

**FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS**  
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

103225  
E105

1. Manufactured and certified by HEAT TRANSFER SYSTEMS, INC., 8100 POLK, MO. 63111  
(Name and address of Manufacturer)

2. Manufactured for PROTHERM CORPORATION., 11108 SOUTH TOWNE SQUARE, ST. LOUIS, MO. 63123  
(Name and address of Purchaser)

3. Location of Installation UNKNOWN  
(Name and address)

4. Type: HORIZ. HEAT EXCHANGER 12915-2 N/A B-2915-2-01 1802 2007  
(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 2004 Ad / A 2005 N/A N/A  
(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): 4 (b) Overall length (ft & in.): 25' - 10 7/8"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Type	Long Joint (Cat A)		Eff.	Circum Joint (Cat A B & C)		Eff.	Heat Treatment	
	Diameter, In.	Length (ft & in.)		Nom.	Corr.		Full, Spot, None			Type	Full, Spot, None		Temp.	Time
3	32"	8' - 0"	SA-516, Gr. 70	0.500"	0.1250"	1	NONE		70%	1	NONE		1100 F.	0.50 Hr.
1	32"	1' - 10 7/8"	SA-516, Gr. 70	0.500"	0.1250"	1	NONE		70%	1	NONE		1100 F.	0.50 Hr.

7. Heads: (a) SA-516, Gr. 70 1100 F. 0.50 Hr. (b)  
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

(a)	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Type	Category A		Eff.
		Min.	Corr.	Crown	Knuckle					Convex	Concave		Full, Spot, None		
(a)	R - END	0.4375"	0.1250"			2:1			32"		X	S	NONE		85%
(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 80 psi at max. temp. 250 ° F Min. design metal temp. -20 ° F at 80 psi.  
(Internal) (external) (internal) (external)

10. Impact test NONE PER UG-20 (f), AND UCS-66 at test temperature of ° F  
(indicate yes or no and the component(s) Impact tested)

11. Hydro., pneu., or comb. test press. HYDRO - 104 PSI Proof test

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-516, Gr. 70 36 7/8" 2" 0.1875" BOLTED  
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: SA-214 ERW 3/4" 0.083" Min. 280 U - TUBES  
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 (b) Overall length (ft & in.): 1' - 9 5/8"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Type	Long Joint (Cat A)		Eff.	Circum Joint (Cat A B & C)		Eff.	Heat Treatment	
	Diameter, In.	Length (ft & in.)		Nom.	Corr.		Full, Spot, None			Type	Full, Spot, None		Temp.	Time
1	32"	1' - 9 5/8"	SA-516, Gr. 70	0.500"	0.0625"	1	NONE		70%	1	NONE			

15. Heads: (a) SA-516, Gr. 70 (b)  
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

(a)	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Type	Category A		Eff.
		Min.	Corr.	Crown	Knuckle					Convex	Concave		Full, Spot, None		
(a)	L - END	0.4375"	0.0625"			2:1			32"		X	S	NONE		85%
(b)															

If removable, bolts used (describe other fastening) 3/4" - 24 PCS OF SA-193-B7 STUDS AND 3/4" - 48 PCS OF SA-194-2H NUTS  
(Mat'l Spec. No., Grade, Size, No.)



16. MAWP 100 psi at max. temp. 150 ° F Min. design metal temp. -20 ° F at 100 psi.  
(internal) (external) (internal) (external)

17. Impact test NONE PER UG-20 (f), AND UCS-66 at test temperature of \_\_\_\_\_ ° F  
(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. HYDRO - 130 PSI 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	
S-INLET	1	14"	RFSO	SA-106-B SML	SA-105	0.375"	0.1250"		C	O	
S-OUTLET	1	4"	RFSO	SA-106-B SML	SA-105	0.237"	0.1250"		C	O	
T-INLET	1	12"	RFSO	SA-106-B SML	SA-105	0.375"	0.0625"		C	O	
T-OUTLET	1	12"	RFSO	SA-106-B SML	SA-105	0.375"	0.0625"		C	O	

20. Supports: Skirt NO Lugs NO Legs NO Others SADDLE SUPPORTS Attached WELDED TO SHELL  
(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:

#### 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. 20649 Expires 11/04/2009

Date 5/17/07 Name HEAT TRANSFER SYSTEMS, INC. Signed [Signature]  
(Manufacturer) (Representative)

#### CERTIFICATE OF SHOP INSPECTION

BOSTON MASS.

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of MO and employed by OneBeacon America Insurance Co of BOSTON MASS. have inspected the pressure vessel described in this Manufacturer's Data Report on 5-22-07 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 5-22-07 Signed [Signature] Commissions MB909818-MO-0213  
(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.)