

**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 A&B Process Systems 223 SOUTH WISCONSIN AVENUE Stratford WI 54484 USA  
(Name and address of Manufacturer)

2. Manufactured for Delta-T Corporation PO Box 3024 Williamsburg, VA 23187  
(Name and address of Purchaser)

3. Location of installation UNKNOWN  
(Name and address)

4. Type: Vertical Heat Exch 0909450607 - 0909450607RevB 839 2009  
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2007 Edition - - -  
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): 7 (b) Overall length (ft & in.): 192"

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
<u>1+2</u>	<u>53 1/8"ID</u>	<u>96"</u>	<u>SA-516 70</u>		<u>.5"</u>	<u>-</u>	<u>1</u>	<u>Spot</u>	<u>85</u>	<u>1</u>	<u>None</u>	<u>70</u>	<u>-</u>	<u>-</u>
<u>3</u>	<u>53 1/8"ID</u>	<u>49"</u>	<u>SA-516 70</u>		<u>.5"</u>	<u>-</u>	<u>1</u>	<u>Spot</u>	<u>85</u>	<u>1</u>	<u>None</u>	<u>70</u>	<u>-</u>	<u>-</u>
<u>4</u>	<u>53 1/8"ID</u>	<u>33</u>	<u>SA-516 70</u>		<u>.5"</u>	<u>-</u>	<u>1</u>	<u>Spot</u>	<u>85</u>	<u>1</u>	<u>None</u>	<u>70</u>	<u>-</u>	<u>-</u>

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

If removable, bolts used (describe other fastening) -

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

If bar, give dimensions: - If bolted, describe or sketch. -

9. MAWP 150 15 psi at max. temp. 400 400 °F Min. design metal temp. -20 °F at 150 psi.  
(internal) (external) (internal) (external)

10. Impact test No exempt UHA 51 (d)(e) at test temperature of - °F

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

11. Hydro. PROXY BK EXCHG test press. 195 Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-240 304 53 1/8" 2 1/2" - Weld  
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.) SA-249 304 1" 18 ga 1554 Straight  
Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: SA-249 304 1" 18 ga 1554 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): 2 (b) Overall length (ft & in.): 66 3/8"

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
<u>1</u>	<u>53 1/2"</u>	<u>49 9/16"</u>	<u>SA-240 304</u>		<u>1/4"</u>	<u>-</u>	<u>1</u>	<u>Spot</u>	<u>85</u>	<u>1</u>	<u>None</u>	<u>70</u>	<u>-</u>	<u>-</u>
<u>2</u>	<u>53 1/2"</u>	<u>16 13/16"</u>	<u>SA-240 304</u>		<u>1/4"</u>	<u>-</u>	<u>1</u>	<u>Spot</u>	<u>85</u>	<u>1</u>	<u>None</u>	<u>70</u>	<u>-</u>	<u>-</u>
<u>3</u>	<u>-</u>	<u>-</u>	<u>-</u>		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

15. Heads: (a) SA-240 304 (b) SA-240 304

(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	Conical	Hemispherical	Flat	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle	Ratio	Apex Angle	Radius	Diameter	Convex	Concave	Type	Full, Spot, None	Eff.
(a) TOP		<u>.1518</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2:1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>yes</u>	<u>yes</u>	<u>-</u>	<u>-</u>	<u>85</u>
(b) BOTTOM		<u>.16</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2:1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>yes</u>	<u>yes</u>	<u>-</u>	<u>-</u>	<u>85</u>

If removable, bolts used (describe other fastening) [72]3/4" SA-193-B7& [177]3/4" SA-194-2H  
(Mat'l Spec. No., Grade, size, No.)



16. MAWP 75 15 psi at max. temp. 500 500 °F Min. design metal temp. -20 °F at 75 psi.  
 (internal) (external) (internal) (external)

17. Impact test No Exempt UHA 51(d)(e) at test temperature of - °F

18. Hydro., ~~press~~ test press. 97.5 (Indicate yes or no and the component(s) impact tested) 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	29 1/4"	RFSO	SA-240 304L	SA-105	0.375	-	-	h	2-4(3)	-
Inlet/Outlet	2	11.376	RFSO	SA-53 E/B Wld	SA-105	0.687	-	-	h	2-4(3)	-
Misc.	2	1.939	RFSO	SA-312 TP304L WLD	SA-182 F304L	0.218	-	-	d	2-4(3)	-
Outlet	1	6.065	RFSO	SA-312 TP304L WLD	SA-182 F304L	0.28	-	-	d	2-4(3)	-
Drain	1	1.689	RFSO	SA-106B	SA-105	0.343	-	-	d	2-4(3)	-
Misc.	1	0.957	RFSO	SA-312 TP304L	SA-182 F304L	0.179	-	-	d	2-4(3)	-
Misc.	1	2.9	RFSO	SA-312 TP304L	SA-182 F304L	0.3	-	-	d	2-4(3)	-

20. Supports: Skirt No Lugs 4 Legs - Others - Attached - Sidewall and Welded -  
 (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: Flanged and Flued expansion joint .625" Thickness. 54" OD x 68" OD SA-516 Gr 70. Nozzles attached per UW16.1. Vessel hydro tested in horizontal position. OPP device to be UG125(a). Vessel is designed for non-lethal/corrosive service.; All Nozzle diameters are Inside Dimensions. Shell Courses 5&6 62" ID SA-516GR70 1/2" Thick, Long Joint 1 None 70, Circ. J. Course 7 67" ID SA-516GR70 1/2" Thick, Long Joint 1 None 70, Circ. Joint 1 None 70

#### 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. 30,274 Expires 02/20/12  
 Date 05/04/09 Name A & B PROCESS SYSTEMS Signed Paul W. Hiers  
 (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 WI and employed by HSB CT of CT have inspected the pressure vessel described in this Manufacturer's Data Report on 4/20/09, 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 5/4/09 Signed Paul W. Hiers Commissions NB13326A LOT1055886  
 (Authorized Inspector) (Nat'l Board incl. endorsements, 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 -  
 Date - Name A & B PROCESS SYSTEMS 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 the 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. endorsements, State, Province and No.)