

1. Manufactured and certified by Perry Products Corporation 25 Mt. Laurel Road, Hainesport, NJ 08036
(Name and address of Manufacturer)

2. Manufactured for JLM Chemicals Inc., 3350 West 131st Street, Blue Island, IL 60406
(Name and address of Purchaser)

3. Location of installation Same
(Name and address)

4. Type: Horizontal Heat Exchanger B-5985 --- D-99301 Rev. 0 5874 1999
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 1998-98A
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): 1 (b) Overall length (ft & in.): 4' - 11 3/4" #110407

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	8-5/8"	4' - 11 3/4"	SA-53 GrB		.277"	0	E	None	85%	---	---	---	---	---
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(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 --- If bolted, describe or sketch

9. MAWP 150 --- psi at max. temp. 320 --- °F. Min. design metal temp. 20 °F at 150 psi.
(internal) (external) (internal) (external)

10. Impact test No per Code paragraphs UG-20 (f), UCS-66(a) and UHA-51(d)(e).
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. 225 Proof test ---
Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-240 Tp304 8-5/8" 1" 0 Welded
Stationary (Mat'l Spec. No.) Dia., in. (subject to press.) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)

Body Flg. SA-105 8" 150# 0 Retained by tubesheet
Floating (Mat'l Spec. No.) Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: SA-249 TP304 3/4" 16 GA. 32 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): 1/1 (b) Overall length (ft & in.): 2 @ 6"

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
2	8-5/8"	6"	SA-312 TP304		.148"	0	E	None	85%	1	None	70%	---	---
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(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	.0456	0	---	---	2:1	---	---	---	---	Yes	S	None	85%	
(b)	---	---	---	---	---	---	---	---	---	---	---	---	---	---

If removable, bolts used (describe other fastening) SA-193 B7, 3/4" Dia. x 6" Lg., (16)
(Mat'l Spec. No., Grade, Size, No.) RR 1026.10

16. MAWP 150 psi at max. temp. 320 °F Min. design metal temp. 20 °F at 150 psi.
(internal) (external) (internal) (external)

17. Impact test No per Code paragraphs UG-20 (f), UCS-66(a) and UHA-51(d)(e).

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

18. Hydro., pneu., or comb. test press. 256

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	1"	CL150 LJ	SA-312 TP304L	SA-105	.109"	0	---	d	1a	---
Inlet	1	2"	CL150 SO	SA-106 GrB	SA-105	.154"	0	---	d	3	---
Outlet	1	1"	CL150 SO	SA-106 GrB	SA-105	.133"	0	---	d	3	---
Vent/Drain	2	3/4"	Half Coupling	SA-182 F304	---	3000#	0	---	d	---	---

20. Supports: Skirt --- Lugs --- Legs --- Others --- Attached ---
(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: Unit not designed for lethal service. UG-46(a). For noncorrosive service.

Unit hydro-tested in horizontal position. Safety valve installed elsewhere in system.

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. 4328 Expires 12/31 2000

Date 10/22/99 Name Perry Products Corporation Signed B. Messich
(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 NJ and employed by HSB I&I Co. of Hartford, CT have inspected

the pressure vessel described in this Manufacturer's Data Report on 10/22, 19 99, 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 10/22/99 Signed Robert P. [Signature] Commissions NB11852A NJ1117
(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 ---

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) (Nat'l Board incl. endorsement, State, 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

[illegible]

#110407

Date 4/7/09 Signed Commissions NB11005-ABN, NJ1012
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)



PART

RES
VW



PERRY

CERTIFIED BY

PRODUCTS CORP. HAINESPORT, NY

7278

MAWP SHELL SIDE

320 °F

MAEWP SHELL SIDE

— °F

MDMT SHELL SIDE

150 PSI

MAWP TUBE SIDE

— °F

MAEWP TUBE SIDE

— °F

MDMT TUBE SIDE

— PSI

SERIAL NO.

B-7305

JOB NO.

17205

MODEL

FTSX-8-31Z

YEAR

2009

TAG NO.

—

SHELL ASSEMBLY

HEAT EXCHANGER SPECIFICATION SHEET

19E308

1	Company:JLM CHEMICALS INC									
2	Location:									
3	Service of Unit:					Our Reference:				
4	Item No.:					Your Reference:				
5	Date:9-27-99		Rev No.:REV#1			Job No.:				
6	Size 8-60		Type	BEM	hor	Connected in		1 parallel		1 series
7	Surf/unit(eff) 31		ft2; Shells/unit		1	Surf/shell(eff)		31		ft2
8	PERFORMANCE OF ONE UNIT									
9	Fluid allocation					Shell Side		Tube Side		
10	Fluid name					STEAM		AMS		
11	Fluid quantity, total lb/h					251		3042		
12	Vapor (in/out) lb/h					251				
13	Liquid lb/h					251		3042		3042
14	Noncondensable lb/h									
15	Temperature (in/out) F					298		298		50 225
16	Dew point/bubble point F					298		298		
17	Density lb/ft3					0.147		57.347		57.5 51.88
18	Viscosity cp					0.014		0.199		0.97 0.31
19	Molecular weight, vapor									
20	Molecular weight, noncondensable									
21	Specific heat Btu/(lb*F)					0.562		1.013		0.39 0.39
22	Thermal conductivity Btu/(ft*h*F)					0.017		0.398		0.073 0.073
23	Latent heat Btu/lb					908		908		
24	Inlet pressure psia					65		65		
25	Velocity ft/s					3.8		3.8		1.2
26	Pressure drop, allow./calc. psi					0.3 / 0.016		0.3 / 0.016		2 / 0.246
27	Fouling resist. (min.) ft2*h*F/Btu					0.0005		0.0005		0.002
28	Heat exchanged 228300		Btu/h; MTD (corrected)			143.1		F		
29	Transfer rate, service 52		dirty 75		clean 94		Btu/(ft2*h*F)			
30	CONSTRUCTION OF ONE SHELL Sketch									
31						Shell Side		Tube Side		
32	Design/test pressure psig					150/code		150/code		
33	Design temperature F					320		320		
34	No. passes per shell					1		6		
35	Corrosion allowance in					0.0625		0.0		
36	Connections	in	in	2/150		1/150				
37	size/rating	out	in	1/150		1/150				
38						/		/		
39	Tube no.	32	od	0.75	thk-avg	0.049	in;length	5	ft;pitch	0.9375 in
40	Tube type	plain			Material	SS304		Pattern	60	
41	Shell	CS	id	8	in	Shell cover				
42	Channel or bonnet	SS304				Channel cover				
43	Tubesheet-stationary	SS304				Tubesheet-floating				
44	Floating head cover					Impingement protection on bundle				
45	Baffles-cross	CS	Type	sseg	Cut (%d)	41	v;Spacing: c/c	6.0 in		
46	Baffles-long	Seal type						Inlet	9 in	
47	Supports-tube	U-bend				Type				
48	Bypass seal					Tube-tubesheet joint		groove/expand		
49	Expansion joint					Type				
50	Rho*V2-inlet nozzle	69	Bundle entrance	1	Bundle exit	0				
51	Gaskets-shell side					Tube side				
52	-floating head									
53	Code requirements	ASME Code Sec VIII Div 1				TEMA class				
54	Weight/shell	466	Filled with water	581	Bundle	132	lb			
55	Remarks									
56										
57										
58										