



NAT'L. BD. No. _____
CERTIFIED BY
ALABAMA HEAT EXCHANGERS, INC.
U
W
RES
RT-4
MAWP 50 PSIG @ 300 °F
MDMT -20 °F @ 50 PSIG
MFG. SERIAL NO. AHE-_____
YEAR BUILT - 1996
EQUIPMENT NO. V-2815
I.D. NO. _____
WEIGHT: EMPTY 707# FULL 1800#
ADDITIONAL N/P. DATA PER CUST. SPEC.
MAWP 50 PSIG @ 300 °F
HYDRO TEST PR. 75 PSIG
CORR. ALLOW. 0"
KNOCKOUT POT
AHE JOB. No.: 3355N CUST PO No. 08000145

NOZZLE SCHEDULE

MARK	NOZZLE			FLANGE			FIN.	REMARKS
	SIZE	SCH	THK	PRES	TYPE	FACE		
C1	1.5"	80	.200	150	SO	RF	STD	INLET, CHILLED
C2	1.5"	80	.200	150	SO	RF	STD	OUTLET, CHILLED
V	7"	40	.154	150	SO	RF	STD	VAPOR OUT
A	7"	40	.154	150	SO	RF	STD	VAPOR INLET
L1	3"	40	.218	150	SO	RF	STD	LEVEL TRANSMITTER
B	7"	40	.154	150	SO	RF	STD	CONDENSATE OUT
D1	3/4"	80	.154	150	SO	RF	STD	VENT
D2	3/4"	80	.154	150	SO	RF	STD	VENT

- NOTES:**
- VESSEL FABRICATED PER ASME SECT. VIII DIV. 1, 1992 ED.; 1994 ADDENDA.
 - ALL BOLT HOLES SHALL STRADDLE VESSEL MAJOR CENTERLINES.
 - ALL S/S WELDS PER AHE-800. ALL C/S TO S/S WELDS PER AHE-803. ALL C/S WELDS PER AHE-100.
 - SHOP HYDRO SHELL SIDE @ 75 PSI. SHOP HYDRO TUBE SIDE @ 225 PSI.
 - TUBE TO TUBESHEET JOINT TO BE DOUBLE GROOVED & EXPANDED.
 - ALL DIMENSIONS ARE FROM GASKET FACES.
 - WEIGHT EMPTY: 707#. WEIGHT FULL: 1908#.

DESIGN DATA

DESCRIPTION	SHELL		TUBE	
	INTERNAL - PSIG	EXTERNAL - PSIG	INTERNAL - PSIG	EXTERNAL - PSIG
DESIGN PRESSURE	50	150	150	225
DESIGN TEMPERATURE	300° F	300° F	300° F	300° F
MAWP	50	150	150	225
CORR ALLOW.	0"	0"	0"	0"
HYDRO. PRESS. PSIG.	75	225	75	225
WELD PROCEDURE	SEE NOTE 3			
RADIOGRAPHY PER CODE	PER WELD DET'L			
JOINT EFFICIENCY	85%	85%	85%	85%
HEAT TREATMENT	NOT REQUIRED			

MATERIAL SPECIFICATIONS ASME

	SHELL SIDE		TUBE SIDE	
	SA312-316L/SA240/316L	SA106-B	SA213-316L	SA234-WPB
SHELL	SA312-316L/SA240/316L	SA106-B	SA213-316L	SA234-WPB
HEADS	SA240-316L	SA106-B	SA213-316L	SA234-WPB
SUPPORTS	SA 36	SA 36	SA 36	SA 36
FLANGES	SA182-316L	SA105	SA182-316L	SA105
PIPE	SA312-316L	SA106-B	SA312-316L	SA106-B
TUBES	SA213-316L	SA213-316L	SA213-316L	SA213-316L
TUBE SHEETS	SA240-316L	SA240-316L	SA240-316L	SA240-316L
BOLTS/NUTS	SA193-B7/SA194-2H			
GASKETS	GARLOCK 3100			
BODY FLG.	SA240-316L	SA516-70	SA240-316L	SA516-70
BAFFLE / TUBE SUPP.	SA240-316L	SA516-70	SA240-316L	SA516-70

NAT'L. BD. No. _____
CERTIFIED BY
ALABAMA HEAT EXCHANGERS, INC.
U
W
RES
MAWP TUBES 150 PSIG @ 300 °F
SHELL -20 50/FV
MDMT TUBES -20 °F @ 150 PSIG
MFG. SERIAL NO. AHE-_____
YEAR BUILT - 1996
EQUIPMENT NO. X-2815-3
I.D. NO. _____
WEIGHT: EMPTY 160# FULL 260#

ADDITIONAL N/P. DATA PER CUST. SPEC.

SHELL 50/FV	300
MAWP TUBES 150	PSIG @ 300 °F
HYDRO TEST PR.	SHELL = 75; TUBES = 225 PSIG
CORR. ALLOW.	SHELL = 0; TUBES = 1/16"
RAFINATE VENT CONDENSER	
AHE JOB. No.:	3355N CUST. PO No.: 08000145

REVISIONS

1. REVISED & REL FOR CONST. PER CUST. DWG. DATED 11/20/95 JWP 2/13/96	ALABAMA HEAT EXCHANGERS, INC. MOBILE, ALABAMA
	RAFINATE VENT CONDENSER (KNOCKOUT POT) HULS AMERICA X-2815-3
CUST. ORDER NO. 08000145	JOB NO. 3355N
DRAWN BY Neville	DATE 9/14/95
APP'VD BY	DATE
	SCALE 1/8" = 1"



HULS AMERICA ENGINEERING DEPARTMENT

99348
SHELL & TUBE EXCHANGER SPECIFICATION

X-2815-3

01	EQUIPMENT NUMBER X-2815-3	QUANTITY 1	PREPARED BY rj barns	APPROVED BY	APPROVED BY	DATE: 4/26/95	SHEET 1 OF 1	
02	PLANT	AREA OR UNIT	RFQ NUMBER 47221002	P.O. NUMBER 08000145	PROJECT NUMBER			
03	SERVICE RAFINATE VENT CONDENSER (KNOCKOUT POT)	ACCOUNT NUMBER	B / M NUMBER	CAR NUMBER 47221				
04	SIZE	SQ FT / UNIT - EFFECTIVE	SQ FT / SHELL	CONNECTED IN	NA			
05	TYPE	SQ FT / UNIT - GROSS	SHELLS / UNIT	ORIENTATION	HORIZONTAL			
06	PERFORMANCE OF ONE UNIT [1]							
07		SHELL SIDE			TUBE SIDE			
08	FLUID ALLOCATION (HOT or COLD)		HOT		COLD		1	
09	FLUID DESCRIPTION		ORGANIC VENT		CHILLED WATER		1	
10	TOTAL FLUID ENTERING	PPH	199		6,569		1	
11	VAPOR	PPH	199				1	
12	LIQUID	PPH			6,569		1	
13	STEAM	PPH						
14	NON-CONDENSIBLES	PPH	30 (AIR)				1	
15	FLUID VAPORIZED	PPH						
16	FLUID CONDENSED	PPH	158				1	
17	INLET PRESSURE	Psia	14.70		65.00		1	
18	VELOCITY	Ft/Sec						
19	PRESSURE DROP ALLOWABLE	Psi	0.1		10.0		1	
20	PRESSURE DROP CALCULATED	Psi						
21			IN	OUT	IN	OUT		
22	TEMPERATURE	C			5	10.6		
23	LIQUID VISCOSITY	Cps	SEE	SEE	1.547	1.547		
24	VAPOR VISCOSITY	Cps	ATTACHED	ATTACHED				
25	LIQUID DENSITY	#/CF	CONDENSING	CONDENSING	62.31	62.31		
26	VAPOR DENSITY	#/CF	CURVE	CURVE				
27	LIQUID SPECIFIC HEAT	BTU/#-F			1.003	1.003		
28	VAPOR SPECIFIC HEAT	BTU/#-F						
29	LIQUID THERMAL CONDUCTIVITY	BTU/Hr-Ft-F			0.331	0.331		
30	VAPOR THERMAL CONDUCTIVITY	BTU/Hr-Ft-F						
31	LATENT HEAT	BTU/#	96	30.4				
32	MOLECULAR WEIGHT	Liquid / Vapor			18.02	18.02		
33	FOULING FACTOR REQUIRED	Hr-SF-F/BTU	0.001		0.001			
34	HEAT EXCHANGED	BTU/Hr	MTD		CORRECTED MTD			
35	OVERALL TRANSFER COEFFICIENT	BTU/Hr-SF-F	DIRTY		CLEAN			
36	DESIGN & CONSTRUCTION DATA							
37		SHELL SIDE			TUBE SIDE			
38	DESIGN PRESSURE	Psig	50 / FV		150		1	
39	DESIGN TEMPERATURE	C	150 C		150 C			
40	HYDROSTATIC TEST PRESSURE	Psig	75		225			
41	NUMBER OF PASSES		1				1	
42	CORROSION ALLOWANCE	Inch CS-.065	0		0.0625			
43			SIZE	RATING	FACING	SIZE	RATING	FACING
44	INLET CONNECTIONS			SEE			SEE	
45	OUTLET CONNECTIONS			ATTACHED			ATTACHED	
46	INTERMEDIATE CONNECTIONS			DRAWING			DRAWING	
47	DRAIN CONNECTION							
48	VENT CONNECTION							
49	TUBES	O.D.: 0.75	BWG:	LENGTH: 3'-0"	NO.: 18	TYPE:	PITCH:	
50	SHELL	O.D.: 8"	I.D.: SCH 20	COVER TYPE (Integral or Removable):	REMOVABLE WITH REMOVABLE BUNDLE			
51	CROSS BAFFLES	TYPE:	* % CUT:	SPACING:	INLET SPACING:			
52	LONG BAFFLES	SEAL TYPE:						
53		MATERIALS OF CONSTRUCTION	THICKNESS	TUBESHEET TYPE (Fixed or Floating)	FIXED			
54				TUBESHEET JOINT	GROOVED AND ROLLED			
55	TUBES	316L SS		EXPANSION JOINT				
56	SHELL	316L SS	8" SCH 20	IMPINGEMENT PROTECTION	NONE			
57	SHELL COVER			TUBE SUPPORTS				
58	CHANNEL or BONNET	CS		U-BEND SUPPORTS	NONE			
59	CHANNEL COVER	CS		GASKETS (Shell / Tube / Packing)	GARLOCK 900 W/TEFLON ENVE			
60	FLOATING HEAD COVER			SHELL WEIGHT - SHIPPING				
61	FLOATING TUBESHEET			SHELL WEIGHT - FILLED W/ WATER				
62	FIXED TUBESHEET	316L SS		BUNDLE WEIGHT				
63	BAFFLES	316L SS		CODE REQUIREMENT	ASME CODE SEC VIII DIV 1			
64	SUPPORTS	316L SS		TEMA CLASS	B			
65				CUSTOMER INSPECTION REQUIRED	YES			
66	STRESS RELIEVED MARKED "SR" & RADIOGRAPHED MARKED "XR"			VENDOR	ALABAMA HEAT EXCHANGER			
67	* DATA MARKED BY AN ASTERISK MUST BE FURNISHED BY VENDOR UNLESS SPECIFIED BY PURCHASER WITH QUOTE							
68	REVISION: 1 DATE: 7/7/95 APP'D: RJB	REVISION: 2 DATE: APP'D:	REVISION: 3 DATE: 04/06/96 APP'D: DMB	REVISION: DATE: APP'D:	REVISION: DATE: APP'D:	REVISION: DATE: APP'D:	S&T01R01	