

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

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

1. Manufactured and certified by DOYLE & ROTH MFG. CO., INC. ONE MORSE AVENUE SIMPSON, PA 18407
(Name and address of Manufacturer)
2. Manufactured for ALLIED SIGNAL
(Name and address of Purchaser)
3. Location of Installation HOPEWELL, VA 23860
(Name and address)
4. Type VERTICAL HEAT EXCHANGER J-7128
(Horiz., vert., or sphere) (Tank, separator, jkt vessel, heat exch, etc.) (Mfg's serial No.)
(CRN) B-9192-2 16246 1993
(Drawing No.) (Nat'l Bd. No.) (Year Built)
5. ASME Code, Section VIII, Div. 1 1989 & A-91 - -
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.): 9'2"

Course(s)			Material	Thickness		Long. Joint. (Cat A)			Circum Joint (Cat. A B&C)			Heat Treatment	
No.	Diam Inches	Lgth(ft&in)	Spec:Grade/Type	Nom	Corr	Type	Full,Spot,None	Eff	Type	Full,Spot,None	Eff	Temp.	Time
1	24"	4'7"	SA240GR304	.1875	-	1	NONE	70	2	-	65	-	-
1	24"	4'7"	SA240GR304	.1875	-	1	NONE	70	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) EXPANSION JOINT: SA240GR304 (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		Ellip 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 CENTER	.1875	-	-	1-1/8"	-	-	-	-	-	X	-	-	-
b -	-	-	-	-	-	-	-	-	-	-	-	-	-

If removable bolts used (describe other fastenings) -

8. Type of Jacket - (Mat'l., Spec. No. Gr. Size, No.)
Jacket closure - (Describe as Ogee & weld. bar, etc.)
If bar, give dimensions - If bolted, describe or sketch.

9. MAWP 100 - PSI at Max. Temp. 300 - °F Min. design metal temp. -20 °F at 100 psi.
Internal External Internal External

10. Impact Test NO PER UG20(f), UHA51 & WF6
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test pressure 150 Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA240GR304 28.375 1.375 - WELDED
Stationary (Mat'l. Spec. No.) Diam.(in)(Subject to Pressure) Nom. thk., in. Corr.Allow. in. Attach:Welded,Bolted
13. Tubes: ALLOY 20CB SB468 1 .065" 248 STRT
Mat'l. Spec. No. Gr. 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.): 1'11-3/16"

Course(s)			Material	Thickness		Long. Joint. (Cat A)			Circum Joint (Cat. A B&C)			Heat Treatment	
No.	Diam Inches	Lgth(ft&in)	Spec:Grade/Type	Nom	Corr	Type	Full,Spot,None	Eff	Type	Full,Spot,None	Eff	Temp.	Time
1	24"	1'11-3/16"	SA240GR304	.1875	-	1	NONE	70	1	NONE	70	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

15. Heads: (a) SA240GR304 (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		Ellip 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	.1875	-	-	-	2:1	-	-	-	-	X	-	-	-
b -	-	-	-	-	-	-	-	-	-	-	-	-	-

If removable, bolts used (describe other fastening) -

ALLOY SA193B7M & SA194-2H 24 (.75")
(Mat'l., Spec. No. Gr. Size, No.)

16. MAMP 50 - psi at max. temp 150 °F Min. design metal temp. -20 °F at 50 PSI.
 Internal External
 17. Impact Test NO PER UG20(f) UHA-51 & NF6
 (Indicate yes or no and the component(s) impact tested)
 18. Hydro., pneu., or comb. test press. 75 Proof test
 19. Nozzles, Inspection and Safety Valve Openings:

Purpose (Inlet, Outlet Drain, etc.)	No.	Diam. or Size	Flange Type	Material Nozzle Flange	Nom Tk Nom Corr	Reinforcement Material	How Attach Nozz/Flge	Location (Insp Open.)
INLET OUTLET	2	10"	RF/SO	SA312TP304 SA105	SCH 10 -	-	WELDED	BONN SECT
INLET OUTLET	1	8"	RF/SO	SA312TP304 SA105	SCH 10 -	-	WELDED	SHELL SECT
INLET OUTLET	1	2"	LJ	SA312TP304 SA105	SCH 10 -	-	WELDED	SHELL SECT
DRAIN VENT	4	3/4"	CPLG	SA182F304 -	3000# -	-	WELDED	SHELL/BONN

20. Supports: Skirt NO Lugs 2 Legs - Others - Attached WELDED TO SHELL
 (Yes/No) (No.) (No.) (Describe) (Where & 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: VERTICAL SHELL AND TUBE HEAT EXCHANGER
TAG EQUIP: STEAM CONDENSER

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. 982 expires 1/31/96
 Date 03/01/93 Name DOYLE & ROTH MFG. CO., INC Signed [Signature]
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of Pennsylvania and employed by Arkwright Mutual Insurance Co. of Norwood Massachusetts have inspected the pressure vessel described in this Manufacturer's Data Report on 03/01 1993, 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 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.
 FACTORY MUTUAL ENGINEERING ASSOCIATION

Date 03/01/93 Signed [Signature] Commissions NB8845 Pa2361 'A'
 (Authorized Inspector) (Natl. 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 the 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 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 (Natl. Board incl. endorsement State, Province and No.)