FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS 1602-313-2

As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured by Camden Alloy Fabricators Camden, New Jersey #86923
(Name and address of manufacturer)

2. Manufactured for E. I. Du Pont De Nemours & Company Wilmington, Delaware
(Name and address of purchaser)

3. Location of installation E. I. Du Pont De Nemours & Company Old Hickory, Tenn
(Name and address)

4. Type Horizontal Heat Exchanger (Horiz., or vert. tank) Vessel No. 80-7871B (Mfgr's Serial No.) (CRN) A-1523 (Drawing) 1744 (Nat'l Brd No.) Year Built 1980

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1977 (Year) and Addenda to 6-30-79 (Date) and Code Case no. --- Special service per UG-120(d) ---

Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: ---
(Name of part, item number, mfgr's name and identifying stamp)

Items 6-11 incl. to be completed for single walled vessels, jackets of jacketed vessels, or shells of heat exchangers

6. Shell: Material SA240T316L (Spec. No., Grade) Nominal Thickness .438 in. Corrosion Allowance .125 in. Diam. 1 ft 6 in. Length 21 ft 0 in.

7. Seams: Longitudinal DBL Butt (Welded, Dbl., Sngl., Lap, Butt) R.T. Spot (Spot or Full) Efficiency 85 % H.T. Temp --- F

Time --- Girth Single Butt, UA 48(8) (Welded Dbl., Sngl., Lap, Butt) R.T. Spot (Spot, Partial or Full) No. of Courses 1

8. Heads: (a) Material SA240 T316L (Spec. No., Grade) (b) Material (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio
(a)	End	.375	/125			2 to 1
(b)						

	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)				Concave
(b)				

If removable, bolts used (describe other fastenings) (Material, Spec. No., Gr., Size, No.)

9. Type of Jacket Proof Test

10. Jacket Closure (Describe as ogee & weld, bar, etc.) If bar, give dimensions If bolted, describe or sketch.

11. Constructed for max. allowable working pressure 375 psi at max. temp. 212 F Min. temp. (when less than -20 F) --- F.
Hydrostatic, ~~pneumatic or combination~~ test pressure 563 psi

Items 12 and 13 to be completed for tube sections

12. Tubesheets: Stationary—Material SA240 T317L (Spec. No. Gr.) Diam. 23.125 (Subject to pressure) in. Nominal Thickness 2.094 in. Corrosion Allowance 0 in. Attachment Bolted (Welded, Bolted) Floating—Material (Spec. No., Grade) Diam. in.

Nominal Thickness in. Corrosion Allowance in. Attachment

13. Tubes: Material SB338-7 (Spec. No., Gr.) O.D. .750 in. Nominal Thickness 16 ~~XXX~~ or gauge Number 91 Type "U" (Straight or "U")

Items 14-17 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: Material SA240T316L (Spec. No., Gr.) Nominal Thickness .500 in. Corrosion Allowance .125 in. Diam. 1 ft 6 in. Length 1 ft 2 in.

15. Seams: Longitudinal DBL Butt (Welded, Dbl., Sngl. Lap. Butt) R.T. Spot (Spot or Full) Efficiency 85 % H.T. Temp --- F Time ---

Girth DBL Butt, UA 48(8) (Welded, Dbl., Sngl., Lap, Butt) R.T. Partial (Spot, Partial, or Full) No. of courses 1

16. Heads: (a) Material SA 240 T316L (Spec. No., Grade) (b) Material (Spec. No., Gr.)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio
(a)	End	.375	.125			2 to 1
(b)						

	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)				Concave
(b)				

If removable, bolts used (describe other fastenings) 321 S/S, SA193 B8MC12, 125000, 3/4, 28.
(Material, Spec. No., Gr., Size, No.)

17. Constructed for max. allowable working pressure 400 psi at max temp. 275 F. Min. temp. (when less than −20 F) --- F
Hydrostatic, ~~pneumatic or combination~~ test pressure 600 psi.

#86923

Items below to be completed for all vessels where applicable

18. Safety Valve Outlets: Number _____ Size _____ Location Elsewhere in System

19. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Diam. or Size	Type	Material	Nominal Thickness	Reinforcement Material	How Attached
Inlet,Outlet	2	6"	SO	SA312T316L	Sch 80	SA240 T316L	Welded
Inlet,Outlet	2	4"	SO	SA312T316L	Sch120	None	Welded
Drain	1	1"	LWF	SA182T316L	300#	None	Welded
	2	1 1/2"	LWF	SA182T316L	300#	None	Welded

20. Inspection Openings:
Manholes No. _____ Size _____ Location _____
Handholes No. _____ Size _____ Location _____
Threaded No. _____ Size _____ Location _____

21. Supports: Skirt No (Yes or no) Lugs No (No.) Legs No (No.) Other (4)Saddles (Describe) Attached Shell, Welded (Where and how)

22. Remarks: This vessel is a 4 Pass, 722 Sq Ft Heat Exchanger.
Overall Length 23'-5 1/2". Contents Unknown.
DuPont P.O. # OHC-3287-W Item # 1602-313-2 P6809

CERTIFICATE OF 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.

Date Aug 19,1980 Signed Camden Alloy Fabricators (Manufacturer) by Frank E. Hoffman (Representative)

"U" Certificate of Authorization No. 399 expires March 30 1981.

CERTIFICATE OF SHOP INSPECTION

Vessel made by Camden Alloy Fabricators at Camden, New Jersey

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 PA and employed by *The Factory Mutual System of Norwood, MA have inspected the pressure vessel described in this Manufacturers' Data Report on _____ 19 ____, 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 the Manufacturers' 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 8-19-80
Signed Herbert J. Pietz (Inspector) Commissions NB5412 Pa1924 +Ohio (Nat'l Board, State, Province and No.)

CERTIFICATE OF COMPLIANCE FOR FIELD WORK

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.

Date _____ Signed _____ (Manufacturer) by _____ (Representative)

"U" Certificate of Authorization No. _____ expires _____, 19 ____.

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 Manufacturers' 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 that, 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 Manufacturers' 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 _____ (Authorized Inspector) Commisisons _____ (Nat'l Board, State, Province and No.)

PT#	QTY.	DESCRIPTION
5A	8	TIE RODS - 3/8" DIA. x 19'-9 1/4" (237 1/4") LG. *
7	8	SPACERS - 1/2" O.D. x 20 GA. x 17 3/8" LG. - UNITS 2 & 3
7	232	SPACERS - 1/2" O.D. x 20 GA. x 7 3/16" LG. - UNITS 2 & 3
	8	SPACERS - 1/2" O.D. x 20 GA. x 17 3/8" LG. - UNIT 1
	232	SPACERS - 1/2" O.D. x 20 GA. x 7 1/4" LG. - UNIT 1

NOZ	SIZE	FLG. TYPE	FLG. RATE	NOZ. NECK TK. & MAT'L.	FLG. MAT'L.	DUTY	REMARKS
F_1	4"	R.F. / S.O.	300#	SCH. 120 - 316L S/S - SA-312	316L S/S SA-182 F	INLET	
F_2	6"	R.F. / S.O.	300#	SCH. 80 - 316L S/S - SA-312	316L S/S SA-182 F	INLET	
U_1	4	R.F. / S.O.	300#	SCH. 120 - 316L S/S - SA-312	316L S/S SA-182 F	OUTLET	
U_2	6	R.F. / S.O.	300#	SCH. 80 - 316L S/S - SA-312	316L S/S SA-182 F	OUTLET	
D	1"	LONG W.N.	300#	9/16 WALL TK'S. - 316L S/S - SA-182-F	—	DRAIN	
T_1	1 1/2"	LONG W.N.	300#	5/8" WALL TK'S. - 316L S/S - SA-182-F	—		UNIT 02 ONLY
T_2	1 1/2"	LONG W.N.	300#	5/8" WALL TK'S. - 316L S/S - SA-182-F	—		UNIT 02 ONLY

EST. WT. DRY 4,[illegible]# FLOODED 7,000# BUNDLE 1,850#

DESIGN DATA	SHELL SIDE	TUBE SIDE
DESIGN PRESSURE	375 PSIG	400 PSIG
DESIGN TEMPERATURE	212° F	275° F
HYDRO TEST	[illegible] PSIG	600 PSIG
RADIOGRAPHIC EXAM	SPOT	PARTIAL
CORROSION ALLOWANCE	.125" (1/8")	.125" (1/8") EXCEPT TUBES
CONTENTS	PROCESS	PROCESS

ITEM	MATERIAL	SPECIFICATION
TUBES	TITANIUM WELDED, SIZED & ANNEALED	SB-338-GR-7
TUBESHEET	317L S/S	SA-240
BAFFLES	317L S/S UNIT 1 - 316L UNITS 2 & 3	SA-240
TIE RODS	316L S/S	SA-479
SPACERS	316L S/S	SA-249
SHELL	316L S/S	SA-240
SHELL HEAD	316L S/S	SA-240
BONNET SHELL	316L S/S	SA-240
BONNET HEAD	316L S/S	SA-240
SHELL FLANGE	316L S/S	SA-182-F
BONNET FLANGE	316L S/S	SA-182-F
LONGITUDINAL BAFFLE	316L S/S	SA-240
PARTITION PLATES	316L S/S	SA-240
REINFORCING RING	[illegible]	SA-240
SEALING STRIPS	TITANIUM GR 2	
STUDS	[illegible] CLASS II	SA-193-B8M
NUTS	303 S/S	SA-194-8F
COLLAR STUDS	[illegible] S/S CLASS II	SA-193-B8M
GASKETS	316 S/S & TEFLON SPIRAL WOUND	
SUPPORT LUGS	CARBON STEEL	SA-36
TIE ROD NUTS	HAST C-276	COMMERCIAL
SEALING STRIP BAR	[illegible]	SA-479
[illegible]	304 S/S	SA-240
SUPPORT PADS	304 S/S	SA-240

MAY 5 1980

BPF 259498

ORIGINAL SHEET # 10

DUPONT COMPANY
OLD HICKORY TENNESSEE
F.C. # OHC-3287W
PROJ. # [illegible]809
[illegible] EN-1602-313-2, & EN-1602-313-3

NO	DATE	REVISION	APPROVED
6	[illegible]	[illegible]	ERM
5	[illegible]	SEAL STRIP BOLT DIA. CHG'D FROM [illegible] & Nº OF BOLTS REQ'D ; DOWEL PINS 316 S/S - WIDTH OF LONG. BAFFLE WAS 16 3/4"	ERM
4	[illegible]	[illegible]	ERM
3	1/28/80	CHANGED T.S. TKS • RERATE TO 400 PSIG TUBESIDE • MOVE PULLING STUD HOLES • ADDED DOWEL PINS • ADDED NOZS T_1 & T_2 TO UNIT 2 ONLY • REVISED SPACERS AND BAFFLES UNIT 1 ONLY • REVISED SEAL STRIP • CHANGED TIEROD NUTS TO HAST. C-276 • ADDED DET. OF F_1 & F_2 W/ REIN RING • REVISED BONNET CYLINDER • CHANGED TUBESIDE TO PARTIAL RADIOGRAPH	ERM
2	10/29/79	REVISED SEAL STRIP DETAIL.	HVW
1	9/27/79	[illegible]	HVW

DRAWN	F. CONSTANTINO 8-17-79
CHECKED	HVW 8-20-79
APPROVED	HVW 8-27-79
SCALE	
FIRST MADE FOR	DUPONT # [illegible]

CAMDEN ALLOY FABRICATORS

17" x 240" - BFU x 722 SQ. FT.
4-PASS TUBESIDE W/2-PASS SHELLSIDE
3-H. [illegible] HEAT EXCHANGER

REF DWGS E-1190, E-1191, E-1179, E-1189

DRAWING NO A-1523

BPF

REV. #6