

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

93666
C8515-A 1/2

1. Manufactured and certified by CRYOCHEM, INC., 7938 Boyertown Pike, Boyertown, Pennsylvania 19512
(Name and address of manufacturer)
2. Manufactured for JACOBS ENGINEERING GROUP INC., SABINE & ESSEX AVE., NARBERTH, PA 19072
(Name and address of purchaser)
3. Location of installation FMC CORPORATION, 1525 CHARLESTOWN HIGHWAY, ORANGEBURG, NC 29115-1327
(Name and address)
4. Type Vertical 2788 — C8515-A1 TO A3 2788 1996
(Horiz. or vert. tank) (Mfg's serial No.) (CRN) (Drawing no.) (Nat'l Bd. No.) (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1995
Year
- to 1995 — —
Addenda (Date) Code Case Nos. Special Service per UG 120(d)
6. Shell: SA-240 Ty 316L .3125 .0313 4'-0" 68'-0"
Mat'l. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)
7. Seams: 1 Spot .85 — — 1 — 4
Long. (Welded, Dbl., Sngl., Lap, Butt) R.T. (Spot or Full) Eff. (%) H.T. Temp (F) Time (hr) Girth (welded, Dbl., Sngl., Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses
8. Heads: (a) Mat'l. SA-240 Ty 316L (b) Mat'l. SA-240 Ty 316L
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	Top	.205	.0313	48	3	—	—	—	—	BOTH
(b)	Bottom	.205	.0313	48	3	—	—	—	—	BOTH

If removable, bolts used (describe other fastenings)

SA-193-B7; 1" DIA.; 44 EA. SECTION

(Mat'l., Spec. No., Gr., Size, No.)

9. MAWP F.V. & 17 psi at max. temp. 400 ° F
Min. design metal temp. -20 ° F at 17 psi. Hydro., ~~other~~, or ~~other~~ test pressure 75 psi.
10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat'l.	Nom. Thk.	Reinforcement Mat'l.	How Attached	Location
Outlet	1	24"	RFSO	SA-240 Ty 316L	.3125	SA-240 Ty 316L	WLD.	TOP HEAD
Inlet	1	24"	RFSO	SA-240 Ty 316L	.3125	SA-240 Ty 316L	WLD.	SHELL
Manway/Cvr	4	24"	RFSO	SA-240 Ty 316L	.3125	SA-240 Ty 316L	WLD.	SHELL
Outlet	1	8"	RFSO	SA-312Ty316L	.322	SA-240 Ty 316L	WLD.	BOT. HEAD

11. Supports: Skirt NO Lugs 4 Legs — Other — Attached WLD. TO SHELL
(Yes or no) (No.) (No.) (Describe) (Where and how)
12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report:

(Name of part, item number, Mfr's name and identifying stamp)

UNIT IS A DISTILLATION COLUMN FOR NON-LETHAL SERVICE. IMPACT EXEMPT UHA-51.
COLUMN IS DIVIDED INTO (4) FLANGED SECTIONS, FLG'S. ARE LINED AND WELDED PER FIG. 2-4(3).
SEE SUPPLEMENTARY SHEET U-4 FOR ADDITIONAL NOZZLES.

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. 5876 expires JAN. 31, 19 99.
Date 7-11-96 Co. Name CRYOCHEM, INC. Signed Raymond B. Kiefer
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by CRYOCHEM, INC. at BOYERTOWN, PA 19512
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of PA and employed by H.S.B.I. & I. CO. HARTFORD, CT have inspected the component described in this Manufacturer's Data Report on 7-11, 19 96, 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 7-11-96 Signed [Signature] Commissions NB B155(A) PA 2219 OHIO
(Authorized Inspector) (Nat'l Board (incl. endorsements) State, Prov. and No.)

BLDG -34 C-350

93666 C8515-A 2/2

(Name and address of Manufacturer)

(Name and address of Purchaser)

(Name and address)

(Horiz., vert., or sphere)

(Tank separator, heat exh., etc)

(Mfg's serial No.)

(CRN)

(Drawing No.)

(Nat'l. Bd. No.)

(Year built)

Remarks

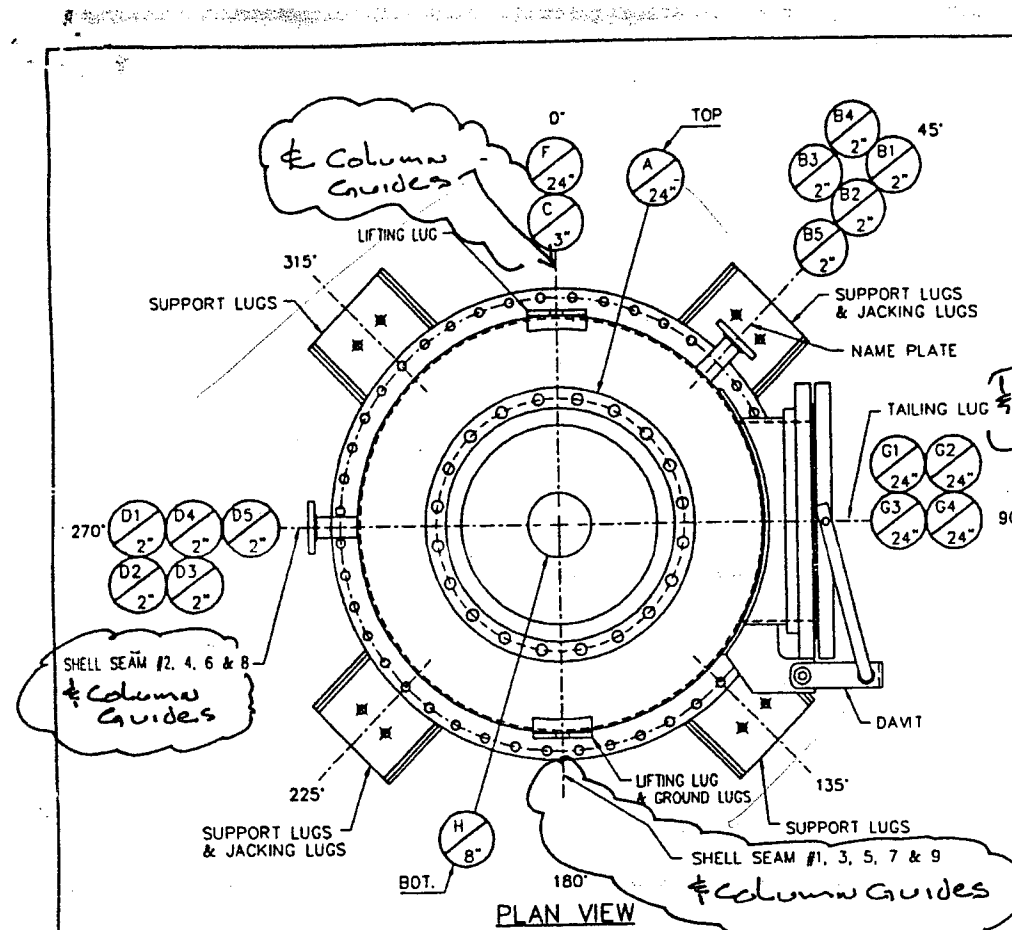
Item Number

NOZZLES CONT'D.

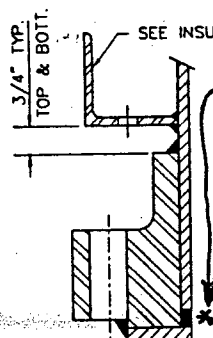
Certificate of Authorization: Type U No. 5876 Expires JAN. 31 , 19 99

Signed Kayum B. Beshir
(Representative)

Commission NO 8155(A) - PA 2219 OH/10
(Nat'l Board (incl. endorsements) State, Province and No.)



PLAN VIEW



ELEVATION VIEW

SEE PLAN VIEW FOR 12" ORIENTATION

NOZZLE SCHEDULE				DESIGN CONDITIONS	
MARK	SIZE & RATING	NECK THICK.	SERVICE	SHELL	
A	24"-150#	.313"	GAS OUT	WAMP (INTERNAL) 15 F.V. PSIG @ 400 °F	
B1	2"-150#	.218"	TE	WAMP (EXTERNAL) -20 °F @ 15 PSIG	
B2	2"-150#	.218"	TE	JACKET	
B3	2"-150#	.218"	TE	WAMP (INTERNAL) PSIG @ °F	
B4	2"-150#	.218"	TE	WAMP (EXTERNAL) PSIG @ °F	
B5	2"-150#	.218"	TE	WAMP (INTERNAL) PSIG @ °F	
C	3"-150#	.216"	REFLUX IN	WAMP (EXTERNAL) PSIG @ °F	
D1	2"-150#	.218"	DPI	TEST CONDITIONS	
D2	2"-150#	.218"	DPI	SHELL 70 PSIG (HYDRO)	
D3	2"-150#	.218"	DPI (SPARE)	JACKET - PSIG (HYDRO)	
D4	2"-150#	.218"	DPI (SPARE)	COL - PSIG (HYDRO)	
D5	2"-150#	.218"	DPI (SPARE)	CORR. ALLOW. HEAD 11/32"	
F	24"-150#	.313"	VAPOR IN	POST WELD HEAT TREAT	NO
G1	24"-150#	.313"	MANHOLE W/ DAVIT	LPT	MP - UT -
G2	24"-150#	.313"	MANHOLE W/ DAVIT	SPOT	YES
G3	24"-150#	.313"	MANHOLE W/ DAVIT	RADIOGRAPH	FULL
G4	24"-150#	.313"	MANHOLE W/ DAVIT		
H	8"-150#	.322"	LIQUID OUT		

DESIGN CONDITIONS	
WAMP (INTERNAL) 15 F.V. PSIG @ 400 °F	
WAMP (EXTERNAL) -20 °F @ 15 PSIG	
JACKET	
WAMP (INTERNAL) PSIG @ °F	
WAMP (EXTERNAL) PSIG @ °F	
WAMP (INTERNAL) PSIG @ °F	
WAMP (EXTERNAL) PSIG @ °F	
TEST CONDITIONS	
SHELL 70 PSIG (HYDRO)	
JACKET - PSIG (HYDRO)	
COL - PSIG (HYDRO)	
CORR. ALLOW. HEAD 11/32"	
POST WELD HEAT TREAT	NO
LPT	MP - UT -
SPOT	YES
RADIOGRAPH	FULL
CODE	ASME 1995 SECT. VIII, DIV. 1
ADDENDA	
CODE STAMP	YES
JOINT EFF. SHELL	BSX
JOINT EFF. HEADS	100R
NOZZLE TYPE	SLIP-ON
RATING	150# & 175#
FACING	RAISED FACE
MATERIALS	
SHELL	SA-240-316L
HEADS	SA-240-316L
JKT. SHELL	
JKT. HEADS	
JKT. CLOSURE RING	
COL	
SUPPORTS	SA-516-70
STIFFENER RINGS	S/S 316L
REINFORCING PADS	SA-240-316L
NOZZLE FLANGES	SA-105 & SA-182-316L
MANHOLE FLANGES	SA-105 LINED W/ SA-240-316L
MANHOLE COVER	SA-105 LINED W/ SA-240-316L
EXTERNAL PIPE	SA-312-316L
INTERNAL PIPE	SA-312-316L & SA-240-316L
EXTERNAL BOLTING	SA-193-B7/SA-194-2H
INTERNAL BOLTING	S/S 316L BY OTHERS
INTERNAL	S/S 316L
GASKETS	GYLON 3504
PART	SEE NOTE 1 & 2
INSPECTION	
INSURANCE CO.	MSBI
CUSTOMER	YES
WT. OF VESSEL (EMPTY)	25,000 LBS
ALL BOLTING HOLES TO STRADDLE VESSEL	
0" TO 180" CENTERLINE OR ITS PARALLEL	
ALL BEVEL AND FILLET WELDS 45° UNLESS	
NOTED OTHERWISE	
TAIL SYMBOLS	
(1) E 316L	
(2) E 309	
(3) E 7018	
WT. OF VESSEL FULL OF H ₂ O = 79,000 LBS	

INSULATION/STIFFENING RING DETAIL

(12) REQ'D

FOR COMMENTS

REVIEW BY 5/10/96

SHOW TIE-INS TO CORRESPONDING WPS NUMBER

Please submit Rev'd Code and Support Design CALC'S.

- NOTES:
- ALL EXTERIOR S/S SURFACES TO BE BLASTED W/ DUPONT STAR-BLAST 1 COAT BRINER 2954 STYRENE BUTADIENE RUBBER (BLACK) (5-6 MILS WFT, 2-1/2 MILS DFT)
 - ALL EXTERIOR C/S SURFACES TO BE COMMERCIAL SAND BLASTED (SSPC-SP6) 1 COAT BRINER 4977 SILICONE ACRYLIC PRIMER (2-1/2 MILS DFT) 1 COAT BRINER 4946 SILICONE ACRYLIC BLACK (1-1/2 MILS DFT)
 - ALL INTERNAL WELDS TO BE GROUND SMOOTH.
 - WATER FOR HYDRO TEST SHELL HAVE A CHLORIDE CONTENT LIMITED TO 50 PPM.
 - REINFORCING PADS TO BE PNEUMATICALLY TESTED @ 15 PSI.
 - ALL FLANGES TO BE PROPERLY PROTECTED FOR SHIPMENT, AND MACHINED FACES COATED WITH A REMOVABLE RUST PREVENTATIVE COATING.
 - VESSEL INTERNALLY PASSIVATED WITH QUAL CHEM QC-33.
 - THE P.O. # AND VESSEL NUMBER ARE TO BE MARKED ON SIDE OF VESSEL WITH WHITE PAINT IN BLOCK LETTERS AT LEAST 12" HIGH.
 - ALL STUBS, RODS, FLUX, SLAG OR FOREIGN MATERIAL SHALL BE REMOVED AFTER WELDING.

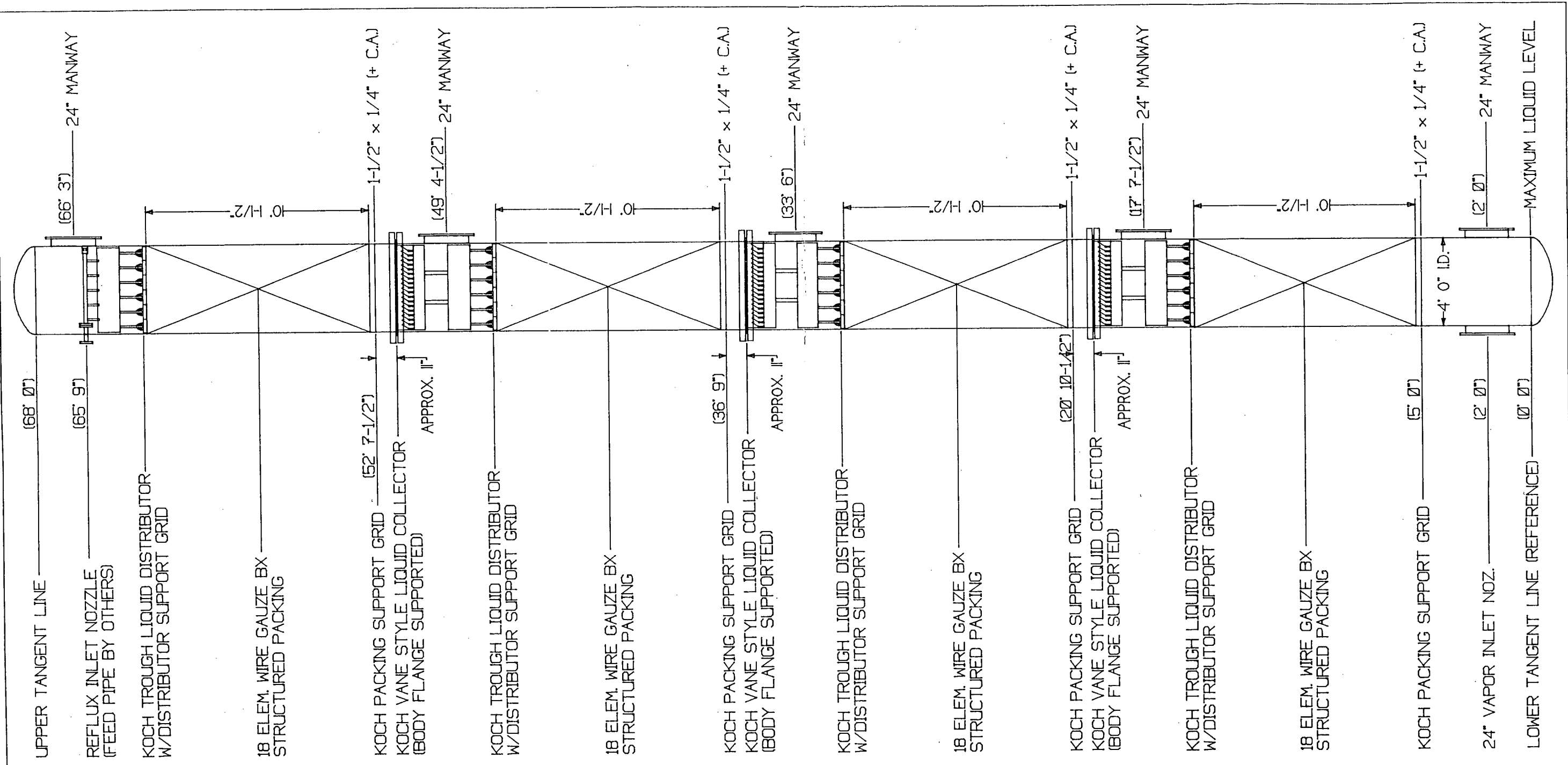
(1) UNIT REQ'D.

APR 30 1996

REV.	DATE	BY	REVISIONS	CK
0	4/29/96	HJK	RELEASED FOR FAB.	
A	3/13/96	HJK	RELEASED FOR APPROVAL	
DESCRIPTION	C-350 STEP III DISTILLATION COLUMN			
CUSTOMER	FMC-CORP.			
CUST. ORD. NO.	63-G670-5-P12-0003	ITEM NO.	C-350	
CUST. REF. DWG	63-G670-01			
CRYO CHEM	CRYOCHEM INC. R.D. #2 BOX 74A BOYTOWN, PA 19512			
	R.D. #4 BOX 363 HONEYBROOK, PA 19344			
DRAWN BY	HJK	DATE	3/13/96	CHECK BY
SCALE	NONE	DWG. NO.	CB515-A1	REV. NO.
				0

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APR 24 1996

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FMC
COLUMN C-350
LAYOUT OF INTERNALS

KOCH ENGINEERING COMPANY, INC
WICHITA, KANSAS

BY: DMH
DATE: 3/14/96

QUOTE NO
94182A00

REV
1

NOTE: All tower attachments are by others.