

13030 PO 001-110A
FOR RECORDS ONLY
DATE 10/1/98



KOCH PROCESS TECHNOLOGIES INC

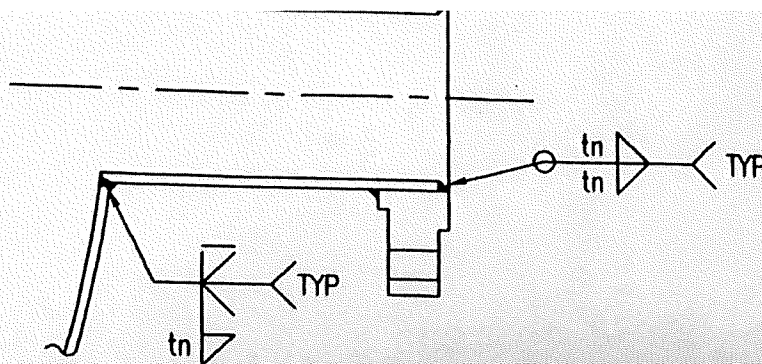
Operating Manual

**DMF Distillation System
(Rodel, Inc., Monroe, NC)**

For

**Process Facilities Inc.
(PFI Ref. No. 13030)**

KPTI Job No. T97-1222



TYPICAL NOZZLE DETAIL (U.O.N.)

1	ADDED NOZZLE 'D' DETAIL & REVISED DAVIT ORIENTATION	4-3-98	CJB	CJB
0	FOR CONSTRUCTION	3-18-98	CJB	CJB
P2	REVISED NOZZLES, RENUMBERED TRAYS	2-26-98	EV	
REV.	DESCRIPTION	DATE	BY	APPVD

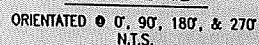
REVISIONS

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KOCH

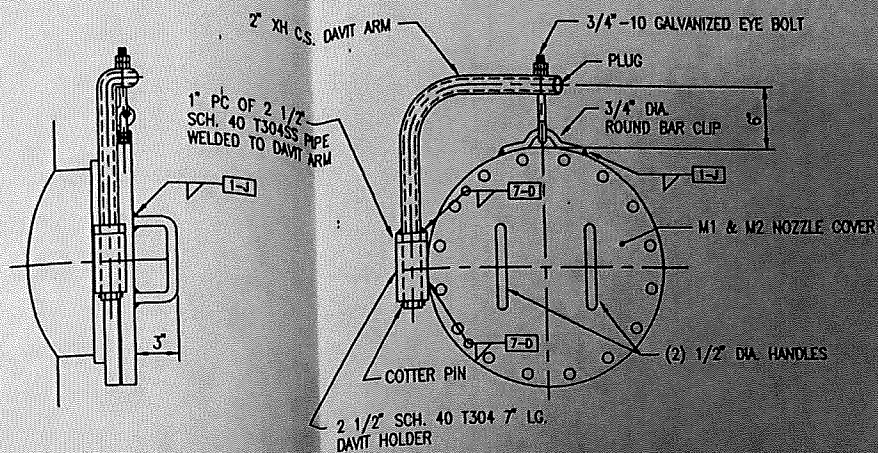
KOCH PROCESS TECHNOLOGY INC

CLIENT INFORMATION			LAYOUT DRAWING FOR CL-7001 36" O.D. TRAYED COLUMN	
PROJ NO.				
PO NO.				
SCALE 1/4" = 1'-0"				
DESIGNED	EV	DATE 2-19-98	JOB NO. T97-1222 DRAWING NO. D-1222-08-01 REV. 1	
DRAWN	EV	DATE 2-19-98		
CHECKED	RAB	DATE 2-19-98		
APPROVED	RAB	DATE 2-19-98		



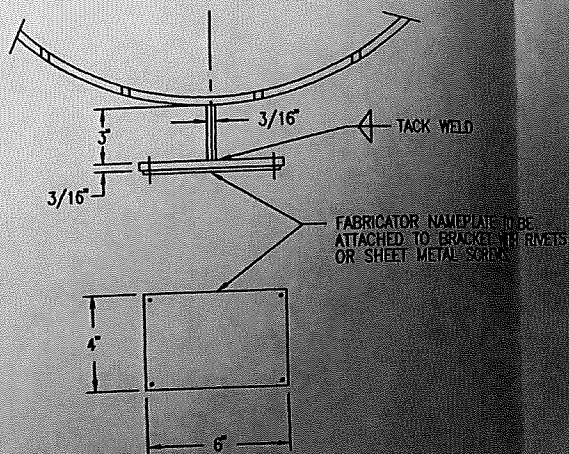
NOZZLE SCHEDULE

SEE KOCH-GLITSCH
DWG D-909407-D000

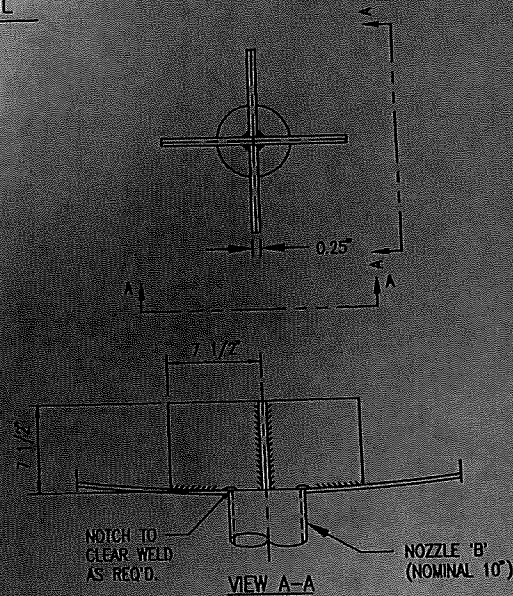


1 DAVIT ARM DETAIL
(NOT TO SCALE)

3/16" THK.
T304SS BAND



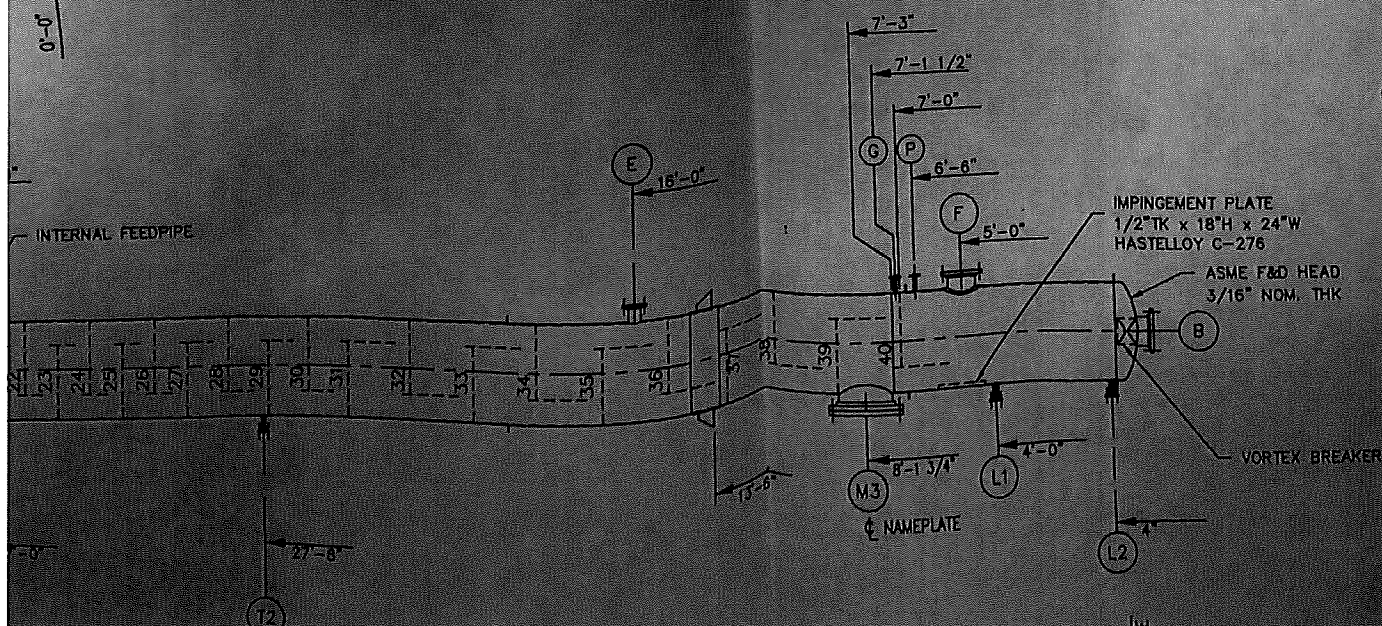
NAMEPLATE BRACKET DETAIL
(NOT TO SCALE)



VORTEX DETAIL

SB-575-C276
(NOT TO SCALE)

- NOTES:
- 1) CONSTRUCTION SHALL
ASME CODE SECTION
ASME STAMP AND
 - 2) MATERIAL OF CONSTRUCTION
SHELL -
SA 240 316L
- HEADS -
TOP: SA 240
- NOZZLES -
SEE NOZZLE
- FLANGES -
SEE NOZZLE
C/STL FLANGE
- BOLTS -
A193 B7 C'S
- NUTS -
A194 2H C'S
- LUGS -
SA 516 GR
- 3) LOCATE ALL WELD
 - 4) ALL BOLT HOLES
 - 5) ALL NOZZLES SEE
TO FACE OF FLANGE
MOUNTED TRUE
 - 6) VENDOR SHALL
FLANGES ARE:
ASTM A193-B
 - 7) ALL WELDING
AND OTHER D
 - 8) NO FLANGES
AFTER WELDING
 - 9) GASKETS 1/4"
 - 10) FABRICATOR
 - 11) WHEN WELD
GOVERN THE
 - 12) PAINTING:
PER KOK
 - 13) FABRICATOR
A) FABRICATOR
B) FABRICATOR
THICK
 - 14) LIQUID PEN
 - 15) MANWAYS
 - 16) NOZZLE T
 - 17) DUSENBERG
1-J
6-D
7-D
H-2
H-3
H-5
 - 18) MTR'S REQ



(NOT TO SCALE)

CLEAR WELD
AS REQ'D.

VIEW A-A

NOZZLE D
(NOMINAL 10")

17) DUSENBERY WELDING

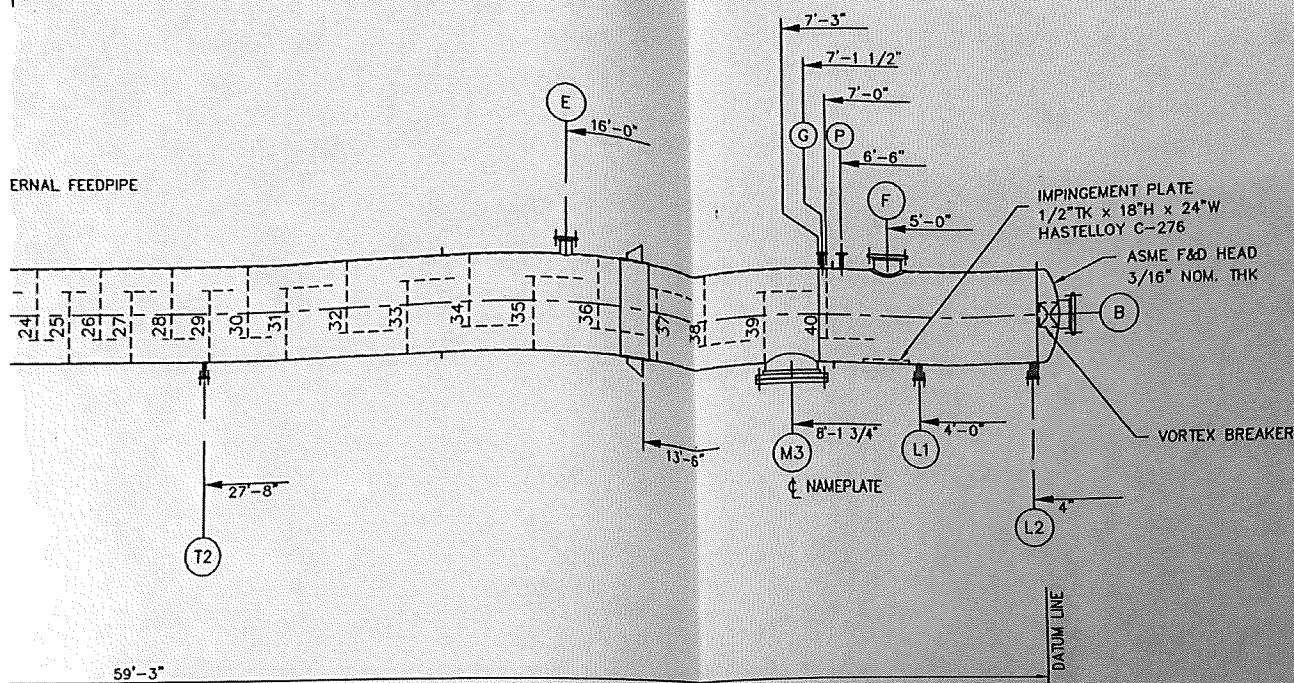
1-J	CARBON
6-D	STAINLESS
7-D	STAINLESS
H-2	C-278
H-3	C-276
H-5	C-276

18) MTR'S REQ'D ON HEAD

VORTEX DETAIL

SB-575-C276

(NOT TO SCALE)

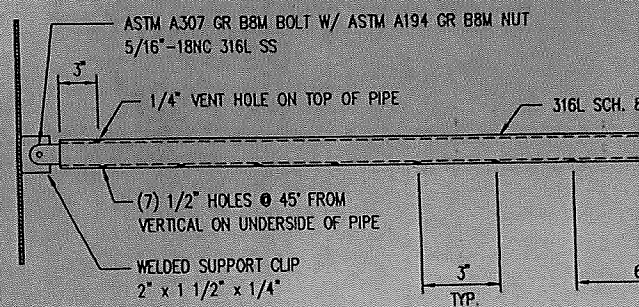
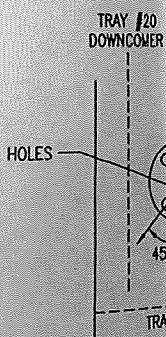


NOZZLE 'F'
1/4" THK. x 16"
T316L REPAD
W/ WEEP HOLE

1/4"

TANGENT TO TANGENT

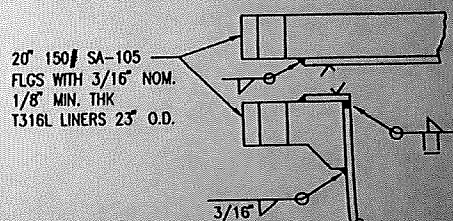
0			-	-
0	A182F316L		-	-
0			-	-
0	A105	SA-240-T316L	-	-
0	SB-564-N10276		-	-
0	SB-564-N10276		-	-
0	A182F316L		-	-
0	A182F316L		-	-
0	A182F316L		-	-
0	A182F316L		-	-
0	A105		-	-
0	A105		-	-
0	A105		-	-
0	A105		-	-
0	A182F316L		-	-
G	FLG MAT'L	MATERIAL	IMPACT TEST	NORMAL -IZED
NGE		REINFORCING PAD		



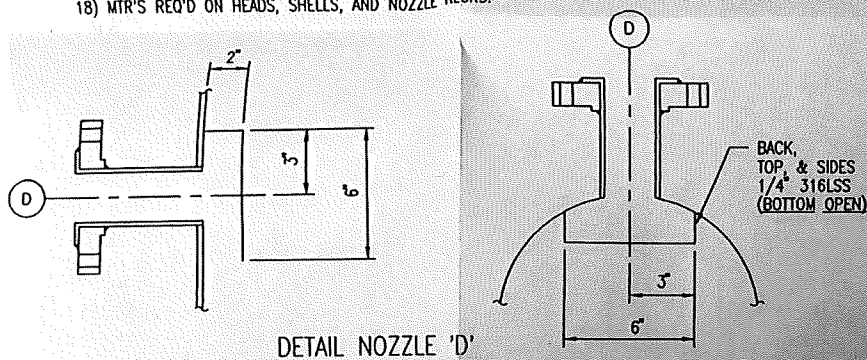
NOZZLE A DETAIL

- 3) LOCATE ALL WELDING SEAMS TO CENTERLINE UNLESS OTHERWISE NOTED.
- 4) ALL BOLT HOLES STRADDLE PRINCIPAL CENTERLINES UNLESS OTHERWISE NOTED.
- 5) ALL NOZZLES SHALL PROJECT 6" FROM OUTSIDE OF EQUIPMENT TO FACE OF FLANGE, UNLESS OTHERWISE NOTED, AND SHALL BE MOUNTED TRUE TO CENTERLINES.
- 6) VENDOR SHALL FURNISH BOLTS, NUTS AND GASKETS WHERE MATING FLANGES ARE SUPPLIED. ALLOY STEEL STUD BOLTS, ASTM A193-B7, WITH HEAVY HEX NUTS ASTM A194-2H.
- 7) ALL WELDING SHALL BE FULL, CONTINUOUS, FREE FROM SLAG, POROSITY AND OTHER DEFECTS.
- 8) NO FLANGES SHALL BE WARPED, BUT SHALL BE TRUE AND GASKET SMOOTH AFTER WELDING.
- 9) GASKETS 1/8" THICK GYLON 3510.
- 10) FABRICATOR TO SUPPLY GASKETS FOR HYDROTEST.
- 11) WHEN WELDING DISSIMILAR METALS, THE HIGHER ALLOY SHALL GOVERN THE TYPE OF WELD ROD TO BE USED.
- 12) PAINTING:
PER KOCH SPEC. 011-03.
- 13) FABRICATOR RESPONSIBILITIES
 - A) FABRICATOR TO SUPPLY DETAIL OF THE FOLLOWING: EQUIPMENT SUPPORT.
 - B) FABRICATOR TO VERIFY ALL SHELL, HEAD, NOZZLE AND SUPPORT THICKNESSES; KPTI IS TO HAVE A COPY OF CALCULATIONS.
- 14) LIQUID PENETRANT EXAM AS PER UNF-58.
- 15) MANWAYS TO BE PROVIDED WITH DAMPS.
- 16) NOZZLE 'F' NOT DESIGNED FOR REBOILER SUPPORT LOADS.
- 17) DUSENBERY WELDING PROCEDURES:
 - 1-J CARBON STEEL TO C.S.
 - 6-D STAINLESS STEEL TO S.S.
 - 7-D STAINLESS STEEL TO C.S.
 - H-2 C-276 TO C-276
 - H-3 C-276 TO STAINLESS
 - H-5 C-276 TO C.S.
- 18) MTR'S REQ'D ON HEADS, SHELLS, AND NOZZLE NECKS.

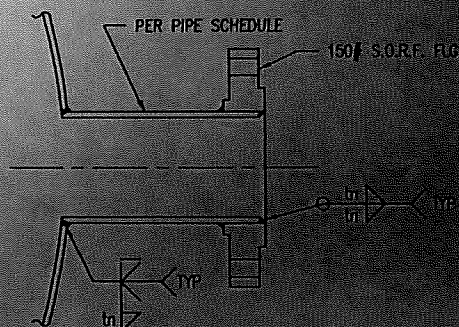
CORROSION ALLOWANCE	NONE	
HYDROSTAT	105 PSIG IN HORIZONTAL	
CONSTRUCTION CODE	ASME	
HEAT TREATMENT		
RADIOGRAPHY	NONE	
TYPE HEADS	F&D	
GASKETS		9
HARDWARE		2
AGITATOR		
SPECIAL TESTS	14	
JOINT EFFICIENCY	SHELL	0.7
	HEADS	0.85



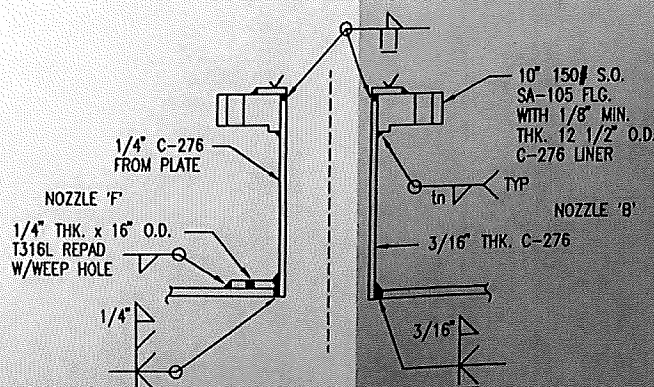
TYPICAL MANHOLE DETAIL



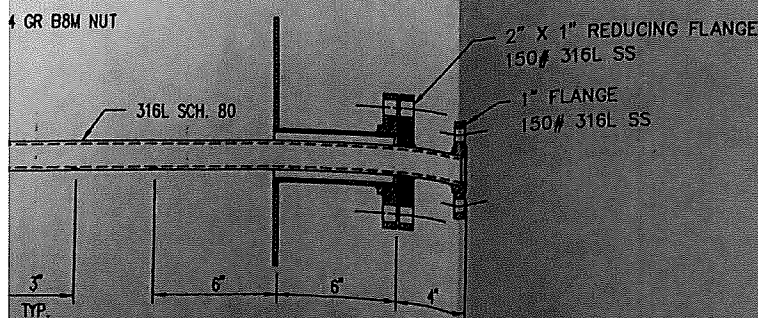
DETAIL NOZZLE 'D'



TYPICAL NOZZLE DETAIL (U.O.N.)



DETAIL NOZZLE 'F' & 'B'



DETAIL

1	ADDED NOZZLE 'D' DETAIL & REVISED DAVIT ORIENTATION	4-3-98	CJB	CJB
0	FOR CONSTRUCTION	3-18-98	CJB	CJB
P2	REVISED NOZZLES, RENUMBERED TRAYS	2-26-98	EV	
REV.	DESCRIPTION	DATE	BY	APPROV

REVISIONS

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KOCH

KOCH PROCESS TECHNOLOGY INC

CLIENT INFORMATION		LAYOUT DRAWING FOR CL-7001 36" O.D. TRAYED COLUMN	
PROJ NO.	PO NO.		
SCALE	1/4" = 1'-0"		
DESIGNED	EV	DATE	2-19-98
DRAWN	EV	DATE	2-19-98
CHECKED	RAB	DATE	2-19-98
APPROVED		DATE	
		JOB NO.	T97-1222
		DRAWING NO.	
		REV.	
		D-1222-08-01	1

NOTES:

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST ASME CODE SECTION VIII, DIV. 1. ASME STAMP AND NATIONAL BOARD STAMP REQ'D.
- MATERIAL OF CONSTRUCTION TO BE:
SHELL -
SA 240 316L EXCEPT BOTTOM 7'-3" WHICH IS TO BE SB 575 HASTELLOY C-276.

HEADS -
TOP: SA 240 316L; BOTTOM: SB 575 HASTELLOY C-276.

NOZZLES -
SEE NOZZLE SCHEDULE.

FLANGES -
SEE NOZZLE SCHEDULE.
C'STL FLANGES TO BE LINED WITH APPROPRIATE ALLOY.

BOLTS -
A193 B7 C'STL, ZINC PLATED.

NUTS -
A194 2H C'STL, ZINC PLATED.

LUGS -
SA 516 GR 70 W/ 304SS BACKING BOND.

- LOCATE ALL WELDING SEAMS TO CLEAR NOZZLES.
- ALL BOLT HOLES STRADDLE PRINCIPAL CENTERLINES UNLESS OTHERWISE NOTED.
- ALL NOZZLES SHALL PROJECT 6" FROM OUTSIDE OF EQUIPMENT TO FACE OF FLANGE, UNLESS OTHERWISE NOTED, AND SHALL BE MOUNTED TRUE TO CENTERLINES.
- VENDOR SHALL FURNISH BOLTS, NUTS AND GASKETS WHERE MATING FLANGES ARE SUPPLIED. ALLOY STEEL STUD BOLTS, ASTM A193-B7, WITH HEAVY HEX NUTS ASTM A194-2H.
- ALL WELDING SHALL BE FULL, CONTINUOUS, FREE FROM SLAG, POROSITY AND OTHER DEFECTS.
- NO FLANGES SHALL BE WARPED, BUT SHALL BE TRUE AND GASKET SMOOTH AFTER WELDING.
- GASKETS 1/8" THICK GYLON 3510.

10) FABRICATOR TO SUPPLY GASKETS FOR HYDROTEST.

11) WHEN WELDING DISSIMILAR METALS, THE HIGHER ALLOY SHALL GOVERN THE TYPE OF WELD ROD TO BE USED.

12) PAINTING:
PER KOCH SPEC. 011-03.

13) FABRICATOR RESPONSIBILITIES
A) FABRICATOR TO SUPPLY DETAIL OF THE FOLLOWING: EQUIPMENT SUPPORT.
B) FABRICATOR TO VERIFY ALL SHELL, HEAD, NOZZLE AND SUPPORT THICKNESSES; KPTI IS TO HAVE A COPY OF CALCULATIONS.

14) LIQUID PENETRANT EXAM AS PER UNF-58.

15) MANWAYS TO BE PROVIDED WITH DAVITS.

16) NOZZLE 'F' NOT DESIGNED FOR REBOILER SUPPORT LOADS.

17) DUSENBERY WELDING PROCEDURES:

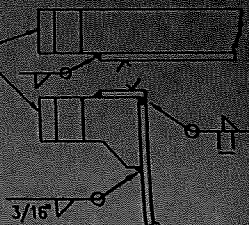
- 1-J CARBON STEEL TO C.S.
- 6-D STAINLESS STEEL TO S.S.
- 7-D STAINLESS STEEL TO C.S.
- H-2 C-276 TO C-276
- H-3 C-276 TO STAINLESS
- H-5 C-276 TO C.S.

18) MTR'S REQ'D ON HEADS, SHELLS, AND NOZZLE NECKS.

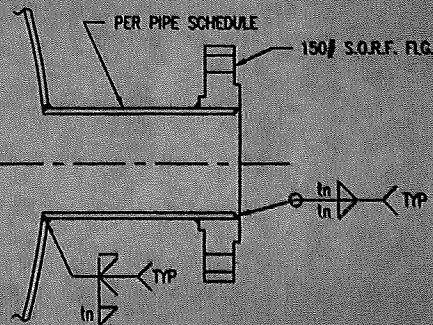
DESIGN DATA

HORIZONTAL		VERTICAL		X	
TYPE SUPPORT	CHAIR	LEGS	LUGS	X	SHOTS
PAINT EXT. CARBON STEEL: SEE NOTE 12					
INSULATION RINGS: 5 FOR 2" INSULATION					
ESTIMATED WEIGHT					
EMPTY:	8500 LBS	FULL	34500 LBS	OPERATING	14300 LBS
		VESSEL		MOVES	
CAPACITY					
DIAMETER		36" O.D.			
LENGTH		59'-6"			
BASIC MATERIAL		316L S.S.			
INSIDE FINISH					
DESIGN TEMP.		400° F			
DESIGN PRESS.		50 PSIG/FV			
CORROSION ALLOWANCE		NONE			
HYDROSTAT		105 PSIG IN HORIZONTAL			
CONSTRUCTION CODE		ASME			
HEAT TREATMENT					
RADIOGRAPHY		NONE			
TYPE HEADS		F&D			
GASKETS				2	
HARDWARE				2	
AGITATOR					
SPECIAL TESTS				14	
JOINT EFFICIENCY		SHELL	0.7		
		HEADS	0.85		

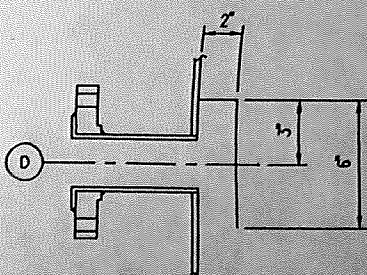
20" 150# SA-105
FLGS WITH 3/16" NOM.
1/8" MIN. THK
T316L LINERS 23" O.D.



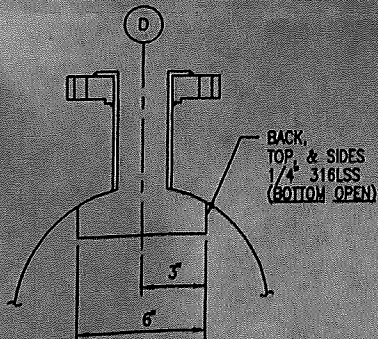
TYPICAL MANHOLE DETAIL



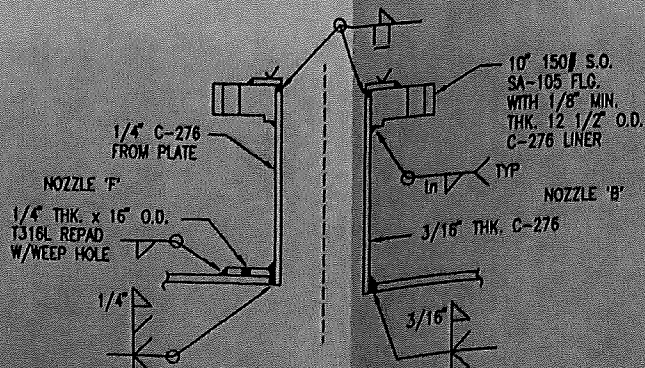
TYPICAL NOZZLE DETAIL (U.O.N.)



DETAIL NOZZLE 'D'



BACK,
TOP, & SIDES
1/4" 316LSS
(BOTTOM OPEN)



1	ADDED NOZZLE 'D' DETAIL & REVISED DAVIT ORIENTATION	4-3-98	CJB	CJB
0	FOR CONSTRUCTION	3-18-98	CJB	CJB
P2	REVISED NOZZLES, RENUMBERED TRAYS	2-26-98	EV	
REV.	DESCRIPTION	DATE	BY	APPROV

REVISIONS

SHELL NOZZLE ORIENTATION

DETAIL DOWNCOMER BARS

DETAIL TRAY SPT RINGS

DAWT ARM DETAIL
(NOT TO SCALE)

VORTEX DETAIL

VORTEX DETAIL

LIFTING LUG DETAIL
(2) REQD

LUG DETAIL
ORIENTATED @ 0°, 90°, 180°, & 270°

NAMEPLATE BRACKET DETAIL

SHELL SEAMS

TANGENT TO TANGENT

DETAIL NOZZLE H

DSC-11 MINIBOLE SETUP

ORIGINAL NOTULE DETAIL (U.S.N.)

[illegible]

NOTICE: A DETAIL...

DESIGN DATA				
HORIZONTAL	VERTICAL			Y
TYPE SUPPORT	CHAM	LEGS	LEGS	SHORT
PUMP EXT. CARBON STEEL SEE NOTE 12				
INSULATION RINGS: 5 FOR 2" INSULATION				
ESTIMATED WEIGHT				
EMPTY	15000 LBS	FULL	34000 LBS	OPERATING
				14000 LBS
		VESSEL	NOTES	
CAPACITY				
DIAMETER	36" O.D.			
LENGTH	59'-6"			
BASIC MATERIAL	316L SS			
INSIDE FINISH				
DESIGN TEMP.	400° F			
DESIGN PRESS.	50 PSIG/IN			
CORROSION ALLOWANCE	NONE			
HYDROSTAT	105 PSIG IN HORIZONTAL			
CONSTRUCTION CODE	ASME			
HEAT TREATMENT				
RADIOGRAPHY	NONE			
TYPE HEADS	F&O			
GASKETS	9			
HARDWARE	2			
ACTUATOR				
SPECIAL TESTS	14			
JOINT EFFICIENCY	SHALL	0.7		

1	ASBESTOS REMOVAL	4-5-90	C2B
2	FOR CONSTRUCTION	7-10-90	C2B
3	ASBESTOS REMOVAL, REMEDIATION	7-10-90	C2B
4	REDEMPTION	DATE	30

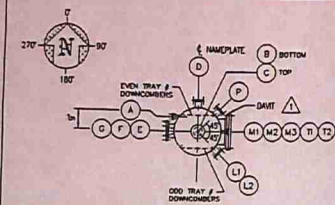
REVISIONS

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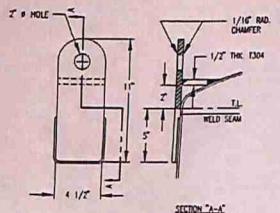
K&H

K&H PROCESS TECHNOLOGY, INC.

CLIENT INFORMATION		LOCAL MARKING FOR	
FIRM NO.	DATE	PROJECT NO.	DATE
100000	10/1/90	100000	10/1/90
PROJECT NO.	DATE	PROJECT NO.	DATE
100000	10/1/90	100000	10/1/90

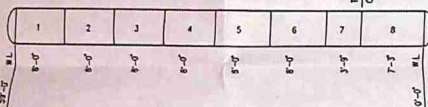
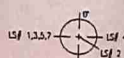


SHELL NOZZLE ORIENTATION



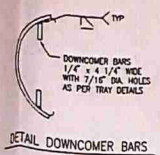
LIFTING LUG DETAIL

(2) REED N.T.S.

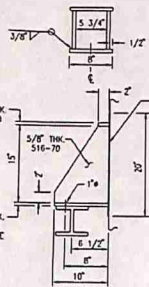


SHELL SEAMS

N.T.S.

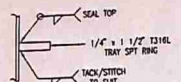


DETAIL DOWNCOMER BARS



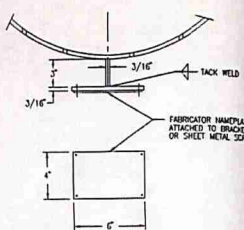
LUG DETAIL

ORIENTED @ 0°, 90°, 180°, & 270° N.T.S.



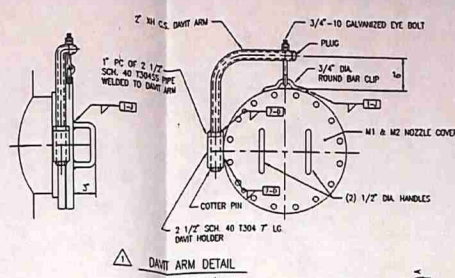
DETAIL TRAY SPT RINGS

SEE KOCH-GUTSCH DWG D-209497-2000



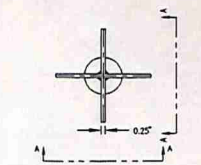
NAMEPLATE BRACKET DETAIL

(NOT TO SCALE)



DAWIT ARM DETAIL

(NOT TO SCALE)



VORTEX DETAIL

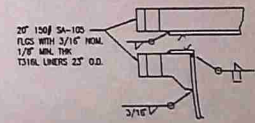
SB-575-C276 (NOT TO SCALE)

NOTES:

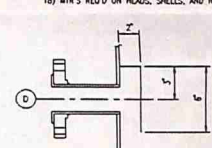
- CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST ASME CODE SECTION VIII, DIV. 1.
- WATER OF CONSTRUCTION TO BE SHELL.
- HEADS - TOP: SA 240 316L, EXCEPT BOTTOM 7'-5" WHICH IS TO BE SA 575 HASTELLOY C-276.
- NOZZLES - SEE NOZZLE SCHEDULE.
- FLANGES - SEE NOZZLE SCHEDULE.
- BOLTS - A193 B7 C276, ZINC PLATED.
- NUTS - A193 B7 C276, ZINC PLATED.
- LUGS - SA 516 OR 70 W/ 304SS BACKING BAND.
- LOCATE ALL WELDING SEAMS TO CLEAR NOZZLES.
- ALL BOLT HOLES STRAIGHT THROUGH PRINCIPAL CENTERLINES UNLESS OTHERWISE NOTED.
- ALL NOZZLES SHALL PROJECT 6" FROM OUTSIDE OF EQUIPMENT TO FACE OF FLANGE, UNLESS OTHERWISE NOTED, AND SHALL BE MOUNTED TRUE TO CENTERLINES.
- VENDOR SHALL FURNISH BOLTS, NUTS AND GASKETS WHERE MATING FLANGES ARE SUPPLIED. ALLOY STEEL STUD BOLTS.
- ASTM A193-B7, WITH HEAVY HEX NUTS ASTM A194-2H.
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- NO FLANGES SHALL BE WARPED, BUT SHALL BE TRUE AND GASKET SMOOTH AFTER WELDING.
- GASKETS 1/8" THICK CYLON 3510.
- FABRICATOR TO SUPPLY GASKETS FOR HYDROTEST.
- WHEN WELDING DISSIMILAR METALS, THE HIGHER ALLOY SHALL GOVERN THE TYPE OF WELD ROD TO BE USED.
- PAINTING: PER KOCH SPEC. 011-03.
- FABRICATOR RESPONSIBILITIES:
 - FABRICATOR TO SUPPLY DETAIL OF THE FOLLOWING: EQUIPMENT SUPPORT.
 - FABRICATOR TO VERIFY ALL SHELL, HEAD, NOZZLE AND SUPPORT THICKNESSES: KPTI IS TO HAVE A COPY OF CALCULATIONS.
- LIQUID PENETRANT EXAM AS PER UNF-58.
- MANWAYS TO BE PROVIDED WITH SHIELDS.
- NOZZLE 'P' NOT REQUIRED FOR REEDLER SUPPORT LOADS.
- DISCOVERY WELDING PROCEDURES:
 - 1-C CARBON STEEL TO C.S.
 - 2-C STAINLESS STEEL TO C.S.
 - 3-C STAINLESS STEEL TO C.S.
 - 4-C C-276 TO C-276
 - 5-C C-276 TO C-276
 - 6-C C-276 TO C.S.
- WTP'S REED ON HEADS, SHELLS, AND NOZZLE NECKS.

DESIGN DATA

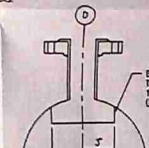
HORIZONTAL TYPE SUPPORT	CHAIR		VERTICAL		Y	
	CHAIR	LEGS	LEGS	X	SHORT	
PAINT EXT. CARBON STEEL: SEE NOTE 12						
INSULATION RINGS: 5 FOR 2" INSULATION						
ESTIMATED WEIGHT						
EMPTY:	8500 LBS	FULL 34500 LBS	OPERATING	14300 LBS	NOTES	
VESSEL						
CAPACITY						
DIAMETER	36" O.D.					
LENGTH	59'-6"					
BASIC MATERIAL	316L S.S.					
INSIDE FINISH						
DESIGN TEMP.	400° F					
DESIGN PRESS.	50 PSIG/TYP					
CORROSION ALLOWANCE	NONE					
HYDROTEST	105 PSIG IN HORIZONTAL					
CONSTRUCTION CODE	ASME					
HEAT TREATMENT	NONE					
RADIOGRAPHY	NONE					
TYPE HEADS	F&D					
GASKETS	8					
HARDWARE	2					
ACTUATOR	14					
SPECIAL TESTS						
JOINT EFFICIENCY	SHELL	0.7				
	HEADS	0.85				



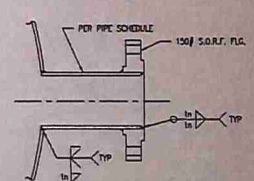
TYPICAL MANHOLE DETAIL



DETAIL NOZZLE 'D'

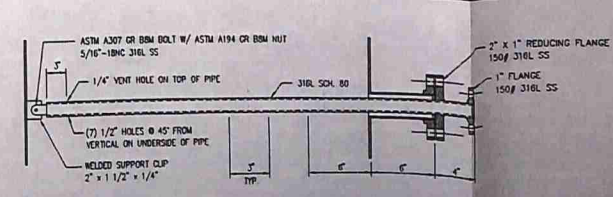
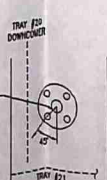


DETAIL NOZZLE 'E' & 'B'



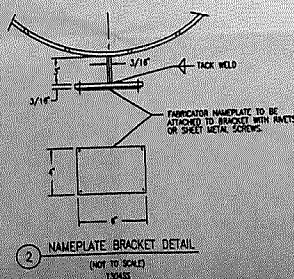
TYPICAL NOZZLE DETAIL (U.O.N.)

NO.	SERVICE	DESCRIPTION	ORIENT	NOZZLE	NOZZLE SCHEDULE
G	CAUSTIC (FUTURE) W/BUND	SCM 80	270.0	0	SB-619-N10276
E	PRODUCT DRAIN	SCM 40	270.0	0	SA 312 TP316L WELD NCH
P	PRESSURE	SCM 80	45.0	0	SB-619-N10276
F	RECYCLE RETURN	SCM 40	270.0	0	SB-575-N10276
L2	LEVEL GAUGE/TRANS.	SCM 40	135.0	0	SB-619-N10276
L1	LEVEL GAUGE/TRANS.	SCM 40	135.0	0	SB-619-N10276
T2	TEMPERATURE	SCM 80	00.0	0	SA 312 TP316L WELD NCH
T1	TEMPERATURE	SCM 80	00.0	0	SA 312 TP316L WELD NCH
D	REFLUX	SCM 80	0.0	0	SA 312 TP316L WELD NCH
A	FEED RECEPTACLE	SCM 80	0.0	0	SA 312 TP316L WELD NCH
M3	MANWAY	3/16" WALL	90.0	0	SA 240 316L NCH
M2	MANWAY	3/16" WALL	90.0	0	SA 240 316L NCH
M1	MANWAY	3/16" WALL	90.0	0	SA 240 316L NCH
L	LIQUID OUTLET	3/16" THK.	0.0	0	SB-575-N10276
C	VAPOR OUTLET	SCM 40	0.0	0	SA 312 TP316L WELD NCH



NOZZLE A DETAIL

1	ADDED NOZZLE 'D' DETAIL & REVISED DAWIT ORIENTATION	4-3-98	CJB	CJB
0	FOR CONSTRUCTION	3-18-98	CJB	CJB
P2	REVISED NOZZLES, RENAMBERED TRAYS	2-26-98	EV	
REV.	DESCRIPTION	DATE	BY	APP
REVISIONS				
THIS INFORMATION OR DATA CONTAINED HEREIN IS PROPRIETARY TO KOCH PROCESS TECHNOLOGY, INC. AND IS NOT TO BE COPIED, REPRODUCED, DUPLICATED, OR DISCLOSED TO OTHERS, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN CONSENT OF KOCH PROCESS TECHNOLOGY, INC.				
				
KOCH PROCESS TECHNOLOGY INC.				
CLIENT INFORMATION				
PROJ. NO.		LAYOUT DRAWING FOR		
PO. NO.		CL-700		
SCALE		36" O.D. TRAYED COLUMN		
DESIGNED		1/4" = 1'-0"		
DRAWN	EV	DATE	2-19-98	JOB NO.
DRAWN	EV	DATE	2-19-98	107-1222
CHECKED	DATE	2-19-98	DRAWING NO.	
APPROVED	RAJ	DATE	2-19-98	REV.
D-1222-08-01				



- [illegible]

DESIGN DATA				
HORIZONTAL		NOTIONAL		2
TYPE SUPPORT	CHAM	LESS	LESS	SHORT
VIBRATION RINGS: FOR 1" INSUL AS SHOWN				
ESTIMATED WEIGHT				
EMPTY: 560 LBS	FULL: 2550 LBS	OPERATING: 1,310 LBS		
		VESSEL		
CAPACITY	170 GALLONS		130 GALLONS OPERATING	
DIMENSIONS	30" DIA.			
LENGTH	4'-5 1/2"			
WELD MATERIAL	316LSS			
WEDGE FINISH	-			
DESIGN TEMP.	400F / -207			
DESIGN PRESS.	50 PSIG/3.5			
CORROSION ALLOWANCE	-			
HYDROSTAT	65 PSIG			
CONSTRUCTION CODE	-		NOTE 1	
HEAT TREATMENT	N/A			
RADIOPACITY	NOT TESTED			
TYPE HEADS	JACKET T80			
GASKETS	-		NOTE 8	
WINDING	-		NOTE 5	
ACTIVATOR	-			
SPECIAL TESTS	-			
JOINT EFFICIENCY	WELD HEADS	70% 80%		
WEDGE SCHEDULE				
ITEM	SIZE	MATERIAL / PIPE SCH.	SOURCE	
A	2"	100# A182.1 316LSS SCH. 16S	FEED	
B	2"	100# A182.1 316LSS SCH. 16S	LIQUID OUTLET	
C	2"	100# A182.1 316LSS SCH. 40	PUMP RECIPIENT	
D	2"	100# A182.1 316LSS SCH. 40	VAPOR OUTLET	
E	2"	100# A182.1 316LSS SCH. 40	IN WATER (FURNACE)	
F	1 1/2"	100# A182.1 316LSS SCH. 40	WINDMILL	
G	1 1/2"	100# A182.1 316LSS SCH. 40	LEVEL GASKET	

1	ARMED MODELS I AND T	5-20-84	CR
2	FOR CONSTRUCTION	5-20-84	CR
3	FOR COURSE APPROVAL	5-20-84	CR
4	REVISION	5-20-84	CR
REVISIONS			
THIS DOCUMENT IS NOT CURRENTLY USED IN PROJECT. IT WAS PREPARED FOR THE PURPOSE OF OBTAINING COURSE APPROVAL. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE WITHOUT CONSENT OF KOCH PROCESS TECHNOLOGIES INC.			
			
KOCH PROCESS TECHNOLOGIES INC.			
Client Information		License Granted For	
Part No.		W-7500	
Rev.	1 of 1		
Rev.	Revisions	Rev.	5-20-84
Rev.		Rev.	5-20-84
Rev.		Rev.	5-20-84
		D-1222-09-01	



1 LEG DETAIL

DESIGN DATA

HORIZONTAL			VERTICAL	X	
TYPE SUPPORT	CHAIR	LEGS	X	WIGS	SHIRT

INSULATION RINGS: FOR T INSUL. AS SHOWN

ESTIMATED WEIGHT

EMPTY: 500 LBS	FULL 2,000 LBS	OPERATING 1,810 LBS
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	VESSEL	NOTES

CAPACITY	170 GALLONS	150 GALLONS OPERATING
DIALECTER	30" O.D.	

LENGTH	4-5 1/2	
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BASIC MATERIAL	310LS5	
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INSIDE FINISH	-	
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DESIGN TEMP.	400T / -20T
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DESIGN PRESS.	50 PSC/TV	
CONSTRUCTION ALLOWANCE		

HYDROSTAT	85 PSI	
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CONSTRUCTION CODE	NOTE 1
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HEAT TREATMENT	N/A	
----------------	-----	--

RADIOGRAPHY	NOT REQ'D.	
OTHER		

TYPE HOODS	ASME F80	
GASKETS		NOTE 9

WORKSHEET	NOTE 4
HARDWARE	NOTE 5

ACTIVATOR	-	
-----------	---	--

SPECIAL TESTS	-	
---------------	---	--

JOINT EFFICIENCY	SHELL	TOX	
------------------	-------	-----	--

HOOD	BOX	
LITERATURE COLLECTION		

ITEM	SIZE	RATING / PPT. SCH.	STATUS
------	------	--------------------	--------

A	J	150/ RJ 5.0 316LSS SCH 10S	FEED
---	---	----------------------------	------

B	J	150# R.F.S.O. 310/55 SCH. 10S	LIQUID OUTLET
---	---	-------------------------------	---------------

C	T	150/ R.F.S.D. 316LSS SCH. 40	PUMP RECYCLE
---	---	------------------------------	--------------

D	Z	150 RJ S.O. 316SS SOL. 40	VAPOR OUTLET
E	C	150 RJ S.O. 316SS SOL. 40	

C	15	1904 R.F.S.D. 314525 3024 40	DR. WATER (FUTURE)
F	17	1904 R.F.S.D. 314525 3024 40	HANDSOME

1122	1"	150# R.F.S.O. 310/35 SCH. 40	LEVEL GAUGE/TRANS
------	----	------------------------------	-------------------

1	ADDED NOZZLES, E AND F	5-21-90	CJB
0	FOR CONSTRUCTION	5-10-90	CJB
P	FOR CUSTOMER APPROVAL	3-2-90	CJB
REV.	DESCRIPTION	DATE	APP.

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К КОСН

Koch Process Technologies Inc.

CLIENT INFORMATION		LAYOUT DRAWING FOR TK-7002	
PROJ. NO. PO. NO.			
SCALE	1 1/2" = 1'-0"		
DRAWN BENDEROTH	DATE 3-2-88	JOB NO.	197-1222
DESIGNED	DATE	DRAWING NO.	REV.
ENGR. SANFORD	DATE 3-2-88	D-1222-09-01	1

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

1. Manufactured and certified by Dusenbery Engineering Co., Inc. 309 E. Hanover Ave.
(Name and address of manufacturer) Morristown, NJ 07962

2. Manufactured for Koch Process Tech., Inc. 1055 Parsippany Blvd. Parsippany, NJ 07054
(Name and address of purchaser)

3. Location of installation Rodel, Inc. Monroe, NC
(Name and address)

4. Type Vert. Tank 1493A - D-1222-09-01, R1 3471 1998
(Horiz. or vert. tank) (Mfg's serial No.) (CRN) (Drawing No.) (Net 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
to 12/96 Addenda (Date) None Codes Case Nos. Special Services per UG-120(d)

6. Shell: SA-240-316L 3/16" - 2'-5-5/8" 4'-0"
(Matl. (Spec. No., Grade)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft. & in.)) (Length (overall) (ft. & in.))

7. Seams: DBW - 70 - DBW&SBW, UW-12(2) 1
(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) Matl. SA-240-316L (b) Matl. -
(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&Bot	.153"	-	30"	2.25"	-	-	-	-	Both
(b)										

If removable, bolts used (describe other fastenings) -
(Matl., Spec. No., Gr., Size, No.)

9. MAWP Full Vacuum or 50 psi at max. temp. 400 °F
Min. design metal temp. -20 °F at FV or 50 psi. Hydro., pneu., or comb. test pressure 85 psi.

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
Feed, Out	2	3"	150#SOF	SA-312-TP316L	S40S	-	UW-16.1e	Sh1, Hd
Outlet	1	2"	" "	" "	" "	-	"	Top Hd
Misc.	4	1"	" "	" "	" "	-	"	Sh1, Hd
Handhole	1	12"	" "	" "	S10S	-	"	Shell

11. Supports: Skirt No Lugs - Legs 3 Other - Attached Welded 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 the report: -
(Name of part, item number, Mfg's name and identifying stamp)

Vessel used for chemicals. Exempt from impact testing per para. UHA-51(d) & (e). No NDE performed. Vessel tested in horizontal position.

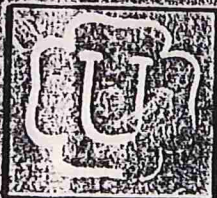
Note: 12" flange & blind are SA-105 lined with SA-240-316L.

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. 1,005 expires 3/31, 2001
Date 5/19/98 Co. name Dusenbery Engineering Co., Inc. signed William A. Reband (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by Dusenbery Engineering Co., Inc. Morristown, NJ
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of NJ and employed by Commercial Union Insurance Company
have inspected the component described in this Manufacturer's Data Report on 5/19, 1998, 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 5/19/98 Signed William A. Reband (Authorized Inspector) Commissions 105776A-NYS2258 (Natl. Board (ind. endorsement), State, Prov. and No.)



NATL. BD. **3471**

CERTIFIED BY

DUSENBERY ENG'R. CO., INC.

MAX. ALLOWABLE WORKING PRESSURE

F.V. OR 50 P.S.I.G. AT 400 °F

MINIMUM DESIGN METAL TEMPERATURE

-20 °F AT 50 P.S.I.G. OR F.V.

MFG. SERIAL NUMBER **1493A**

YEAR **1998**

CORROSION ALLOWANCE **NONE**

TK - 7002



PO# 33162
Tag# CL-7001

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

1. Manufactured and certified by Dusenbery Engineering Co., Inc. 309 E. Hanover Ave.
(Name and address of Manufacturer) Morristown, NJ 07962
2. Manufactured for Koch Process Tech., Inc. 1055 Parsippany Blvd. Parsippany, NJ 07054
(Name and address of Purchaser)
3. Location of installation Rodel, Inc. Monroe, NC
(Name and address)
4. Type: Vertical Distillation Column 1481A
(Horiz., vert., or sphere) (Tank, separator, kit vessel, heat exch., etc.) (Mfg's serial No.)
- D-1222-08-01,R2 3480 1998
(CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)
5. ASME Code, Section VIII, Div. 1 1995 Ed., 12/96 Add. 2236 None
(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): 8 (b) Overall length (ft & in.): 59'-0 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
1-6	36"OD	8'-0"+	SA240T316		3/16"	-	1	None	70%	1	None	70%	-	-
7	"	4'-0"	"		"	-	"	"	"	"	"	"	-	-
8	"	7'-1"	SB575C276		"	-	"	"	"	"	"	"	-	-

7. Heads: (a) SA-240-316 (b) SB-575-C276
(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		Eff.
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	
(a)	Top	.155"	-	36"	2.25"	-	-	-	-	X	X	S	-	85%
(b)	Bottom	.152"	-	36"	2.25"	-	-	-	-	X	X	S	-	85%

If removable, bolts used (describe other fastening)

(Mat'l Spec. No., Grade, size, No.)

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

If bar, give dimensions

9. MAWP 50 FV psi at max. temp. 400 400 °F Min. design metal temp. -20 °F at FVor50 psi.
(internal) (external) (internal) (external)

10. Impact test No, exempt per paras. UHA-51(d)&(e) and UNF-65.
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. 105 PSIG Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: N/A
Stationary (Mat'l Spec. No.) Dis., in. (subject to press.) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)
Floating (Mat'l Spec. No.) Dis., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: N/A
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.

N/A

14. Shell (a) No. of course(s) (b) Overall length (ft & in.):

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

15. 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		Eff.
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	
(a)														
(b)														

If removable, bolts used (describe other fastening)

(Mat'l Spec. No., Grade, size, No.)

This form (E00108) may be obtained from the ASME Order Dept., 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

REPRINT 9/92

FORM U-1 (Back)

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

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

18. Hydro., pneu., or comb. test press. _____ Proof test _____

19. Nozzles, inspection, and safety valve openings:

19. Nozzles, inspection, and safety valve openings:												
Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	316 Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)	
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange		
Misc.	4	1", 2" 1/2	50#SO	SA312	SA182	S80	-	-	UW	16.1e	DFW	Shell
Outlet	2	4", 6"	" "	" "	" "	S40	-	-	" "	" "	" "	Shl, Hd
Manway	3	20"	" "	SA240	*1	3/16"	-	-	" "	" "	" "	Shell
Misc.	2	2"	" "	*2	*3	S80	-	-	" "	" "	" "	"
Level Ga.	2	3"	" "	" "	" "	S40	-	-	" "	" "	" "	"
Return	1	10"	" "	*4	*5	5/16"	-	SA240316L	"	q	" "	"
Outlet	1	10"	" "	" "	" "	3/16"	-	-	" "	e	" "	Bot. Hd

20. Supports: Skirt No Lugs 4 Legs - Others - Attached Welded to belly band.
(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)

N/A

*1:SA-105 lined w/SA-240-316L. *2:SB-622-C276. *3:SB-564-C276

*4:SB-575-C276. *5:SA-105 lined w/SB-575-C276.

22. Remarks: Vessel tested in horizontal position. Vessel used for chemicals.
Liquid Penetrant Examination performed on all C276 welded joints per para. UNF-58(c).

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. 1,005 Expires 3/31 ~~2001~~ 2001

Date 5/19/98 Name Dusenbery Engineering Co., Inc. Signed William J. Jones
(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/or the State of NJ and employed by Commercial Union Insurance Company of Boston, MA have inspected the pressure vessel described in this Manufacturer's Data Report on 5/19/98, 1998, 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 5/19/98 Signed William A. Roland Commissions NB5776A-NY52288
(Authorized Inspector) (Net'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.

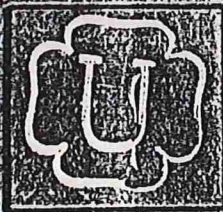
U Certificate of Authorization No. _____ Expires _____, 19 _____

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/or 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) (Net'l Board Incl. endorsement, State, Province and No.)



NATL. BD. 3480

CERTIFIED BY

DUSENBERY ENG'R. CO., INC.

MAX. ALLOWABLE WORKING PRESSURE

FV OR 50 PSIG AT 400 °F

MINIMUM DESIGN METAL TEMPERATURE

-20 °F AT 50 PSIG OR FV

MFG. SERIAL NUMBER 1481A

YEAR 1998

CORROSION ALLOWANCE NONE

CL-7001





KOCH PROCESS TECHNOLOGIES INC

BOOK 1 OF 3

**OPERATING
MANUAL
(OPERATING
INSTRUCTIONS &
DRAWINGS)**

**DMF
DISTILLATION
SYSTEM
(Rodel, Inc., Monroe, NC)**

**FOR
Process Facilities, Inc.
(PFI Ref. No. 13030)**

**KPTI Job No.
T97-1222**



KOCH PROCESS TECHNOLOGIES INC

BOOK 1 OF 3

**OPERATING
MANUAL
(OPERATING
INSTRUCTIONS &
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**DMF
DISTILLATION
SYSTEM
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**FOR
Process Facilities, Inc.
(PFI Ref. No. 13030)**

**KPTI Job No.
T97-1222**

Gamewell
Mechanics

REPORTS
&
TESTS

K KOCH

KOCH PROCESS TECHNOLOGIES INC

BOOK 2 OF 3

**OPERATING
MANUAL**
(VENDOR INFORMATION)

**DMF
DISTILLATION
SYSTEM**
(Rodel, Inc., Monroe, NC)

FOR
Process Facilities, Inc.
(PFI Ref. No. 13030)

KPTI Job No.
T97-1222

K KOCH

KOCH PROCESS TECHNOLOGIES INC

BOOK 3 OF 3

**OPERATING
MANUAL**
(VENDOR INFORMATION)

**DMF
DISTILLATION
SYSTEM**
(Rodel, Inc., Monroe, NC)

FOR
Process Facilities, Inc.
(PFI Ref. No. 13030)

KPTI Job No.
T97-1222

HOOVER GROUP

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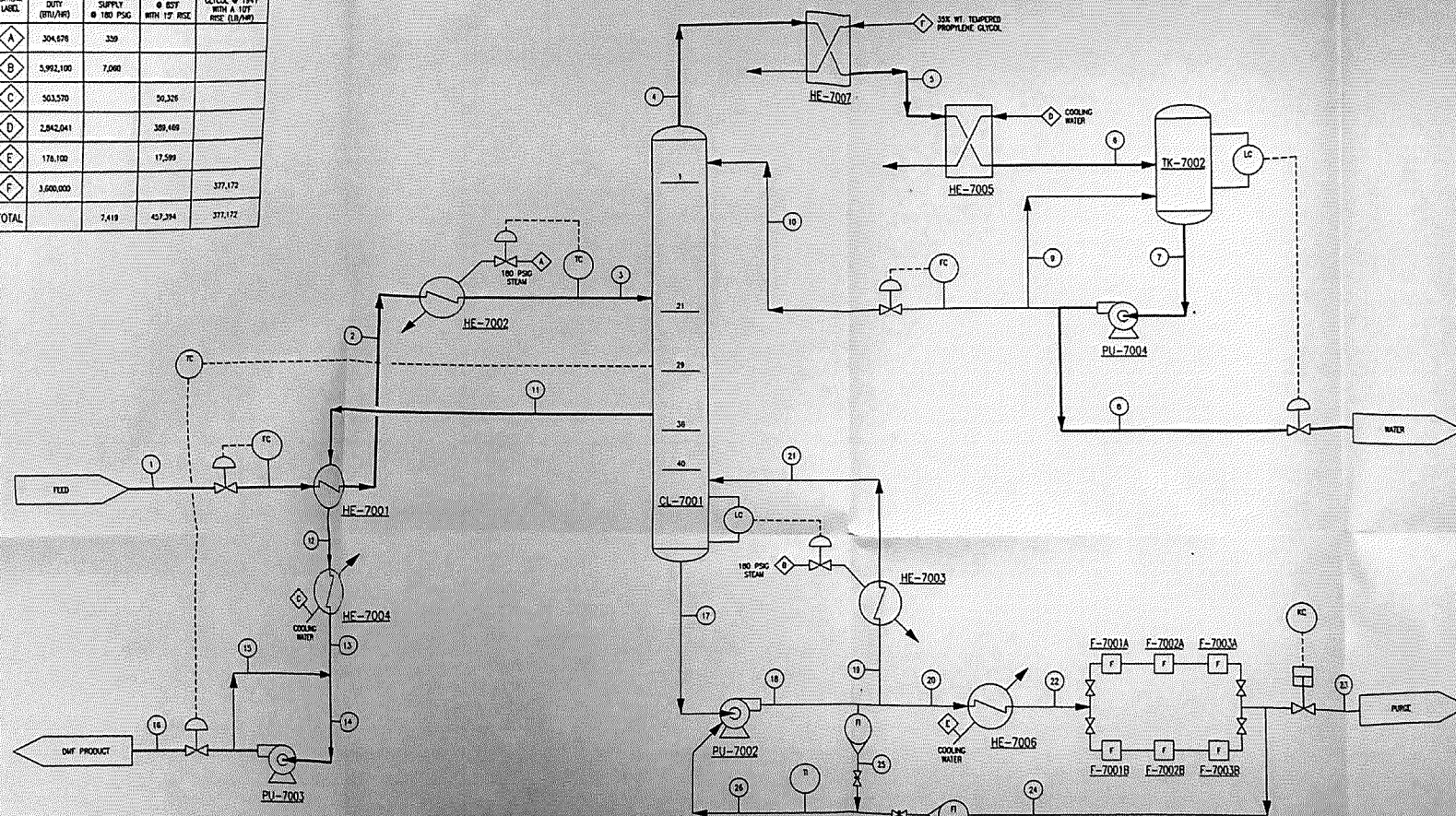
KPTI J
T97-1

Game
Mech

Game
Mech

Game
Mech

UTILITIES				
SERIAL LAND	HEAT OUT (BTU/HK)	STEAM SUPPLY @ 180 PSIG	COOLING WATER @ 85°F WITH 12' RISE	33% WT PROPYLENE GLYCOL @ 140°F WITH A 10°F RISE (lb/HK)
A	304,678	329		
B	5,992,100	7,060		
C	503,370		50,328	
D	2,842,041		389,469	
E	176,100		17,599	
F	3,600,000			377,172
TOTAL		7,419	457,394	377,172

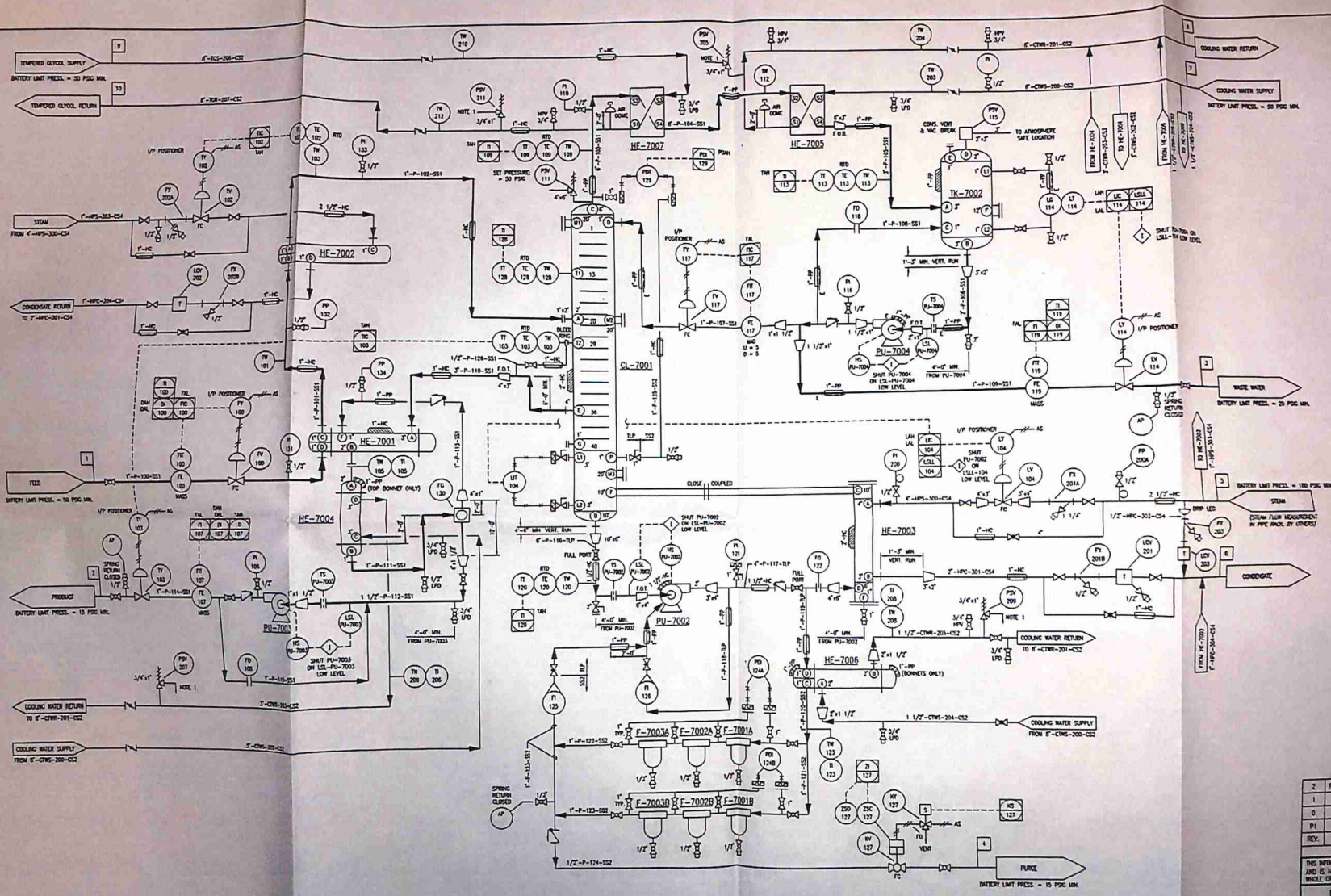


EQUIPMENT LIST		
ITEM	DESCRIPTION	MATERIAL
CL-7001	DISTILLATION COLUMN	316LSS/HASTELLOY C-276
FE-7002	BOTTOMS REFLUXES	316SS
HE-7001	FEED PREHEATER	SHELL: CARBON STEEL TUBES: 316LSS
HE-7002	STEAM HEATER	SHELL: CARBON STEEL TUBES: 316LSS
HE-7003	REBOILER	SHELL: CARBON STEEL TUBES: HASTELLOY C-276
HE-7004	PRODUCT COOLER	SHELL: CARBON STEEL TUBES: 316LSS
HE-7005	COLUMN CONDENSER	JOWSS/GASKETS: EPDM
HE-7006	BOTTOM: PURGE COOLER	SHELL: CARBON STEEL TUBES: HASTELLOY C-276
HE-7007	HEAT RECOVERY CONDENSER	JOWSS/GASKETS: EPDM
PU-7002	BOTTOMS PUMP	HASTELLOY C
PU-7003	PRODUCT PUMP	316SS
PU-7004	REFLUX PUMP	316SS
TR-7002	REFLUX DRUM	316LSS

- 1. MATERIAL BALANCE DESIGN IS FOR 12% WT DAF AVERAGE FEED COMPOSITION.
- 2. UTILITIES DATA INCLUDES MAXIMUM DUTY ACROSS THE 14-20% WT RANGE FOR THE DAF FEED.
- 3. WHEN MC-7007 IS NOT IN SERVICE STREAM 9 WILL BE AS STREAM 4.
- 4. FOR MATERIAL BALANCE PURPOSE SOLIDS ARE CONSIDERED TO BE COMPLETELY REMOVED BY FILTERS.
- 5. NO ALLOWANCE IS MADE FOR SOLVENT LOSSES DUE TO CHANGING OF FILTERS.

[illegible]

S	AS BUILT	3-19-86	CN
P	FOR COMPANY APPROVAL	3-2-86	CA
REV.	DESCRIPTION	DATE	APP.
REVISIONS			
THIS INFORMATION IS DATA OBTAINED HEREIN IS PROPRIETARY TO KOCH PROCESS TECHNOLOGY, INC. IT IS NOT TO BE COPIED, REPRODUCED, TRANSMITTED, OR DISCLOSED TO ANYONE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN CONSENT OF KOCH PROCESS TECHNOLOGY, INC.			
KOCH			
KOCH PROCESS TECHNOLOGIES INC			
CLIENT INFORMATION			
FACIL. NO.		PROCESS FLOW DIAGRAM	
PLANT NO.			
SCALE	NONE		
DRAWN BY	ROBERTSON	DATE	3-27-86
CHECKED BY	DATE	JOB NO.	107-1222
DESIGNED BY	DATE	DRAWING NO.	
OWNER	SHAWDO	DATE	3-2-86
			D-1222-00-01



NOTES:
 1. PIPE DISCHARGE OF RELIEF VALVES TO OUTSIDE OF BUILDING SOME THIS PIPING TO BE FURNISHED BY OTHERS, EXCEPT P-111 WHICH WILL BE SUPPLIED BY IPT.
 2. LINE NO. P-106, 107, 108, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, AND 124, LOCATED ON CL-7001 BELOW THE 10' AND 15' PRESSURE CONNECTIONS TO PU-7004. HE-7004 AND HE-7005 REQUIRE SPECIAL GASKETS FOR SHUT SERVICE.

REV.	DESCRIPTION	DATE	APPROV.
2	REVISED LINE # 1-125 TO 1", SPEC. BREAK AT P-125, ADD NOTE 1	8-5-88	CJR
1	REVISED PER CHANGE ORDER 2	5-23-88	CJR
0	ISSUED FOR CONSTRUCTION	5-13-88	CJR
P1	FOR CUSTOMER APPROVAL	2-27-88	CJR

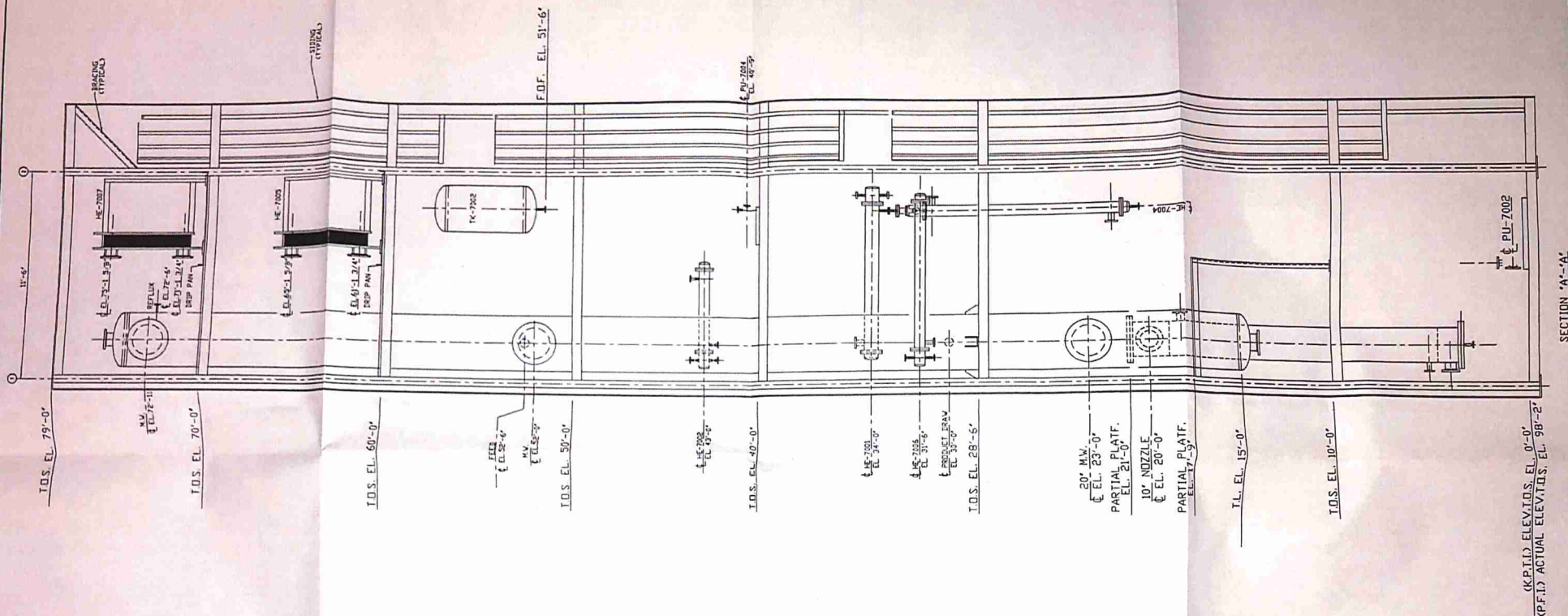
REVISIONS

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KOCH KOCH PROCESS TECHNOLOGY INC.

CLIENT INFORMATION		PROJECT INFORMATION	
PROJ. NO.	DATE	JOB NO.	DATE
SCALE	1-16-88	727-1222	1-16-88
DRAWN	DATE	DRAWING NO.	REV.
DESIGNED	DATE	D-1222-01-01	2
ENGR.	DATE		

- HE-7002**
STEAM HEATER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- CL-7001**
DISTILLATION COLUMN
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7003**
HEAT RECOVERY CONDENSER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7005**
COLUMN CONDENSER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- PU-7004**
REFLUX PUMP
MODEL: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- TK-7001**
TANK
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- PU-7003**
PRODUCT PUMP
MODEL: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7001**
HEAT EXCHANGER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7004**
PRODUCT COOLER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- PU-7002**
NOTHING PUMP
MODEL: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7003**
REBOILER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4
- HE-7005**
NOTHING PUMP COOLER
TYPE: RSH 6-14
A = 30 FT
Q = 30,000 BTU/H
SHELL: 8" x 24" A.S.
WATER: CARBON STEEL
DES. PRESS: 100 PSIG
DES. TEMP: 400°F
TUBES: 12 TUBES
O.D. 1.315" x 10'-0" L.C. 18 BWG
WATER: 316SS
DES. PRESS: 100 PSIG/TY
DES. TEMP: 400°F
NO. OF PASSES: 4

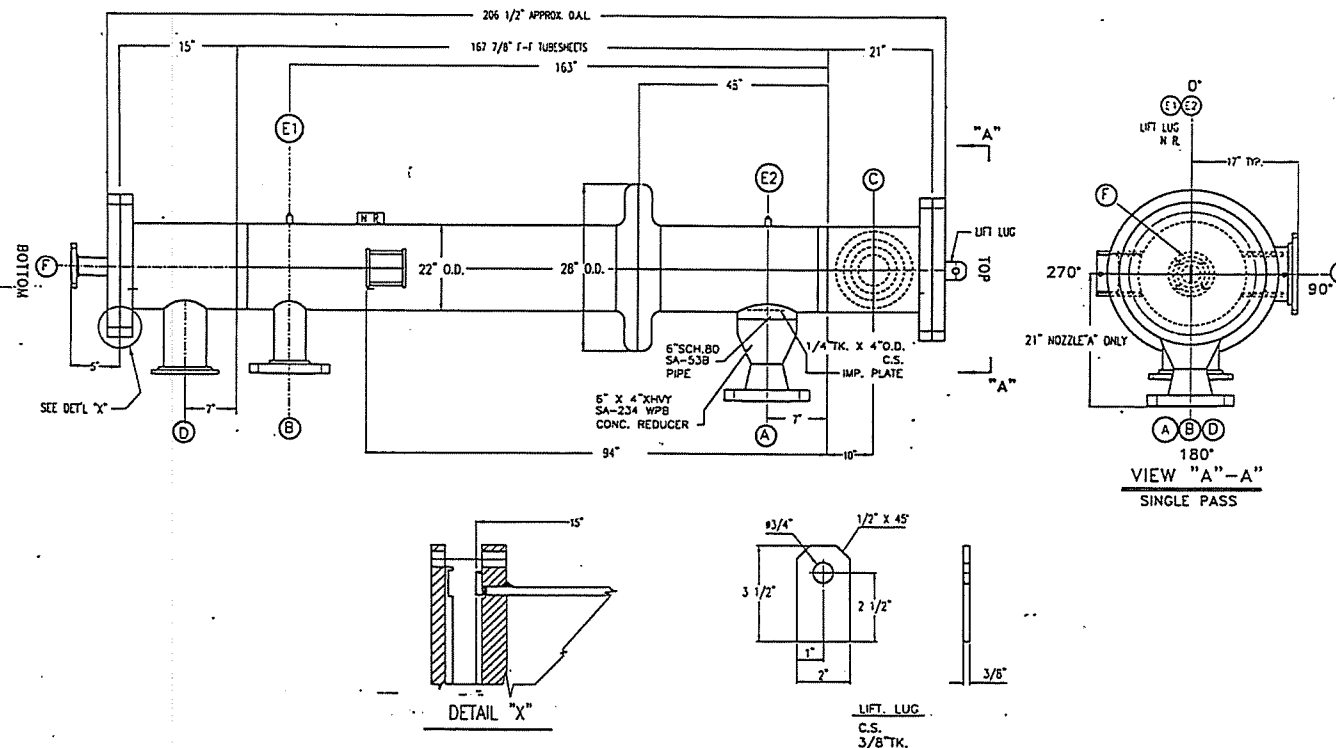


0	ISSUED FOR CONSTRUCTION	3-2-88	C.B.
1	ISSUED FOR DESIGN	3-2-88	C.B.
A	FOR CUSTOMER APPROVAL	3-2-88	C.B.
REV.	DESCRIPTION	DATE	APPROV.

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KOCH
KOCH PROCESS TECHNOLOGY INC

CLIENT INFORMATION			
PROJ. NO.	13030001	ELEVATION VIEW	
PO. NO.	XX-XXXX-XX		
SCALE	3/8"=1'-0"	JOB NO.	707-1222
DRAWN	PI	DATE	2-20-88
DESIGNED	PI	DATE	3-2-88
ENGR.	C.B.	DATE	3-2-88
D-1222-02-04			0



GENERAL NOTES

- CONSTRUCTION TO COMPLY WITH A.S.M.E. CODE SECTION VIII, DIV 1 LATEST EDITION.
- A.S.M.E. STAMP & NAT'L BD. INSPECTION
☒ YES ☐ NO
- TEMA CLASS "R", TYPE "NEN"
- 832 SQ. FT. HEAT TRANSFER SURFACE AREA
- ALL BOLT HOLES TO STRADDLE CENTER LINES.
- SEE VIEW "A-A" FOR TRUE NOZZ. ORIENTATION.
- ALL DIMENSIONS ARE IN INCHES.
- WEIGHT: 4779 LBS. EMPTY
7265 LBS. FLOODED
- PAINT: (C.S. ONLY)
 A) SURFACE PREPARATION: SANDBLAST PER SSPC-SP6
 B) PRIMER: CARBOZINC-11 3 MILS DFT
- DYE CHECK ALL C-276 WELDS

MECHANICAL DESIGN CONDITIONS	SHELL SIDE	TUBE SIDE
DESIGN TEMPERATURE, °F	450	350
MIN. DESIGN METAL TEMP., °F	20	20
DESIGN PRESSURE, PSIG	200	150
TEST PRESSURE, PSIG	300	76
CORROSION ALLOWANCE	1/8"	-
RADIOGRAPHY	-	-

CUSTOMER KOCH PROCESS TECHNOLOGIES, INC.

ADDRESS: 1055 PARSIPPANY BLVD PARSIPPANY, NJ 07054

P.O. No. 33205

REFERENCE: -

TAG: HE-7003

RUBICON MODEL No.: SC22C1-168VE

RUBICON SERIAL No.: 2609-J

No. Req'd: ONE(1)

JOB No.: J-1112-3

RUBICON INDUSTRIES CORP.

848 E. 43rd ST., BROOKLYN, N.Y. 11210

ITEM	MAT'L SPEC	SIZE & DESCRIPTION	MARK	FLG & FITTING SPECIFICATIONS		NECK SPECIFICATIONS		SERVICE	REMARKS
				SIZE, RATING & TYPE	MATERIAL	SIZE & SCH.	MATERIAL		
SHELL	SA-538	22" O.D. STD. WT. (.375" NOM. TK.)							
TUBESHEETS	SA-575 C-276	22" O.D. X 1 1/32" TK.	A	4"-300# RFWN	SA-105			STEAM IN	WITH CONC. REDUCER
TUBES	SB-626 C-276	(230)-1" O.D. X 16 BWG 14'-0" NOM. LG ON 1 1/4" TR. PT.	B	3"-300# RF50	SA-105	3" SCH. 160	SA-538	COND. OUT	
CHANNEL FLG	SA-516-70	26 3/8" O.D. X 22 1/8" I.D. X 1 1/2" TK WITH 3/16" TK. C-276 FACE	C	10"-150# RF50	SA-105	10" SCH. 105	SB-619 C-276	OUT	WITH 1/8" TK. C-276 FACE
CHANNEL CYL.	SB-575 C-276	22" O.D. X 3/16" TK.	D	6"-150# RF50	SA-105	6" SCH. 105	SB-619 C-276	IN	WITH 1/8" TK. C-276 FACE
CHANNEL COV.	SA-516-70	26 3/8" O.D. X 1 3/8" TK WITH 5/16" TK. C-276 FACE	F	1"-150# L.J.	SA-105	1" SCH. 40	SB-366 C-276	DRAIN	W/3/16" STUB END C-276
BAFFLES	C.S.	SEGMENTAL TYPE 7 1/4" NOM. PITCH 45% HORIZ. CUT (18 REQ'D)	E 1-2	3/4"-3000# MCPLG	SA-105			VENT/ DRAIN	WITH PLUG
CASKETS	GUYON 3510	1/16" TK.							
BOLTING	SA-193/B7/194/2H	ZINC PLATED							
SHELL SUPPT'S	A-36	AS PER RUBICON R-100 TYPE "C"	2	REVISED PER CUSTOMER NOTES/CERTIFIED					04/12/98 Y.P.
EXP. JNT	SA-516-70	28" O.D. X 3/8" TK. FLANGED & FLUED HEADS	1	ISSUED FOR FABRICATION/CERTIFIED					03/27/98 Y.P. DRN. Y.P. DATE 03/10/98

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

1. Manufactured and certified by Dusenbery Engineering Co., Inc. 309 E. Hanover Ave.
(Name and address of manufacturer) Morristown, NJ 07962

2. Manufactured for Koch Process Tech., Inc. 1055 Parsippany Blvd. Parsippany, NJ 07054
(Name and address of purchaser)

3. Location of installation Rodel, Inc. Monroe, NC
(Name and address)

4. Type Vert. Tank 1493A - D-1222-09-01,R1 3471 1998
(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 12/96 - None
Addenda (Date) Code Case Nos. Special Service per UG-120(d)

6. Shell: SA-240-316L 3/16" - 2'-5-5/8" 4'-0"
Matl. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: DBW - 70 - - DBW&SBW, UW-12(2) 1
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) Matl. SA-240-316L (b) Matl. -
(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&Bot	.153"	-	30"	2.25"	-	-	-	-	Both
(b)										

If removable, bolts used (describe other fastenings) -
(Matl., Spec. No., Gr., Size, No.)

9. MAWP Full Vacuum or 50 400 °F
psi at max. temp. -20 °F at FV or 50 85 psi
Min. design metal temp. -20 °F FV or 50 85 psi
Hydro., pneu., or comb. test pressure

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
Feed, Out	2	3"	150#SOF	SA-312-TP316L	S40S	-	UW-16.1e	Sh1, Hd
Outlet	1	2"	" "	"	"	-	"	Top Hd
Misc.	4	1"	" "	"	"	-	"	Sh1, Hd
Handhole	1	12"	" "	"	S10S	-	"	Shell

11. Supports: Skirt No Lugs - Legs 3 Other - Attached Welded 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 the report: -
(Name of part, item number, Mfg.'s name and identifying stamp)

Vessel used for chemicals. Exempt from impact testing per para. UHA-51(d) & (e). No NDE performed. Vessel tested in horizontal position.
Note: 12" flange & blind are SA-105 lined with SA-240-316L.

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. 1,005 expires 3/31, 2001
Date 5/19/98 Co. name Dusenbery Engineering Co., Inc. Signed William A. Heland (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by Dusenbery Engineering Co., Inc. Morristown, NJ
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of NJ and employed by Commercial Union Insurance Company
have inspected the component described in this Manufacturer's Data Report on 5/19, 1998, 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 5/19/98 Signed William A. Heland (Authorized Inspector) Commissions AB5776A-NJ42258
(Nat'l. Board (incl. endorsement), State, Prov. and No.)