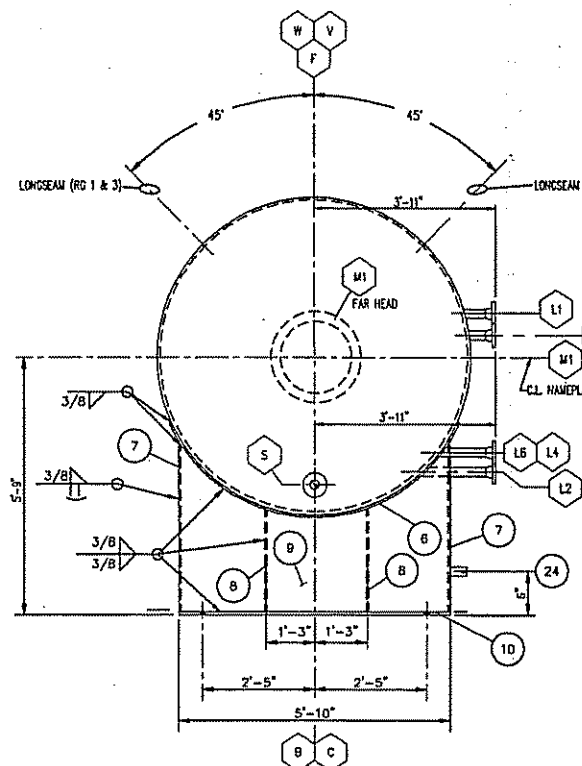
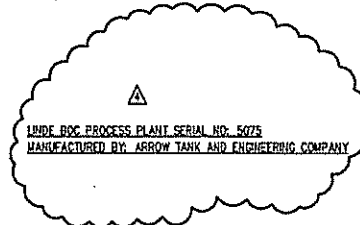
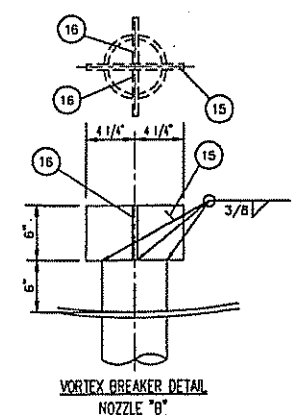




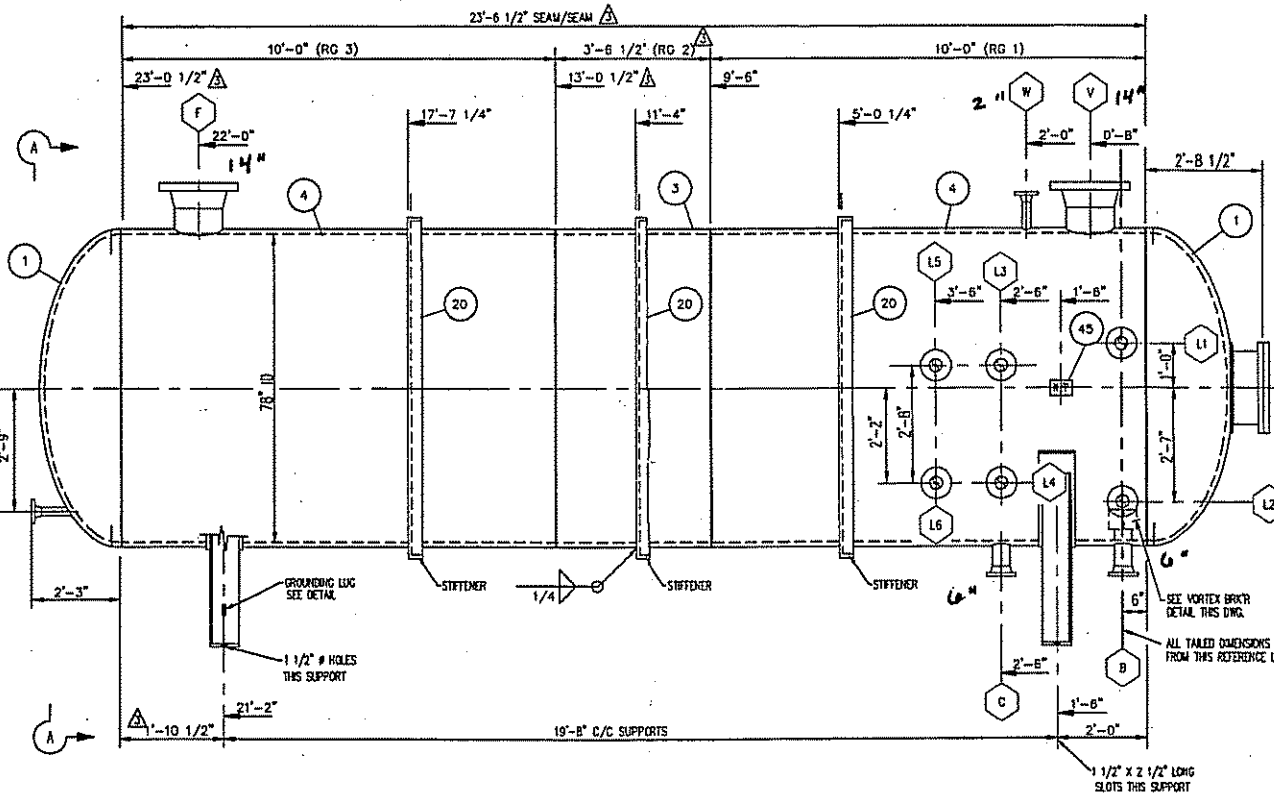
VIEW "A-A"



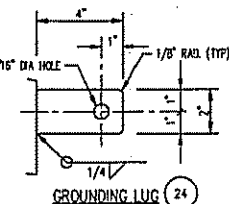
MAX. EXTERNAL PRESSURE: 11.2 @ 0°F/600°F



VORTEX BREAKER DETAIL NOZZLE "D"



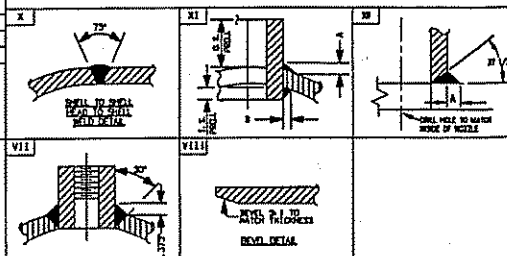
ELEVATION



GROUNDING LUG

1. VESSEL IS IN SOUR WATER SERVICE.
2. ** VACUUM DEGASSED LOW SULPHUR 0.006% MAX. SULPHUR WITH SULFUR SHAPE CONTROL & 0.002% MAX. SULFUR WITHOUT SULFUR SHAPE CONTROL.
3. MAGNETIC PARTICLE EXAMINATION PER ENGINEERING SPECIFICATION 89C-15, PARA. 6.3
4. ULTRASONIC TEST PER PARA. 6.5
5. WET FLUORESCENT MAGNETIC PARTICLE TEST PER PARA. 6.6
6. HARDNESS TEST PER PARA. 6.7
7. ALL WELDS 1/4" CONTINUOUS UNLESS OTHERWISE NOTED.
8. * - MATERIALS TO BE SHIPPED LOOSE
9. SA-516-70 MATERIAL MAY BE SUBSTITUTED FOR SA-36 MATERIAL.
10. PAINT: CARBOLINE
11. PRIMER: CARBOZINC 11 HS 2.5/3 MIL D.F.T.
12. INTERMED: 893 SG 4/6 MIL D.F.T. (WHITE)
13. FINISH COATS: CARBOTHANE 134 HG 1.5/2 MIL D.F.T. (WHITE)
14. SURFACE PREPARATION: SSPC-SP10
15. ESTIMATED WEIGHT EMPTY: 13,740 LBS.
16. INSULATION: NONE
17. CLEAN VESSEL THOROUGHLY AND PROTECT ALL OPENINGS FOR SHIPMENT
18. ALL REINFORCING PADS AND SEAMENTS TO HAVE (1) 25" N.P.T. TELL-TALE HOLE PADS TO BE AIR TESTED AT 25 PSIG.
19. ALL FLANGES TO HAVE BOLT HOLES STRADDLING TRUE VESSEL CENTER LINES
20. ALL NOZZLES TO HAVE FULL PENETRATION WELDS

GENERAL NOTES (UNLESS OTHERWISE NOTED)



BILL OF MATERIAL

NO.	QTY.	DESCRIPTION	MAT'L SPEC.
1	2	HEADS, 78" ID X .3125" MIN 2:1 ELLIP W/ 2" SF (3/8" NOM.)	SA-516-70N
2	1	PLATE, 3/8" THK X 78" I.D. X 3'-6 1/2" LG	SA-516-70N
3	1	PLATE, 3/8" THK X 78" I.D. X 10'-0" LG	SA-516-70N
4	2	FLANGE, 3/8" THK X 10" X 7'-3" LG (ROLL 10" RHD ROLLS TO 39 3/8" IS)	SA-516-70
5	2	FLANGE, 3/8" THK X 7" X 3'-8" LG	SA-36
6	2	FLANGE, 3/8" THK X 7" X 3'-8" LG	SA-36
7	2	FLANGE, 3/8" THK X 5'-10" X 4'-0 1/8" LG	SA-36
8	2	FLANGE, 3/4" THK X 8" X 5'-10" LG	SA-36
9	2	FLANGE, 3/4" THK X 8" X 5'-10" LG	SA-36
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13	2	FLANGE, 3/4" THK X 8" X 5'-10" LG	SA-36
14	2	FLANGE, 3/4" THK X 8" X 5'-10" LG	SA-36
15	1	FLANGE, 3/8" THK X 6" X 0'-8 1/2" LG	SA-36
16	2	FLANGE, 3/8" THK X 6" X 0'-4 1/16" LG	SA-36
17	2	FLANGE, 3/8" THK X 6" X 0'-4 1/16" LG	SA-36
18	2	FLANGE, 3/8" THK X 6" X 0'-4 1/16" LG	SA-36
19	2	FLANGE, 3/8" THK X 6" X 0'-4 1/16" LG	SA-36
20	3	ANGLE, 1/4" THK X 2 1/2" X 2 1/2" (ROLL TO 78 7/8" ID. LEG-R)	SA-36
21	2	FLANGE, 1/4" THK, X 2" WD. X 4" LG.	SA-36
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32	1	FLANGE, 1/4" THK, X 2" WD. X 4" LG.	SA-36
33	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
34	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
35	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
36	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
37	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
38	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
39	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
40	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
41	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
42	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
43	2	FLANGE, 14"-150# RFLWN W/ SCH. 120 BORE	SA-105
44	2	FLANGE, 6"-150# RFLWN W/ SCH. 120 BORE	SA-105
45	1	NAMEPLATE W/ BRACKET	SNL STL
46	1	NAMEPLATE W/ BRACKET	SNL STL
47	1	NAMEPLATE W/ BRACKET	SNL STL
48	1	NAMEPLATE W/ BRACKET	SNL STL
49	1	NAMEPLATE W/ BRACKET	SNL STL
50	1	NAMEPLATE W/ BRACKET	SNL STL
51	1	NAMEPLATE W/ BRACKET	SNL STL
52	1	NAMEPLATE W/ BRACKET	SNL STL
53	1	NAMEPLATE W/ BRACKET	SNL STL
54	1	NAMEPLATE W/ BRACKET	SNL STL
55	1	NAMEPLATE W/ BRACKET	SNL STL
56	1	NAMEPLATE W/ BRACKET	SNL STL
57	1	NAMEPLATE W/ BRACKET	SNL STL

GENERAL SPECIFICATION

SOUR WATER SERVICE
 AMCCO RATING NO. 2

MATERIAL

SHELL: 0.375" THK SA-516-70N**

HEADS: 0.3125" MIN THK SA-516-70N** TYPE 2:1 ELLIP.

FLANGES: 150# SA-105

PIPE NOZZLES: SA-106-B

WELDING FITTINGS: SA-234-WPB

COUPLINGS: SA-

STUD BOLTS: SA-193-B7 (ZINC PLATED)

NUTS: SA-194-2H (ZINC PLATED)

H.N. BOLTS & NUTS: SA-

GASKETS: 1/8" THK FLEX. "CG" 304SS W/FLEXICARB FILLER

DESIGN DATA

DESIGN PRESSURE: 50 PSIG AT 0°F/600°F

IMPACT TEST EXEMPT PER UCS-66(c)

HYDROSTATIC TEST: 205 PSIG

CORROSION ALLOWANCE: 0.125" INCHES

WIND PRESSURE ZONE: 105 MPH

EARTHQUAKE ZONE: 1

HEAT TREAT: 2 HRS 0 MINUTES AT 1175 T ± 25F

HEATING RATE: ABOVE 800°F ≤ 400°F PER HOUR

COOLING RATE: ABOVE 800°F ≤ 500°F PER HOUR

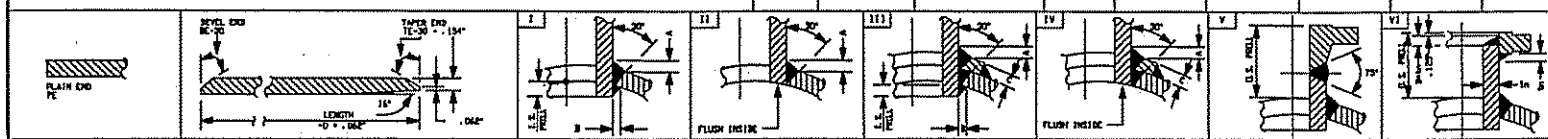
RADIOGRAPHY

CATEGORY A WELDS	RT1	RT2	RT3	RT4
LONG SEAMS	■	□	□	□
CATEGORY B WELDS	■	□	□	□
HEAD TO SHELL	■	□	□	□
INTERMEDIATE GIRTH	■	□	□	□
NOZZLE >10" OR >1.125 WT	■	□	□	□
NOZZLE <10" OR <1.125 WT	■	□	□	□
JOINT EFFICIENCIES(%)	100	100	85	100
LONG SEAM	100	100	85	100
SEAMLESS	100	100	85	100
ADDITIONAL N.D.E.	SEE NOTE 12			

VESSEL TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE 2001 ASME BOILER & PRESSURE VESSEL CODE SECTION VIII DIVISION 1, 2003 ADDENDA AND IS TO BE SO STAMPED. INSPECTION BY AUTHORIZED INSPECTION AGENCY

QTY.	WK.	SIZE	RATING	TYPE	FACING	SERVICE	REMARKS	O.S.	I.S.	WELD DETAIL	A	B	C	D	WALL	SEAMLESS	LENGTH	PREPARATION	PREPARATION	ORIGIN
1	W	2"	150#	WN	RF	VENT		38	5"	0	II	V	3/8		.344"	SA-106-B	0'-5 13/16"	BE 37 1/2"	PE	
1	V	14"	150#	WN	RF	VAPOR OUTLET		33	10"	0	II	V	5/8		1.094"	SA-106-B	0'-5 15/16"	BE 37 1/2"	PE	
1	S	2"	150#	WN	RF	STEAM OUT		38	10"	0	II	V	3/8		.344"	SA-106-B	1'-0 15/16"	BE 37 1/2"	PE	
1	M1	18"	150#	LWN	RF	MANWAY W/BLIND & DAMP	26,30,31,52,53,54,55	BE 37 1/2"	0	IV	3/8	1/4			.344"	SA-106-B	1'-4 1/2"	BE 37 1/2"	PE	
1	L6	2"	150#	WN	RF	LEVEL TRANSMITTER		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	0'-6 1/8"	BE 37 1/2"	PE	
1	L5	2"	150#	WN	RF	LEVEL TRANSMITTER		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	0'-6 1/8"	BE 37 1/2"	PE	
1	L4	2"	150#	WN	RF	LEVEL TRANSMITTER		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	1'-4 1/2"	BE 37 1/2"	PE	
1	L3	2"	150#	WN	RF	LEVEL TRANSMITTER		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	0'-6 1/8"	BE 37 1/2"	PE	
1	L2	2"	150#	WN	RF	LEVEL GAGE		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	1'-10 7/16"	BE 37 1/2"	PE	
1	L1	2"	150#	WN	RF	LEVEL GAGE		38	BE 37 1/2"	0	II	V	3/8		.344"	SA-106-B	0'-7 3/4"	BE 37 1/2"	PE	
1	F	14"	150#	WN	RF	MAIN INLET		33	10"	0	II	V	5/8		1.094"	SA-106-B	0'-5 15/16"	BE 37 1/2"	PE	
1	C	6"	150#	WN	RF	HYDROCARBON DRAIN		34	8"	0	II	V	1/2		.562"	SA-106-B	0'-5"	BE 37 1/2"	PE	
1	B	6"	150#	WN	RF	HYDROCARBON LIQUID OUTLET		34	8"	0	I	V	3/8		.562"	SA-106-B	0'-10 7/8"	BE 37 1/2"	PE	

CONNECTION SCHEDULE



NO.	QTY.	DESCRIPTION	MAT'L SPEC.
1	2	HEADS, 78" ID X .3125" MIN 2:1 ELLIP W/ 2" SF (3/8" NOM.)	SA-516-70N
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FORM 1002 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

Later

1. Manufactured and certified by ARROW TANK AND ENGINEERING COMPANY 650 NORTH EMERSON CAMBRIDGE, MINNESOTA 55008
(Name and address of manufacturer)

2. Manufactured for LINDE BOC PROCESS PLANTS 8522 EAST 61 ST STREET TULSA, OK 74133-1923
(Name and address of purchaser)

Location of installation UNKNOWN
(Name and address)

4. Type: Horiz 38929 - D14568-18 34437 2005
(Horiz. or vert. tank) (Mfr'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

2001
Year

to 2003
Addenda (Date)

6. Shell: SA-516 70N 375" 1/8" 6'-6" 23'-6 1/2"
Mat'l. (Spec. No., Grade) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft. & in.)) (Length (overall) (ft. & in.))

7. Seams: 1 FULL 100 1175 2 hr. 1 Full 3
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-516 Gr70N (b) Mat'l. SA-516 Gr 70N
(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)	END	.3125"	1/8"	-	-	2:1	-	-	-	CONCAVE
(b)	END	.3125"	1/8"	-	-	2:1	-	-	-	CONCAVE

If removable, bolts used (describe other fastenings) -

9. MAWP 50 psi at max. temp. 600 °F
Min. design metal temp. 0 °F at 50 psi Hydro., 205 test pressure
(Mat'l., Spec. No., Gr., Size, No.)

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
MANWAY	1	18"	LWNF/RF	SA-105	150#	NONE	UW16.1 (d)	HEAD
OUTLET/INLET	2	14"	WNF/RF	SA-106 Gr B	SCH 120	NONE	UW16.1 (d)	-
MISC.	2	6"	WN/RF	SA-106 Gr. B	SCH 120	NONE	UW16.1 (d)	-
MISC.	8	2"	WN/RF	SA-106 Gr. B	SCH 120	NONE	UW16.1 (d)	-

11. Supports: Skirt NO Lugs - Legs - Other (2x) SADDLES 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: NONE

IMPACT EXEMPT PER UG20(f)
(Name of part, item number, Mfr's name and identifying stamp)

HYDRO TEST IN HORIZONTAL POSITION

ATE JOB# 14568-18

CERTIFICATE OF SHOP / FIELD 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. 10676 expires December-31-2006

Date July-19-2005 Co. Name ARROW TANK AND ENGINEERING COMPANY Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP / FIELD INSPECTION

Vessel constructed by ARROW TANK AND ENGINEERING COMPANY at 650 NORTH EMERSON, CAMBRIDGE, MINNESOTA 55008

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of MN and employed by Hartford Steam Boiler Insp. & Ins. Co. of CT have inspected the component described in this Manufacturer's Data Report on July-19-2005, 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 July-19-2005 Signed [Signature] Commissions NB 11620A.B MN 039692-CO
(Authorized Inspector) (Nat'l Board, (incl. endorsements) State, Prov. and No.)

Tag #

20-514

(N)

34437

(U)

CERTIFIED BY ARROW TANK
& ENGINEERING CO.
CAMBRIDGE & MINNEAPOLIS MINE

W

MAX. ALLOWABLE
WORKING PRESS.

RT1

HT

[50] PSI AT [600] °F

MIN. DESIGN METAL TEMPER.

[0] °F AT [50] PSI

MFG'S SERIAL NO. [38929]

YR. BUILT [2005]

C.A. .125"

[N/A] [375] [313]

CONC.

SHLL.

HEAD

HEAD RAD. [2:1]

[illegible]