

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

193

1. Manufactured and certified by API KETEMA INC. 2300 W. Marshall Drive Grand Prairie, TX 75051
 (Name and address of Manufacturer)
2. Manufactured for THERMAL & MECHANICAL EQUIPMENT CORPORATION 241 W. AIRTEX HOUSTON TX 77090
 (Name and address of Purchaser)
3. Location of installation UNKNOWN
 (Name and address)
4. Type: Vertical EMULSION SEP. REBOILER U981397B2 OVD981397B 15268 1998
 (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 1995, A97
 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.): 18' 7.5"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
	Diameter, in.	Length (ft. & in.)		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	16"	7' 5.25"	SA106B	3/8"	1/8"	S	None	85%	1	Spot	100%		
2	16"	7' 5.25"	SA106B	3/8"	1/8"	S	None	85%	1	Spot	100%		

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
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 ogree & weld, bar, etc.)

- If bar, give dimensions _____ If bolted, describe or sketch _____
9. MAWP 200 15 psi at max. temp. 400 400 °F Min. design metal temp. -20 °F at 200 psi.
 (internal) (external) (internal) (external)

10. Impact test NO UCS66(a).
 (Indicate yes or no and the component(s) impact tested)
11. Hydro., pneu., or comb. test press. HYDRO. 300 Proof test _____

- Items 12 and 13 to be completed for tube sections.
12. Tubesheet: SA-516Gr.70 20.375" 1.875" 1/8" 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: SA214 3/4" 16 GA. 191 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.): 0' 7.25"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
	Diameter, in.	Length (ft. & in.)		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	16"	0' 3.625"	SA106B	3/8"	1/8"	S	None	85%	1	Spot	100		
2	16"	0' 3.625"	SA106B	3/8"	1/8"	S	None	85%	1	Spot	100		

15. Heads: (a) SA-516Gr.70 (b) SA-516Gr.70
 (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 | .338" | 1/8" | | | 2:1 | | | | | Concave | | | |
| (b) | Ends | .338" | 1/8" | | | 2:1 | | | | | Concave | | | |

- If removable, bolts used (describe other fastening) _____ SA 193-B7 3/4X10 32 EACH
 (Mat'l Spec. No., Grade, Size, No.) RR 1026.10

16. MAWP 75 0 psi at max. temp. 400 N/A °F Min. design metal temp. -20 °F at 75 psi.
 (internal) (external) (internal) (external)

17. Impact test NO, UCS66(a).

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

18. Hydro., pneu., or comb. test press. HYDRO. 135

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	
TUBE IN/OUT	2	8"	CL150WN	SA106Gr.B SMLS	SA105	.322"	1/8"		Welded	Welded	
SHELL IN.	1	8X6	CL150WN	SA106Gr.B SMLS	SA105	.322"	1/8"		Welded	Welded	
SHELL OUT	1	2"	CL150WN	SA106Gr.B SMLS	SA105	.344"	1/8"		Welded	Welded	
SHELL V/D	2	3/4"	SCCP	SA105		6000#	1/8"		Welded		

20. Supports: Skirt No Lugs (No.) Legs (No.) Others BRACKETS Attached Side 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)

BELLOWS EXPANSION ELEMENT, ITEM # 6, PACIFIC BELLOWS CORP.. S/N. 3522

22. Remarks: TYPE: BEM SIZE: 15-B-192

SA 516-70 20.375" OD X 2.5" THK.

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. 12,881 Expires 7/2, 19 99

Date 8-24-98 Name API KETEMA INC. Signed Warren E Patterson
 (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 TEXAS and employed by OLD REPUBLIC INSURANCE COMPANY of DALLAS, TX have inspected the pressure vessel described in this Manufacturer's Data Report on 8-24, 19 98, 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 9-1-98 Signed Michael J. [Signature] Commissions NB12125 ATX 1368
 (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 _____, 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) (Nat'l Board incl. endorsement, State, Province and No.)

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)

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

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Form U-2A

1. Manufactured and certified by Pacific Bellows Corp. 5251 Tweedy Blvd., South Gate, California, USA 90280
(Name and address of Manufacturer)

2. Manufactured for API KETEMA 2300 WEST MARSHALL DR. GRAND PRAIRIE, TX 75051
(Name and address of Purchaser)

3. Location of Installation UNKNOWN
(Name and address)

4. Type: BELLOWS EXPANSION ELEMENT (Description of vessel part (shell, two-piece head, tube bundle))
NONE (Mfg's serial No.) 3521 & 3522 NONE (CRN)
NONE (Nat'l. Bd. No.) BB 8869 REVISION 0 (Drawing No.) * PACIFIC BELLOWS CORPORATION (Drawing prepared by) 1998 (Year Built)

5. ASME Code, Section VIII, Div. 1 1995 EDITION 1996 ADDENDA Edition and Addenda (date) NONE Code Case No. NONE Special Service per UG-120 (d)

6. Shell: (a) No. of course(s): 3 (b) Overall length (ft & in.): 0' - 9 1/2"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long Joint (Cat. A) Type Full, Spot, None	Eff.	Circum. Joint (Cat. A, B & C)			Heat Treatment			
	Diameter, in.	Length (ft & in.)		Nom.	Corr.			Type	Full	Spot	None	Eff.	Temp.	Time
1	16" OD	0' - 2 1/4"	SA106 B	.375	.125	S		NONE	85	6	NONE	45	NONE	NONE
2	16" ID	0' - 5"	SA240 T304	.060	0	1		NONE	100				NONE	NONE
3	16" OD	0' - 2 1/4"	SA106 - B	.375	.125	S		NONE	85	6	NONE	45	NONE	NONE

7. Heads: (a) NONE (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp. (b) NONE (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
(a) <u>NONE</u>														
(b)														

If removable, bolts used (describe other fastening) NONE

8. MAWP 200 & FV (internal) 200 (external) psi at max. temp. 400 (internal) AMB (external) °F Min. design metal temp. -20 °F at 200 psi.

9. Impact test NONE - EXEMPT PER PARAGRAPH UCS-66A & UHA-51
(Indicate yes or no and the component(s) impact tested)

10. Hydro., pneu., or comb. test press. BY OTHERS Proof test NONE

11. 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	
<u>NONE</u>											

12. Supports: Skirt NO (Yes or No) Lugs 0 (No.) Legs 0 (No.) Others NONE (Describe) Attached NONE (Where and How)

13. Remarks * SEE ATTACHED U-4 SUPPLEMENTARY SHEET

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. 7167 Expires 12/31/2000, 19
Date: 7/22/98 Name: Pacific Bellows Corp. Signed: R. W. Olson
(Manufacturer) (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 the State or Province of CALIF and employed by Div. of Occupational Safety & Health - Pressure Vessels of California

have inspected the pressure vessel part described in this Manufacturer's Data Report on 7-22, 1998, 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 7-22-98 Signed [Signature] (Authorized Inspector) Conditions Ca. 1234 (Nat'l Board incl. endorsement, State, Province and No.)

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

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Form U-4

1. Manufactured and certified by Pacific Bellows Corp. 5251 Tweedy Blvd., South Gate, California, USA 90280
(Name and address of Manufacturer)

2. Manufactured for API KETEMA 2300 WEST MARSHALL DR. GRAND PRAIRIE, TX 75051
(Name and address of Purchaser)

3. Location of installation UNKNOWN
(Name and address)

4. Type UNKNOWN BELLOWS EXPANSION ELEMENT 3521 & 3522
(Horiz., vert. or sphere) (Tank, separator, heat exch., etc.) (Mfg's. serial No.)

NONE BB 8869 REVISION 0 NONE 1998
(CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

Data Report Item Number	Remarks
6	VESSEL DESIGN CALCULATIONS BY OTHERS
6	END BANDS: SA 240 T304 X 1/8" 0 CORROSION ALLOWANCE FILLET WELD
	FOR VESSEL NO: OVD 981397B4MP 1 & 2
	VESSEL MANUFACTURED BY: API KETEMA
	ELASTIC SPRING RATE: 11562.95 #/ INCHES
	ALLOWABLE AXIAL MOVEMENT: .4527328 INCHES
	ALLOWABLE LATERAL MOVEMENT: 4.389498E-02 INCHES
	ALLOWBLE ANGULAR MOVEMENT: 3.017999 DEGREES
	CYCLE LIFE: 2000 CYCLES
	SERVICE CONDITIONS OF EXPANSION JOINT LIMITED TO NON - LETHAL SERVICE AND TO THOSE STATED IN ATTACHED U-2A PARTIAL DATA REPORT. AND TO THOSE STATED ABOVE IN THIS U-4 SUPPLEMENTARY SHEET. THE SPECIFIC DESIGN OF THIS EXPANSION JOINT IS FOR THE ABSORPTION OF AXIAL, LATERAL OR ANGULAR NON - CURRENT MOVEMENT.
	MANUFACTURED IN ACCORDANCE WITH ASME SECTION VIII, DIVISION 1 1995 EDITION 1996 ADDENDA PER APPENDIX 26
	MECHANICAL SHOCK LOADING IS NOT A CONTROLLING DESIGN REQUIREMENT. NO OTHER LOADINGS ARE APPLICABLE.

Certificate of Authorization: Type "U" No. 7167 Expires 12/31/2000, 1998
 Date 7/22/98 Name Pacific Bellows Corp. Signed RW Olson
 (Manufacturer) (Representative)
 Date 7/22/98 Name [Signature] Cor. ion Ca-1234
 (Authorized Inspector) (Nat'l. Board incl. endorsement, State, Province and No.)

