980085

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

70043

1. Manufactured and certified by Valley Steel Company, Inc. 115 Quinif Lane - Sistersville, WV 2617514'-10 1/2"
(Name and address of Manufacturer)

2. Manufactured for Bayer Corporation, New Martinsville, WV 26155 P.O. Number M-07-M-29369
(Name and address of Purchaser)

3. Location of installation SAME AS ABOVE

4. Type: Vertical Heat Exchanger (Description of vessel part (shell, two-piece head, tube bundle)) | 980085 (Mfg's serial No.) | X (CRN)

523	L-980085-1, REV. D	Valley Steel Company, Inc.	1998
(Nat'l. Bd. No.)	(Drawing No.)	(Drawing prepared by)	(Year built)

5. ASME Code, Section VIII, Div. 1 — 1995 ED, 96 ADD. (Edition and Addenda (date)) | X (Code Case No.) | X (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.: 14'-10 1/2"

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	30" O.D.	8'-0"	SB-209-A95083-0	1/2"	1/16"	1	Spot	85%		1	Spot	85%		---	---
1	30" O.D.	6'-10 1/2"	SB-209-A95083-0	1/2"	1/16"	1	Spot	85%		1	Spot	85%		---	---
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7. Heads: (a) X (Mat'l Spec. No., Grade or Type) H.T.-Time & Temp (b) X (Mat'l Spec. No., Grade or Type) H.T.-Time & Temp

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

If removable, bolts used (describe other fastening) X (Mat'l Spec. No., Grade, Size, No.)

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

If bar, give dimensions X If bolted, describe or sketch.

9. MAWP 175 (internal) -15 (external) psi at max. temp. 127 (internal) 127 (external) °F Min. design metal temp. -20 °F at -15 & 175 psi.

10. Impact test NO (Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. 263 Proof test X

Items 12 and 13 to be completed for tube section.

12. Tubesheet:

SB-209-A90100-0	29"	2"	1/16"	Welded
Stationary (Mat'l Spec. No)	Dia., in. (subject to press.)	Nom. thk., in.	Corr. Allow., in.	Attachment (welded or bolted)

X	X	X	X	X
Floating (Mat'l Spec. No.)	Dia., in.	Nom. thk., in.	Corr. Allow., in.	Attachment

13. Tubes:

SB-241-A91100-0	3/4"	14 GA.	800	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): X (b) Overall length (ft & in.): X

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
--	--	---	-----	----	----	--	----	---		--	----	---		---	---
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RR 1032.9

Form U-2 (Back)

70043

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

	Location (Top, Bottom, Ends)	Thickness Min.	Thickness Corr.	Radius Crown	Radius Knuckle	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure Convex	Side to Pressure Concave	Category A Type	Category A Full, Spot, None	Category A Eff.
(a)	———	———	———	———	———	———	———	———	———	———	———	———	———	———
(b)	———	———	———	———	———	———	———	———	———	———	———	———	———	———

If removable, bolts used (describe other fastening) X (Mat'l Spec. No., Grade, Size, No.)

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

17. Impact test NO (Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. 188 Proof test X

19. Nozzles, Inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material Nozzle	Material Flange	Nozzle Thickness Nom.	Nozzle Thickness Corr.	Reinforcement Material	How Attached Nozzle	How Attached Flange	Location (Insp. Open)
Vent	1	3/4"	CL150LAPJNT	SB-247-A95083H112	SA182F 304	.218"	1/16"	———	Welded	Bolted	Shell
Instrum. Conn.	2	2"	CL300LAPJNT	SB-247-A95083H112	SA182F 304	.343"	1/16"	———	Welded	Bolted	Shell
Inlet	1	8"	CL300LAPJNT	SB-247-A95083H112	SA182F 304	.812"	1/16"	A95083-0	Welded	Bolted	Shell
Outlet	1	12"	CL300LAPJNT	SB-247-A95083H112	SA182F 304	1.00"	1/16"	A95083-0	Welded	Bolted	Shell
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———
———	--	---	———	———	———	---	—	———	———	———	———
———	--	---	———	———	———	---	---	———	———	———	———

20. Supports: Skirt No (Yes or No) Lugs 4 (No.) Legs ——— (No.) Others ——— (Describe) Attached Shell Welded (Where and How)

21. Remarks: (1) Stiffening Ring - 1/4" Thk. X 30 1/8" I.D. X 34 1/8" O.D. SB-209-5083 Material
Shellside of heat exchanger A.S.M.E. Code stamped only
Nozzle neck material SB-209-A95083-H112

Liquifier overall length 191 7/8"

Exempt from impact testing per UNF Appendix NF6.

(2) 2" LR 90 - Elbows machined from SB247-A95083-0 material.

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. 20,885 Expires 12-6 2000

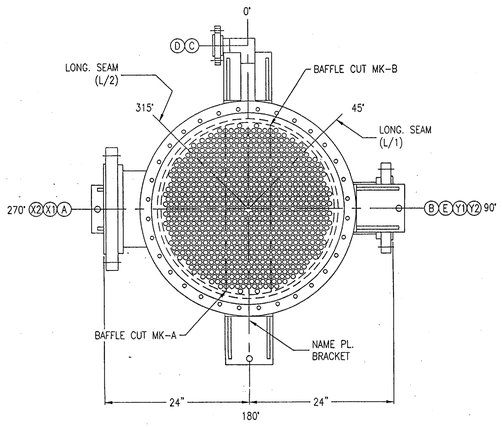
Date 8-14-98 Name Valley Steel Company, Inc. (Manufacturer) Signed (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

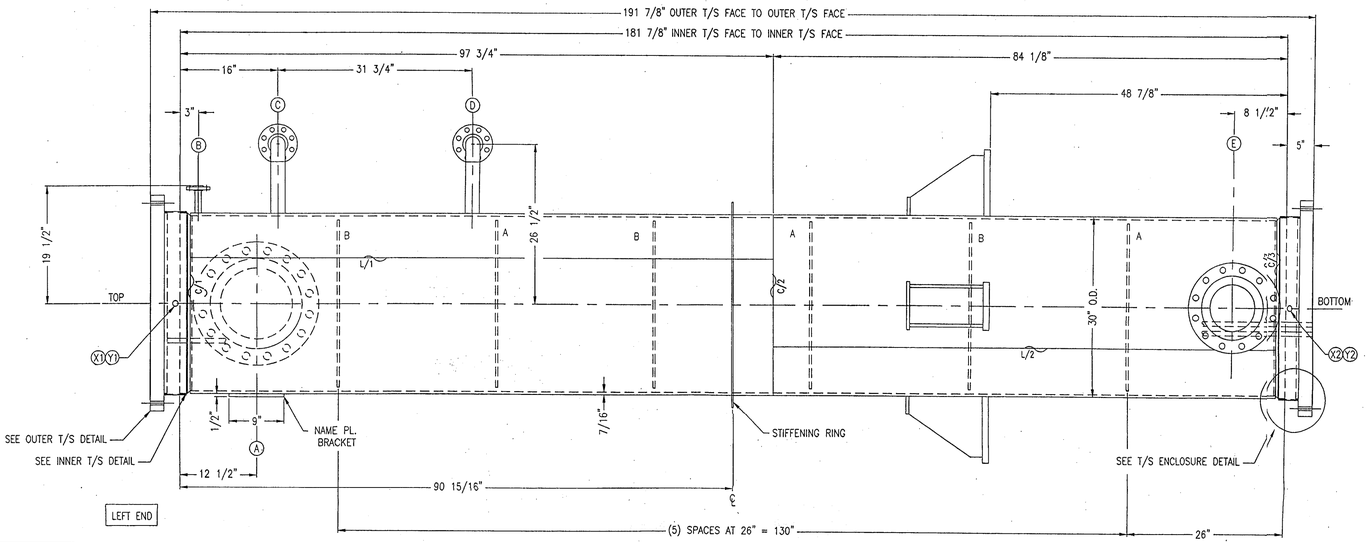
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of WV and employed by Arkwright Mutual Insurance Company of Waltham, Ma. have inspected the pressure vessel described in this Manufacturer's Data Report on AUG 12, 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 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 8-17-98 Signed Linda Dimento (Authorized Inspector) Commissions NB11139(B) WV1309 (Nat'l Board incl. endorsement, State, Province and No.)

10043



ORIENTATION
SCALE: 1" = 1'-0"



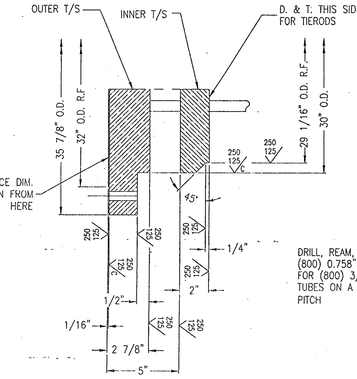
LEFT END

ELEVATION
SCALE: 1" = 1'-0"

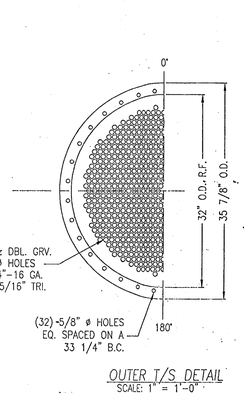
RIGHT END
D. & T. INNER T/S ON THIS END FOR TIERODS

TIERODS: (6) 1/2 ø BAR T.B.E. 2" LG. X 1/2-13 UNC
(2) @ 130 9/16" LG.
(4) @ 156 9/16" LG.
SPACERS: (24) 3/4" X 16 GA.
(2) @ 49 13/16" LG.
(4) @ 23 13/16" LG.
(8) @ 51 5/8" LG.
(10) @ 25 5/8" LG.
TUBES: (800) 3/4" ø X 0.083" WALL X 182" LG. LOCATE ON A 15/16" TRI. PITCH
BAFFLES: (6) 3/8" THK. X 29 1/16" ø
(3) REQ'D. CUT MK-A
(3) REQ'D. CUT MK-B

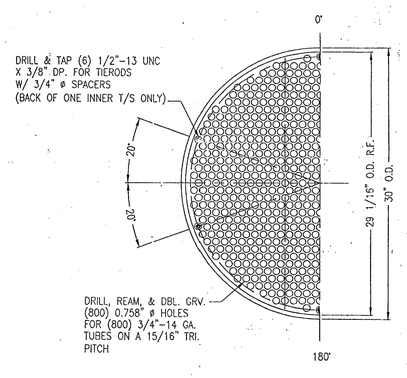
GENERAL NOTES:
1. HELIUM LEAK TEST PER ASME CODE SECT. V 10-8 @ HYDROTEST PRESSURE (SHELL SIDE ONLY)
2. ALL MOISTURE TO BE REMOVED AFTER TESTING.
3. SHELL TO BE N. PURGED @ 5 PSI FOR SHIPMENT
4. TUBE SIDE TO BE TESTED TO 24 PSI WITHOUT ALUMINUM HEADS. IF TESTED WITH ALUMINUM HEADS, THE PRESSURE NOT TO EXCEED 5 PSIG



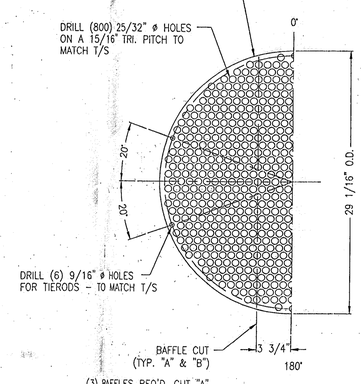
T/S DETAIL
SCALE: N.T.S.



OUTER T/S DETAIL
SCALE: 1" = 1'-0"

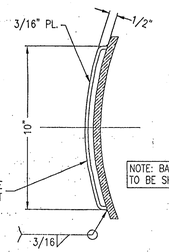


INNER T/S DETAIL
SCALE: 1 1/2" = 1'-0"



(3) BAFFLES REQ'D. CUT "A"
(3) BAFFLES ERQ'D. CUT "B"

BAFFLE DETAIL
SCALE: 1 1/2" = 1'-0"



NOTE: BAAYER NAME PL. TO BE SHIPPED LOOSE

NAME PL. BRACKET
SCALE: N.T.S.

WELD TOLLERANCE
CWP-1 | FIG. 2

MATERIAL OF CONSTRUCTION

	VESSEL OR SHELL SIDE	JACKET OR TUBE SIDE
SHELL	SB-209 A95083-O	
TUBE SHEETS		SB-209 A91100-O
FLANGES	SA-182-F304	
NOZZLE NECKS	SA-247 A95083 H112	
VESSEL SUPPORTS	SA-209 A95083-O	
EXT. BOLTS NUTS		
IN. BOLTS NUTS		
GASKETS		
SUPPORT LUGS		
BAFFLES	SA-209 A95083-O	
TIERODS	5083 ALUMINUM	
SPACERS	1100 ALUMINUM	
SUPPORT LUGS	SA-209 A95083-O	
RCINFORCING PADS	SA-209 A95083-O	
T/S ENCLOSURE	304 S/S	
STIFFENING RING	SA-209 A95083-O	
OTHER	AS SHOWN	

DESIGN CONDITIONS

DESIGN PRESS.	175 & F.V. PSI	75 & F.V.
DESIGN TEMP.	127° F	
OPERATING PRESS.		
OPERATING TEMP.		
CORR. ALLOW.	1/16	
CODE	ASME SECT VIII, DIV. 1, 96 ADD	ASME SECT VIII, DIV. 1, 96 ADD
CODE STAMP	YES & NAT'L BD. REG.	NO
STRESS RELIEF	NO	
RADIOGRAPH	SPOT	
JOINT EFF.	85%	
HYDRO TEST	263 PSIG	SEE NOTES
SP.GR. CONTENTS		

CAPACITIES AND WEIGHTS

OPERATING CAP.		GAL.		CU.FT.
FULL CAPACITY		GAL.		CU.FT.
EMPTY WEIGHT	4,161	LBS.	FULL H_2O 8,837	LBS.
OPERATING WT.	4,048	LBS.	FULL PROD. 4,048	LBS.

GENERAL NOTES

1. BOLT HOLES TO STRADDLE SHOWN CENTERLINE. YES
2. FABRICATOR TO PROVIDE PROTECTIVE SHIELDS FOR ALL FLANGES AND OPENINGS. YES
3. FABRICATOR SHALL PROVIDE GASKETS, BOLTS AND HEX NUTS FOR ALL MATING PARTS INCLUDING BLIND FLANGES WHERE NOTED. YES
4. SPARE SET OF GASKETS IS (NOT) REQUIRED.
5. INDICATE MACHINE FINISHED SURFACES IN MICROINCHES WITH ANSI SYMBOL, e.g.: 125 YES
6. INSULATION SUPPORTS ARE (NOT) REQUIRED.
7. SURFACE PREPARATION
8. PAINTING
9. LIST OF APPLICABLE BAYER STANDARDS AND SPECS.

MARK	NO.	SIZE	RATING	FACING	SCH.	PROJ.	REMARKS
Z							
Y	2	1/2"	3000#	HALF CPLG			VENT
X	2	1/2"	3000#	HALF CPLG			VENT
W							
V							
U							
T							
S							
R							
P							
N							
M							
L							
K							
J							
H							
G							
F							
E	1	8"	300#	L.J.	160	24"	INLET
D	1	2"	300#	L.J.	160	26 1/2"	INSTR. CONN.
C	1	2"	300#	L.J.	160	26 1/2"	INSTR. CONN.
B	1	3/4"	150#	L.J.	160	19 1/2"	VENT W/ BLIND
A	1	12"	300#	L.J.	160	24"	OUTLET

FITTING SCHEDULE

BAYER REFERENCE DATA

PURCH. ORDER NO. M-07-M-29369 PURCH. ORDER DATE: 5/4/98

ITEM NUMBER	EQUIP. NUMBER	ITEM NUMBER	EQUIP. NUMBER
021-102.1	32E-009		

CODE: U W RT-3
NAT'L BD. N40. LATER
CERTIFIED BYY
VALLEY STEEL COMPANY
SISTERSVILLE, W. VA.
MAWP -15 TO 175 PSI AT 127 F (SHELL)
MIN. DES. METAL TEMP. -20 F AT -15 TO 175 PSI
MAWP PSI AT F (JACKET)
MIN. DES. METAL TEMP F AT PSI
MAWP PSI AT F(TUBE)
MIN. DES. METAL TEMP. F AT PSI
SERIAL NO. 980085
YEAR BUILT 1998

MANUFACTURER DATA

MFR. NAME VALLEY STEEL COMPANY CONTRACTORS LIC. # WV012601
STREET / P.O. BOX 115 QUINIF LANE
CITY SISTERSVILLE STATE W.VA ZIP 26175
TELEPHONE A.C. 304-652-4522 FAX 304-652-1408
ENGINEERING CONTACT M. MILLER
S.O. NO. 980085 MFR. DWG. NO. L-980085-1 REV. C

[redacted]

PROJ. LOC. NEW MARTINSVILLE, W.VA PROJ. NO. AREA 021

LIQUIFIER - TUBE BUNDLE

SCALE 1" = 1'-0"
D07-021-M102.1-3
REV. 0

CERTIFIED
VALLEY STEEL COMPANY
DATE 7/28/98

ASME CODE
10043

IN ADDITION TO TOLERENCES SPECIFIED HERE THE FABRICATOR MUST COMPLY WITH ADDITIONAL TOLERANCES INCLUDED IN BAYER ENGINEERING STANDARDS OR SPECIFICATIONS MADE A PART OF THIS ORDER. FAILURE TO COMPLY TO ALL TOLERENCE SPECIFICATIONS WILL CAUSE FOR REJECTION. EQUIPMENT GENERALLY IS JOINED-UP WITH PREFABRICATED PIPING, REQUIRING ACCURATE NOZZLE LOCATIONS AND FACE ALIGMENTS WITHIN THE SPECIFIED TOLERENCES.

HORIZONTAL EQUIPMENT SUPPORT TOLERENCES

TOLERENCE	DESCRIPTION OF TOLERENCES
+1-1/8"	HORIZONTAL EQUIPMENT, CENTERLINE TO BOTTOM SUPPORT
+1/4"	HORIZONTAL EQUIPMENT, BASELINE TO CENTERLINE OF SUPPORT
+1/4"	CENTERLINE TO CENTERLINE OF HORIZONTAL EQUIPMENT SUPPORTS.

VERTICAL EQUIPMENT SUPPORT TOLERENCE

EQUIPMENT DIAMETER	SUPPORT LOCATION BELOW BASELINE		SUPPORT LOCATION ABOVE BASELINE		SUPPORT OUT OF LEVEL ACROSS DIAMETER
7'-0" AND UNDER	+0	-1/4"	-0	+1/4"	1/8"
OVER 7'-0" TO 13'-0"	+0	-5/16"	-0	+5/16"	3/16"
OVER 10'-0" TO 16'-0"	+0	-3/8"	-0	+3/8"	1/4"
OVER 13'-0" TO 16'-0"	+0	-7/16"	-0	+7/16"	5/16"
OVER 16'-0"	+0	-1/2"	-0	+1/2"	3/8"

GENERAL FABRICATION TOLERENCE

METAL EQUIPMENT: SHOP FABRICATED	METAL EQUIPMENT: FIELD ERECTED	FRP OR NONMETAL EQUIPMENT	DESCRIPTON OF TOLERENCES
±1/8"	±1/8"	±1/4"	FACE OF NOZZLE TO CENTERLINE OF EQUIPMENT
±1/4"	±1/2"	±1/4"	CENTERLINE OF NOZZLE TO BASELINE OR DATUM REFERENCE
±1/2"	±1/2"	±1/2"	NOZZLE FLANGE FACE ALIGMENT CENERLINE TO EDGE, IN DEGREES RISE.
±1/8"	±1/8"	±1/4"	PLAN LOCATION OF NOZZLE OR SUPPORT LUGS FROM EQUIP. CENTERLINE OR DATUM REFERENCE
+1/4" OR 1/64° FT. 3/4" MAXIMUM	+1/4" OR 1/64° FT. 3/4" MAXIMUM	+1/4" UP TO 60" +3/8" OVER 60"	HEIGHT OF NOZZLE, FROM BASELINE TO FACE OF TOP NOZZLE (SET NOZZLE LAST TO HOLD TOLERENCE AND ALIGMENT TO A MINIMUM.
±1/4"	±1/4"	±1/4"	FACE OF BOTTOM NOZZLE TO BASELINE OR DATUM REFERENCE

DRAWINGS AND REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD.	APPD.
A	5-18-98	FOR APPROVAL	JH	MM	REK
0	11-9-98	FOR RECORD	PD	REK	REK

REFERENCE DRAWINGS OR SPECIFICATIONS

DOCUMENT NO.	TITLE

EXCHANGER
BAYER PITTSBURG, PA.
NATIONAL BOARD NO.

EQUIP. MFR.	VALLEY STEEL CO., INC.			MFR. S/N	980085
BAYER P.O. NO.	M-07-M-29369	P.O. INS. DATE	5	4	98
BAYER ASSEST NO.				YEAR BUILT	1998

BAYER INSP. STAMP

	VESSEL PRESS.	VESSEL TEMP.	JACKET/COIL PRESS.	JACKET/COIL TEMP.
MAX DESIGN (PSIG & °F)	175 & F.V.	127	75 & F.V.	100DTEXT
MAT'LS OF CONST.	5083 ALUM.		1100 ALUM	
TUBES	(800) 3/4" ø X 0.083" WALL			
SPECIAL NOTES	HYDROTEST AT 263 PSI			
INS. CO.				

	ORIG. NOM. THKS.	MIN. ALLOW. THKS.
SHELL		
TOP HEAD		
BTM. HEAD		