

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

86085
E-308

1. Manufactured and certified by HUGHES-ANDERSON HEAT EXCHANGERS, INC., 1001 N. FULTON, TULSA, OKLAHOMA 74115
(Name and address of Manufacturer)

Manufactured for THE PRITCHARD CORPORATION, OVERLAND PARK, KANSAS
(Name and address of Purchaser)

3. Location of installation AMERICAN CYANAMID, FORTINER, LA.
(Name and address)

4. Type: HORIZ. HEAT EXCHANGER 7110
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Mfg's serial No.)
7110-01 THRU 7110-13 4017 1993
(CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 1989; (1991 Add.)
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) No. of course(s): 2 (b) Overall length (ft & in.): 19'-8-1/4"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	36" ID	9'-11-1/2"	SA-516-70 FG		7/16"	1/8"	1	Spot	85%	1	Spot	85%	----	----
1	36" ID	9'-7-3/4"	SA-516-70 FG		7/16"	1/8"	1	Spot	85%	1	Spot	85%	----	----

7. Heads: (a) _____ (b) _____
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp. (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)														
(b)														

If removable, bolts used (describe other fastening) _____
(Mat'l Spec. No., Grade, size, No.)

8. Type of jacket: _____ Jacket closure _____
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions 115 210 10
9. MAWP (internal) (external) psi at max. temp. (internal) (external) °F Min. design metal temp. (internal) (external) °F at 115 psi.

10. Impact test No - Exempt from impacts UG-20
(Indicate yes or no and the component(s) impact tested)

11. Hydro. ~~xxxxxx~~ test press. 173 PSI Proof test _____

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-266 Gr. 2 37-1/2" 1-1/2" 1/4" Welded
Fixed (Mat'l Spec. No.) (Dis., in. (subject to press.)) (Nom. thk., in.) (Corr. Allow., in.) (Attachment (welded or bolted))
SA-266 Gr. 2 37-1/2" 1-1/2" 1/4" Welded
(Floating (Mat'l Spec. No.)) (Dis., in.) (Nom. thk., in.) (Corr. Allow., in.) (Attachment)

13. Tubes: SA-179 3/4" 14 BWG (Avg.) 988 Straight
(Mat'l Spec. No., Grade or Type) (O.D., in.) (Nom. thk., in. or gauge) (Number) (Type (Straight or U))

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 1

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	36" ID	1	SA-516-70 FG		7/16"	1/8"	1	Spot	85%	1	Spot	85%	----	----

15. Heads: (a) SA-516-70 Finegrain (b) _____
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp. (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Ends	7/16"	1/8"			2:1					X			
(b)														

If removable, bolts used (describe other fastening) SA-193-B7, 3/4" dia. - 44
(Mat'l Spec. No., Grade, size, No.)

FORM U-1 (Back)

16. MAWP 115 psi at max. temp. 175 °F. Min. design metal temp. 10 °F at 115 psi.
(internal) (external) (internal) (external)

17. Impact test NO - EXEMPT FROM IMPACTS PER UG-20

(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. 173 Proof test _____

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
In/Out	1/1	12"-150#	RF-WN	SA-106-B	SA-105	Sch.40	1/8"	SA-516-70 FG	Welded	Welded	Shell
In/Out	1/1	8"-150#	RF-WN	SA-106-B	SA-105	Sch.40	1/8"	SA-516-70 FG	Welded	Welded	Front Channel
Vent/Drain	1/1	2"-150#	RF-LWN		SA-105	5/8"	1/8"	----	----	Welded	Back Channel
Aux.	2/2	3/4"-6000#	Cplg.		SA-105		1/8"	----	----	Welded	Each Flow Noz
Aux.	2/2	1"-6000#	Cplg.		SA-105		1/8"	----	----	Welded	Each Flow Noz
ANY OF THE ABOVE INLET & OUTLET CONNECTIONS MAY BE USED FOR RELIEF VALVES OR INSPECTION OPENINGS.											

20. Supports: Skirt _____ Lugs _____ Legs _____ Others 2 Saddles Attached Welded to Shell
(Yes or no) (No.) (No.) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
 (List the name of part, item number, mfg's. name and identifying number)

22. Remarks: Front Channel Flg. = 2-5/8" Thk.; Rear Channel Flg. = 2-5/8" Thk.
Both Girth Flanges Material = SA-105-N
36" x 20' (BRM) Methanol Cooler
(1) Front Channel 1 course 1'-9-1/4" Lg.; Back Channel 1 course 1'-7-3/8" Lg.

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

U Certificate of Authorization No. 11979 Expires DECEMBER 31, 19 94

Date 11/1/93 Name HUGHES-ANDERSON HEAT EXCHANGERS, INC.
(Manufacturer)

Signed

JC Fairless
(Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Oklahoma and employed by Commercial Union Ins. Co. of Boston, Mass. have inspected

the pressure vessel described in this Manufacturer's Data Report on 11-2-, 19 93, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 11-2-93 Signed *L. S. Cooney* Commissions Okla. #251, N.B.#5745(A)
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1.

U Certificate of Authorization No. _____ Expires _____, 19 _____

Date _____ Name _____ Signed _____
(Assembler) (Representative)

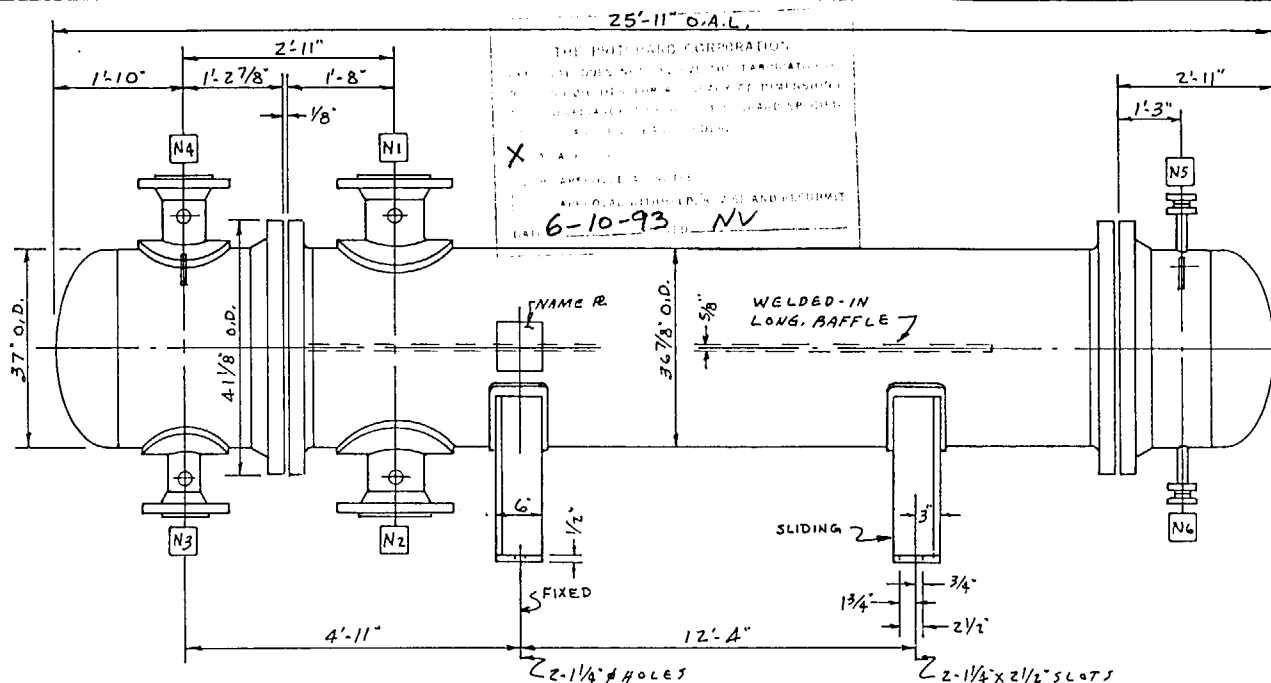
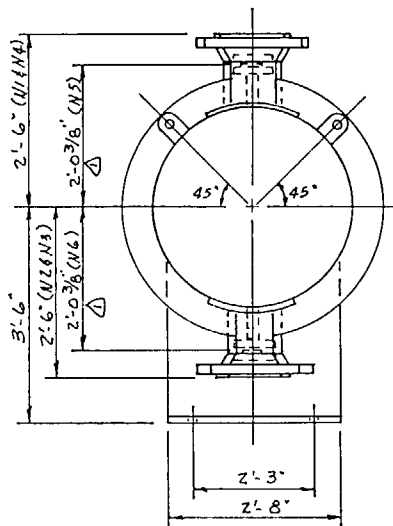
CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items

_____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

PROJECT: AMMONIA TO METHANOL PLANT CONVERSION
THE PRITCHARD CORPORATION
TPC REQ'N NO.: 7-4
TPC P.O. NO.: 2639-7-4-19
TAG NO.: E-308
FORTIER METHANOL CO.: WESTWEGO, LA.



THE PRITCHARD CORPORATION
DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH
ASME SECT. VIII, 1989 EDITION (1991 ADD.) AND SO
STAMPED BY NATIONAL BOARD.
(B) TEMA CLASS "R" & ART-660
(C) CUST. SPEC'S.: 6496-7.01X & 2639-14.01X.
DATE: 6-10-93 NV

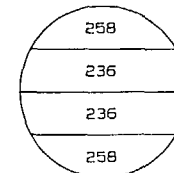
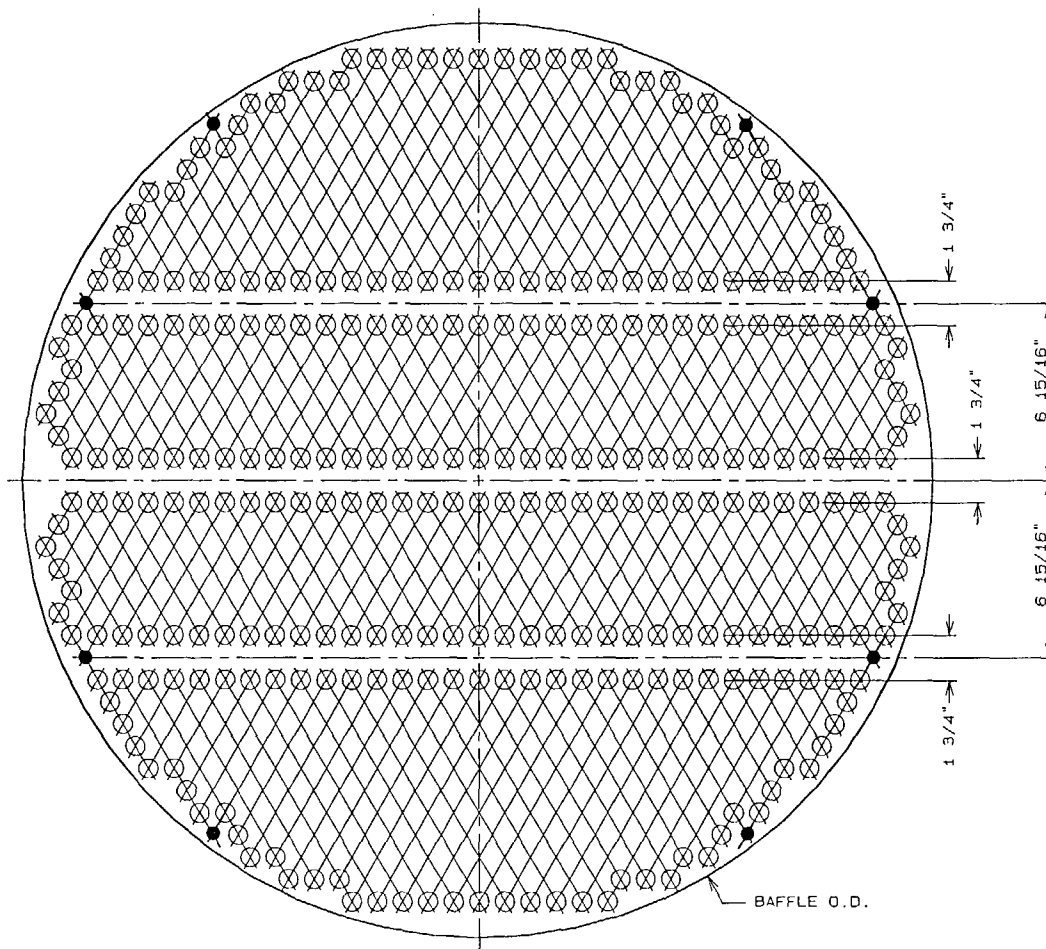
DESIGN DATA	SHELL	TUBES	NOZZLE DATA			
DESIGN PRESSURE (PSI)	45	100	MARK	SIZE	RATING	SERVICE
MAX ALLOW WORK PR (PSI)	115	115	N1	12"	150#	RF-WN INLET
TEST PRESS. (SHOP) (PSI)	173	173	N2	12"	150#	RF-WN OUTLET
TEST PRESS. (FIELD) (PSI)	173	173	N3	8"	150#	RF-WN INLET
DESIGN TEMPERATURE (F)	210	175	N4	8"	150#	RF-WN OUTLET
MIN DESIGN METAL TEMP. (F)	10	10	N5	2"	150#	VENT WITH BLIND
CORROSION ALLOWANCE (IN)	1/8"	1/8"	N6	2"	150#	DRAIN WITH BLIND
NUMBER OF PASSES	2	4				
TUBE SURFACE (EFF.)	3893	(SQ-FT)				
TUBES: 988-3/4" O.D. X 14 BWG (AVG) SA-179						
DRY WT. (LBS) WET WT. (LBS)	20,000	20,600				
MAX SHELL SIDE LIM. BY TUBESHEET						
MAX TUBE SIDE LIM. BY TUBESHEET						
USE 60°F (MIN) TEST WATER.						

NOZ'S N1, N2, N3 & N4 EQUIPPED WITH
1-1"-6000# CPLG (NS) & 1-3/4"-6000#
CPLG (FS).
ALL CPLG'S ARE PLUGGED.

- GENERAL NOTES
- DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH:
(A) ASME SECT. VIII, 1989 EDITION (1991 ADD.) AND SO
STAMPED BY NATIONAL BOARD.
(B) TEMA CLASS "R" & ART-660
(C) CUST. SPEC'S.: 6496-7.01X & 2639-14.01X.
 - ALL BOLT HOLES TO STANDARDS.
 - HEAT TREAT-NONE
 - SPOT RADIOGRAPH CHANNELS & SHELL.
 - PROVIDE ONE SPARE SET OF GASKETS.
 - STRENGTH WELD TUBES TO TUBESHEETS.
 - AFTER HYDRO & DRAINING, BLOW HOT AIR THRU
BOTH SIDES FOR ONE HOUR.
 - SANDBLAST OUTSIDE/SSPC-SP6 & PRIME
CHANNELS w/ ONE COAT OF VAL CHEM EPOXY
13-R-62 (270 & MILS DFT).
 - SANDBLAST SHELL/SSPC-SP6 & PRIME w/
ONE COAT OF VALSPAR MR-7 13-F-12
(270 & MILS DFT).
 - SHELL SIDE INSUL. THICKNESS 1 1/2". TUBE SIDE: NONE.

CERTIFIED CORRECT FOR FABRICATION			
BY: J.A. Munio	DATE: 11/23/92		
CUST.: THE PRITCHARD CORP./FORTIER METHANOL CO.			
DEST.: WESTWEGO LOUISIANA			
CUST. P.O.: 2639-7-4-19			
ITEM: E-308			
SERVICE: METHANOL COOLER			
SERIAL: 7110			
FILE: 420-92			
HUGHES-ANDERSON HEAT EXCHANGERS, INC.			
TULSA, OKLAHOMA			
DRAWING TITLE	OUTLINE DRAWING		
WORK ORDER	7110	NUMBER REQ'D	ONE
OR	DATE	SIZE	DRAWING NO.
JIM	11/23/92	36"X20"	7110-01
CK	SCALE	TYPE	
1/4"	NONE	AFM	

86085



TUBES PER PASS

THE PRITCHARD CORPORATION
 APPROVAL DOES NOT RELIEVE THE PRITCHARD CORPORATION
 RESPONSIBILITIES FOR ACCURACY OF DIMENSIONS
 AND COMPLIANCE TO LOCAL PRITCHARD SPECIFICATIONS
 AND PURCHASE ORDER

☒ A. APPROVED
☐ B. APPROVED AS NOTED
☐ C. APPROVAL WITHHELD, REVISE AND RESUBMIT

DATE: 6-10-93 ISSUED: NV

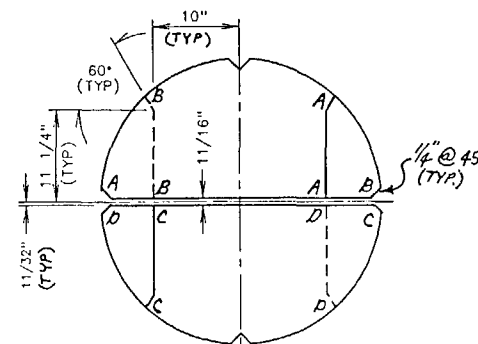
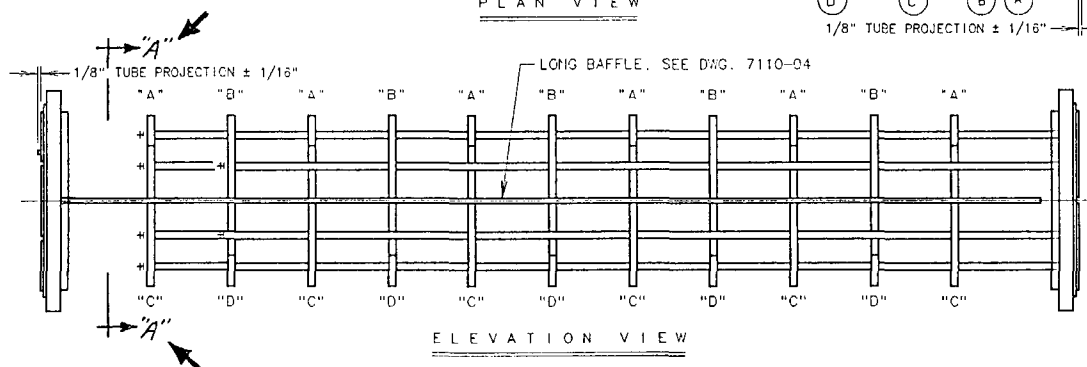
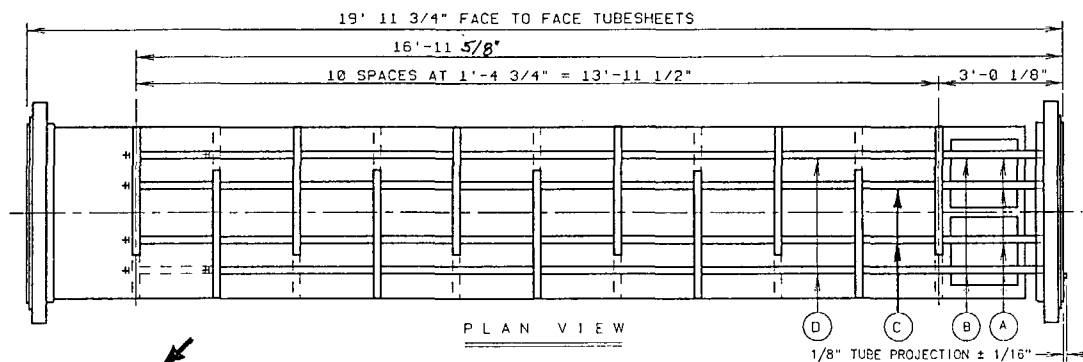
PROJECT: AMMONIA TO METHANOL PLANT CONVERSION
 THE PRITCHARD CORPORATION
 TPC REQ'N NO: 7-4
 TPC P.O. NO.: 2639-7-4-19
 TAG NO.: E-308
 FORTIER METHANOL CO.: WESTWEGO, LA.

● DENOTES TIE ROD (8 - REQD)

NOTE:
 DRILL AND REAM TUBE HOLES TO 0.760" +/- .002"
 988-3/4" O.D. TUBES ON 1" Δ PITCH
 35 7/16" ACTUAL TUBE CIRCLE
 GROOVE TUBE HOLES PER DETAIL "A" ON DWG. 7110-08

DRAWING TITLE				TUBE LAYOUT	
ITEM NO. E-308		P.O. NO. 2639-7-4-19			
SERIAL NO. 7110		NUMBER REQD. 1			
DR. JIM	DATE 11/18/92	SIZE 36"-20"	DRAWING NUMBER 7110-07		
CK. AF	SCALE NONE	TYPE BFM			

58085



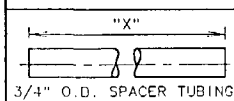
BAFFLE O.D. = 35 13/16"

6- REQD CUT AAA 5/16" THK

5- REQD CUT BBB 5/16" THK

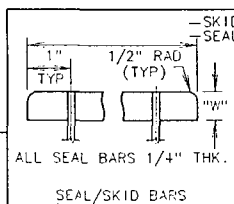
6- REQD CUT CCC 5/16" THK

5- REQD CUT DDD 5/16" THK



MKD	REQ'D	"X"
A	6	2'-10 15/32"
R	2	4'-3 7/32"
C	40	1'-4 7/16"
D	18	2'-9 3/16"

MKD	REQ'D	"Y"
E		
F	2	15'-8"
G	6	17'-0 5/8"
H		
I		
J		



MKD	REQ'D	"W"
(S1)		
(S2)		
(S3)		
(S4)		
(S5)		
(S6)		
(SK)		

THE PRITCHARD CORPORATION

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

DATE: 6-10-93

APPROVED BY: NV

NOTES:

1. NOTCH BAFFLES 1/4" X 90 DEG. TOP AND BOTTOM.
2. DRILL 49/64" DIA. HOLES FOR TUBES.
3. DRILL 9/16" DIA. HOLES FOR TIERODS.
4. DEBURR ALL TUBE HOLES.
5. REMOVE ALL SHARP CORNERS ON BAFFLES.

PROJECT: AMMONIA TO METHANOL PLANT CONVERSION

THE PRITCHARD CORPORATION

TPC REQ'N NO.: 7-4

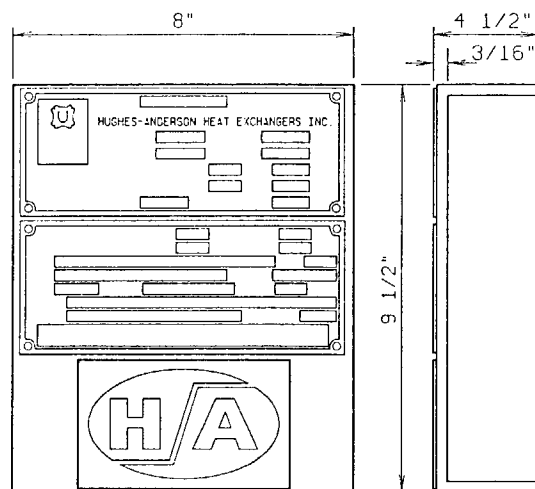
TPC P.O. NO.: 2639-7-4-19

TAG. NO.: E-308

FORTIER METHANOL CO., WESTWEGO, LA.

HUGHES-ANDERSON HEAT EXCHANGERS INC.			
DRAWING TITLE		BUNDLE DETAILS	
ITEM NO.	E-308	P.O. NO.	2639-7-4-19
SERIAL NO.	7110	NUMBER REQ'D	1
OR	MM	DATE	4/12/93
CK	P.F.	SCALE	NONE
		SIZE	36" X 20"
		TYPE	BFM
		DRAWING NUMBER	7110-09

86085



NATL BOARD NUMBER REQD	
CERTIFIED BY:	
HUGHES-ANDERSON HEAT EXCHANGERS INC.	
SHELL MAWP	115 PSI AT 210 °F
TUBES MAWP	115 PSI AT 175 °F
MIN. DESIGN METAL TEMP. SHELL SIDE	10 °F AT 115 PSI
MIN. DESIGN METAL TEMP. TUBE SIDE	10 °F AT 115 PSI
SERIAL NO. 7110	YEAR BUILT 1993

SHOP TEST PRESS. SHELL SIDE	173 PSI	TUBE SIDE	173 PSI
FIELD TEST PRESS. SHELL SIDE	173 PSI	TUBE SIDE	173 PSI
R.T. SPOT CHANNELS & SHELL	TYPE BFM		
H.T. NONE	ITEM NO. E-308		
SIZE 36" X 20'	P.O. NO. 2639-7-4-19	SURFACE 3893	SQ. FT.
TUBES 988-3/4" O.D. X 14 BWG (AVG) SA-179			
SERVICE METHANOL COOLER	SERIAL NO. 7110		
PROJECT: AMMONIA TO METHANOL PLANT CONVERSION			
CUSTOMER: THE PRITCHARD CORP./FORTIER METHANOL CO.			

PROJECT: AMMONIA TO METHANOL PLANT CONVERSION
 THE PRITCHARD CORPORATION
 TPC REG'D NO: 7-4
 TPC P.O. NO.: 2639-7-4-19
 TAG. NO.: E-308
 FORTIER METHANOL CO.: WESTWEGO, LA.

HUGHES-ANDERSON HEAT EXCHANGERS INC.			
DRAWING TITLE		NAME PLATE DRAWING	
ITEM NO. E-308	P.O. NO. 2639-7-4-19		
SERIAL NO. 7110	NUMBER REQ'D ONE		
DR MM	DATE 4/13/93	SIZE 36" X 20'	DRAWING NUMBER
CK R.F.	SCALE NONE	TYPE BFM	7110-II

A 100 Pcs CUST 10 11 5-70-92 A MM 1.10/02

86085