

104283

FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS

As required by the Provisions of the ASME Code Rules, Section VIII, Division I

1. Manufactured by Camden Alloy Fabricators Camden, New Jersey
(Name and Address of Manufacturer)

2. Manufactured for Hercules Incorporated Hanover Plant Wilmington, No. Car.
(Name and Address of Purchaser)

3. Type Vert Kind Heat Exch Vessel No. 73-5575A (Name, Serial) (Date & Serial No.)
(Horizontal or Vertical) (Tank, Jacketed, Heat Exch) (Type & Serial) (Date & Serial No.)

Items 4-9 incl. to be completed for single wall vessels (such as air tank), jackets of jacketed vessels, or shells of heat exchangers.
4. SHELL: Material C/SSA515-70 S. 70000 Nominal Thickness 2/16 Corrosion Allowance 1/16 In. Diam. 2 Ft. 7 - 7/8 Length 24 Ft. 0 1/16 F/F
(Kind and Spec. No.) (Fig. or F.B. & Spec. Min. T.S.)

* 5. SEAMS: Long Dbt Butt H.T. No R.T. Spot Sectioned No Efficiency 85 %
(Welded, Bolt, Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
Dbt & Sing. Butt H.T. No R.T. Spot Sectioned No No. of Courses 4
Girth UW13 2(d) H.T. No R.T. Spot Sectioned No No. of Courses 4
If reported describe seams fully on reverse side of form.

6. HEADS (a) Material T.S. (b) Material T.S.
Location Top, bottom, ends Thickness Crown Radius Knuckle Radius Elliptical Ratio Conical Apex Angle Hemispherical Radius Flat Diameter Side to Pressure (Convex or Concave)
(a) (b)
If removable, bolts used (Material, Spec. No., T.S., Size, Number) Other fastening (Describe or Attach Sketch)

7. STAYBOLTS: (Material) If hollow Attachment Threaded, Welded Pitch (Horizontal) X (Vertical) Diam. (Nominal)

8. JACKET CLOSURE: (Describe an edge & weld, bar, etc. If bar, give dimensions, if hollow, describe or sketch)

9. Constructed for max. allowable working press. 175 psi at max. temp. 375 °F. less than -20° Hydrostatic Test 263 psi.
(Min. temp. when less than -20°) (Type & Pressure)

Items 10 and 11 to be completed for tube sections.
10. TUBE SHEETS: Stationary. Material 316S/S SA240 Diam. 31-7/8 Thickness 1-3/4 Attachment Welded
(Kind & Spec. No.) (Subject to Pressure) (Incl. or Excl.)

Both Fixed Material 316S/S SA240 Diam. 31-7/8 Thickness 1-3/4 Attachment Welded
(Kind & Spec. No.)

11. TUBES: 316S/S SA240 O.D. 3/4 In. Thickness 16 Inches 790 Type Straight
(Kind & Spec. No.) (Incl. or Excl.) (Gage Number) (Straight or U)

Items 12-15 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

12. SHELL: Material 316S/S SA240 S. 75000 Nominal Thickness 3/8 Corrosion Allowance 0 In. Diam. 2 Ft. 7 - 7/8 Length 2 Ft. 1 1/4
(Kind and Spec. No.) (Fig. or F.B. & Spec. Min. T.S.)

13. SEAMS: Long Dbt Butt H.T. No R.T. Spot Sectioned No Efficiency 85 %
(Welded, Bolt, Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
UW13 2(d) H.T. No R.T. Spot Sectioned No No. of Courses 1 each end
Girth UA48(1a) H.T. No R.T. Spot Sectioned No No. of Courses 1 each end
C/S SA515-70 H.T. No R.T. Spot Sectioned No No. of Courses 1 each end
316S/SSA240 Liner H.T. No R.T. Spot Sectioned No No. of Courses 1 each end

14. HEADS (a) Material T.S. (b) Material T.S. (c) Material T.S.
Location Top, bottom, ends Thickness Crown Radius Knuckle Radius Elliptical Ratio Conical Apex Angle Hemispherical Radius Flat Diameter Side to Pressure (Convex or Concave)
(a) (b) (c)
(b) Channel (c) Floaring

If removable, bolts used (a) A1 St. SA193B7.125000.3/4.64 (b) (Material, Spec. No., T.S., Size, Number)

(c) (Material, Spec. No., T.S., Size, Number) Other fastening (Describe or Attach Sketch)

15. Constructed for max. allowable working press. 150 psi at max. temp. 350 °F. less than -20° Hydrostatic Test 232 psi.
(Min. temp. when less than -20°) (Type & Pressure)

Items below to be completed for all vessels where applicable.

16. SAFETY VALVE OUTLETS: Number 1 Size 1/2 Location Elsewhere in System

17. NOZZLES	Purpose (Inlet, Outlet, Drain)	Number	Diam. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
Inlet & Outlet		2	20"	L.J.	316S/SSA240	1/4	None	Welded
Inlet & Outlet		2	12"	S.O.	C/SSA106B	Sch. 40	None	Welded
Vent		1	3/4"	Coup.	316S/S	3000#	None	Welded
Drain		1	3/4"	Coup.	Fq. St.	3000#	None	Welded
Vent		1	3/4"	S.O.	C/SSA106B	Sch. 80	None	Welded
Drain		1	3"	L.J.	316S/SSA312	Sch. 40	None	Welded

* If postweld heat-treated.

† List under remarks other internal or external pressures with resultant temperature when applicable.

FORM U-1 (back)

1. INSPECTION Method(s), No. _____ Size _____ Location _____
 OPENINGS: Pan-thenes, No. _____ Size _____ Location _____
 Threaded, No. _____ Size _____ Location _____
 2. SUPPORTS Shell ☒ NO ☐ YES (If Yes, No) _____ Legs _____ Ears _____ No _____ Other _____ Attached _____
 3. REMARKS: This Vessel is a 1 Pass 3720 sq. ft. Oxidizer Cooler. Vessel is not designed for lethal service. Overall length 30'-2 3/4" Long. seam of shell section fabricated by Phoenix Steel Corp. See partial Data report #6652 & 6653.
 ** Vessel has a fabricated expansion joint consisting of (2) flanged and flued heads. Material is C/S SA515-70.
 Contents tube side Oxidizer off gas. Shell side cooling water

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 I.

Date March 6, 1973 Signed Camden Alloy Fabricators by Frank E. Hoffmann

Certificate of Authorization Expires

12/31/74

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 P.A. and employed by Factory Mutual, Group of Ins. Co./MBI Co. of Massachusetts.

have inspected the pressure vessel described in this manufacturer's data report on MAR 6 1973, and state that to the best of my knowledge and belief, the manufacturer has constructed this pressure vessel in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code.

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 MAR 6 1973

[Signature]
Inspector's Signature

Commission

Nat'l Board, State, or Province and No.

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 _____

have compared the statements in this manufacturer's data report with the described pressure vessel and state that parts referred to as data items, _____ and _____ 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 the applicable sections of the ASME

Boiler and Pressure Vessel Code. 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 _____ 19 _____

[Signature]
Inspector's Signature

Commission

Nat'l Board, State, or Province and No.

FORM U-2 MANUFACTURER'S PARTIAL DATA REPORT
A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

JOB NO. : 22261

1. Manufactured and certified by Manning & Lewis Engineering Company 675 Rahway Ave. Union, NJ 07083 104283
(Name and address of Manufacturer)
2. Manufactured for KOSA - WILMINGTON PLANT PO BOX 327, WILMINGTON NC 28402-0327
(Name and address of Purchaser)
3. Location of installation KOSA - WILMINGTON PLANT 4600 HWY 421 NORTH WILMINGTON NC 28401
(Name and address)
4. Type: Shell 17637 2002
(Description of vessel part (shell, two-piece head, tube bundle)) (Mfg's serial No.) (CRN)
- 9145 C-24266-1 2002
(Nat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)
5. ASME Code, Section VIII, Div. 1 2001, A-- 2001, A-- 2002
(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): 6 SEE ITEM No. 21 (b) Overall length, (ft & h.): 23 FT. - 9 1/4 IN.

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length, (ft. & h.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	32"	12' - 0"	SA-516Gr.70		1/2"	1/16"	1	Spot	85%	1	Spot	70%		
1	32"	4' - 1/8"	SA-516Gr.70		1/2"	1/16"	1	Spot	85%	1	Spot	70%		
1	32"	2' - 10 1/8"	SA-516Gr.70		1/2"	1/16"	1	Spot	85%	1	Spot	70%		

7. Heads: (a) (Mat'l Spec. No., Grade or Type) (H.T.-Time & Temp.) (b) (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 175 375 50 375
(internal) (external) psi at max. temp. (internal) (external) °F Min. design metal temp. °F at psi.

10. Impact test NO, CHARPY IMPACT TEST EXEMPT PER UCS-66(a), UHA-51 at test temperature of °F.
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. Hydro - 228 Proof test

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-240-2205 31" 1 5/8" 0 Welded
(Stationary (Mat'l. Spec. No.)) (Dia., in. (subject to press.)) (Nom. thk., in.) (Corr. Allow., in.) (Attachment (welded or bolted))
- (Floating (Mat'l Spec. No.)) (Dia., in.) (Nom. thk., in.) (Corr. Allow., in.) (Attachment)

13. Tubes: SA789-2205 3/4" 16 GA. 790 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): (b) Overall length, (ft & h.):

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length, (ft. & h.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time

Platcom 01-02E01

Form U-2 (Back)

15. 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.) _____

16. MAWP _____ psi at max. temp. _____ °F. Min. design metal temp. _____ °F at _____ psi.

(internal) (external) (internal) (external)

17. Impact test _____ at test temperature of _____ °F.

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

18. Hydro., pneu., or comb. test press. _____ 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	
Inlet/Outlet	2	12"	CL150FLG.	SA-106-B	SA105	.406"	1/16"		UW16.1(d)	2-4(3)	
Vent/Drain	2	3/4"	THD'DCPLG	SA-105		3000#	1/16"		UW16.1(d)		

20. Supports: Skirt No Lugs (No.) Legs 2 Others (Describe) Attached Welded to Shell

(Yes or No) (No.) (No.) (Where and how)

21. Remarks: 32-288 OXIDATION EXCHANGER SHELL SECTION. SHELL SIDE HAS (2) 47"OD x 1/2 TK x 5 1/2 OA FLANGED AND FLUED EXPANSION JOINT. MAT'L. SA516-70

ATTACHED CHANNELS FROM UNIT BUILT BY CAMDEN ALLOY FABRICATORS, SN: 73-5575A, NAT. BD.: 934, SEE R-1 FORM

SAFETY DEVICE PROVIDED BY OTHERS. UG-46a

CERTIFICATE OF SHOP/FIELD COMPLIANCE

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

U Certificate of Authorization No. 1574 Expires 03/31

Date OCT 07 2002 Name Manning & Lewis Engineering Company

(Manufacturer)

Signed

(Representative)

CERTIFICATE OF SHOP/FIELD 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 NJ and employed by HSB CT of Hartford, CT have inspected the pressure vessel part described in this Manufacturer's Data Report on SEP 11 2002, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part 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 part 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 OCT 07 2002 Signed [Signature] (Authorized Inspector)

Commissions

NB 7050AB, NJ 476
(Nat'l Board incl. endorsement, State, Province and No.)

		REQ.	
D	MANUAL	X	
E	AUTOMATIC		
			X
	M & L STD.	X	
	SPECIAL		X

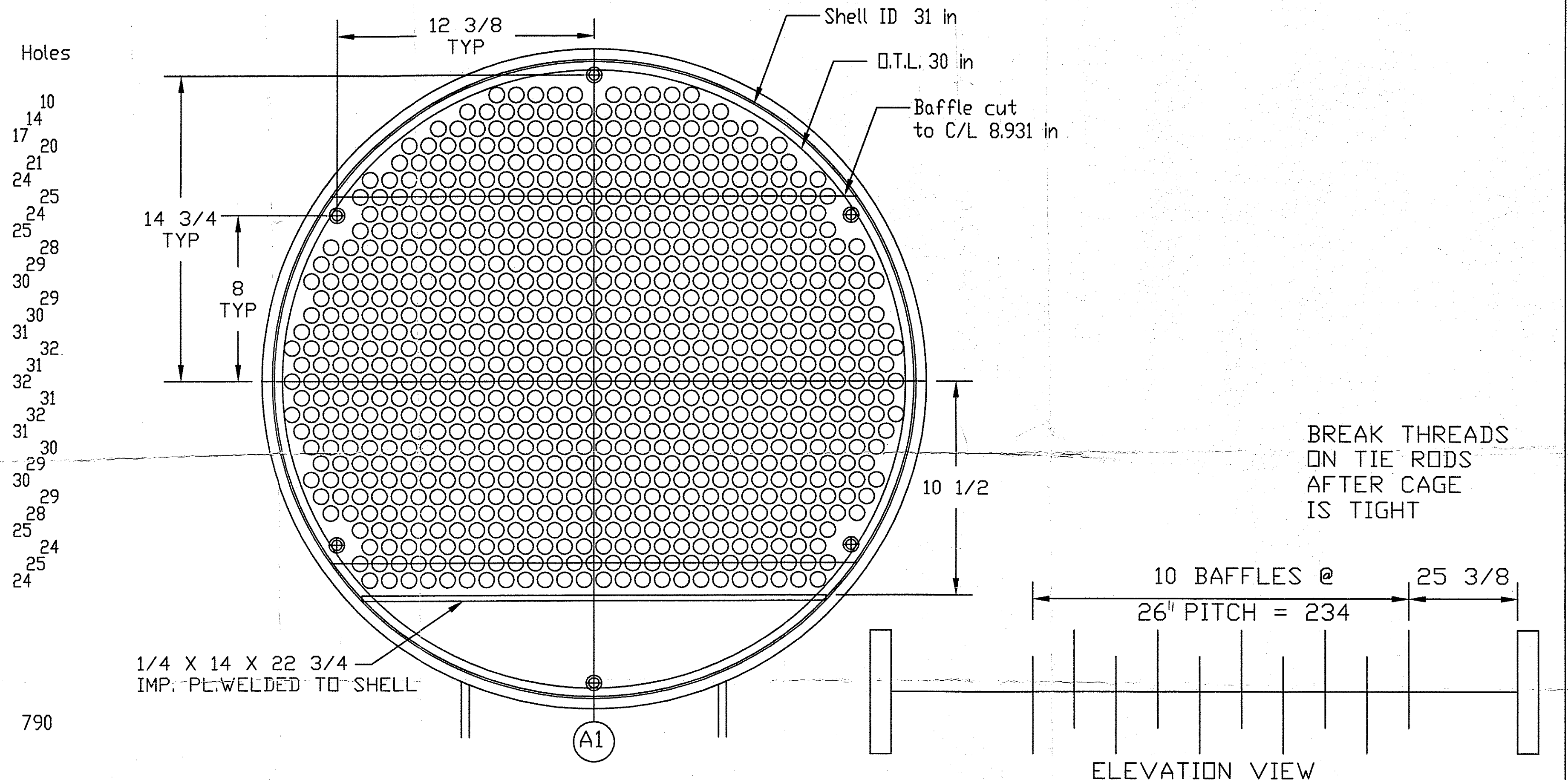
UNIT GASKETS		X	
AFFECTED	SHELL		X
☐	CHAN.		X

CONTROLLED ROLLER EXPANDED
TO A DEPTH OF 1500 INCHES
STRENGTH WELDING PER

LINE CUT SURFACES OF AFTER WELDING.	
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104283

104283 #



Design Specifications				Notes:							
Number of Tube Holes	790	Tube Type	STRAIGHT					MANNING & LEWIS ENG. CO. 675 Rahway Avenue Union, NJ 07083			
Tube Outside Diameter	0.75 in	Hole Dia	.76562 ^{+0.010} _{-0.000}								
Tube Pitch	0.9375 in	Spacer Size	3/4 OD								
Tube Pattern	Triangular	Imp. Nozzle	12"								
Tube Passes	1	Baffle Mat'l	CS								
Number of Tie Rods	6	Ht. Ent. Area	4 3/4"	Scale: .12437 / 8.040308				MADE BY JB CKD. TR DATE 06/25/02			
Tie Rod Diameter	0.5 in	Ht. Exit Area	1.322"								
Baffle Diameter	30.8125 in	Baffle TK.	1/2"	Rev:	Date:	Description	Dwg	Ckd	Appd	Tube Layout	
Baffle Type	Single Segmental	No. of Baffles	10							MADE BY	JB
Baffle Cut	21%	JOB NO.	22261/22262							CKD.	TR
		REF DWG. NO.	C-24266/C-24267							Dwg No.	BT-24268
											Rev: 0

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