

FOR RECORD

SHELL AND TUBE HEAT EXCHANGER SPECIFICATION SHEET

CLIENT: Eastern Petrochemical Company (SHARQ)

PROJECT

TITLE: Sharq Expansion Project

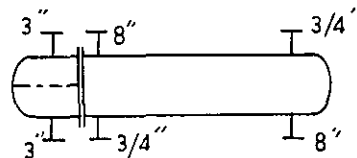
JOB NO.: 01011

DOC NO.: SE46-H1-DS-003

(1 / 1)

REV	1	2	3	(/)
BY	Misashi			MADE
CHKD				CHKD
APVD	S			APVD
DATE	Feb. 4 '91			DATE
				APR. 12 '91

1	Service DUMP CONDENSATE COOLER		: Lethal S.S.() Yes() No	T.S.() Yes() No	Item No.	2E-4603	
2	Type	BEU	(*) Horiz. () Vert.	No. of Trains	1	Surf./Train	50 m ²
3	Shells/Train 1	(1 in Parallel, 1 in Series)				Surf./Shell	50 m ²
PERFORMANCE OF ONE TRAIN							
4	Fluid Allocation		Shell Side		Tube Side		
5			Inlet	Outlet	Inlet	Outlet	
6	Fluid Name		CLOSED COOLING WATER		STEAM CONDENSATE		
7	Flow Rate, Total	kg/h	189,000		18,500		
8	Vapor	kg/h	--		--		
9	Liquid	kg/h	189,000		18,500		
10			--		--		
11	Temperature	°C	39		49		
12	Density :Liq.(Vap.)	kg/m ³	--		--		
13	Viscosity :Liq.(Vap.)	cP	--		--		
14	Specific Heat :Liq.(Vap.)	kcal/kg.°C	--		--		
15	Thermal Conductivity :Liq.(Vap.)	kcal/m ² h.°C	--		--		
16	Latent Heat	kcal/kg					
17	Inlet Pressure	kg/cm ² G	3.5		8.0		
18	Velocity (Allow./Calc.)	m/s	/ 1.0		/ 1.3		
19	Pressure Drop (Allow./Calc.)	kg/cm ²	1.0 / 0.6		1.0 / 0.63		
20	Fouling Resistance Required	m ² h.°C/kcal	0.0002		0.0002		
21	Heat Exchanged	1,890,000 kcal/h	MTD(Corrected)		34	°C	
22	Transfer Rate, Service	1,112 kcal/m ² h.°C	Clean		kcal/m ² h.°C		
CONSTRUCTION OF ONE SHELL							
23	Shell ID	450 mm	Sealing Strip	--	pair(s)	Dummy Pipe(Rod)	-- pc's/row
24	Tube OD	19.05 mm	Tube Thickness	2.11 mm	Tube Length	6,000 mm	straight
25	No. of Tubes	70U's	Tube Pitch	25 mm () Tri Ang. (*) Square 90	Tube Type	(*) Plain () Fin	
26	Cross Baffle Type	SINGLE SEG	Baffle Cut%	26 (*) H () V (*) Dia () Area	No. of Crosses	17	
27	Baffle Spacing(Center)	360 mm	Max Inlet Baffle Spacing	mm	Imping. Protect.	(*) Yes () No	
28	Inlet Nozzle ft ²	3.400 kg/ms ²	Shell Entrance ft ²	2,270 kg/ms ²	Shell exit ft ²	1,600 kg/ms ²	
29	Tube-Tubesheet Joint	2)			Shell Side	Tube Side	
30	Shell	A-516 GR.60	Design Pressure	kg/cm ² G	8.0	11.0	
31	Shell Cover	() Integ. () Remov.	Design Temperature	°C	65	180	
32	Channel or Bonnet	A-516 GR.60	No. of Passes per Shell		1	6	
33	Channel Cover	-	Type of Cleaning for Maint.	() Chem. (*) Mech. () Chem. () Mech.			
34	Floating Head Cover	-	Corrosion Allowance	mm	3.0	3.0	
35	Girth Flange(S.S/T.S)	A-105	Radiographing	() Full (*) Spot () No	() Full (*) Spot () No		
36	Nozzle Flange(S.S/T.S)	A-105	Postweld Heat Treatment	() Code () Yes (*) No	() Code () Yes (*) No		
37	Tubesheet	A-105	Nozzle	In	8" ANSI	3" ANSI	
38	Tube	A-179	Connection	Out	8" 150LBRF	3" 150LBRF	
39	Stud Bolt	A-193 GR.B7/A-194 GR.2H	4)	Intermediate			
40	Regulation	NONE	Threaded Connection	() Allow (*) Not	() Allow (*) Not		
41	Code	ASME VIII Div.1	TEMA Class	C	Gasket	Girth Flange	ASB
42	Vent/Drain	(*) Flange Type			Nozzle Flange	--	--
43	Stacking	() Yes (*) No	Insulation	mm	--	25	
44	Weight/Shell	Shipping	kg	Full Water	kg	Bundle	kg
45	Remarks:			Sketch			
46	1) Cleaning requirement at shop: () Yes (*) No						
47							
48	2) (*) Expand						
49	() Seal Weld/Expand						
50	() Strength Weld						
51	3) Comp. Asbestos (ASB)						
52	Double Jacketed/Asbestos (DJMA)						
53	Spiral Wound/Asbestos (SP)						
54	4) Refer To SE46-H1-SE-003						



DESIGN INFORMATION

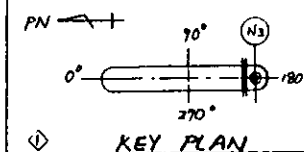
CLIENT : EASTERN PETROCHEMICAL COMPANY (SHARQ)
PROJECT TITLE : SHARQ EXPANSION PROJECT
JOB NO. : 01011
DOC NO. : SE46 - H1-SK-003
SHEET NO. (1 / 1)

REVISIONS					MADE BY	
MARK	①	②	③	④		
MADE BY	N.T. Hisashi				CHECKED BY	<i>[Signature]</i>
CHECKED BY	<i>[Signature]</i>				APPROVED BY	<i>[Signature]</i>
APPROVED BY	N.T.					
DATE	Aug 23, 1961				DATE	APR. 15 '61

FOR RECORD

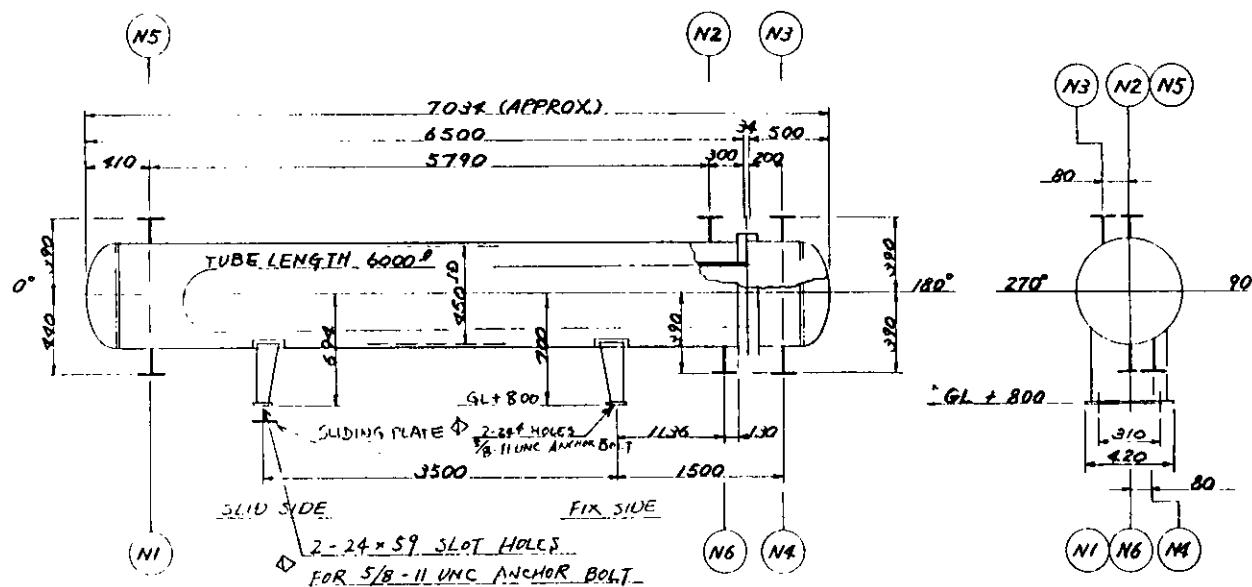
EQUIPMENT NO.	2E-4603	SERVICE	DUMP CONDENSATE COOLER
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CUT OFF LINE



MATERIALS SHELL A-516 Gr. 60
CHANNEL A-516 Gr. 60
TUBE A-179
19.05^{OD} x 2.11^t x 6000^P 70U TUBES

EXPAND FOR TUBE JOINT



N6	3/4"	DRAIN	1		
N5	3/4"	VENT	1		
N4	3"	CONDENSATE OUT	1		
N3	3"	CONDENSATE INLET	1		
N2	8"	C.W. OUTLET	1		
N1	8"	C.W. INLET	1		ANSI 150 RF
MARK	SIZE	SERVICE	QUANT.	REMARKS	

NOZZLE SCHEDULE		
DESCRIPTION	SHELL SIDE	TUBE SIDE
REGULATION OR CODE	TEMA "C"	
FLUID NAME	CLOSED COOLING WATER	STEAM CONDENSATE
OPERATING PRESSURE	1.5 kg/cm ² G	8.0 kg/cm ² G
OPERATING TEMPERATURE	39/49 °C	151/50 °C
DESIGN PRESSURE	8.0 kg/cm ² G	11.0 kg/cm ² G
DESIGN TEMPERATURE	65 °C	180 °C
TUBE DESIGN TEMP.		180 °C
TUBESHEET DESIGN TEMP.		180 °C
TEST PRESSURE (HYDROSTATIC)	12.0 kg/cm ² G	16.5 kg/cm ² G
TEST PRESSURE (PNEUMATIC)	— kg/cm ² G	— kg/cm ² G
STRESS RELIEVED	YES (NO)	YES (NO)
RADIOGRAPHED	FULL (SPOT) NO	FULL (SPOT) NO
JOINT EFFICIENCY	85 %	85 %
JOINT TYPE	DOUBLE SINGLE	DOUBLE SINGLE
CORROSION ALLOWANCE	3.0 mm	3.0 mm
NUMBER OF PASS	1	6
TUBE LAYOUT	25 mm □	◇ Δ PITCH
NOZZLE FLANGE RATING	ANSI 150 RF	ANSI 150 RF
INSULATION	— mm	25 mm
HEATING SURFACE		50.0 m ² /SHELL
NUMBER REQUIRED	1	SHELL

20-(2) T-CHSY-524,780