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.: D1

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
2	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-D1
Date: XX.XX.XX	Signature:	

REV	DATE ISSUE	PREPARED	CHECKED	APPROVED
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

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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	**29.8** m²			IN PARALLEL	**1**
4	SHELLS PER UNIT	**1**		SURFACE PER SHELL	**29.8** m²			IN SERIES	**1**
5	TEMA CLASS	**R**		REQUIRED OVERDESIGN				CODE	**TEMA. 9TH ED.**
6	**PERFORMANCE**								
7				SHELL SIDE			TUBE SIDE		
8	FLUID CIRCULATED			**OIL**			**JACKETE WATER**		
9	FLUID QUANTITY, TOTAL		kg/h	**12672**			**22548.6**		
10				IN	OUT		IN	OUT	
11	VAPOUR		kg/h	-	-		-	-	
12	LIQUID		kg/h	**12672**	**12672**		**22548.6**	**22548.6**	
13	NON CONDENSABLES		kg/h	-	-		-	-	
14	TEMPERATURE		°C	**80.3**	**50**		**37**	**45**	
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**	**0.1500**		**0.6252**	**0.6352**	
20									
21	INLET PRESSURE (abs)		bar	**21.900**			**6.914**		
22	VELOCITY (Mean/Max)		m/s	/ **0.18**			/ **0.79**		
23	PRESSURE DROP (Allowable/Calculated)		bar	**0.200**	**0.024**		**1.000**	**0.146**	
24	FOULING RESISTANCE (Min)		m²·K/W	**0.00017**			**0.000200**		
25	TYPE OF CLEANING MAINTENANCE			☑ NONE	☐ MECH. ☐ CHEM.		☑ NONE ☐ MECH. ☐ CHEM.		
26	HEAT EXCHANGED	**209**	kW	MTD (CORRECTED)			**20.1**		°C
27	TRANSFER RATE: SERVICE:	**356.38**	CALCULATED:	**420.80**	CLEAN:		**513.01**		W/m²·K
28	**CONSTRUCTION**								
29	DESIGN PRESSURE		barg	**25**			**20**		
30	VACUUM PRESSURE		barg						
31	TEST PRESSURE		barg	**32.5**			**26**		
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		

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CONSTRUCTION OF ONE SHELL

TUBE TYPE :	☑ PLAIN ☐ FINNED		SHELL OD	406.4	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.	13	#
TUBE LENGTH:	3000	mm	OUTER TUBE LIMIT	366.309	mm	BAFFLE THK.	4.763	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	371.734	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					

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	61.66	-	-	-
MEAN TUBE METAL TEMPERATURE	°C	48.25	-	-	-
MINIMUM TUBE METAL TEMPERATURE	°C	40.06	-	-	-
MAXIMUM TUBE METAL TEMPERATURE	°C	54.74	-	-	-

WEIGHT — EMPTY: 1439 kg — HYDROTEST: 1840 kg

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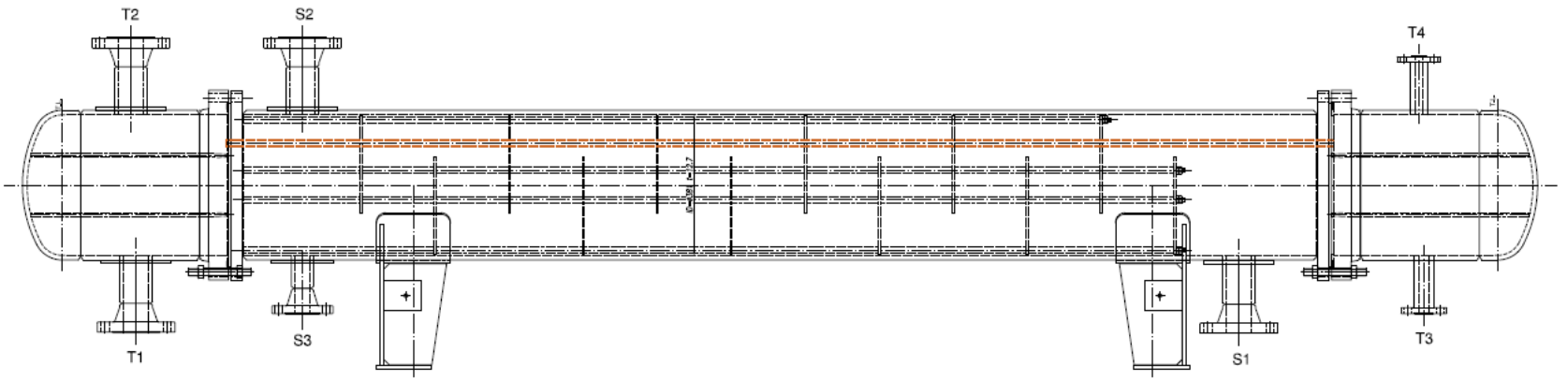
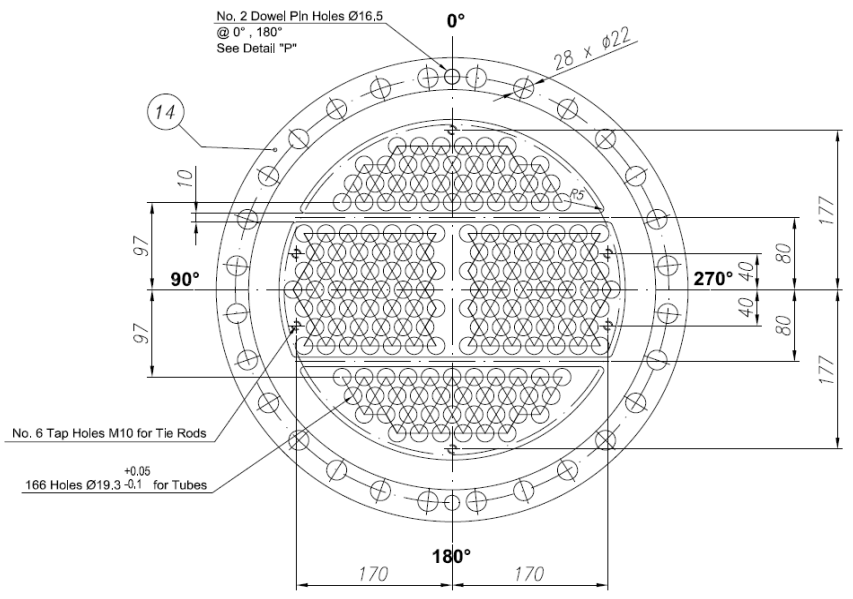
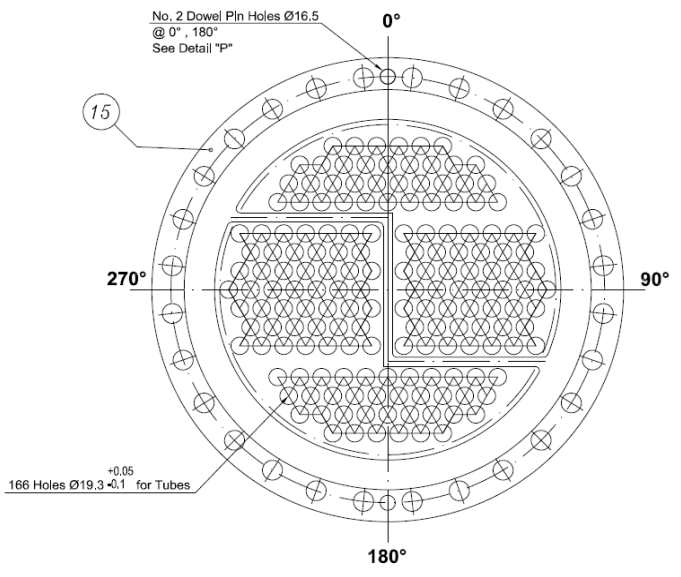
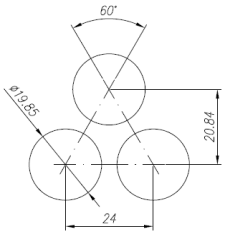




View "M" (1:5)
Front Tube Sheet



View "N" (1:5)
Rear Tube Sheet



Tube Holes Arrangement (1:2)
for Tube Sheet

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