000-ME-MR-4150-0001-D1
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-0078-D2
Date: 06.03.2022	Signature: A.AB	

REV	DATE ISSUE	PREPARED	CHECKED	APPROVED
D2	26.Jan.22	A.VOSOUGH	DR.A.NEJATI	DR.A.NEJATI
D1	01.Jan.22	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 عام)
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2	x	x	x		
3	x	x	x		
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1	SERVICE		**OIL COOLER**					ITEM	**E-PK6101-1A/B**	
2	ID. X LENGTH	**381**	X	**3000**	mm	MOUNTIN	**HORIZONTAL**		TYPE	**BEM**
3	NO. OF UNIT			**1**		SURFACE PER UNIT	**29.24**	m²	IN PARALLEL	**1**
4	SHELLS PER UNIT			**1**		SURFACE PER SHELL	**29.24**	m²	IN SERIES	**1**
5	TEMA CLASS			**R**		REQUIRED OVERDESIGN			CODE	**TEMA. 9TH ED.**
6	**PERFORMANCE**									

			SHELL SIDE		TUBE SIDE	
7						
8	FLUID CIRCULATED		**OIL**		**JACKETE WATER**	
9	FLUID QUANTITY, TOTAL	kg/h	**12586**		**22395.6**	
10			IN	OUT	IN	OUT
11	VAPOUR	kg/h	-	-	-	-
12	LIQUID	kg/h	**12586**	**12586**	**22395.6**	
13	NON CONDENSABLES	kg/h	-	-	-	
14	TEMPERATURE	°C	**80.3**	**50**	**37**	
15	DENSITY at T and P (Vap./Liq.)	kg/m³	**873.29**	**886.0**	**993.59**	**990.48**
16	VISCOSITY at T and P (Vap./Liq.)	cP	**1.6365**	**2.1900**	**0.6914**	**0.5960**
17	MOLECULAR WEIGHT,Vap					
18	SPECIFIC HEAT (Vap./Liq.)	kJ/kg.K	**2.0871**	**1.8530**	**4.1773**	**4.1774**
19	THERMAL CONDUCTIVITY (Vap./Liq.)	W/m.K	**0.150**		**0.6252**	**0.6352**
20						
21	INLET PRESSURE (abs)	bar	**19.9**		**6.914**	
22	VELOCITY (Mean/Max)	m/s			/	**0.79**
23	PRESSURE DROP (Allowable/Calcul	bar	**0.200**		**1.000**	**0.144**
24	FOULING RESISTANCE (Min)	m²·K/W	**0.000**		**0.000200**	
25	TYPE OF CLEANING MAINTENANCE		☑ NONE ☐ MECH. ☐ CHEM.		☑ NONE ☐ MECH. ☐ CHEM.	
26	HEAT EXCHANGED	**208** kW	MTD (CORRECTED)		**20.1**	°C
27	TRANSFER RATE: SERVICE:	**353.96**	CALCULATED:	**419.4**	CLEAN:	**510.93** W/m²·K
28	**CONSTRUCTION**					
29	DESIGN PRESSURE	barg	**25**		**25**	
30	VACUUM PRESSURE	barg				
31	TEST PRESSURE	barg	**32.5**		**32.5**	
32	DESIGN TEMPERATURE	°C	**120**		**190**	
33	MIN. DESIGN METAL TEMPERATURE	°C	**-10**		**-10**	
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	

Cooling water velocity in carbon steel tubes shall be within 1-3m/s.

Please clarify why 25barg is considered as design pressure. since upstream compressor design pressure is higher.

Discrepancy with equipment list

135

-45

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CONSTRUCTION OF ONE SHELL

TUBE TYPE :	☑ PLAIN ☐ FINNED		SHELL OD	406.40	mm	BAFFLE TYPE	Single segmental	
TUBE OD:	19.05	mm	SHELL ID	381	mm	ORIENTATION	Horizontal	
TUBE THK (avg):	2.11	mm	IMPINGEMENT PROTECTION	NO		BAFFLE NO.	12	#
TUBE LENGTH:	3000	mm	OUTER TUBE LIMIT	366.609	mm	BAFFLE THK.	6.0	mm
TUBE NO:	166	#	TUBESHEET THK	46	mm	BAFFLE CUT	30	%
PITCH:	24	mm	TUBE TO TUBESHEET JOINT			C/C SPACING	200	mm
☑ 30°	☐ 60°		☑ WELD ☑ EXPAND ☐ GROOVES			INLET SPACING	325	mm
☐ 90°	☐ 45°		TUBE TO TUBESHEET WELD TYPE			CLEARANCE TO SHELL	3.1750	mm
			☐ SEAL ☑ FULL STRENGTH ☐ PARTIAL STRENGTH			CLEARANCE TO TUBE	0.7938	mm

MATERIALS

TUBES	SA-179	SELL SIDE :		BODY FLANGE :		
SHELL	SA-106 GRB	NOZZLES:	SA-106 GRB	SHELL:	SA-266-2	
CHANNEL	SA-106 GRB	FLANGES:	SA-105	CHANNEL:	SA-266-2	
SHELL COVER	SA-516 GR70	TUBE SIDE :		BOLTS	SA 193 Gr. B7	
TUBE SHEET	SA-266-2	NOZZLES:	SA-106 GRB	NUTS	SA 194 Gr. 2H	
CROSS BAFFLES	SA-516 GR70	FLANGES:	SA-105	GASKET	JACKETED METAL	
SADDEL/LEG	SA-283GR.C					

Discrepancy with vendor DWG

INSULATION AND PAINTING

	SHELL SIDE	CHANNEL SIDE
INSULATION (TYPE / THK)	PERSONAL PROTECTION / 100 mm	-
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	61.84	-	-	-
MEAN TUBE METAL TEMPERATURE °C	45.66	-	-	-
MINIMUM TUBE METAL TEMPERATURE °C	42.96	-	-	-
MAXIMUM TUBE METAL TEMPERATURE °C	48.36	-	-	-

WEIGHT EMPTY: 1439 kg HYDROTEST: 1840 kg

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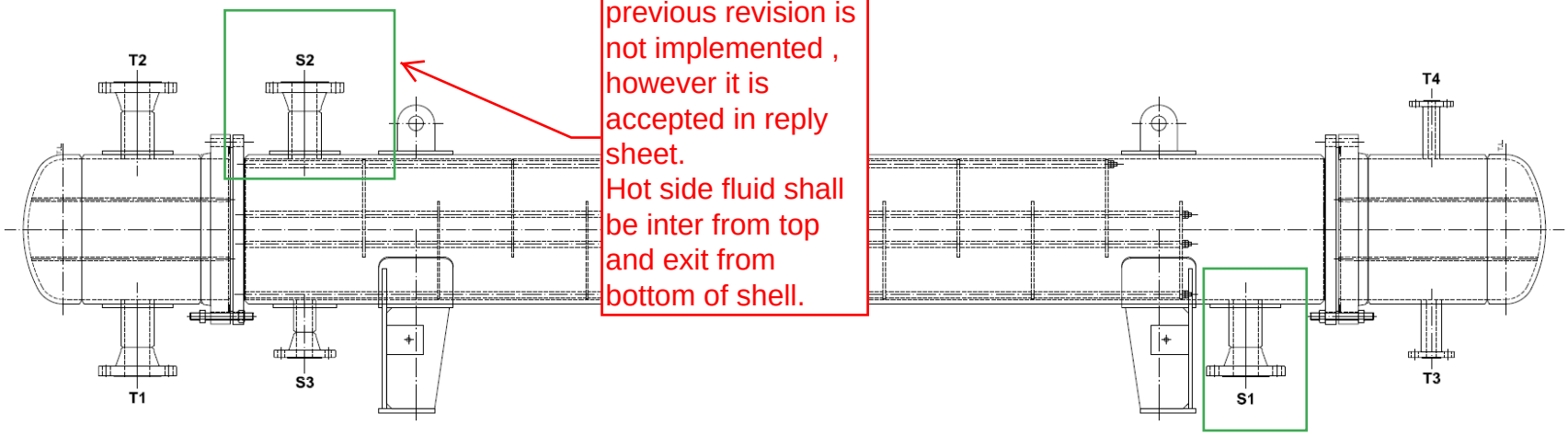
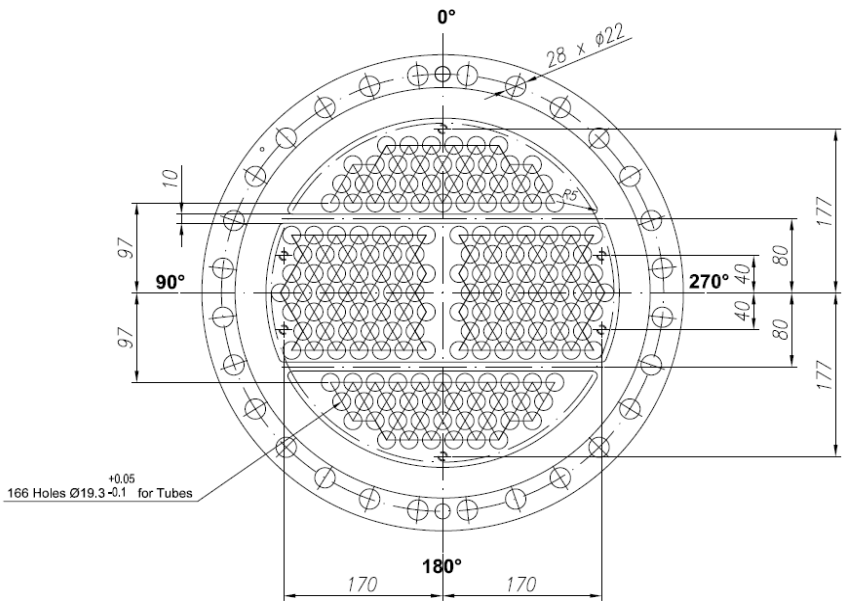
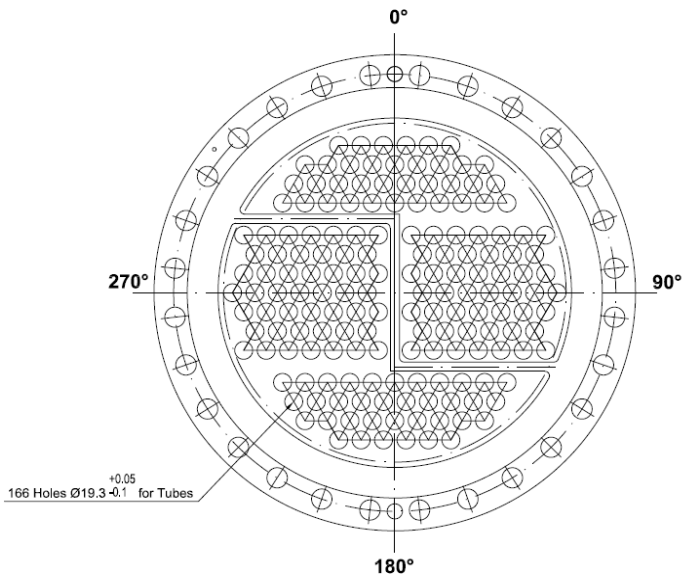
Comment on previous revision is not implemented , however it is accepted in reply sheet.
Hot side fluid shall be inter from top and exit from bottom of shell.

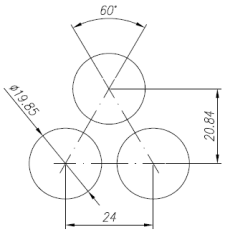




Front Tube Sheet



Rear Tube Sheet



Please specify size on PID

Tag.	No.	Description	Size	Rating	Facing	PROJECTION (mm)
S3	1	DRAIN	2"	300#	RF	200
S2	1	OIL OUTLET	3"	300#	RF	200
S1	1	OIL INLET	3"	300#	RF	200
T4	1	VENT	3/4"	300#	RF	200
T3	1	DRAIN	1"	300#	RF	200
T2	1	JACKETED WATER OUTLET	3"	300#	RF	200
T1	1	JACKETED WATER INLET	3"	300#	RF	200