PPI / NARGAN	DEHDASHT PETROCHEMICAL INDUSTRY COMPANY DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT	PGPIC
	DOCUMENT TITLE: Economizer Data Sheet	POI: IFA / Rev. : D0
Contract No.: DPIC/98-12	DOCUMENT NUMBER: DPIC9812-000-VD-1002-ME-DS-0076	Sheet 1 of 5

Instrument Nozzles will be checked after finalization of P&ID

Economizer Data Sheet

Following problems to be detected in this design. Please recheck and resolve.

1- Dry wall mist flow is expected for the boiling fluid. This condition may lead to high tube wall temperatures.
2- Bundle entrance rho-v-squared exceeds TEMA maximum recommended value.
3- The B-stream flow fraction is very low.
4- Film and transition boiling regime has been predicted.

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)	
X	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-0076-D0
Date: 20.11.2021	Signature: A.AB	

REV	DATE ISSUE	PREPARED	CHECKED	APPROVED
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**	PGPIC
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DEHDASHT PETROCHEMICAL INDUSTRY COMPANY

DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT

T TITLE: Economizer Data Shee | **POI: IFA** | **Rev. : D0**

T NUMBER: DPIC9812-000-VD-100 | **Sheet 3 of 5**

Note:
1- Please specify the thickness of shell.

It seems that selected surface is under design please recheck.

according to DPIC-12-001/000-4150ME-PFD-027 there is discrepancy at the shell side. It's consider that error to arrangement of shell and tube side.

Based on PFD flow rate shall be 8123kg/h.

1	SERVICE	ECONOMIZER				ITEM	E-PK6101-3	
2	DIAM. X LENGTH	591 X 6000 mm	MOUNTIN	HORIZONTAL		TYPE	BEM	
3	NO. OF UNIT	1	SURFA		m²	IN PARALLEL	1	
4	SHELLS PER UNIT	1	SURFA		m²	IN SERIES	1	
5	TEMA CLASS	R	REQUI				. 9TH ED.	
6								
7			SHELL SIDE			TUBE SIDE		
8	FLUID CIRCULATED		PROPYLENE			PROPYLENE		
9	FLUID QUANTITY, TOTAL	kg/h	19500 x 1.1			7431x 1.1		
10			IN	OUT		IN	OUT	
11	VAPOUR	kg/h	-	-		2370	8174	
12	LIQUID	kg/h	21450	21450		5804	-	
13	NON CONDENSABLES	kg/h	-	-		-	-	
14	TEMPERATURE	°C	48.55	14		12.37	15	
15	DENSITY at T and P (Vap./Liq.)	kg/m³	/ 461.41	/ 524.12		17.36 / 526.76	17.02 /	
16	VISCOSITY at T and P (Vap./Liq.)	cP	/ 0.0598	/ 0.0915		0.0087 / 0.0933	0.0087 /	
17	MOLECULAR WEIGHT,Vap					42.08	42.08	
18	SPECIFIC HEAT (Vap./Liq.)	kJ/kg.K	/ 3.332	/ 2.558		1.65 / 2.578	1.655 /	
19	THERMAL CONDUCTIVITY (Vap./Liq.)	W/m.K	/ 0.0897	0 / 0.1072		0.0162 / 0.1081	0.0165 /	
20	LATENT HEAT	kj/kg				360	360	
21	INLET PRESSURE (abs)	bar	19.940	19.85		8.3	8.25	
22	VELOCITY (Mean/Max)		0.33 /	0.39		2.36 /	5.14	
23	PRESSURE DROP (Allowable/Calculated)	bar	0.25	0.08738		0.2	0.04763	
24	FOULING RESISTANCE (Min)	m²·K/W	0.00017			0.00017	0.00021	Ao based
25	TYPE OF CLEANING MAINTENANCE		☐ NONE	☑ MECH	☐ CHEM.	☐ NONE	☑ MECH	☐ CHEM.
26	HEAT EXCHANGED	590.2 kW	MTD (CORRECTED)			11.81		°C
27	TRANSFER RATE: SERVICE:	42	512.7		CLEAN:	638.3		W/m²·K
28			UCTION					
29	DESIGN PRESSURE		23			23		
30	VACUUM PRE		-1.01			-1.01		
31	TEST PRESSU	barg	29.9			29.9		
32	DESIGN TEMP	°C	120			120		
33	MIN. DESIGN T	°C	-45			-45		
34	NUMBER PAS		1			3		
35	CORROSION A		3			3		
36	PARTICULAR		-			-		
37	PROVIDE X-RAY		FULL			FULL		
38	PROVIDE STRESS RELIEVING		☐ CHANNEL	☐ BUNDLE	☐ SHELL			

Not possible due to TEMA type.

will be finalized after rec sh

Please clarify why design pressure of economizer and water cooler is higher than chiller.

Design temperature of both sides shall be saturate temperature corresponding to design pressure which is equal to 125C+10C. Please recheck.

Please check which one shall be done

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CONSTRUCTION OF ONE SHELL

TUBE TYPE :	☑ PLAIN ☐ FINNED		SHELL OD	611	mm	BAFFLE TYPE	Single segmental
TUBE OD:	25.4	mm	SHELL ID	591	mm		Horizontal
TUBE THK (avg):	2.6	mm	IMPINGEMENT PROTECTION	NO		BAFFLE NO.	47 #
TUBE LENGTH:	6000	mm	OUTER TUBE LIMIT	576.9	mm	BAFFLE THK.	5 mm
TUBE NO:	249	#	TUBESHEET THK	45	mm	BAFFLE CUT	15 %
PITCH:	32	mm	TUBE TO TUBESHEET JOINT			C/C SPACING	115 mm
☑ 30°	☐ 60°		☑ WELD ☑ EXPAND ☑ GROOVES			INLET SPACING	307 mm
☐ 90°	☐ 45°		TUBE TO TUBESHEET WELD TYPE			CLEARANCE TO SHELL	4.76 mm
			☐ SEAL ☑ FULL STRENGTH			CLEARANCE TO TUBE	0.79 mm
			☐ PARTIAL STRENGTH				

Baffle spacing is low

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 GR70N		FLANGES:	SA-350 LF2	CHANNEL:	SA-350 LF2
SHELL COVER	SA-516 GR70N	TUBE SIDE :			BOLTS	SA320 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					

please specify

INSULATION AND PAINTING

	SHELL SIDE	CHANNEL SIDE
INSULATION (TYPE / THK)	-	-
PAINTING		
PRIMER	???	???
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	24.32	-	-	-
MEAN TUBE METAL TEMPERATURE	°C	18.44	-	-	-
MINIMUM TUBE METAL TEMPERATURE	°C	13.05	-	-	-
MAXIMUM TUBE METAL TEMPERATURE	°C	43.21	-	-	-

WEIGHT EMPTY: 4010 kg HYDROTEST: 5509 kg

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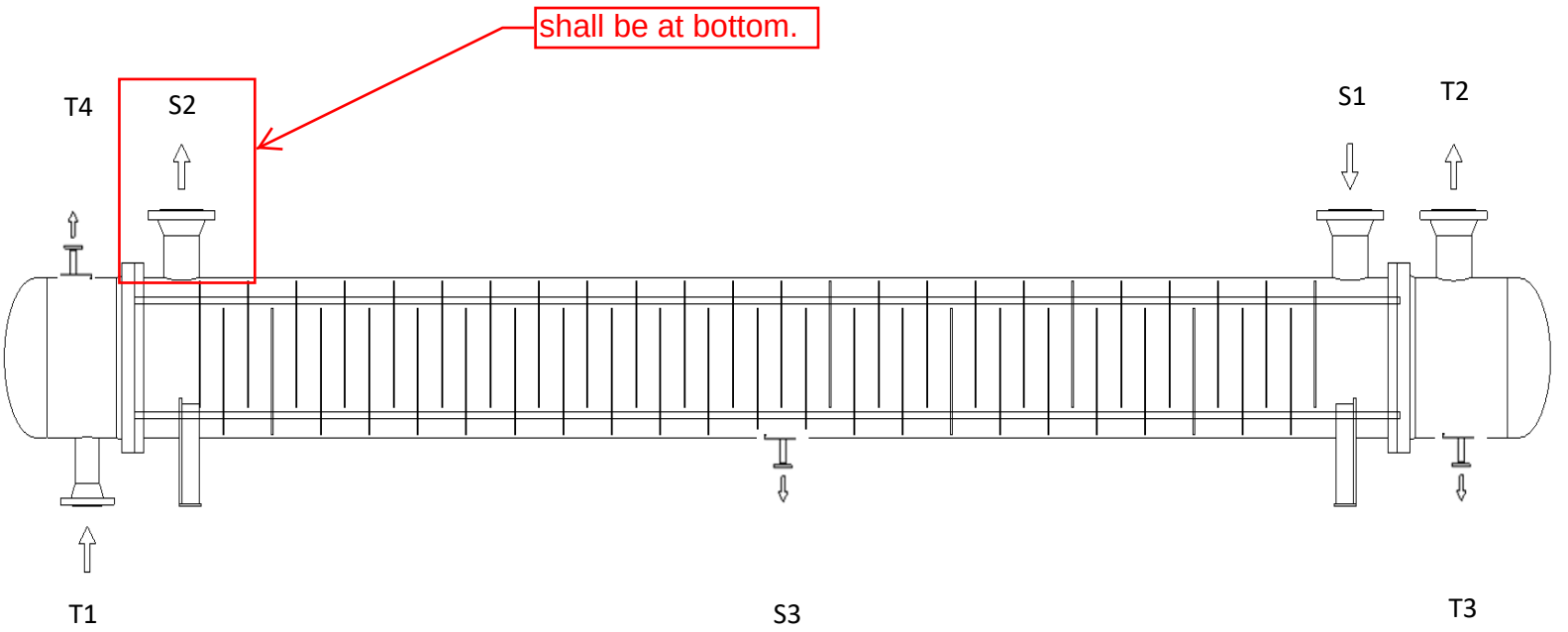

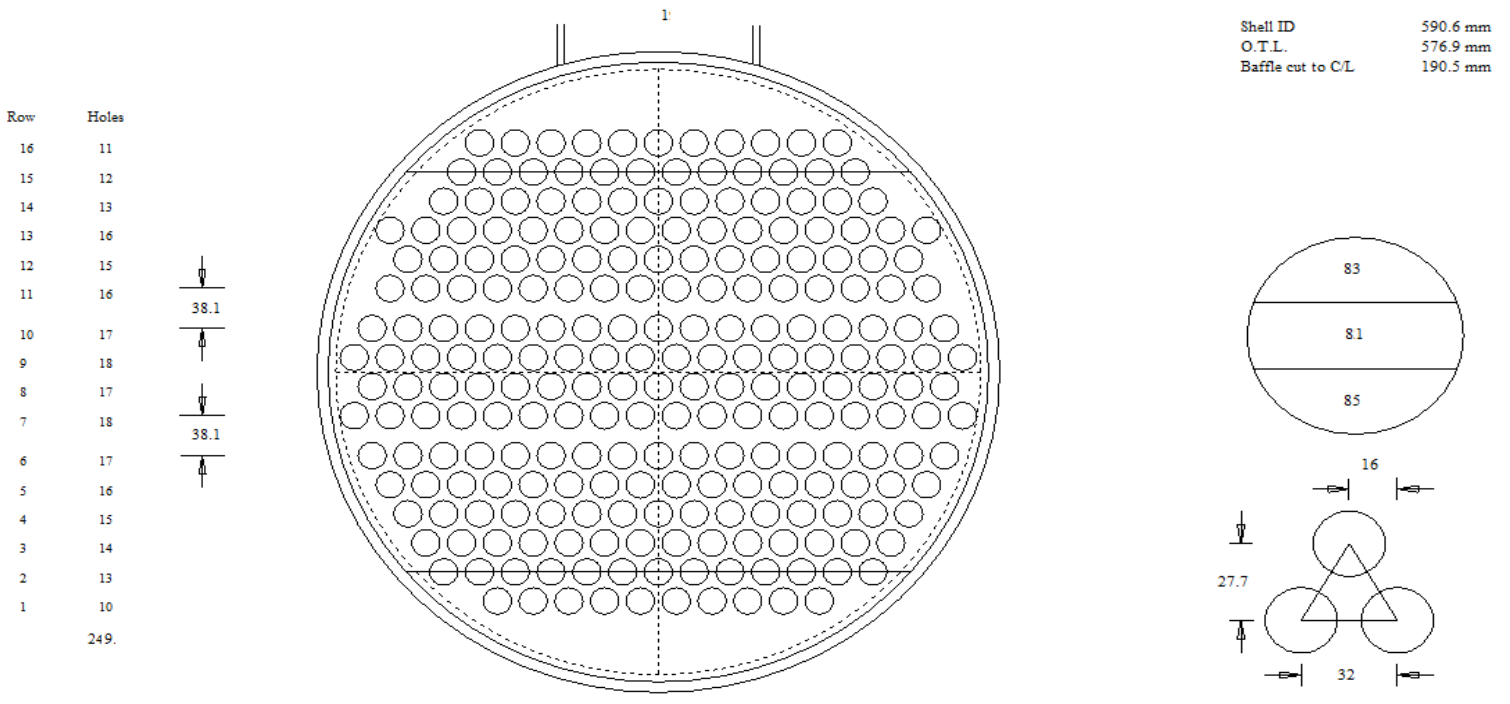

Tag.	No.	Description	Size	Rating	Facing	PROJECTION (mm)
T3	1	DRAIN	1"	300#	RF	200
T4	1	VENT	3/4"	300#	RF	200
S3	1	DRAIN	2"	300#	RF	200
S2	1	PROPYLENE OUTLET	6"	300#	RF	200
S1	1	PROPYLENE INLET	6"	300#	RF	200
T2	1	PROPYLENE OUTLET	6"	300#	RF	200
T1	1	PROPYLENE INLET	4"	300#	RF	200